

Policy: Utilizing the GEM 3000 for Patient Blood Samples in Critical Care					
Section:					
Number:					
Originator:					
This policy applies to:	<input type="checkbox"/> LHSC	<input type="checkbox"/> SJH	<input type="checkbox"/> Park wood	<input type="checkbox"/> Mount Hope	<input type="checkbox"/> RMHC ST & L

POLICY

Purpose; to ensure appropriate and high quality point of care testing using the GEM 3000 within the Adult Critical Care of London Health Sciences Centre. This policy refers to all Registered Nurses (RNs) and Registered Respiratory Therapists (RRTs) working within Adult Critical Care that have been approved to operate this piece of equipment. Approval to operate the GEM 3000 is contingent on the fact that the RN/RRT has successfully completed a training session and the quiz provided. The completed quiz must be submitted to the educator who then forwards this on to the Point of Care Coordinator. Re-certification of the GEM 3000 is due every two years via successfully completion of the quiz provided.

INDICATIONS for BLOOD DRAWING and ANALYZING with the GEM 3000

The GEM 3000 is capable of performing the following laboratory tests: Blood gases, Na+, K+, and ionized Ca+ levels.

1. An order is required for all blood work drawn and tested on the GEM 3000. The Adult Critical Care preprinted orders include most testing of blood by the GEM 3000. Please note which tests are not included in the preprinted orders and ensure an order is written when necessary.
2. The GEM 3000 is programmed to default to the full panel of tests which includes: blood gases, Na+, K+ and ionized Calcium, however; only those tests that are required to be analyzed should be done (IE: If blood gases are required but there is no indication to do electrolytes then only blood gases will be analyzed and all other tests will be deselected).

- All patients are to have electrolytes sent to the lab once per day (suggest A.M. blood work) in order for a chloride level to be obtained. The morning blood work going to the lab would include the CBC, electrolytes, INR/PTT, lactate and any other orders such as drug levels or TPN blood work if required. Arterial, venous, capillary and mixed venous gases can be performed on the GEM 3000.
3. When testing a patient's glucose, for accuracy and consistency, continue to use the glucometer when following the insulin protocol.
 4. Ionized calciums, needed for PRISMAFLEX can be done on the GEM 3000. No code is required to differentiate between the systemic and post filter calcium. What is necessary is that you go to the "**comments section**" in the GEM 3000 and specify that you require either an ionized systemic calcium or a post filter ionized calcium. As well under the **comments section** enter "mixed venous" for these samples to differentiate what type of gases you require.
 5. When using the Gem 3000, ensure that blood tests are cohorted (i.e.: if blood gases are needed due to a ventilator change and electrolytes will be needed soon because of an electrolyte replacement, wait and draw both samples together) unless the patient's condition requires immediate results.
 6. If blood work is required that cannot be analyzed by the GEM 3000 all samples should be sent to the lab for analysis. (i.e.: if Calcium, Magnesium and Phosphate are needed with electrolytes, these should all go to the lab as the GEM 3000 cannot give a Mg or Phosphate).
 7. Both the RNs and RRTs approved in the procedure of blood drawing and Point-of-Care testing may draw blood samples using the current method of blood drawing from an arterial or venous line and analyze samples.
Communication is imperative among RN/RRT to avoid unnecessary blood drawing and duplication of tests.
 8. A Laboratory Technician is not authorized to analyze samples in the Adult Critical Care. The Laboratory Technician will draw and label the capillary gas sample and give them to the RN or RRT to be analyzed by the GEM 3000. Labelling should be done by using the white label stamped by the addressographer.

PROCEDURE

- Allow at least 20 minutes post changes in ventilator parameters, FiO₂, when suctioning and/or performing any patient care before collecting samples. This is to ensure the results of the sample will reflect the patient's true respiratory status.
- Obtain an appropriate amount of blood from patient using the pre-heparinized, dry blood gas syringe.
Arterial blood: 1.5 – 2.0 ml
Mixed venous blood: via pulmonary artery catheter
1.5 – 2.0 ml
Venous blood: 1.5-2.0ml via central venous line
- Remove any air drawn from syringe to maintain anaerobic conditions.
- Grab syringe firmly over cap and repeatedly rock syringe 5 times, then roll syringe between your hands for 20 seconds to prevent clotting.
- Transport patient's labeled blood sample to GEM 3000 test station. You will require the Patient's **ID number**. The patient's ID number (barcode) will be located at the Point-of-Care test station. You will also require the patient's temperature, FiO₂ requirements, peep, the patient's minute volume and time when the sample was obtained when analyzing blood gases.
- Check that the instrument displays the **READY** screen (if the **READY** screen is not displayed, press "cancel" or "OK" until the **READY** screen appears).

Note: If an interruptible calibration is in progress, the instrument will interrupt the calibration and start the sampling process.

- Select the appropriate Test Panel as follows:
 - a. Touch the "Panel" button on the **READY** screen.
 - b. Select the desired test(s) that have been ordered
 - c. Ensure all values to be measured are green and checked off.
 - d. Confirm by touching the "OK" button.
- Analytes (tests) may also be selected/deselected from the **READY** screen.

- Specify the sample type by touching ARTERIAL, VENOUS, CAPILLARY or OTHER at the **READY** screen. Note: use “OTHER” for mixed venous.
- On “Enter Password” screen, scan your own barcode with the bar code reader attached to the GEM 3000.
- On “Enter Patient ID” screen, enter the patient’s **visit** number using the touch screen. (**NOTE: visit numbers are 9 digits, PIN numbers are 8 digits**). This visit number will be provided at the GEM 3000 station, on paper as a patient barcode with this number.
- The analyzer then prepares to accept a sample.
- Always use Universal Precautions.
- Using Personal Protection Equipment (PPE) (gloves), remix the specimen thoroughly by rolling the syringe between your hands for at least 20 seconds and inverting it five times. Remove the end cap from the syringe and holding it upright. Discard the first few drops of blood onto 2x2 nonsterile gauze. Discard gauze in the biohazard waste container provided.
- Analyze the sample immediately, for short delays (less than 15 minutes) the specimen must be kept on ice to slow metabolism of the sample and remixed as described above to ensure accuracy of results. If there is a known delay of 15 minutes or more (cartridge change occurring) send the sample on ice to the core lab for testing.
- Position the sample so that the sampler is near but not touching the bottom of the syringe plunger Select “OK” to begin aspirating the sample.
- When the instrument beeps four (4) times, immediately remove the sample.
- Recap and place sample aside to ensure testing and results acceptable before disposal of sample.
- Enter the patient’s temperature using “Temp” button. Follow the screen prompts. The machine defaults to 37 degrees Celsius, if necessary change the default to the patient’s correct temperature. You do this by clearing the default temperature and entering the patient’s temperature at present.
- Enter the ventilator parameters using the “O2 and Vent settings” button and follow the prompts (enter the patient’s FiO2 in percent i.e. 90% is 90,

peep) under mode enter the minute volume (MV) instead of mode of ventilation. Touch “OK” to confirm.

- When analysis is complete, choose review results on the “Patient Sample Results” screen and either “Accept”, or “Discard”. Each specimen must manually be “Accepted” to continue. If discard selected re-run or redraw sample.
- Dispose of the sample in the biohazard waste container.
- When the “Show History” button is selected on the Result screen, results from the last six (6) accepted samples of a single patient ID are displayed.
- When analysis is complete, the analyzer will rinse the system and return it to the **READY** mode for the next analysis.
- If for any reason you are unable to obtain a result from the GEM 3000, send the sample to the lab for processing.
- Results are automatically updated in “Powerchart.” The GEM 3000 paper that is generated with results is then discarded in the confidential waste container after appropriate transcriptions in patient’s chart occur. The RN/RRT who analyzes results is responsible for this transcription and reporting critical test values to a physician.

REFERENCES

Analyzing Patient Samples on the GEM Premier 3000, Controlled document, ID: CHEM-POC-GEM-C-003, July 2004

Operator’s Guide GEM Premier 3000, May 2003

Point-of-Care Testing Policy, London Health Sciences Centre PCC012, February 1999

Policy and Procedures Using the GEM Premiere 3000 to analyze blood work

Approval Level: