

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

|  |                  |
|--|------------------|
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### **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 ([Connect Care POCT Information Sheet](#)) 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
  - [Roche Accu-Chek Inform II Glucose Meter](#)
  - [Abbott i-STAT1 and i-STAT Alinity](#)
  - [Mobile Integrated Health](#)

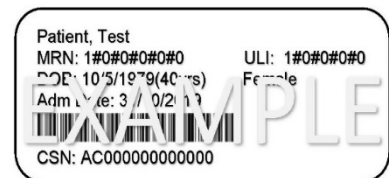
- [Radiometer ABL90 Flex Plus](#)
- [Siemens Clinitek Status Plus](#)
- [Werfen GEM 5000](#)
- [Siemens DCA Vantage](#)
- [Siemens CoaguChek XS Pro](#)
- [Werfen Avoximeter 1000E](#)

Unconnected device workflows:

- POCT Workflows for Manual Test Methods
  - [AegisPOC Launch Button Set Up for Manual Test Result](#)
  - [AegisPOC Manual Test Result Entry - AmnioTest](#)
  - [AegisPOC Manual Test Result Entry - AmniSure](#)
  - [AegisPOC Manual Test Result Entry - Drager Jaundice Meter](#)
  - [AegisPOC Manual Test Result Entry - Glucose Meter](#)
  - [AegisPOC Manual Test Result Entry - Hemocue 201](#)
  - [AegisPOC Manual Test Result Entry - Manual Urine Dipstick](#)
  - [AegisPOC Manual Test Result Entry - Siemens Clinitek Status](#)
  - [AegisPOC Manual Test Result Entry - Urine Drugs of Abuse Screen](#)
  - [AegisPOC Manual Test Result Entry - Urine Pregnancy](#)
- **Additional AegisPOC Manual Test Result Entry Resource:**
  - 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 AHS employee ID barcode number to access POCT devices or to access the AegisPOC Manual Test Result Entry application.
- Use correct Epic patient identifier for POCT:
  - Use the correct 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:**
  - [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                     |

### 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).

**Table 1. Urinalysis result reporting for Connect Care**

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

| Test component               | Siemens Clinitek Status   | Manual Dipstick Urinalysis  | Connect Care (Epic)<br>Result Reporting  |
|------------------------------|---|---|--|
|                              | Device result reporting   | Test strip vial reporting   |  |
|                              | 1.015<br>1.020<br>1.025<br><br>≥1.030<br>Unable to interpret due to interfering substance | 1.015<br>1.020<br>1.025<br>1.030<br><br>Unable to interpret due to interfering substance  | 1.015<br>1.020<br>1.025<br>1.030<br>≥1.030<br>Unable to interpret due to interfering substance |
| pH                           | 5.0<br>5.5<br>6.0<br>6.5<br>7.0<br>7.5<br>8.0<br>8.5<br>≥9.0                              | 5.0<br><br>6.0<br>6.5<br>7.0<br>7.5<br>8.0<br>8.5   | 5.0<br>5.5<br>6.0<br>6.5<br>7.0<br>7.5<br>8.0<br>8.5<br>≥9.0                                   |
| LEU (Leukocytes)<br>Leu/μL   | Negative<br>Ca 15<br>Ca 70<br>Ca 125<br>Ca 500  | Negative<br>Trace (15)<br>Small (+) (70)<br>Moderate (++) (125)<br>Large (+++) (500)  | Negative<br>15<br>70<br>125<br>500   |
| NIT (Nitrite)                | Negative<br>Positive  | Negative<br>Positive  | Negative<br>Positive   |
| PRO (Protein)                | Negative<br>Trace<br>0.3<br>1.0<br>≥3.0   | Negative<br>Trace<br>0.3<br>1.0<br>3.0<br>≥20   | Negative<br>Trace<br>0.3<br>1.0<br>≥3.0<br>≥3.0  |
| GLU (Glucose)<br>mmol/L      | Negative<br>5.5<br>14<br>28<br>≥55  | Negative<br>5.5<br>14<br>28<br>55<br>≥111   | Negative<br>5.5<br>14<br>28<br>≥55<br>≥55  |
| KET (Ketone)<br>mmol/L       | Negative<br>Trace<br><br>1.5<br>3.9<br>7.8<br><br>≥15.6                                   | Negative<br><br>0.5<br>1.5<br>4.0<br><br>8.0<br><br>16.0  | Negative<br>Trace<br>0.5<br>1.5<br>3.9<br>≥7.8<br>≥7.8<br>≥7.8<br>≥7.8                         |
| ERY (Erythrocytes)<br>Ery/μL | Negative<br>Trace-Lysed<br><br>Trace-Intact<br>Ca 25<br>Ca 80<br>Ca 200                   | Negative<br>Non Hemolyzed Trace<br>Non Hemolyzed Moderate<br>Hemolyzed Trace<br>Small (+) (25)<br>Moderate (++) (80)<br>Large (+++) (200) | Negative<br>Trace<br>Trace<br>Trace<br>25<br>80<br>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; [Blood Gas Standardization of Reference Intervals & Critical Values](#)).

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  | Critical Values |        |
|---------------------------------|--------------------------------------|--------|-----------------|--------|
| pH                              | 7.35 – 7.45                          | None   | < 7.20          | > 7.60 |
| pCO <sub>2</sub>                | 35 – 45                              | mmHg   | <20             | >70    |
| pO <sub>2</sub>                 | 70 – 90                              | mmHg   | <56             | None   |
| Bicarbonate (HCO <sub>3</sub> ) | 20 – 27                              | mmol/L | < 10            | > 40   |
| Total CO <sub>2</sub>           | 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                         | -      | -               | -      |
| AaDO <sub>2</sub>               | <15 Room Air <100 100%O <sub>2</sub> | mmHg   | None            | None   |

##### Venous

| Analyte               | Reference Interval | Units  | Critical Values |                 |
|-----------------------|--------------------|--------|-----------------|-----------------|
| pH                    | 7.30 – 7.40        | None   | < 7.15          | > 7.55          |
| pCO <sub>2</sub>      | 35 – 50            | mmHg   | < 15            | >55 if pH < 7.2 |
| pO <sub>2</sub>       | 30 – 50            | mmHg   | None            | None            |
| HCO <sub>3</sub>      | 20 – 27            | mmol/L | < 10            | >40             |
| Total CO <sub>2</sub> | 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 |        |
|-----------------------|--------------------|--------|-----------------|--------|
| pH                    | 7.32 – 7.42        | None   | < 7.20          | > 7.50 |
| pCO <sub>2</sub>      | 35 – 45            | mmHg   | < 25            | > 70   |
| pO <sub>2</sub>       | None               | mmHg   | None            | None   |
| HCO <sub>3</sub>      | 20 – 27            | mmol/L | <10             | >40    |
| Total CO <sub>2</sub> | 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 |      |
|-------------------|--------------------|--------|-----------------|------|
| pH                | 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 |      |
|-------------------|--------------------|--------|-----------------|------|
| pH                | 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 |      |
|-------------------|--------------------|--------|-----------------|------|
| pH                | 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       | -      | -               | -    |

#### Cord Blood Gas - Arterial

| Analyte               | Reference Interval | Units  | Critical Values |      |
|-----------------------|--------------------|--------|-----------------|------|
| pH                    | 7.2 – 7.4          | None   | <7.15           | None |
| pCO <sub>2</sub>      | 35 – 70            | mmHg   | None            | None |
| pO <sub>2</sub>       | Not Reported       | mmHg   | -               | -    |
| HCO <sub>3</sub>      | 17 – 27            | mmol/L | None            | None |
| Total CO <sub>2</sub> | 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 |      |
|-------------------|--------------------|--------|-----------------|------|
| pH                | 7.25 – 7.45        | None   | <7.15           | None |
| pCO <sub>2</sub>  | 30 – 55            | mmHg   | None            | None |
| pO <sub>2</sub>   | Not Reported       | mmHg   | -               | -    |
| HCO <sub>3</sub>  | 16 – 25            | mmol/L | None            | None |
| tCO <sub>2</sub>  | Not Reported       | -      | -               | -    |
| Base Excess       | -10 to 0           | mmol/L | < -10           | None |
| Oxygen Saturation | Not Reported       | -      | -               | -    |

#### pH Fluid

| Analyte | Reference Interval | Units | Critical Values |      |
|---------|--------------------|-------|-----------------|------|
| pH      | >=7.20             | None  | None            | None |

### C. Hematology , Coagulation and Flow Cytometry

#### 1.. Hematology and Coagulation Reference Range changes



October 2022  
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”

**Chart Review**  
**UAH I. Validate**  
 Female, 11 y.o., 25/5/2011  
 MRN: 150068150  
 UEL: No Value Set  
 Code: Not on file (no ACP docs)  
 Legal Guardian: None  
 Lab Safety Risk: None  
 UEL: None  
 Pt Allergies (AKAs): None  
 Allergies: Not on File  
 Edward John Asman, MD  
 Attending  
 Coverage: Alberta Health/Alberta...  
 Travel Exposure Screening: Incomplete  
 Lab Safety Risk: None  
 ACTIVE PVIS: None  
 Collection: Lab  
 Hc: —, Last Wt: —, BMI: —

| A. | R. | CSN          | Date/Time          | Specimen ID    | Test                                  |
|----|----|--------------|--------------------|----------------|---------------------------------------|
|    |    | 403120510889 | Today at 07:25     | Z2DE-161000003 | Partial Thromboplastin Time - Acti... |
|    |    | 403120510889 | Yesterday at 09:50 |                | ADAMTS13 Activity -- Blood            |
|    |    | 403120510889 | Yesterday at 07:53 | Z2UA-160H00002 | Peripheral Blood Smear                |
|    |    | 403120510889 | Yesterday at 07:53 | Z2UA-160H00002 | Scan (Blood Smear) -- Blood           |
|    |    | 403120510889 | Yesterday at 07:53 | Z2UA-160H00002 | Manual Differential -- Blood          |
|    |    | 403120510889 | Yesterday at 07:53 | Z2UA-160H00002 | CBC and Differential -- Blood         |
|    |    | 403120510889 | Yesterday at 07:53 | Z2UA-160H00002 | Smear For Consult Panel -- Blood      |

**Peripheral Blood Smear**  
 Order: 2202486 - Reflex for Order 2202478  
 Status: Final result. Visible to patient: No (scheduled for 10/6/2022 4:18 PM)  
 0 Result Notes  
 Component: 1 d ago  
 Pathologist Re: This is where the pathologist will type their comment if the Smear was clinician initiated (ie. a "Smear for Consult" order led to a Peripheral Blood Smear).  
 Reviewed by Dr. Raza Reza  
 Resulting Agency: EDM UAH LAB  
 Specimen Collected: 09/06/22 07:53 Last Resulted: 10/06/22 16:18  
 Order Details: View Encounter Lab and Collection Details Routing  
 Result History  
 Result Care Coordination  
 Patient Communication  
 10/6/2022 4:18 PM X Not seen Back to Top  
 Smear For Consult -- Blood Order: 2202478 - Part of Panel Order 2202476  
 Status: Final result. Visible to patient: No (not released)  
 0 Result Notes  
 Component: 1 d ago  
 Smear For Con: Sent to pathologist for review.  
 Resulting Agency: EDM UAH LAB

**Related Result Highlights**  
 CBC and Differential -- Blood Final result 9/6/2022  
 Manual Differential -- Blood Final result 9/6/2022  
 Scan (Blood Smear) -- Blood Final result 9/6/2022

**Other Results from 25/5/2021**  
 Partial Thromboplastin Time (PTT) -- Blood Final result 10/6/2022  
 Electrolyte Panel (Na, K, Cl, CO2, Anion Gap) -- Blood, Venous in process 2/6/2021  
 Blood, Venous in process  
 Thyroid Stimulating Hormone (TSH) -- Blood, Venous in process 2/6/2021  
 Amikacin Level, Pre-dose 2/6/2021

**Warning: Additional results from 25/5/2021 are available but are not displayed in this report.**

- 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”:

**Chart Review**  
**UAH O. Validate**  
 Female, 51 y.o., 19/5/1971  
 MRN: 150067827  
 UEL: No Value Set  
 Code: Not on file (no ACP docs)  
 Legal Guardian: None  
 Lab Safety Risk: None  
 UEL: None  
 Pt Allergies (AKAs): None  
 Allergies: Not on File  
 No PCP  
 Coverage: Alberta Health/Alberta...  
 Travel Exposure Screening: Incomplete  
 Lab Safety Risk: None  
 ACTIVE PVIS: None  
 Collection: Lab  
 Hc: —, Last Wt: —, BMI: —

| A. | R. | CSN          | Date/Time          | Specimen ID    | Test                          |
|----|----|--------------|--------------------|----------------|-------------------------------|
|    |    | 403120512015 | Yesterday at 07:55 | Z2UA-160H00003 | Scan (Blood Smear) -- Blood   |
|    |    | 403120512015 | Yesterday at 07:55 | Z2UA-160H00003 | Peripheral Blood Smear        |
|    |    | 403120512015 | Yesterday at 07:55 | Z2UA-160H00003 | CBC and Differential -- Blood |

**Peripheral Blood Smear**  
 Order: 2202540 - Reflex for Order 2202539  
 Status: Final result. Visible to patient: No (not released)  
 0 Result Notes  
 Component: 1 d ago  
 Pathologist Review-Lab Initiated: This is where the pathologist will type their comment if the Smear was lab initiated (ie. Progressive CBCD testing has led to addition of a Peripheral Blood Smear).  
 Reviewed by Dr. Raza Reza  
 Resulting Agency: EDM UAH LAB  
 Specimen Collected: 09/06/22 07:55 Last Resulted: 09/06/22 14:28  
 Order Details: View Encounter Lab and Collection Details Routing  
 Result History  
 Result Care Coordination  
 Patient Communication  
 Not Released X Not seen Back to Top  
 CBC and Differential -- Blood Order: 2202539  
 Status: Final result. Visible to patient: No (not released)  
 0 Result Notes  
 Component: 1 d ago  
 Ref Range & Units  
 Auto WBC 5.0  
 4.0 - 11.0 10<sup>9</sup>/L  
 HbC 2.00  
 3.80 - 5.20 10<sup>12</sup>/L

**Other Results from 1/6/2021**  
 Electrolytes, Serum - Blood, Venous in process 1/6/2021  
 Warning: Additional results from 1/5/2021 are available but are not displayed in this report.

### 3. Bone Marrows

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

- Recommend ordering a “Bone Marrow Panel (Proc Panel)” in Epic. This automatically orders a Panel of tests which includes a:
  - 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

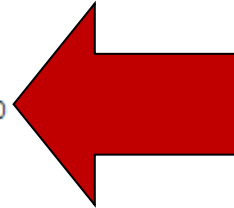
- Across Alberta, there are a variety of different D-Dimer methods in use due to differing analyzers, patient volumes, and historic commercial contracts.
  - Each method has a single manufacturer-determined clinical cutoff for Venous Thromboembolism (VTE) exclusion, which undergoes a limited verification by the lab prior to test implementation.
  - 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:

D-Dimer, Quantitative (FEU) **>10.00** **>10.00** **>10.00** **>10.00**  
^ ^ ^ ^  
<0.50 mg/L FEU CM CM CM CM

Comment: A D-Dimer BELOW the 0.50 mg/L FEU cutoff may be used with a standardized clinical assessment and/or imaging studies to help exclude venous thromboembolism (VTE). Values above the cutoff are not diagnostically useful in VTE assessment.

Results obtained using the HemosIL D-Dimer HS 500 (IL Diagnostics/Werfen) assay.



## 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

- 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:
    - 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:

| <b>Body Weight (kg)</b>    | <b>Site 1</b>                           | <b>Site 2</b>                        | <b>Number of bottles to be collected</b> |
|----------------------------|---|--------------------------------------|--|
| Less than or equal to 5 kg | Pediatric Bottle<br>Minimum 1 mL        |                                      | 1  |
| 5.1 - 12.7 kg              | Pediatric Bottle<br>4 mL                | Pediatric Bottle<br>2-4 mL           | 1-2                                      |
| 12.8 kg - 30 kg            | Aerobic +<br>Anaerobic<br>10 mL + 10 mL | Aerobic<br>10 mL                     | 2-3                                      |
| Greater than 30 kg         | Aerobic +<br>Anaerobic<br>10 mL + 10 mL | Aerobic + Anaerobic<br>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  |
|---|---|--|
| <b>ROUTINE BACTERIOLOGY</b>   |   |  |
| FLUID CULTURE,<br>TISSUE CULTURE,<br>WOUND CULTURE (Swab, Deep),<br>BONE CULTURE,<br>BONE MARROW CULTURE<br>BLOOD CULTURE ROUTINE | 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.  |
|   |   | Some preference lists may include this order. <b>DO NOT use this, as this will only order one set of blood cultures. 2 sets of blood cultures are almost always indicated.</b> Instead use one of the orders listed below.   |
| BLOOD CULTURE PANEL –<br>PEDIATRIC (WEIGHT BASED)   | Blood Culture, Neonate (single set)<br>Blood Culture, Pediatric <14yrs (single set) | Use “Blood Culture Panel-Pediatric (weight based)” for children weighing ≤30kg.<br>Use BLOOD CULTURE X 2 for children weighing >30kg.  |
| BLOOD CULTURE PANEL – ADULT x<br>2<br>or<br>BLOOD CULTURE X 2   | Blood Culture, Adult<br>(order set for 2 sets blood cultures)                       | Use for all patients weighing >30kg.   |
| ORDER PANEL: BLOOD CULTURE –<br>ADULT X 3 (ENDOCARDITIS)  | Blood Culture, Adult Endocarditis<br>(order set for 3 sets blood cultures)          | Available in the Connect Care Facility List.   |
| IMPLANTED MEDICAL DEVICE<br>CULTURE   | Device Culture  | Use for culture of explanted pacemakers, prosthetic joints, deep brain stimulators, etc. <b>Do not use for catheter tips</b> – use “Catheter Tip Culture” instead.   |
| Not orderable.  | WBC Stool   | Follow process for tests not orderable in Connect Care.  |
| <b>PARASITIC INVESTIGATIONS</b>   |   |  |
| FILARIAL BLOOD SMEAR  | Microfilaria Blood Examination  | Was not orderable in SCM (paper only).<br>As per previous, consult the microbiologist on call before ordering.   |
| STOOL PARASITE SCREEN<br><br>OVA AND PARASITES, TISSUE<br>AND/OR FLUID  | Ova and Parasite Examination<br>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 <b>must</b> 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   |
|--|--|---|
| <b>INFECTION PREVENTION AND CONTROL</b>  |  |   |
| ARO SCREENING MRSA AND CPO<br>- <b>MRSA Nasal and Inguinal Swab (1 order, 2 swabs)</b><br>- MRSA wound swab<br>- CPO Screen<br><br>Screening will be triggered as per IPC current protocols. | ARO Hospital Admission Screen Adult:<br>- <b>MRSA Nasal swab</b><br>- <b>MRSA Rectal/ostomy Swab</b><br>- MRSA Wound swab<br>- VRE rectal/ostomy swab (routine screening discontinued in 2021)<br><br>ARO Hospital Admission Screen Peds:<br>- <b>MRSA Nasal swab</b><br>- <b>MRSA Groin swab</b> (umbilicus if <2 mo)<br>- MRSA wound | 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.<br><br><b>Based on new Infection Prevention and Control 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.</b> |
| CARBAPENEMASE PRODUCING ORGANISMS SCREEN   | Carbapenemase Producing Organisms (previously only orderable on paper requisition: <a href="#">7828M Microbiology Infection Surveillance Requisition</a> )   | 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.  |
| <b>NOTE NAME CHANGE</b>  |  |   |
| EYE CULTURE, INVASIVE  | <b>Critical</b> Eye Bacterial Culture  |   |
| GENITAL CULTURE, BACTERIAL   | <b>Urogenital</b> Bacterial Culture  |   |
| PHARYNGITIS SCREEN   | <b>Throat</b> 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.  |