Radiometer ABL90 Flex
Department of Clinical Laboratories
The Ohio State University Wexner Medical Center

Laboratory:	Document Type:	Original Date Adopted:	Previous Document:
Point Of Care Testing	Procedure	1/2/2015	POC-45 Revision 8

Document Author:	Document Owner:	Acknowledgement / Required Copy Holders*:
Alicia Sheffield, MLS(ASCP)CM	Karen L Scott, MT(ASCP)	All Point of Care coordinators and testing personnel acknowledge of reading procedure and annual competency

Approval*:
Point of Care Chemistry Division Director: Laboratory Medical Director

Approval and Acknowledgements
Refer to QPulse system and Document Details report for laboratory directors(s)' electronic signature approval, employee acknowledgment and effective date.

1. PRINCPLE:

1.1. The Radiometer ABL 90 is a portable, automated analyzer that measures pH, blood gases, electrolytes, glucose, lactate, and oximetry in heparinized whole blood for use at or near the patient.

1.2. The ABL 90 analyzer has four different measuring principles employed in the sensors.

1.2.1. Potentiometry: The potential of a sensor chain is recorded using a voltmeter, and related to the concentration of the sample (Nernst equation). In Potentiometry, the potential of the sensor chain is related to the activity of a substance and not its concentration. The potentiometric measuring principle is applied in the pH, pCO2, K+, Na+, and Ca2+ sensors.

1.2.2. Amperometry: The magnitude of an electrical current flowing through a sensor chain is proportional to the concentration of the substance being oxidized or reduced at an electrode in the chain. The Amperometric measuring principle is applied in the cGlu and cLac sensors.

1.2.3. Optical: The optical system for pO2 is based on the ability of O2 to reduce the intensity and time constant of the phosphorescence from a phosphorescent dye that is in contact with the sample. This measuring principle is applied in the pO2 sensor

1.2.4. Spectrophotometry: Light passes through a cuvette containing a hemolyzed blood sample. The specific wavelengths absorbed and their intensity generates an absorption spectrum used to calculate oximetry parameters. This measuring principle is used for measuring ctHb and sO2.

2. SCOPE OF DOCUMENT:

2.1. This document applies to all laboratory personnel, James OR/ PACU, and Ross Perfusion designated personnel performing blood gas, electrolyte, glucose, lactate, and oximetry whole blood testing.

3. RESPONSIBILITY:

3.1. The Point of Care coordinators and manager are responsible for maintaining the document and ensuring biennial review. The Point of Care Chemistry Division Director is responsible for approving all changes, and reviewing at least biennial. The laboratory medical director is responsible for establishing and approving all changes before activating

4. SPECIMEN COLLECTION:

4.1. All institutional policies and procedures should be followed in the collection of blood as blood is a body fluid capable of transmitting infectious diseases. Universal precautions for the prevention of the transmission of blood borne pathogens must be in effect at all times.

4.2. Personal protective equipment: wear gloves throughout the specimen collection and testing process. Use gauze to avoid any blood and body fluid exposure when opening the specimen tubes.

4.3. Patient Preparation: Verify patient identification using at least 2 identifiers.

4.3.1.1. During surgical procedures, patients are identified per OSU Time Out

4.3.2. Arterial Specimen collection; Refer to Laboratory Policies and Procedures/Specimen Collection on OneSource for collection procedure

4.3.3. Arterial Specimen collection from line draw

4.3.3.1. Follow Mosby's Nurses Skills Guide or anesthesiology policy.

4.4. Specimen type:

4.4.1. Whole blood arterial or venous specimens.

4.4.2. Blood may be tested immediately with no anticoagulant, or collected in lithium, sodium or balanced heparin.

4.4.3. Samples in syringe should be tested within 30 minutes.

4.4.4. The sampling process must be carried out properly, avoiding the aspiration of air bubbles that, if present, must be eliminated immediately. Care should be taken to avoid dilution caused by the anticoagulant solution

4.5. 65ul of whole blood is required to analyze a blood gas.

4.6. Unacceptable Specimens

4.6.1. Unlabeled or mislabeled samples.

4.6.2. Specimen with needle attached

4.6.3. Sample exposed to air in syringe

4.6.4. Clotted specimens

5. REAGENT /EQUIPMENT AND SUPPLIES:

5.1. ABL 90 Analyzer
- 5.1.1. Storage conditions:
  - 5.1.1.1. Instrument operating conditions-room temperature 15-32$_o$ C, humidity 20-80%
  - 5.1.1.2. If a minimum/maximum thermometer is used to perform continuous monitoring of temperature between daily temperature readings or following a laboratory downtime) e.g. laboratory closure for weekend or holiday), both the low and high temperatures must be recorded. To ensure correct temperature readings, the minimum/maximum thermometer device must be reset prior to the monitoring period
  - 5.1.1.3. The analyzer must be placed in a well-ventilated room to ensure proper calibration.
- 5.1.2. Battery pack- Limited power supply for use in instrument location transfer, or temporary power outages
- 5.1.3. Bar code reader
- 5.1.4. Solution pack:
  - 5.1.4.1. Contains calibration, rinse and quality control solutions. No preparation necessary.
  - 5.1.4.2. The solutions contain buffers, salts, enzymes, heparin, surfactant and preservative. The concentrations of the substrates are known and vital in determining the measurement accuracy of the analyzer. The concentration of each substance in the calibration solutions is programmed into the smart chip on the solution pack. The information is automatically read by the analyzer when a solution pack is installed on the analyzer.
  - 5.1.4.3. Store at 2-25$_o$C.
  - 5.1.4.4. Do not use beyond the expiration date, once the solution pack is opened it expires in 30 days or whichever comes first. The ABL90 will track the expiration date.
- 5.1.5. Sensor cassette:
  - 5.1.5.1. The cassette comes dry-stored on the sensor board to ensure a log shelf life. No preparation necessary.
  - 5.1.5.2. The Sensor cassette is for measuring the parameters indicated on the Sensor cassette
  - 5.1.5.3. Store at 2-8$_o$C.
  - 5.1.5.4. Do not use beyond the expiration date, once the Sensor cassette is opened it expires in 30 days or whichever comes first. The ABL90 will track the expiration date.
- 5.1.6. Holder with inlet gasket

5.2. Syringe
- 5.2.1. Luer slip syringe with Filter-Pro®

5.3. Controls
- 5.3.1. Qualicheck5+ are assayed controls for evaluating the accuracy and precision of all parameters.
  - 5.3.1.1. Aqueous solutions containing a biological buffer, salts and preservative. The controls are equilibrated with carbon dioxide and oxygen. Some solutions have glucose, lactate, and or dyes added.
  - 5.3.1.2. Store the controls at 2-25$_o$C including and up to a total of 15 days at up to 32$_o$ C. Controls should be between 18 and 32$_o$C for at least 5 hours before use.
  - 5.3.1.3. Controls must be used immediately after opening.
  - 5.3.1.4. Controls are good until the date printed on the vial. Do not use beyond the expiration date
- 5.3.2. Ampoule opener
- 5.3.3. Qualicheck adapter

5.4. ctHb calibrating solution
- 5.4.1. Contains salts, buffers, preservatives and coloring agent.
- 5.4.2. Storage and Stability: 24 months at 2-25 $_o$C including up to a total of 14 days up to 32 $_o$C. Refer to the label on the ampoule for the expiration date.
- 5.4.3. Ampoules should be conditioned for at least 5 hours at a constant temperature between 18 and 32 $_o$C before use.

5.5. Cal verification- VK-R5 Levels 1, 2, 3
- 5.5.1. Aqueous solutions containing a biological buffer, salts and preservative. The controls are equilibrated with carbon dioxide and oxygen. Some solutions have glucose, lactate, and or dyes added.
- 5.5.2. Storage: 2-8 $_o$C

6. SPECIAL SAFETY PRECAUTIONS:

WARNING: BODY FLUID PRECAUTION
Blood is a body fluid capable of transmitting infectious diseases. Universal precautions for the prevention of the transmission of blood borne pathogens must be in effect at all times.

6.1. Universal precautions must be followed when collecting and handling blood specimens.
6.2. Personal protective equipment: wear gloves and gown throughout the specimen collection and testing process.

7. CALIBRATION/PROGRAMMING/MAINTENANCE:

7.1. Correlations: performed biannually. Refer to POC Quality Management Policy
7.2. Internal Calibration:
7.2.1. Calibrations are performed automatically with CAL1, CAL2 and CAL3 and ambient air for each of the measured parameters.
7.2.2. A one point Calibration is performed with each patient sample

Calibration identifier (parameters)	Calibration	Calibration material	Default frequency	Default start time
Elec, pH (cK^+, cNa^+, cCa^{2+}, cCl^-, pH)	Sensitivity	CAL 1 solution CAL 2 solution	Once a day	08:00 hours
	Status	CAL 1 solution	Every measurement	N/A
BG, Met (pCO_2, cGlu, cLac)	Sensitivity	CAL 1 solution CAL 3 solution	Every 4 hours	02:00 hours
	Status	CAL 1 solution	Every measurement	N/A
BG (pO_2)	Sensitivity	CAL 1 solution Ambient air	Once a day	16:00 hours
	Status	CAL 1 solution	Every measurement	N/A

7.2.3. Calibration data is stored in the Calibration log from which they can be viewed.
7.2.4. Calibrations are done more frequently in the 24-hour period that follows a Sensor Cassette replacement.

Time period after a replacement	Calibration frequency
0-4 hours	In connection with every measurement
4-6 hours	Every 15 minutes
6-8 hours	Every 30 minutes
8-12 hours	Every hour
12-24 hours	Every 2 hours

7.2.5. Calling an unscheduled calibration
7.2.5.1. Check that the analyzer is in the Ready mode
7.2.5.2. Press Menu>Start programs>Calibration programs and call a calibration.
7.2.5.3. If a button is greyed out, it means it is not available.

7.3. External calibration verification

7.3.1. CalVer VK-R5: performed every six months (POCC Only)

7.3.1.1. Set the instrument to Calibration Verification mode: a preset measuring mode that lets you analyze solutions for calibration verifications as patient samples.

7.3.1.1.1. Menu>Utilities>Setup>Analysis setup>Syringe modes

7.3.1.1.2. Tap a button with no text in the "Select button to set up" field

7.3.1.1.3. Select the ***Button is enabled***: check button.

7.3.1.1.4. Tap the arrows in the "Measuring program:" field, until **Cal. Verification** is shown on the button. **Cal. Verification** will only be shown on the button, not in the "Measuring program:" field.

7.3.1.1.5. Tap the close button

7.3.1.2. Condition the VK-R5 kit between 18-32 ^{o}C

7.3.1.3. Check the analyzer is in READY mode

7.3.1.4. Remove the inlet clip

7.3.1.5. Hold ampoule between your thumb and first finger and shake it vigorously for 15 seconds

7.3.1.6. Hold the ampoule up and tap the solution down

7.3.1.7. Put the ampoule in the ampoule opener and break of the neck of the ampoule. Discard the glass in a sharps container

7.3.1.8. Put the adapter over the open end of the ampoule

7.3.1.9. Lift the inlet to the syringe position

7.3.1.10. Tap the Cal Verification button

7.3.1.11. Put the tip of the adapter with the ampoule in the center of the inlet

7.3.1.12. Push the adapter into the analyzer as far as you can and hold it there, NOTE: Do not bend probe

7.3.1.13. When the analyzer tells you, remove the adaptor with the ampoule and close inlet

7.3.1.14. In the Patient identification screen, enter Level 1, Level 2, or Level 3.

7.3.1.15. Results are saved in the Patient results log

7.3.1.16. Verify results are acceptable with the package insert

7.3.1.17. Repeat on the remaining ampoules.

7.3.1.18. If the results are not acceptable, remedy the error and repeat the calibration verification.

7.3.1.19. Record results, generate a report, and give to the Chemistry Division Director for review and signature.

7.3.2. ctHb calibration

7.3.2.1.1. Performed every 3 months.

7.3.2.1.2. Prepare and ampoule of S7770 ctHb Calibrating Solution

7.3.2.1.2.1. Hold the ampoule neck-side up between your thumb and first finger and shake vigorously for a minimum of 15 seconds.

7.3.2.1.3. Press Menu>Start programs>Calibration programs>tHb calibration

7.3.2.1.4. Enter the barcode information from the S7770 insert.

7.3.2.1.5. Press Close

7.3.2.1.6. Tap the top of the S7770 ampoule to collect the liquid at the bottom and break off the ampoule neck

7.3.2.1.7. Place adaptor over the ampoule

7.3.2.1.8. Open inlet to syringe position

7.3.2.1.9. Place the ctHb calibration ampoule against the inlet gasket and press the adapter upwards.

7.3.2.1.10. When prompted, remove the adapter and close the inlet

7.3.2.1.11. If the calibration results are not accepted, remedy the error and perform a new tHb calibration.

7.3.3. AMR Verification-performed every six months (POCC only)

7.3.3.1. The materials used for calibration verification include low, midpoint, and high values that are near the AMR.

7.4. Maintenance:
- 7.4.1. Replacements- The screens during replacement have an animation on the left side of the screen and the activities/operator actions on the right side. The instrument will alert when a replacement is needed.
  - 7.4.1.1.1. Solution Pack-every 30 days or when the number of test has reached zero or after the max.
  - 7.4.1.1.2. Sensor cassette- every 30 days or when the number of test has reached zero or after the max
  - 7.4.1.1.3. When the Solution pack and Sensor cassette is replaced, the ABL90 automatically performs internal quality controls. Acceptable criteria: quality control performs within manufacturer's acceptable ranges.
    - 7.4.1.1.3.1. Due to significant drift, the cGlu, cLac, Oxi, and pCO2 calibrations have a reduced validity time for the first 24 hours after a sensor cassette replacement.
  - 7.4.1.1.4. Inlet gasket- every 12months
  - 7.4.1.1.5. Connecting gasket- every 12 months
- 7.4.2. Cleaning- Immediately clean all surfaces if they become contaminated with blood or other liquids.
  - 7.4.2.1. Exterior
    - 7.4.2.1.1. Use soapy water or a mild detergent.
  - 7.4.2.2. Inlet
    - 7.4.2.2.1. Press Menu>Analyzer status>other activities>Inlet check
    - 7.4.2.2.2. Remove the inlet gasket with holder and the probe from the inlet. Soak the inlet gasket with holder and the inlet probe in a Deconex cleaning solution or a similar detergent. Do not inject Deconex cleaning solutions into the analyzer.
    - 7.4.2.2.3. Rinse thoroughly with demineralized water to remove all cleaning solution.
    - 7.4.2.2.4. Remount the inlet gasket with holder and the inlet probe.
    - 7.4.2.2.5. Remount the inlet and close it.
    - 7.4.2.2.6. Press Done.
  - 7.4.2.3. Screen
    - 7.4.2.3.1. Use a dry or lightly dampened soft lint-free cloth to clean the screen. Wipe the screen gently to remove fingerprints and/or dirt.
- 7.4.3. Disinfection of outer surfaces-performed when appropriate.
  - 7.4.3.1.1. Wipe the outer surfaces of the analyzer and the touch screen, using a disinfectant on a paper towel or tissue.
    - 7.4.3.1.1.1. Disinfectant to use: 70% isopropyl alcohol, 70% ethanol, or 4% Diversol BX.

7.5. Performance verification after repair
- 7.5.1. If service is performed on the analyzer, perform a calibration and two levels of external QC

7.6. Stat-up/Shutdown of the instrument
- 7.6.1. Temporary shutdown-switching the analyzer off for a short time.
  - 7.6.1.1. Menu>Utilities>Temporary shutdown>confirm shutdown>wait for the analyzer to shut down.
- 7.6.2. Restarting the analyzer after temporary shutdown
  - 7.6.2.1. Verify that the system requirements are met and all components are installed.
  - 7.6.2.2. Place the power switch in the "ON" position.
  - 7.6.2.3. Startup includes: Loading of software, leak test, initialization, liquid sensor adjustment, pump calibration, rinse, startup (conditioning of the sensor cassette), and calibrations.
  - 7.6.2.4. When complete, the main screen appears.
  - 7.6.2.5. The analyzer can be used as soon as the analyzer is in the Ready mode and the traffic light of the Analyzer status is acceptable.
- 7.6.3. Long-term shutdown(performed by POCC only)
  - 7.6.3.1. This is used to prepare the analyzer for a long-term storage if it will not be used for a period of time or if it has to be moved to another location so that it required removal of system components and emptying the analyzer of solutions. This shutdown procedure takes approximately 15 minutes.
  - 7.6.3.2. Menu>Utilities>Long-term shutdown>Refer to the ABL90 FLEX operator's manual Chapter 10 Analyzer shutdown.
- 7.6.4. Restarting the analyzer after a long shutdown

7.6.4.1. Turn on the analyzer and wait for the User-intervention-required mode to appear.
7.6.4.2. Perform a solution pack replacement
7.6.4.3. Perform a sensor cassette replacement
7.6.4.4. Press Test again.

8. QUALITY CONTROL/MANAGEMENT:

8.1. Internal Controls

8.1.1. The solution pack has three levels of controls A, B, and C; the analyzer automatically runs 2 levels every 8 hours.

8.1.2. The assigned value and acceptance range for each parameter are entered automatically into the analyzer each time a new solution pack is installed. Acceptability is defined by manufacturer's ranges.

8.1.3. . Internal controls enter the same sample pathway through the inlet as a normal blood sample.

8.1.4. Internal Controls are automatically reviewed by the analyzer for acceptability prior to reporting patient results.

8.1.5. Results are saved onboard in the Quality control log and transmitted to Radiometer's Aqure and Telcor.

8.1.6. Internal Control Monthly CV's for applicable analytes are within 10%.

8.1.7. New Lot Comparison

8.1.7.1. New lots of reagents (solution pack/sensor cassette) are confirmed for acceptability by automatic performance of 3 levels of manufacturer's internal controls (per manufacturer recommendation).

8.1.7.2. The new solution pack and/or sensor cassette is confirmed acceptable when the internal control values are within the manufacturer's ranges.

8.1.7.3. New lot internal controls are included on the monthly QC report, see the x axis on Levey Jennings graphs for lot changes and internal control performance.

8.2. External Controls

8.2.1. Qualicheck5+

8.2.1.1. Perform External QC

8.2.1.1.1. Upon receipt of new lot number to verify manufacturer's range by running each control once. Acceptable Control limits are defined by the manufacture ranges.

8.2.1.1.2. When troubleshooting

8.2.1.1.3. After repairs/preventative maintenance by manufacturer

8.2.1.2. Procedure for manual controls

8.2.1.2.1. The QC ampoule must be at room temperature (18-32$_0$C) for 5 hours prior to use. The controls are sensitive to light, so always keep the ampoule box closed.

8.2.1.2.2. Check the analyzer is in Ready mode

8.2.1.2.3. Remove the inlet clip

8.2.1.2.4. Vigorously shake the control ampoule for at least 15 seconds.

8.2.1.2.5. Tap the top of the ampoule until all of the solution collects at the bottom

8.2.1.2.6. Place the ampoule in the ampoule opener and break off the ampoule neck

8.2.1.2.7. Place the ampoule into the Qualicheck adapter

8.2.1.2.8. Lift the inlet to the syringe position

8.2.1.2.9. **If running external controls when not required, Select Ampoule QC on the analyzer.**

8.2.1.2.10. Place the adapter tip against the inlet gasket and press it upwards

8.2.1.2.11. Hold on to the adapter when removing the QC solution and when prompted by the analyzer, remove and close the inlet.

8.2.1.2.12. Dispose of the ampoule in a sharps biohazard waste container

8.2.1.2.13. Record the room temperature and document on the instrument, the instrument will not perform QC if the temperature is not recorded.

8.2.1.2.14. Controls must be reviewed and acceptable prior to reporting patient results. Acceptability is defined by manufacturer's ranges.

8.2.2. Entering a new lot of QC ranges
- 8.2.2.1. Press Menu>Utilities>Setup>QC>QC solutions
- 8.2.2.2. Highlight a slot
- 8.2.2.3. Scan the barcode of the Qualicheck5+ insert to enter the information
- 8.2.2.4. To delete a control solution, highlight the desired slot and press Delete. This will irreversibly delete all statistical data related to the selected slot.

8.3. Troubleshooting
- 8.3.1. If any QC results are marked in red with an error, the instrument will not report the analyte that fails.
- 8.3.2. If QC fails – check:
  - 8.3.2.1. Were the ampoules stored according to specifications?
  - 8.3.2.2. Were the ampoules conditioned properly?
  - 8.3.2.3. Was the correct ampoule temperature keyed in correctly?
  - 8.3.2.4. Was the ampoule shaken for at least 15 seconds?
  - 8.3.2.5. Was the ampoule analyzed immediately after opening?
  - 8.3.2.6. Repeat QC with new vial
  - 8.3.2.7. If QC fails again, contact technical support
- 8.3.3. System checks
  - 8.3.3.1. Performed regularly and automatically.
  - 8.3.3.2. If system check fails, they are in most cases retired, and, if possible, remedied automatically by the analyzer.
- 8.3.4. System checks include: computer, software, mechanical, electrical and temperature checks
- 8.3.5. Analysis checks
  - 8.3.5.1. Performed automatically in connection with sample analysis
  - 8.3.5.2. Includes: status calibration checks, sample integrity, temperature, mechanical, electrical measurement preparation and consumable checks.

9. TEST PROCEDURE:

9.1. Check to make sure the analyzer is in "Ready" mode.
9.2. Ensure the inlet clip is in position
9.3. Press Menu> Logon
9.4. Scan your Badge ID
9.5. Make sure the traffic light is displaying all Green lights
9.6. The blood sample must be **mixed thoroughly** immediately before it is introduced into the analyzer.
9.7. Expel any air bubbles that may be present. Ambient air can markedly affect some parameters.
9.8. Check for clots by expelling small amount of blood onto an absorbent surface.
9.9. At the Ready screen, lift the inlet handle to the syringe position
9.10. Press the syringe against the inlet gasket and the inlet probe extends into the sample
9.11. A 1 point calibration begins
9.12. The sample is drawn into the sensor measuring chamber and the oximetry module. This process is controlled by liquid sensors that also check sample homogeneity with respect to air bubbles; Error A appears if air is in the sample, if error occurs the sample is aborted
9.13. When the aspiration is finished, close the inlet
9.14. Enter the Patient ID
9.15. When the sample is complete, the results are computed and then displayed
9.16. No marking next to a parameter indicated that a parameter was measured without any fault. The following markings may appear next to a parameter

Marking	Explanation
"?"	Error in the last QC measurement or calibration, or because of sample problem
↑↓	Parameter value is outside the reference range

	Parameter value is outside the upper or lower critical limit
	Parameter value is outside the analytical measurement range (AMR). The values of parameter with these markings are blanked out and hence not shown in the result.
"……"instead of the value	A parameter cannot be calculated or exceeds the numerical limit of the analyzer

9.17. If a value is not reported due to any of the above markings and there is a need to report an actual value, send a new sample to the main lab for testing.
9.18. After the sample is complete, a rinse is performed
9.19. At the end of the day, check the expiration dates and volumes of the Solution pack and the cassette sensor.

10. CALCULATIONS:

10.1. The ABL90 analyzer performs all calculations required for reporting results.

11. REPORTING RESULTS:

11.1. Results are immediately sent via the medical center network to Radiometer's Aqure and Telcor and uploaded into the LIS system, where the results are accessioned and uploaded into IHIS.
11.2. pH, pCO2, and pO2 are required results for the tests to transmit to the medical record.
11.3. Refer to master listing chart for reference intervals.
11.4. Refer to master listing for Analytical measurement range (technical range)
11.5. Refer to master listing chart reportable (reportable range) CRR
11.6. Refer to Critical/Critical Value policy for critical values
11.7. If an error is suspected in patient resulting, contact the POC office to make the changes.
11.8. If the server is down, or similar computer system is down and cannot allow automatic transmittal of results, the results can be manually entered into Sunquest by a POCC.
11.8.1. Additionally, the results will be stored in the ABL90 and once the system is up and running, the data will transmit.

12. INTERPRETATION OF RESULTS

12.1. If a result falls outside of the AMR, no result will be reported. If there is a need to report an actual value, a fresh patient sample should be sent to the Critical Care Laboratory.
12.2. Critical values for adult samples
12.2.1. If any result is flagged as a critical value, the ordering provider must take the appropriate corrective action.
12.2.2. The physician reviews all ABG results during the procedure.

13. LIMITATIONS OF PROCEDURE:

13.1. If the instrument is unavailable for use, send all specimens to the Main Lab for testing.
13.2. Validity of the test results from this analyzer must be carefully examined by a clinician and related to the patient's clinical condition.
13.3. Review the analyzer's performance data to ensure that the performance fulfills the user-specific analytical needs.
13.4. The ABL90 analyzer measures only HbA and HbF hemoglobins
13.5. To avoid the risk of infection take care not to scratch or stab yourself on the probe
13.6. Press the inlet gasket totally up to make sure that the sample is aspirated
13.7. If pO2<25 mmHg, the cGlu value is not usable and no value is shown. Analyzer message no. 1387 informs you that the cGlu value is not usable.
13.8. Interfering substances

Substance	Parameter Affected
Glycolic Acid	Lactate
Air Bubble	pO2
Hemolysis	Na+, K+, Ca2+, Glu
Liquid Heparin dilution	Na+, K+, Ca2+, Hgb
Arterial blood mixed with venous blood	pO2, pCO2, pH
Dilutions of sample with flush solution(saline)	Na+, K+, Ca2+
Sodium thiocyanate	Glu and Lac
EDTA	pH, pCO2, Na+, K+, Ca2+

14. REFERENCES

14.1. ABL90 FLEX reference manual, Edition K. Software version 3.1xx, 08/2014
14.2. ABL90 FLEX operator's manual, Edition H, software version 3.1xx, 03/2014
14.3. ABL90 FLEX User Manual, Code number:996-189 Version: 201602A

15. RELATED DOCUMENTS

15.1. Refer to QPulse System or Document Detail Report for related Laboratory Policies, Procedures, and Master Forms