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# Laboratory Bulletin

**Date:** **September 20, 2022**
**To:** **Edmonton Zone – Physicians, Nurses, Laboratory Directors, and Managers**
**From:** **Clinical Biochemistry, North Sector, Alberta Precision Laboratories (APL)**
**Re:** **Change in chemistry instruments at Royal Alexandra Hospital (RAH)**

## PLEASE POST OR DISTRIBUTE AS WIDELY AS APPROPRIATE

**Key Messages:**

- The newest generation of Roche Cobas Pro chemistry instruments will replace current instruments at the Royal Alexandra Hospital on **Tuesday September 27, 2022**.
- A number of major changes will occur and are summarized below:

| Test | Changes | More details |
|---|---|---|
| Troponin | Switch to hs-TnT and rapid 2 hr chest pain pathway involving new rule-out and rule-in cutoffs and deltas | Appendix A |
| Natriuretic peptide | Switch to NT-proBNP and updated reference intervals | Appendix A |
| Quantitative beta-hCG | Alignment of assay with DynaLIFE | Appendix A |
| See appendix for list of tests | Provincial standardization of RI for cardiac biomarkers, liver enzymes, and others | Appendix B |
| Intraoperative PTH (IOPTH) | Measuring unit change from pmol/L to ng/L | Appendix C |
| Blood/urine collection container type | Changes to container type for ammonia, NTproBNP, and magnesium/phosphate 24 hr urine | Appendix D |
| See appendix for list of tests | Results are expected to significantly change for select tests. Long-term monitoring of patients will require re-baselining to establish new trends. | Appendix E |

**Why this is important:**

- This change is part of a large-scale provincial standardization effort to implement Roche chemistry instruments in urban hospital laboratories across Alberta.
- UAH, SGH, MCH, and GNH have already switched to Roche over the last several months.
- Smaller suburban and rural sites in the Edmonton Zone will not be switching to Roche and will remain status quo.

**Action Required:**

- Be aware of various changes outlined in Appendix A to E.
- Be aware of differences in instruments, tests, and reference intervals across Edmonton Zone.
- Ordering in Epic will not change.

**Inquiries and feedback may be directed to:**
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**This bulletin has been reviewed and approved by:**
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**Appendix A: Changes to cardiac biomarkers and beta-hCG (see Table A)**

**Troponin T, high sensitivity**

- The Roche high sensitivity troponin T (hs-TnT) assay will replace the Beckman high sensitivity troponin I (hs-TnI) assay in conjunction with a revised rapid chest pain pathway. See hs-TnT Survival Guide for further details.
- Results for hs-TnT are extremely different from hs-TnI and conventional troponin assays used at other suburban/rural sites in Edmonton and cannot be used interchangeably.
- When ordering troponin, the test will default to the local site test, which is hs-TnT. The Epic test order name remains the same ("Troponin").

**Natriuretic Peptides (BNP or NT-ProBNP)**

- The Roche NT-proBNP assay will replace the Beckman BNP assay.
- Results for NT-proBNP are extremely different from BNP and cannot be used interchangeably.
- When ordering natriuretic peptides, the test will default to the local site test, which is NT-proBNP. The Epic test order name remains the same ("B-Natriuretic Peptide (BNP or NT-ProBNP)").
- Outpatient and community BNP samples collected at DynaLIFE or suburban rural centers within Edmonton Zone will be sent to the University of Alberta Hospital for NT-proBNP testing.

**Beta-hCG**

- The Roche beta-hCG assay is the same assay used at DynaLIFE, which will now allow serial monitoring between hospital sites using Roche and community settings.
- This effectively solves the long-standing problem in the Edmonton Zone where hospital and DynaLIFE assays were not interchangeable, and could not be used to directly monitor levels.

**Table A: Summary of changes to cardiac biomarkers and hCG.**

| Test (units) | Ordering name | New RIs or critical limits | Notes |
|---|---|---|---|
| hs-TnT (ng/L) | Troponin | RI: <14<br><br>Critical limit only phoned for outpatient/community results: >52 | • See hs-TnT Survival Guide for rule in and rule out pathway.<br>• Results differ significantly from hs-TnI and other conventional troponin assays and should not be used interchangeably.<br>• The use of the Barricor blood collection container will not change. |
| NT-proBNP (ng/L) | B-Natriuretic Peptide (BNP or NT-ProBNP) | <1 y: 54-556<br>1 to <2 y: 39-578<br>2 to <6 y: 20-565<br>6 to <12 y: 10-340<br>12 to <18 y: 6-216<br>≥18 y: 0-300 | • Results differ significantly from BNP and should not be used interchangeably.<br>• Blood collection container type will change from lavender top EDTA tubes to green top lithium heparin plasma (see Appendix D).<br>• Interpretative comments for adults ≥18 years will be appended to results: |

| | | | |
|---|---|---|---|
| | | | "In an acute setting, Heart Failure is unlikely if NT-proBNP <300 ng/L.<br>Heart Failure is likely if:<br>NT-proBNP >450 ng/L for patients <50 years of age<br>NT-proBNP >900 ng/L for patients 50-75 years of age,<br>NT-proBNP >1800 ng/L for patients >75 years of age<br>2017 CCS HF Guidelines, CJC 2017" |
| hCG (IU/L) | Beta hCG, quantitative | No change | • The Roche assay is the same assay used at DynaLIFE and will allow serial monitoring between hospital and community settings.<br>• The Beckman assay will remain in use at the suburban and rural sites that test hCG on-site. These assays will not trend in Epic. |

RI = reference interval
y = Years

## Appendix B: Changes to reference intervals (RIs) due to switch to Roche instruments

**Table B1. Changes to RIs for tests performed at RAH.**

| | Current RI | | | New standardized RI | | |
|---|---|---|---|---|---|---|
| **Test (units)** | **Age** | **Gender (M,F,U,X)** | **RI** | **Age** | **Gender (M,F,U,X)** | **RI** |
| ALT (U/L) | <18 y | All | <35 | <18 y | All | <40 |
| | ≥18 y | M/U/X | <60 | ≥18 y | M/U/X | <70 |
| | ≥18 y | F | <40 | ≥18 y | F | <50 |
| Anion gap (mmol/L) | All | All | 5 – 10 | All | All | 4 – 16 |
| AST (U/L) | <30 d | All | <100 | <30 d | All | <115 |
| | 30 d - <1 y | All | <70 | 30 d – <1 y | All | <80 |
| | 1 - <6 y | All | <50 | 1 – <7 y | All | <60 |
| | 7 - <18 y | All | 35 | 7 – <18 y | All | <45 |
| | ≥18 y | M/U/X | <45 | ≥18 y | M/U/X | <55 |
| | ≥18 y | F | <35 | ≥18 y | F | <45 |
| Bilirubin, conjugated (µmol/L) | All | All | Critical limit for <31 d: >18 | All | All | No critical limit |
| Natriuretic peptides (ng/L) | • Test will change from BNP to NT-proBNP.<br>• See Appendix A | | | | | |
| *Lipase (U/L) | All | All | ≤60 | <18 y | All | <50 |
| | | | | ≥18 y | | <80 |
| *LD (U/L) | <2 y | All | 180 – 430 | <1 y | All | 200 – 420 |
| | 2 – <12 y | | 110 – 300 | 1 - <10 y | | 140 – 320 |
| | ≥12 y | | 100 – 225 | 10 – <15 y | | 120 – 300 |
| | | | | ≥15 y | | 120 – 250 |
| Prealbumin (g/L) | All | All | 0.100 – 0.400 | All | All | 0.200 – 0.400 |
| Theophylline (µmol/L) | All | All | 25 – 55 | All | All | 28 – 83<br>Critical limit of >110 remains the same |
| Total protein, CSF (g/L) | All | All | 0.15 – 0.45 | ≤30 d | All | 0.14 – 1.12 |
| | | | | ≥30 d | All | 0.15 – 0.45 |
| Troponin T, hs (ng/L) | • Test will change from hs-TnI to hs-TnT<br>• See Appendix A | | | | | |

M = Male; F = Female; U = Unknown; X = non-binary

d = Days; m = Months; y = Years

RIs = reference intervals

*Click here to access lipase and LD bulletin for more details on updates to these RIs.

**Appendix C: Changes to measuring units for intraoperative PTH (IOPTH)**

**Table C: Summary of measuring unit changes for IOPTH**

| Test | Current units | New units | Notes |
|---|---|---|---|
| IOPTH | pmol/L | ng/L | • Routine PTH performed at DynaLIFE will temporarily remain with pmol/L until further notice. To convert from ng/L to pmol/L divide result by 9.4.<br>• Results from different assays are not comparable and should not be used for trending purposes. |

**Appendix D: Changes to default collection container types for select blood and urine collections**

**Table D1: Summary of changes to default collection container type for ammonia and NT-proBNP.**

| Test | Current container type | New container type | Notes |
|---|---|---|---|
| Ammonia | Lithium heparin plasma (green top tubes) | EDTA plasma (lavender top tubes) | • See Appendix E for expected changes to test results due to instrument and container type changes. |
| NT-proBNP | EDTA plasma (lavender top tubes) for BNP | Lithium heparin plasma (green top) | • NTpro-BNP will replace BNP as indicated in Appendix A. |

**Table D2: Changes to default collection container type for 24 hour urine phosphate and magnesium.**

| Test | Performing site | Current container type | New container type | Notes |
|---|---|---|---|---|
| Magnesium, Urine, 24 Hour | UAH | 24 Hr Urine Container – Plain<br>24 Hr Urine Container – Acid | 24 Hr Urine Container – Acid | • Specimens must be collected in a container preserved with acid |
| Phosphate, Urine, 24 Hour | UAH | 24 Hr Urine Container – Plain | 24 Hr Urine Container – Acid | • Specimens must be collected in a container preserved with acid |

**Appendix E: Approximate changes expected to results with switch to Roche instruments**

**Table E1.**

| Test | Approximate range of result changes | Notes |
|---|---|---|
| Acetaminophen | -15% to -30% | N/A |
| ALP | +20% to +30% | See Appendix B for RI changes. |
| ALT | -5% to +15% | See Appendix B for RI changes. |
| Ammonia | -5% to -15% | See Appendix D for tube type changes. |
| AST | +10% to +80% | See Appendix B for RI changes. |
| Bilirubin, conjugated | +20% to +40% | N/A |
| Bilirubin, total | -5% to -20% | N/A |
| Chloride | +3 mmol/L | See Appendix B for RI changes. |
| Gentamicin | -25% | N/A |
| hCG | -25% to -35% | This is now the same assay used at DynaLIFE and can be used for serial monitoring. See Appendix A. |
| LD | +20% to +30% | See Appendix B for RI changes. |
| Lipase | +20% to +45% | See Appendix B for RI changes. |
| NT-proBNP | +130% to +850% | See Appendix A and B for reporting and RI changes. |
| Prealbumin | -20% | See Appendix B for RI changes. |
| Theophylline | +10 to +15% | N/A |
| Tobramycin | -25% | N/A |
| Troponin T, high sensitivity | -100% to + 800% | See Appendix A and B for reporting and RI changes. |