Appendix B – Lab Not Live - Major Changes for Laboratory Medicine with Connect Care

A. Transfusion Medicine	pg 1
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C. Hematology, Coagulation and Flow Cyt	ometry pgs 7-10
D. Clinical Microbiology	pgs 10-13

A. Transfusion Medicine

There are several resources available pertaining to transfusion medicine in the Connect Care Knowledge Library and the Learning Home Dashboard. The most comprehensive resource for EPIC / WellSky information is called the Blood Administration Manual. It can be found by searching: Blood administration guide | Insite (albertahealthservices.ca) There are also 6 modules within My Learning Link dedicated to different aspects of Blood Administration. More generic transfusion medicine resources continue to be available on Insite and AHS websites (https://insite.albertahealthservices.ca/lab/Page7421.aspx and https://www.albertahealthservices.ca/lab/Page3318.aspx).

Transfusion Prenatal testing should continue to be ordered on the Canadian Blood Services requisition. Work is underway to build a reference laboratory interface to allow results to flow back to the Connect Care chart. For Rh negative prenatal and postpartum patients, please ensure ordering of Prenatal and Postnatal Evaluation to ensure that eligibility for Rh Immune Globulin can be assessed.

For patients who are admitted under an alias name and have Type and Screen testing performed using that alias, do not remove the alias arm band or the TSIN band until the Type and Screen expires or is recollected. Since transfusion of red cells, platelets, plasma and cryoprecipitate requires administration within an approved facility, pre-transfusion testing and blood component requests will be restricted to physicians who have privileges within those environments.

It is very important to ensure that the orders for transfusion are placed in the correct facility and encounter for where the actual transfusion is to occur to avoid loss of orders or components being sent to the incorrect location. It is also important to note that since the transfusion medicine laboratories are seen as a separate facility to the site laboratory, it is not possible to do "add-ons" within the EPIC system.

B. Point of Care Testing (POCT)

1. Connectivity of POCT devices

There are changes to result reporting for POCT devices that require workflow (<u>Connect Care</u> <u>POCT Information Sheet</u>) and clinical practice changes. A controlled connectivity rollover of POCT devices to the POCT AegisPOC data management middleware, and then into Epic will occur in conjunction with Connect Care Launches. Results from POCT devices will either: 1) flow directly from the device through the new POCT middleware into the electronic medical record (i.e. connectable), or 2) be manually entered into AegisPOC so results can flow into Epic (i.e. non-connectable).

Connected device workflows:

- POCT Device Connect Care Workflows
 - o Roche Accu-Chek Inform II Glucose Meter
 - Abbott i-STAT1 and i-STAT Alinity
 - o <u>Mobile Integrated Health</u>

- o Radiometer ABL90 Flex Plus
- o <u>Siemens Clinitek Status Plus</u>
- Werfen GEM 5000
- o <u>Siemens DCA Vantage</u>
- o <u>Siemens CoaguChek XS Pro</u>
- o <u>Werfen Avoximeter 1000E</u>

Unconnected device workflows:

- POCT Workflows for Manual Test Methods
 - o <u>AegisPOC Launch Button Set Up for Manual Test Result</u>
 - o <u>AegisPOC Manual Test Result Entry AmnioTest</u>
 - AegisPOC Manual Test Result Entry AmniSure
 - o <u>AegisPOC Manual Test Result Entry Drager Jaundice Meter</u>
 - o <u>AegisPOC Manual Test Result Entry Glucose Meter</u>
 - o AegisPOC Manual Test Result Entry Hemocue 201
 - o <u>AegisPOC Manual Test Result Entry Manual Urine Dipstick</u>
 - o AegisPOC Manual Test Result Entry Siemens Clinitek Status
 - o AegisPOC Manual Test Result Entry Urine Drugs of Abuse Screen
 - <u>AegisPOC Manual Test Result Entry Urine Pregnancy</u>
- Additional AegisPOC Manual Test Result Entry Resource:
 - o AHS My Learning Link course: "POCT-AegisPOC Manual Test Result Entry"

2. All healthcare professionals/providers must adhere to the following when performing POCT:

- Be a Trained and Certified Clinical User of POCT
 - Completed POCT certification requirements to access or use all devices (manual or automated).
 - APL POCT will provide access to the POCT middleware system, AegisPOC, for result transmission or manual test result entry.
- Use your <u>AHS employee ID barcode number</u> to access POCT devices or to access the AegisPOC Manual Test Result Entry application.
- Use correct <u>Epic patient identifier</u> for POCT:
 - Use the <u>correct</u> Epic-generated patient ID encounter (Contact Serial Number **[CSN]**).
 - Only the correct CSN will allow results to flow uninterrupted to the patient's Epic chart and Netcare.
 - Additional Connect Care CSN Resources:
 - o AHS POCT Playbook Work Package
 - AHS My Learning Link course: "POCT-Connect Care POCT Requirements"

3. POCT Reference Interval and Critical Value Standardization

a) Anion Gap

• Standardization of reference intervals by POCT device (Launch 5 sites included below):

Testing Site	Instrument	Reference Interval (mmol/L)
Foothills Medical Centre	GEM5000	4 – 16
Mobile Integrated Health (MIH)	i-STAT	13 – 21

Patient, Test	
MRN: 1#0#0#0#0#0	ULI: 1#0#0#0#0
COE 10'5/19"9(40 "s)	Ferre
Adm , (e: 3 / 0/2 17	(D)
	IFLE
CSN: AC000000000000	

b) Ionized Calcium

Standardization of critical values: <0.80 mmol/L and >1.50 mmol/L
 Standardization of reference intervals by POCT device for "Calcium, Ionized" and "Calcium Ionized, pH normalized" (Launch 4 sites included below):

Testing Site	Instrument	Reference Interval (mmol/L)
Foothills Medical Centre	GEM5000	0.9 – 1.3 (<29 d)
		1.15 – 1.35 (≥29 d)
Mobile Integrated Health (MIH)	i-STAT	1.15 – 1.35

c) Macroscopic urinalysis

• Standardization of reference intervals:

Analyte	Reference Interval	Units
Blood, Urine	Negative	Ery/μL
Clarity, Urine	Clear	
Color, Urine	Colourless, Yellow, Amber	
Glucose Urine	Negative	mmol/L
Ketones, Urine	Negative	mmol/L
Leukocyte Esterase, Urine	Negative	Leu/µL
Nitrites, Urine	Negative	-
pH, Urine	5.0-8.0	-
Protein, Urine	Negative	g/L
Specific Gravity	1.005-1.030	-

• Macroscopic Urinalysis Reporting

With each Connect Care Launch, all POCT urinalysis patient test results must be reported into the Epic patient electronic medical record. This requirement applies to both **Manual** (dipstick) and **Automated** (Clinitek Status[®]+) testing. All reporting units for urinalysis testing in Epic in EPIC have been standardized provincially to SI units, which provides a numerical result rather than using other reporting schemes (e.g., 1+/2+/3+, small/medium/large).

Test component	Siemens Clinitek Status	Manual Dipstick Urinalysis	Connect Care (Epic)
Test component	Device result reporting	Test strip vial reporting	Result Reporting
Color		Colorless	Colorless
	Yellow	Yellow	Yellow
	Amber	Amber	Amber
	Orange	Orange	Orange
	Red	Red	Red
	Brown	Brown	Brown
		Black	Black
	Other	Other	Other
Clarity	Clear	Clear	Clear
	Slightly Cloudy	Slightly Cloudy	Slightly Cloudy
	Cloudy	Cloudy	Cloudy
	Turbid	Turbid	Turbid
	Other (do not use)		
SG	≤1.005	1.000	<1.005
(Specific Gravity)		1.005	1.005
	1.010	1.010	1.010

Table 1. Urinalysis result reporting for Connect Care

Test some south	Siemens Clinitek Status	Manual Dipstick Urinalysis	Connect Care (Epic)
l'est component	Device result reporting	Test strip vial reporting	Result Reporting
	1.015	1.015	1.015
	1.020	1.020	1.020
	1.025	1.025	1.025
		1.030	1.030
	≥1.030		≥1.030
	Unable to interpret due	Unable to interpret due to	Unable to interpret due to
	to interfering substance	interfering substance	interfering substance
рН	5.0	5.0	5.0
	5.5		5.5
	6.0	6.0	6.0
	6.5	6.5	6.5
	7.0	7.0	7.0
	7.5	7.5	7.5
	8.0	8.0	8.0
	8.5	8.5	8.5
	≥9.0		≥9.0
LEU (Leukocytes)	Negative	Negative	Negative
Leu/µL	Ca 15	Trace (15)	15
	Ca 70	Small (+) (70)	70
	Ca 125	Moderate (++) (125)	125
	Ca 500	Large (+++) (500)	500
NIT (Nitrite)	Negative	Negative	Negative
	Positive	Positive	Positive
PRO (Protein)	Negative	Negative	Negative
	Trace	Trace	Trace
	0.3	0.3	0.3
	1.0	1.0	1.0
	≥3.0	3.0	≥3.0
	Nersting	≥20	≥3.0
GLU (Glucose)	Negative	Negative	Negative
mmol/L	5.5	5.5	5.5
	14	14	14
	28	28	28
	255	55	255 >55
	Norativo		200 Nacativa
KET (Kelone)	Traco	Negative	
mmoly L	IIdee	0.5	0.5
	15	1.5	0.5
	3.9	4.0	3.9
	7.8		>7.8
	110	8.0	>7.8
	>15.6	0.0	>7.8
		16.0	≥7.8
ERY (Erythrocytes)	Negative	Negative	Negative
Ery/μL	Trace-Lysed	Non Hemolyzed Trace	Trace
		Non Hemolyzed Moderate	Trace
	Trace-Intact	Hemolyzed Trace	Trace
	Ca 25	Small (+) (25)	25
	Ca 80	Moderate (++) (80)	80
	Ca 200	Large (+++) (200)	200

d) Blood Gas Tests

The following reference intervals and critical values were standardized for the province in preparation for Connect Care Implementation through Clinical Knowledge and Content Management (CKCM; <u>Blood Gas Standardization of Reference Intervals & Critical Values</u>).. The Working Group assigned to this was created in consultation with the Critical Care Strategic Clinical Network, the Provincial Respiratory Professional Practice Council, and Laboratory Point of Care Testing Network, with additional experts consulted as required. Note: Avoximeter device will be part of the standardized blood gas reporting for Launch 5

Arterial				
Analyte	Reference Interval	Units	Critica	Values
рН	7.35 – 7.45	None	< 7.20	> 7.60
pCO2	35 – 45	mmHg	<20	>70
pO2	70 – 90	mmHg	<56	None
Bicarbonate (HCO3)	20 – 27	mmol/L	< 10	> 40
Total CO2	Not Reported	-	-	-
Base Excess	-4 to 1	mmol/L	None	None
Oxygen Saturation	90 - 100	%	None	None
Oxyhemoglobin	92 – 98	%	None	None
Carboxyhemoglobin	0.0 - 3.0	%	None	>15
Methemoglobin	0.0 - 1.5	%	None	>10
Deoxyhemoglobin	Not Reported	-	-	-
AaDO2	<15 Room Air <100 100%O2	mmHg	None	None

Venous

Analyte	Reference Interval	Units	Critical Values	
рН	7.30 - 7.40	None	< 7.15	> 7.55
pCO2	35 – 50	mmHg	< 15	>55 if pH < 7.2
pO2	30 – 50	mmHg	None	None
HCO3	20 – 27	mmol/L	< 10	>40
Total CO2	Not Reported	-	-	-
Base Excess	-4 to 1	mmol/L	None	None
Oxygen Saturation	50 - 80	%	None	None
Oxyhemoglobin	50 - 80	%	None	None
Carboxyhemoglobin	0.0 - 3.0	%	None	>15%
Methemoglobin	0.0 - 1.5	%	None	>10%
Deoxyhemoglobin	Not Reported	-	-	-

Capillary Blood Gas

Analyte	Reference Interval	Units	Critical Values	
рН	7.32 – 7.42	None	< 7.20	> 7.50
pCO2	35 – 45	mmHg	< 25	> 70
pO2	None	mmHg	None	None
HCO3	20 – 27	mmol/L	<10	>40
Total CO2	Not Reported	-	-	-
Base Excess	-6 to 1	mmol/L	None	None
Oxygen Saturation	90-100	%	None	None
Oxyhemoglobin	85 – 95	%	None	None
Carboxyhemoglobin	0.0 - 3.0	%	None	>15%

Methemoglobin	0.0 - 2.0	%	None	>10%
Deoxyhemoglobin	Not Reported	-	-	-

Mixed Venous

Analyte	Reference Interval	Units	Critical Values	
рН	7.30 - 7.40	None	None	None
pCO2	35 – 50	mmHg	None	None
pO2	None	mmHg	None	None
HCO3	None	mmol/L	None	None
Total CO2	Not Reported	-	-	-
Base Excess	None	mmol/L	None	None
Oxygen Saturation	None	%	None	None
Oxyhemoglobin	None	%	None	None
Carboxyhemoglobin	0.0 - 3.0	%	None	>15
Methemoglobin	0.0 - 1.5	%	None	>10
Deoxyhemoglobin	Not Reported	-	-	-

Central Venous

Analyte	Reference Interval	Units	Critical Values	
рН	7.30 – 7.40	None	None	None
pCO2	35 – 45	mmHg	None	None
pO2	None	mmHg	None	None
HCO3	None	mmol/L	None	None
Total CO2	Not Reported	-	-	-
Base Excess	None	mmol/L	None	None
Oxygen Saturation	None	%	None	None
Oxyhemoglobin	None	%	None	None
Carboxyhemoglobin	0.0 - 3.0	%	None	>15
Methemoglobin	0.0 – 1.5	%	None	>10
Deoxyhemoglobin	Not Reported	-	-	-

ECMO

Analyte	Reference Interval	Units	Critical	Values
рН	7.30 – 7.45	None	None	None
pCO2	35 – 50	mmHg	None	None
pO2	None	mmHg	None	None
HCO3	None	mmol/L	None	None
Total CO2	Not Reported	-	-	-
Base Excess	None	mmol/L	None	None
Oxygen Saturation	None	%	None	None
Oxyhemoglobin	None	%	None	None
Carboxyhemoglobin	None	%	None	None
Methemoglobin	None	%	None	None
Deoxyhemoglobin	Not Reported	-	-	-

Analyte	Reference Interval	Units	Critical	Values
рН	7.2 – 7.4	None	<7.15	None
pCO2	35 – 70	mmHg	None	None
pO2	Not Reported	mmHg	-	-
HCO3	17 – 27	mmol/L	None	None
Total CO2	Not Reported	-	-	-
Base Excess	-9 to +2	mmol/L	< -10	None
Oxygen Saturation	Not Reported	-	-	-

Cord Blood Gas - Venous

Analyte	Reference Interval	Units	Critical	Values
рН	7.25 – 7.45	None	<7.15	None
pCO2	30 – 55	mmHg	None	None
pO2	Not Reported	mmHg	-	-
HCO3	16 – 25	mmol/L	None	None
tCO2	Not Reported	-	-	-
Base Excess	-10 to 0	mmol/L	< -10	None
Oxygen Saturation	Not Reported	-	-	-

pH Fluid

Analyte	Reference Interval	Units	Critical	Values
рН	>=7.20	None	None	None

C. Hematology , Coagulation and Flow Cytometry

1.. Hematology and Coagulation Reference Range changes



Appendix A Major C

2. Blood Smears

- "Smear for Consult" these are Clinician orderable tests requesting pathologist review.
 - Initially a technologist may review the slide. If there is nothing abnormal seen, no (or minimal) numeric abnormalities, and no abnormal analyzer flags then the Smear for Consult will not be further reviewed by a pathologist. If there is a reason that requires a pathologist specifically, please contact the lab within 7 days to provide that reason.
 - If the initial technologist review does reveal findings of potential clinical significance, then a "Peripheral Blood Smear" will be added-on, which a pathologist will result.
- "Peripheral Blood Smear" these are pathologist resulted tests. They may arise in one of two ways:
 - If a "Smear for Consult" is ordered by a clinician and passes initial review by a technologist (as described above). Note that under this circumstance one can tell that a Clinician had requested this testing directly because the report indicates: "Pathologist Review-Clinician Initiated"

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UAH I. Validate Female, 11 y.o., 25/5/2011 MRN: 150068050	Labs Encounters Imaging Cardiology Proced Betresh (4:18 PM) * CRoute Review Selected Synopsis TEllers Hide Canceled	res Medis Media Letters Episodes Preview • ¥ Results Review (# Lab Flowsheet	Referrals Other Orders Notes SnapShot More - KAd to Bookmarks	J
Bed: Pool Bed	A R CSN Date/Time Specime	ID Test		🛛 🖉 🗸 📲 🗐
Code: Not on file (no ACP docs)	Today			
Lab Safety Risk: None ULI: None Pt Aliases (AKAs): None	403120510889 Today at 07:25 22DE-16	000003 Partial Thromboplastin Time - Actin	Peripheral Blood Smear Order: 2202486 - Reflex for Order 2202478	Related Result Highlights
P Search	402120E10999 Vesterday at 09-50	ADAMTO12 Aveloby Blood	D D south Nickers	Blood Final result
Allergies: Not on File	403120510889 Yesterday at 07:53 22UA-16	H00002 Peripheral Blood Smear	0 Result Notes	Manual Differential 9/6/2022
Edward John Aasman,	403120510889 Yesterday at 07:53 22UA-16	H00002 Scan (Blood Smear) Blood	Pathologist Re: This is where the pathologist will type their	Blood Final result
Attending	403120510889 Yesterday at 07:53 22UA-16	H00002 Manual Differential Blood	view-Clinician comment if the Smear was clinician initiated (ie.	Scan (Blood Smear) 9/6/2022
Coverage: Alberta Health/Albert	A03120510889 Yesterday at 07:53 22UA-16	H00002 CBC and Differential Blood	Blood Smear).	
Travel Exposure Screening:	403120510889 Yesterday at 07:53 22UA-16	H00002 Smear For Consult Panel Blood	Reviewed by Dr. Name Here	
Lab Safety Risk: None	6 Months Ago		Resulting EDM UAH LAB	Other Results from 25/5/2021
ACTIVE FYIS	403120510889 02/12/2021 12:43 21UA-33	C00003 Protein, CSF Lumbar Puncture	Pgcts.y Snariman Collartari: 00/06/22 07:52 Last Davidari: 10/06/22 16:19	Partial Thromboplastin 10/6/2022 Time (PTT) Blood
None	403120510889 02/12/2021 12:43 21UA-33	H00003 Cell Count, CSF Lumbar Puncture		Electrolyte Panel (Na, K, 2/6/2021
Collection: Lab	1 Year Ago		Order Details V View Encounter Lab and Collection Details A Routing O Result History	CI, CO2, Anion Gap) Blood, Venous In
nic —, Last Wil —, DWIL —	A03120510889 02/06/2021 12:03 21UA-15	IC00016 Amikacin Level, Pre-dose	Result Care Coordination	A Thread Stimulating 245/2021
	403120510889 02/06/2021 12:03 21UA-15	C00016 Thyroid Stimulating Hormone (TSH)	Patient Communication	Hormone (TSH)
	A03120510889 02/06/2021 12:03 21UA-15	C00016 Electrolyte Panel (Na, K, Cl, CO2, A	O 10/6/2022 4:18 PM X Not seen Back to Top	Blood, Venous In process
	403120510889 02/06/2021 11:38	Amikacin Level, Pre-dose		Amikacin Level, Pre- 2/6/2021
	403120510889 02/06/2021 11:37	Sirolimus Level Blood, Venous	Smear For Consult Blood Order: 2202478 - Part of Panel Order 2202476	
	403120510889 02/06/2021 11:37	Tacrolimus Level Blood, Venous	Status: Final result Visible to patient: No (not released)	Warning: Additional results from
	403120510889 02/06/2021 10.58	Phenytoin Level, Total	0 Result Notes	25/5/2021 are available but are not displayed in this report.
	403120510889 02/06/2021 10:54	Tricyclic Antidepressants Screen, S	O Newer results are available. Click to view them now.	
	403120510889 02/06/2021 10:54	Haptoglobin Blood, Venous	Component 1 d ago	
	403120510889 02/06/2021 10:54	Cystatin C Blood, Venous	SmearForCon-Sent to pathologist for review. sult	v
	٢	>	Desiding DIMITAUTAD	

 The other reason a "Peripheral Blood Smear" may be resulted is when specific abnormalities are identified on a CBC/D that trigger a pathologist review. In this circumstance the clinician did not initially request the "Peripheral Blood Smear" but instead it was added-on as a reflex test per laboratory protocol, as part of progressive testing. If the pathologist sees something that may be of additional clinical significance (beyond what is reported on the CBCD, Manual Differential and Scan) they will document their impression; if something critical is found then the clinician ordering the CBC/D will be contacted directly. Otherwise, the pathologist will just include a note indicating that they have reviewed the smear. Note that under this circumstance one can tell that the "Peripheral Blood Smear" originated because of lab protocol (instead of a direct Clinician order) because the report indicates: "Pathologist Review-Lab Initiated":

	0		
Bit Control Source	E Hyperspace - EDM UAH WMC LABOR	ATDRY - Test - ART 5. 🗧 2 : Letter Queue — 🛋 1 : My Unsig	ned Orders 🖴 0 - 📁 🗡
	Epic - Connect Care - Submit	Hep Tracket 🕷 Drayon Login 🕼 Case Results 💼 Resultation Entry (& Patient Station, 🥵 Case Receiving, 🚱 ResultEntry and Verification 📲 Case Recident 🖗 Specomen Update 🚥 Link Orders 👔 Result Resoluti Resolution Speciment)	🖉 🛃 Chart Correction 🔹 🖶 Print 🔹 🗗 Log Out 🔹
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Normal	Pt Aliases (AKAs): None	403120512015 Yesterday at 07:55 22UA-160H00003 Scan (Blood Smear) Blood Peripheral Blood Smear Order 2003540 - 88flay for Order 2003540	Other Results from 1/6/2021
Average	D Search	403120512015 Yesterday at 07:55 22UA-160H00003 Peripheral Blood Smear Status: Final result. Vioible to patient: No (not released)	A Protein 1/6/2021
No PC/ Concentration On Concentration On Concentratio	Allergies: Not on File	403120512015 Yesterday at 07:55 22UA-160H00003 CBC and Differential Blood O. Result Notes	Electrophoresis, Serum Blood
Control	No PCP Coverage: Alberta Mealth/Albert	6 Months Ago	Venous In process
International contenting # 4932692278 12072921760 210.49330001 54hydrawylodkaedele, Add (HkA) Active train # 493269278 12072921760 210.49330001 54hydrawylodkaedele, Add (HkA) Nome # 493269278 12072921760 210.49330001 Calechames, Links, 24 Hor Ur. View Ago # 4932692718 120029211078 210.49330001 Calechames, Links, 24 Hor Ur. View Ago # 4932692718 12002921108 210.41330001 Fm 14 - Block Views Biotechames Links, 24 Hor Ur. Nome 1000000000000000000000000000000000000	Contrage. Abortal Healthy Aborta.	403120522786 12/07/2021 07:00 21UA-193C00001 Creatinine, Urine, 24 Hour - Urine, Pathologist Re: This is where the pathologist will type their comment	A
Lub Steven # 493126952166 120702210700 210A-193X00001 Cale-cholemines, Usins, 24 Hor - Ur. None # 493126952176 120702210700 210A-193X0001 Cale-cholemines, Usins, 24 Hor - Ur. Barcasti, Inc.	Incomplete	403120522786 12/07/2021 07:00 21UA-193X00001 5-Hydroxyindoleacetic Acid (HAA)	Warning: Additional results from 1/6/2021 are available but
Active ■ # 43325522168 120702512167.00 2104-193300011 Meansphrines, Uning, 24 Hoar - Uning, 2010 Exclusion 12 Hoar Collection: Lab ■ 43325512166 200002211 2.24 Descepts and Metabolits, Level - Uning, 2010 Exclusion 12 Hoar Bioder Details Coll Units, 22 Hoar Exclusion 12 Hoar Bioder Details Coll Units, 22 Hoar Descepts and Metabolits, Level - Unin, 2010 Exclusion 12 Hoar Bioder Details Coll Units, 22 Hoar Descepts and Metabolits, Level - Unin, 2010 Descepts and 20	Lab Safety Risk: None	403120522786 12/07/2021 07:00 21UA-193X00001 Catecholamines, Urine, 24 Hour	are not displayed in this report.
NOME Tear Age Tear Age <t< td=""><td>ACTIVE FYIS</td><td>403120522786 12/07/2021 07:00 21UA-193X00001 Metanephrines, Urine, 24 Hour Ur Reviewed by Dr. Name Here</td><td></td></t<>	ACTIVE FYIS	403120522786 12/07/2021 07:00 21UA-193X00001 Metanephrines, Urine, 24 Hour Ur Reviewed by Dr. Name Here	
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3. Bone Marrows

- For clinicians performing a bone marrow aspiration and/or trephine biposy:

- Recommend ordering a "Bone Marrow Panel (Proc Panel)" in Epic. This automatically orders a Panel of tests which includes a:
 - o Bone Marrow Cell Differential
 - Bone Marrow Exam

- Leukemia/Lymphoma Immunophenotyping
- Cytogenetic Analysis
- HOLD DNA FOR MOLECULAR PATHOLOGY
- HOND RNA FOR MOLECULAR PATHOLOGY
- In addition, a CBCD and Reticulocyte count should be collected within 24 hours (before or after) bone marrow collection. If this has not been completed at the time of marrow procurement, then the clinician has the option to include orders for CBCD and Reticulocyte Count when ordering the Bone Marrow Panel; note that these are not included by default.
- A Bone Marrow Panel does not include the following which must be ordered individually if/when needed (indicate Specimen Src: Bone Marrow Aspirate when ordering):
 - Bone Marrow Culture
 - Mycobacteria Culture
 - Fungal Culture
 - Viruses must order each specific type of test needed individually
 - If uncertain of what testing to order, please page/call the Virologist On-Call to discuss.
- Bone Marrow results in Netcare:
 - All bone marrow reports generated in Connect Care will now appear in the Pathology folder in Netcare.

4. PTT and Heparin Nomogram

With the standardization requirement in both pharmacy and lab, it was a challenge to create a single heparin nomogram that would work with the different reference ranges generated by the various reagent / analyzer combination. The document in the link below describes how this has been accomplished.

https://insite.albertahealthservices.ca/Main/assets/cis/tms-cis-provincially-standardized-ptt-comments.pdf

5. D-Dimer

- Across Alberta, there are a variety of different D-Dimer methods in use due to differing analyzers, patient volumes, and historic commercial contracts.
 - Each method has a single manufacturer-determined clinical cutoff for Venous Thromboembolism (VTE) exclusion, which undergoes a limited verification by the lab prior to test implementation.
 - o APL does not have the ability to perform the outcomes studies required to validate alternative cutoffs.
 - Similar performance between assay methods cannot be guaranteed due to lack of an international D-Dimer reference standard.
 - Some assays are well-studied in the age-adjusted cutoff literature, while evidence for others may be limited or non-existent.
 - Most widely available age-adjustment calculators online do not account for differences between assay types/manufacturers.
 - Even assays with the same VTE cut-off (e.g. 0.50 mg/L FEU) may show very different reactivity at values other than this cut-off.
- The assay method is included as a result comment at ConnectCare sites (see example below).
- When considering whether to apply alternative cutoffs, providers are advised to verify the method used for each patient (do not assume the testing was performed at your local lab), and to be familiar with the evidence for the method.

Example of D-Dimer Method information in ConnectCare:



6. Flow cytometry

- The B, T, and NK Enumeration test is no longer available in Edmonton.
 - Instead T-cell Subsets, or B Cell Enumeration can be ordered separately.
 - NK cell enumeration is not routinely available but can be obtained as part of an Immunodeficiency Screening Panel that is available in Calgary.
- Leukemia/Lymphoma Immunophenotyping (by Flow Cytometry)
 - Clinicians are required to answer a hard stop question to specify the clinical indication.
 - This will allow the laboratory to determine which antibody panels are needed for analysis.
 - Please note: "Pancytopenia (Bone Marrow ONLY)" can only be performed on bone marrow and will be auto-cancelled if requested on peripheral blood if processed in Edmonton.
- Hereditary Spherocytosis
 - "Hereditary Spherocytosis by Flow Cytometry" is adequate for diagnosis of Hereditary Spherocytosis in the vast majority of individuals and can be ordered directly in Epic.
 - In Edmonton only, "Hereditary Spherocytosis by Flow Cytometry and Osmotic Fragility" may be needed in some select cases and requires booking for collection through Client Response (780-407-7484).

7. Body Fluid Crystals

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- Assessing for joint fluid crystals:
 - Order "Body Fluid Crystals"
 - Specify Specimen Type as "Synovial Fluid"
 - Specify the joint aspirated under Specimen Source (eg. "Knee, Left")
 - Assessing any other aspirate type (ie. other than joint fluid) for monosodium urate crystals:
 - Order "Body Fluid Crystals"
 - Specify "Other" under Specimen Type
 - Specify the anatomic site (where the aspirate was collected) under Specimen Source.
- Bile fluid assessment for Cholesterol crystals is not an orderable test.

D. Clinical Microbiology

1. Ordering COVID-19 and other respiratory virus testing in Connect Care:

- Use the "Respiratory Infection (inc. COVID-19) NAT" smart group.
 - Select the patient presentation/encounter (Admitted or ED patient likely to be admitted; ED likely to be discharged; outpatient)
 - Select the symptoms present (influenza-like illness (ILI); other COVID-19 symptoms; asymptomatic)
 - "Rapid COVID-19 PCR" is automatically selected for all patients. All other orders must be selected if testing is indicated.
 - If the patient has ILI:
 - o If influenza or RSV is circulating, select "Rapid Influenza and RSV NAT"
 - If your site has ID NOW testing it can be ordered within the smart group if the patient meets criteria (symptomatic and presenting within 7 days of onset)
 - The respiratory pathogen panel can also be selected if they meet the criteria listed
 - A specific smart group with defaults set for ETT's/BAL's can be added to your preference list upon request if you order this testing on ETT's and BAL's more frequently than other specimen sources.

2. Pediatric Blood Culture

- Changes to the collection guidelines for pediatric blood cultures have been made to optimize the sensitivity of blood cultures and help identify true line infections vs. contaminants. Blood cultures should always be collected from two (2) sites in patients >30kg and is suggested for all patients except neonates.
- For patients weighing ≤30kg, use the "Blood Culture Panel-Pediatric (weight based)" order set. Bottles will be ordered and collected as follows:

Body Weight (kg)	Site 1	Site 2	Number of bottles to be collected
Less than or equal to 5 kg	Pediatric Bottle Minimum 1 mL		1
5.1 - 12.7 kg	Pediatric Bottle 4 mL	Pediatric Bottle 2-4 mL	1-2
12.8 kg - 30 kg	Aerobic + Anaerobic 10 mL + 10 mL	Aerobic 10 mL	2-3
Greater than 30 kg	Aerobic + Anaerobic 10 mL + 10 mL	Aerobic + Anaerobic 10 mL + 10 mL	4

- For patients weighing >30kg, use the "Blood culturesx2" regardless of patient age.
- **3.** Most microbiology/virology tests that were previously not orderable in SCM and required paper requisitions can now be ordered in Connect Care. Check Connect Care first before ordering on paper requisition.
- 4. Further changes to Microbiology orders in Connect Care vs. SCM are summarized in the table below:

Microbiology orders in Connect Care vs. Legacy (SCM):			
Connect Care Order Name	Legacy (SCM) Order Name	Notes	
ROUTINE BACTERIOLOGY			
FLUID CULTURE, TISSUE CULTURE, WOUND CULTURE (Swab, Deep), BONE CULTURE, BONE MARROW CULTURE	Anaerobic Culture	Previously, clinicians could specifically request anaerobic culture when bacterial cultures were ordered. This is no longer necessary as the lab will automatically perform anaerobic culture when appropriate, based on the specimen received.	
BLOOD CULTURE ROUTINE		Some preference lists may include this order. DO NOT use this, as this will only order one set of blood cultures. 2 sets of blood cultures are almost always indicated. Instead use one of the orders listed below.	
BLOOD CULTURE PANEL -	Blood Culture, Neonate (single set)	Use "Blood Culture Panel-Pediatric (weight based)" for	
PEDIATRIC (WEIGHT BASED)	Blood Culture, Pediatric <14yrs (single set)	children weighing ≤30kg. Use BLOOD CULTURE X 2 for children weighing >30kg.	
BLOOD CULTURE PANEL – ADULT x 2 or BLOOD CULTURE X 2	Blood Culture, Adult (order set for 2 sets blood cultures)	Use for all patients weighing >30kg.	
ORDER PANEL: BLOOD CULTURE – ADULT X 3 (ENDOCARDITIS)	Blood Culture, Adult Endocarditis (order set for 3 sets blood cultures)	Available in the Connect Care Facility List.	
IMPLANTED MEDICAL DEVICE CULTURE	Device Culture	Use for culture of explanted pacemakers, prosthetic joints, deep brain stimulators, etc. Do not use for catheter tips – use "Catheter Tip Culture" instead.	
Not orderable.	WBC Stool	Follow process for tests not orderable in Connect Care.	
PARASITIC INVESTIGATIONS			
FILARIAL BLOOD SMEAR	Microfilaria Blood Examination	Was not orderable in SCM (paper only). As per previous, consult the microbiologist on call before ordering.	
STOOL PARASITE SCREEN OVA AND PARASITES, TISSUE AND/OR FLUID	Ova and Parasite Examination Source: Stool, Urine	Note that there are now separate orderables for ova & parasite examination of stool and tissue/fluid. SCM had a single orderable for all specimen sources. If detection of parasites other than <i>Giardia</i> , <i>Cryptosporidium</i> or <i>Entamoeba histolytica</i> in stool is required, you must fill in the history fields on the order and submit both a fresh stool and a preserved (SAF) stool.	

	Microbiology orders in Connect Care vs. Legacy (SCM):			
Connect Care Order Name	Legacy (SCM) Order Name	Notes		
INFECTION PREVENTION AND CONTR	ROL			
 ARO SCREENING MRSA AND CPO MRSA Nasal and Inguinal Swab (1 order, 2 swabs) MRSA wound swab CPO Screen Screening will be triggered as per IPC current protocols. 	 ARO Hospital Admission Screen Adult: MRSA Nasal swab MRSA Rectal/ostomy Swab MRSA Wound swab VRE rectal/ostomy swab (routine screening discontinued in 2021) 	This admission screening order panel is only accessible in Connect Care via the ARO Admission Screening Best Practice Advisory (BPA) which is part of RN and not MD workflow. This panel is not on MD Admission order sets except for ICU admissions. Tests are still accessible independent of order panel if needed. Based on new Infection Prevention and Control		
	 ARO Hospital Admission Screen Peds: MRSA Nasal swab MRSA Groin swab (umbilicus if <2 mo) MRSA wound 	guidelines, MRSA screening will be performed on nasal + inguinal swabs, as opposed to the previous nasal + rectal swabs. The nasal/inguinal swab results will be reported as one order instead of two separate orders.		
CARBAPENEMASE PRODUCING ORGANISMS SCREEN	Carbapenemase Producing Organisms (previously only orderable on paper requisition: <u>7828M Microbiology</u> <u>Infection Surveillance Requisition</u>)	Should only be ordered by Infection Prevention and Control or by consultation with the Microbiologist on-call.		
ESBL SCREEN	Not previously orderable.	Should only be ordered by Infection Prevention and Control or by consultation with the Microbiologist on-call.		
NOTE NAME CHANGE				
EYE CULTURE, INVASIVE	Critical Eye Bacterial Culture			
GENITAL CULTURE, BACTERIAL	Urogenital Bacterial Culture			
PHARYNGITIS SCREEN	Throat Beta Strep Test			
NAT	PCR/viral load	Note that you will see the acronym "NAT" in many tests. These are "nucleic acid tests" which include viral loads, polymerase chain reaction (PCR), or other molecular tests.		