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Laboratory Bulletin

DATE:	2022 July 11
TO:	Edmonton Zone – Physicians, Nurses, Laboratory Directors, and Managers
FROM:	Clinical Biochemistry, North Sector, Alberta Precision Laboratories (APL)
RE:	**Change in Chemistry Instruments at Misericordia Community Hospital and Grey Nuns Community Hospital**

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Key Message

- The newest generation of Roche Cobas Pro chemistry instruments will replace current Beckman Coulter instruments at **Misericordia Community Hospital on Tuesday July 19, 2022 at 10:00 AM and Grey Nuns Community Hospital on Thursday July 21, 2022 at 10:00 AM (Table 1)**.

Table 1. Remaining Roche chemistry implementation schedule in Edmonton Zone

Site	Current instruments	New instrument	Go-Live date
*MCH	Beckman Coulter	Roche Cobas	July 19, 2022
*GNH	Beckman Coulter	Roche Cobas	July 21, 2022
RAH	Beckman Coulter	Roche Cobas	End of September, date TBD

*This bulletin applies to the Misericordia Community Hospital and Grey Nuns Community Hospital. RAH will remain with current instruments until designated go-live.

MCH = Misericordia Community Hospital; GNH = Grey Nuns Community Hospital; RAH = Royal Alexandra Hospital; CCI = Cross Cancer Institute
TBD = to be determined

- A number of changes will be adopted with switch to Roche instruments: cardiac biomarkers & quantitative beta-hCG test changes (Appendix A), reference interval (RI) changes (Appendix B), measuring unit changes for intraoperative PTH (Appendix C), and blood/urine collection container type changes (Appendix D).
- Results for a number of Roche tests are expected to significantly change due to differences in reagent formulation and/or changes in blood collection container types (Appendix E). Long-term monitoring of patients for these select tests will require re-baselining to establish new trends.

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, which will benefit patients by standardizing laboratory practice and reporting components.
- University of Alberta Hospital and Sturgeon Community Hospital have switched to Roche on June 19 and June 21, respectively. Royal Alexandra Hospital will stay on current instruments as an interim state until their designated go-live date (Table 1). During this interim state, beta-hCG, cardiac biomarkers, and other tests with different reference intervals are not comparable across different instruments.
- Smaller suburban and rural sites will not be switching to Roche and will remain status quo.

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Action Required

- Be aware of various changes outlined in Appendix A to D with implementation of Roche at Misericordia and Grey Nuns Community Hospitals.
- Be aware of the phased Roche implementation timeline at relevant sites (Table 1) and interim state where there will be temporary differences in tests and reference intervals.
- Be aware of varying instruments, tests, and reference intervals across all Edmonton Zone urban, suburban, and rural sites.
- It is recommended to establish a new baseline for a number of Roche tests listed in Appendix E.
- 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

- Dr. Kareena Schnabl, Section Chief, Clinical Biochemistry, North Sector, APL
- Dr. Michael Mengel, Medical Director, North Sector, APL

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. A new rapid chest pain protocol will also be implemented. 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 Critical limit only phoned for outpatient/community results: >52	• See hs-TnT Survival Guide for rule in and rule out pathway. • Results differ significantly from hs-TnI and other conventional troponin assays and should not be used interchangeably. • Blood collection container type will not change.
NT-proBNP (ng/L)	B-Natriuretic Peptide (BNP or NT-ProBNP)	<1 y: 54-556 1 to <2 y: 39-578 2 to <6 y: 20-565 6 to <12 y: 10-340 12 to <18 y: 6-216 ≥18 y: 0-300	• Results differ significantly from BNP and should not be used interchangeably. • Blood collection container type will change from lavender top EDTA tubes to green top lithium heparin plasma (see Appendix D).

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. • 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

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

Table B1. Changes to RIs for tests performed at MCH and GNH.

	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. • See Appendix A					
Lipase (U/L)	All	All	≤60	<16 y	All	≤60
				≥16 y	All	≤80
LD (U/L)	<2 y	All	180 – 430	1 d – <5 y	All	125 – 320
	2 – <12 y		110 – 300	6 - <10 y		125 – 300
	≥12 y		100 – 225	11 – <15 y		115 – 260
				≥16 y		100 – 235
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 • See Appendix A					

M = Male; F = Female; U = Unknown; X = non-binary
d = Days; m = Months; y = Years
RIs = reference intervals

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Appendix C: Changes to measuring units for intraoperative PTH (IOPTH) at MCH an GNH

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. • Results from different assays are not comparable and should not be used for trending purposes. • UAH already switched to ng/L with Roche implementation on June 21, 2022.

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 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 using 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 +10%	See Appendix B for RI changes.
Ammonia	-5% to -15%	See Appendix D for tube type changes.
AST	+10% to +30%	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.
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 +800%	See Appendix A and B for reporting and RI changes.
Troponin T, high sensitivity	-100% to + 800%	See Appendix A and B for reporting and RI changes.