Bwrdd Iechyd Prifysgol Caerdydd a'r Fro
Cardiff and Vale University Health Board

Cardiff and Vale UHB HVT Home Ventilation Team

Cardiff and Vale UHB Home Ventilation Team

Protocol for Earlobe Capillary Blood Gas Sampling in Adults 2020

Index

Introduction

Arterial blood gas (ABG) sampling represents the gold standard method for assessing acid base status, ventilation and blood oxygenation. During acute non-invasive ventilation (NIV) monitoring repeated measurement of ABG tension will be requested and can be assessed by capillary blood gas (CBG) sampling or intermittent arterial puncture (BTS 2018). In the assessment of blood gas tensions, CBG sampling have been shown in the literature to be patient friendly, physician independent and comparable to arterial blood specimens with the added benefits of improved patient satisfaction and decreased risk of complications.

Zavorsky et al (2007) found that CBG can substitute ABG for all blood gas parameters, apart from partial pressure of oxygen ($Pa0_2$) in patients breathing a high oxygen fraction. BTS (2017) maintain that for most patients who require blood gas sampling, either ABGs or arterialised CBG may be used to obtain an accurate measure of pH and partial pressure of carbon dioxide ($PaC0_2$). However, the partial pressure of oxygen ($Pa0_2$) is less accurate in earlobe blood gas samples (it underestimates the $Pa0_2$ by 0.5–1 kilopascal (kPa). Therefore, oximetry (oxygen saturations) should be monitored carefully if earlobe blood gas specimens are used and a repeat ABG should be taken if there is any concern about the accuracy of a CBG.

This protocol applies to all healthcare practitioners performing this procedure. Variations in technique can introduce significant differences in results thereby making a standardised procedure essential for all staff. Those undertaking the procedure should ensure that it is appropriate for each patient and that they have achieved an adequate level of competency (refer to page 31 - Assessment of competency for CBG sampling). It is the responsibility of the person performing the procedure to document the results in the medical notes and refer to medical staff if required.

Professional and Legal Issues

Arterial blood gas sampling is an extended role for registered staff. It is important that you are appropriately prepared for this role and fully aware of the implications of your actions and how they impact upon the patient, profession and employer.

The NMC Code (2015) requires that you practice according to a number of competence related standards of practice and behaviour for example:

> *6. Always practice in line with the best available evidence*
>
> *6.2 maintain the knowledge and skills you need for safe and effective practice*
>
> *13. Recognise and work within the limits of your competence*
>
> *13.3 Ask for help from a suitably qualified and experienced healthcare professional to carry out any action or procedure that is beyond the limits of your competence*
>
> *13.5 Complete the necessary training before carrying out a new role*

The Health and Care Professions Council (HCPC) Standards of Conduct, Performance and Ethics (2014) state that as a professional:

> *"You must act within the limits of your knowledge, skills and experience and, if necessary, refer the matter to another practitioner and that you must communicate properly and effectively with service users and other practitioners."*

The safe and effective sampling of arterial blood is a complex process which demands partnership between the various members of the multi professional team.

As a practitioner undertaking this procedure you will often serve as the final checkpoint in this process, having responsibility for the correct sampling labelling and transportation of blood you must ensure that you fulfil your duties according to Cardiff and Vale Trust policies and procedures.

Accountability and Duty of Care

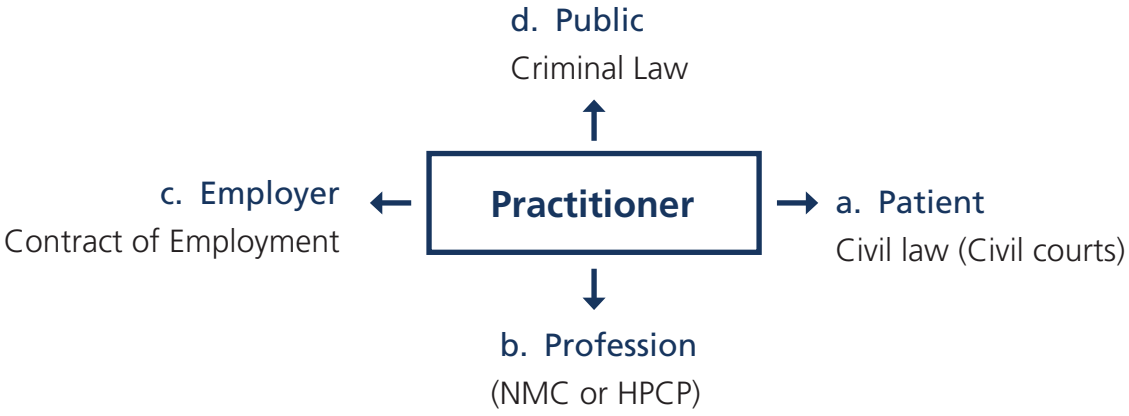
Individual practitioners are responsible for understanding the principles of accountability in relation to their individual practice:

> *'As a professional, you are personally accountable for actions and omissions in your practice, and must always be able to justify your decisions.'*
>
> *Nursing and Midwifery Council (NMC 2008)*

It is vital that you reflect upon your individual accountability in relation to undertaking a new skill.

The Areas of Accountability

Registered practitioners are accountable for their actions and omissions within four distinct areas



The relationship between these four areas can vary according to the situation in question. If the practitioner has been grossly negligent, they may be found guilty of a crime in the criminal courts and deemed liable in civil courts, be dismissed by their employer and removed from the professional register.

a. Civil Liability	This is in relation to your accountability towards a patient: • The family/carers/patient can sue for negligence in a civil law court • Action is usually brought against the employer rather than the practitioner through vicarious liability (as long as UHB policies, procedures and guidelines have been followed).
b. Professiona Accountability:	Registered practitioners are accountable to their professional body and must maintain the professional standards.
c. Accountability to Employer:	All practitioners are accountable to their employer and must work within the employers' policies and procedures. Misconduct or a breach of policy will lead to a formal investigation and proceedings under the disciplinary policy.
d. Accountability to the public (criminal law)	All practitioners must work within the boundaries of criminal law.

Duty of Care

As a practitioner, you are legally accountable for your practice and as a result the law says that it is reasonably foreseeable that if as a result of your actions (or omissions) you could cause harm to another, then you generally owe that person a legal duty of care. If a patient is injured through your care, you could be held to have been clinically negligent if the patient is able to prove that:

- You owed them a legal duty of care, and
- You were in breach of that duty of care, and
- The harm was caused by the breach

In order for clinical negligence to be proven these three duty of care conditions must be satisfied. A breach of duty of care is often determined by using the 'Bolam Test' which is based upon a famous benchmark case *Bolam v Friern Hospital Management Committee (1957).* The Bolam test is where you will be expected to provide a standard of care as demonstrated by another practitioner in the same situation, with the same qualifications and level of experience.

Direct Liability

An employer has direct liability for patient well-being. As an example, if an employee followed the correct procedure for reporting a faulty piece of equipment and the employer failed to act on it, and a patient died because of the continued use of this equipment, the employer would be directly liable for this death.

Conversely, if the employee knew the equipment was faulty and failed to report it he would be deemed directly liable for the death.

Vicarious Liability

The employer is accountable for the standard of care delivered. The employer is also responsible for employees working within a sphere of competence which is appropriate to their abilities. To remain covered by an employer's vicarious liability clause, an employee must only work within their abilities, sphere of competence and within the employers policies and guidelines. If the practitioner is working within the employer's policies and guidelines they will be covered by vicarious liability i.e. it is the organisation rather than the individual that is liable.

When undertaking this skill you must ensure that you follow both the relevant Cardiff and Vale UHB policies and National guidelines.

- Consent to Examination or Treatment Policy
- Infection Control Procedure for Hand Decontamination
- Patient Identification Policy
- Mental Capacity Act and tool kit
- Aseptic Non-Touch Technique
- Waste Management procedures
- Infection control protocol for needle stick and similar sharps injuries
- Policy on the labeling of specimens submitted to medical laboratories

Informed Consent

The consent process: (as per UHB Consent to Examination or Treatment Policy 2012)

Informed consent is the patient's agreement that a health professional can undertake an assessment / provide care or interventions. Health professionals must be satisfied that the patient has given his or her valid consent before providing care or treatment. For consent to be valid, it must be given voluntarily and freely by an appropriately informed person who has the capacity to consent to the intervention in question.

The health professional must provide the patient with sufficient information to enable them to make an informed decision. Prior to taking a capillary blood gas sample verbal consent needs to be sought from the patient by the practitioner who will be taking the sample.

To give valid consent the patient needs to be provided with sufficient information to understand in broad terms the nature and purpose of the procedure - for example, information about the risks and benefits of the proposed treatment and alternative options.

If a patient with mental capacity does not consent to have a capillary blood gas sample taken it is important that you fully explain the possible consequences and risks associated with the sample not being taken and that you document this in the medical notes.

Mental Capacity

The Mental Capacity Act is a statutory framework which became law in April 2005 and came into force in April 2007. The Act is accompanied by a Code of Practice that provides guidance to all those working with people who may lack mental capacity. The Act is intended to help and support people who have difficulty in making decisions for themselves or who want to plan ahead in case they are unable to make decisions in the future.

Mental capacity is an individual's ability to make a specific decision. Mental capacity is always presumed to be present and it is the responsibility of the practitioner to prove through assessment that the patient doesn't have mental capacity rather than the patient's responsibility to prove that they do.

If you suspect that an individual does not have mental capacity you need to ask the following questions. If the answer is no to these questions then capacity must be presumed to be present. It both questions are answered with a yes then you should proceed to a full capacity assessment.

- Is there an impairment of, or disturbance in, the functioning of the person's mind or brain?
- Is the impairment or disturbance sufficient that the person lacks the capacity to make that particular decision?

As part of the consent process it is important that you consider if the patient has the mental capacity to make any decisions involved with this skill, and that you take appropriate action if they don't.

For example: if a confused patient with a cognitive disorder refuses to have a cannula inserted for intravenous antibiotics to treat a severe infection they will be at risk of harm. If they do not have mental capacity a best interest decision may need to be made before cannulation goes ahead. Mental capacity assessments and best interest decisions must be documented using the appropriate documentation.

Please see the Mental Capacity Act pages of Cardiff and Vale intranet page for further information on how to assess capacity or make a best interest decision as you will be required to do this as the person undertaking the intervention.

Ensuring Safe Practice

All practitioners acting under this protocol must have undertaken CBG training, which includes capillary blood gas sampling as part of the formal content.

Practitioners working under this protocol are allowed a maximum of three attempts on each ear lobe at blood gas sampling – if unsuccessful the patient must be referred to medical staff.

Contraindications

- Capillary sampling should not be performed where there is:
- Inflamed, swollen or oedematous tissue
- Cyanotic or poorly perfused tissues
- Localised areas of infection
- Patient with shock
- Arterial access available (e.g. radial arterial line)

Indications

There are a number of indications for CBG sampling in in-patients. These include:

- Anyone with impaired respiratory effort (decreased SpO_2)
- Monitoring of patients receiving acute non-invasive ventilation in line with BTS (2018) guidelines
- In the assessment of respiratory function in haemodynamically stable patients.
- Assessment of supplementary oxygen requirements.

Equipment

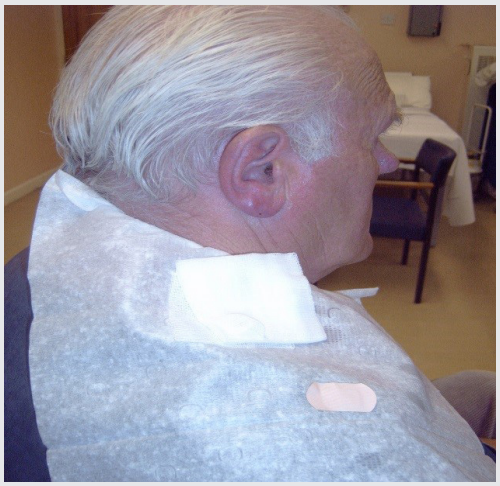
- Heparinised Capillary blood gas tube (55ul, 85ul, 95ul)
- Clot catcher
- Alcohol swab
- Sharps box
- Patient label
- Gloves
- Absorbent towel
- Appropriate lancet
- Clean plastic tray or disposable cardboard tray
- Hot water supply
- Sterile gauze
- Waterproof plaster

Source of Professional & Legal Issues CAV ELD (2017)

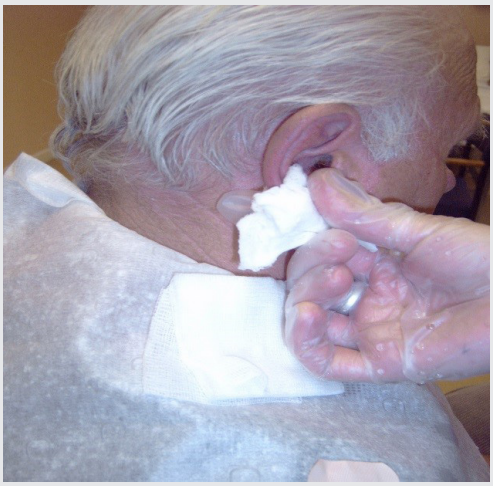
Capillary Blood Gas Procedure

1. Prepare patient

- The patient's identity must first be confirmed. If the patient is unable to confirm these themselves, it is then advisable for the practitioner to confirm by checking the patient's identification band.
- After the patient's identity has been established, the practitioner should inquire if the patient is using any medication that would alter the bloods clotting factors. That is, would make the patient bleed more easily.
- The above will influence how long the ear is warmed, using 2/3 swabs soaked in hot water.
- Seat the patient in a chair or ensure the patient is comfortable in bed, and cover the shoulder with 2/3 paper hand towels. This will stop any drops of blood from dripping on to the patient's clothes unnecessarily (Pic 1).



Picture 1



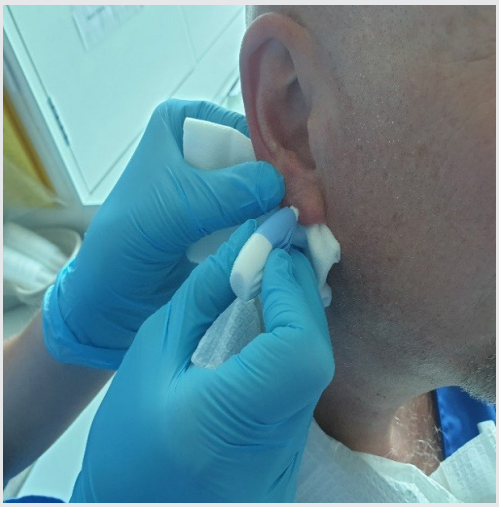
Picture 2

2. Prepare earlobe

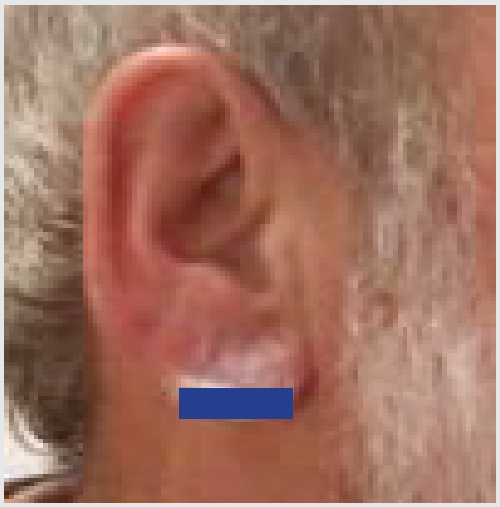
- Soak 2/3 gauze swabs from a hot water source, and then apply these to the patient's ear, for approximately 1 -2 minutes. Be careful not to burn the patient's earlobe as the swabs will be hot at first, but they will lose heat quickly (Pic 2).
- The patient's ear lobe will start to appear red; the ear lobe has now a healthy blood supply running to it.
- Holding a folded swab, place this behind the patient's earlobe.

3. Puncture earlobe

- Firmly press the lancet against the bottom edge of the earlobe, which is effectively sandwiched between the folded swab behind the earlobe and the lancet. Keep pressing the lancet firmly against the earlobe until a 'click' is heard. Blood should be then visible from the puncture site (Pic 3). Remove the folded swab and lancet from the ear lobe, and place them both in the kidney receiver dish, allocated for "used" items. 3.



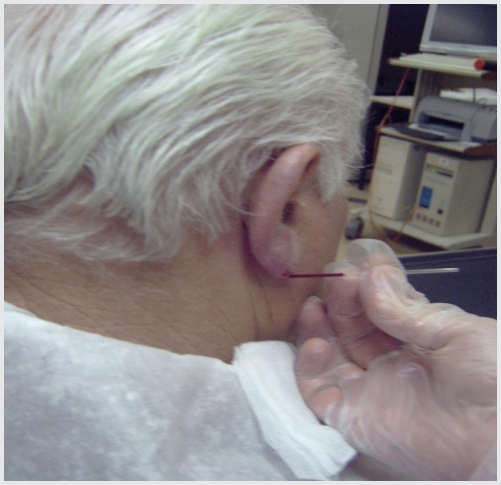
Picture 3 (a)



(b)

4. Access blood sample

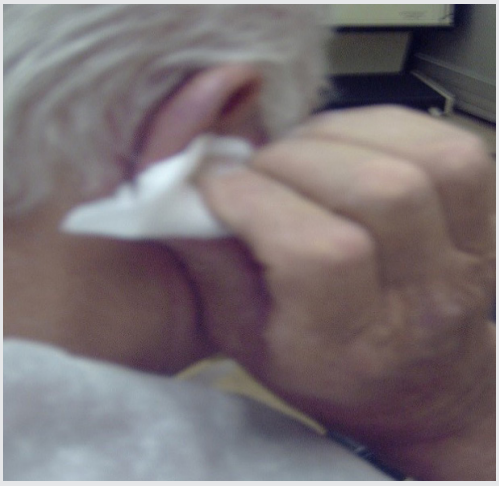
- The earlobe will start to "leak" blood from the site of the "stab". Picking up the capillary tube, start to sample blood into the tube. It is a useful technique to "angle" the capillary tube, slightly angled down off the horizontal (Pic 4). This will avoid the rush of blood into the tube, and consequently give rise to air entering the sample. Air will contaminate the sample with more oxygen, and thus give an error in the reading.
- Any air found in the tube must be "blotted out". "Blotting" requires the tube to be placed on a swab, and allowing the blood to leak out onto the swab until the air bubble has been displaced. Providing this has been done almost immediately, collection of ear lobe blood can begin again, with the same sample.



Picture 4

5. Stop earlobe bleeding

- When the capillary tube is near full, the sampling can stop. The patient is requested to firmly sandwich the ear lobe between a wads of swabs (Pic 5).

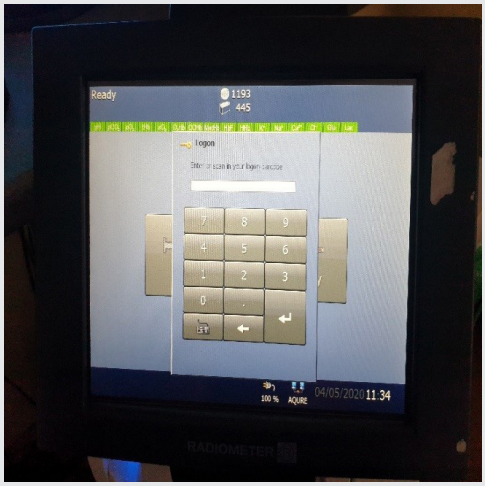


Picture 5

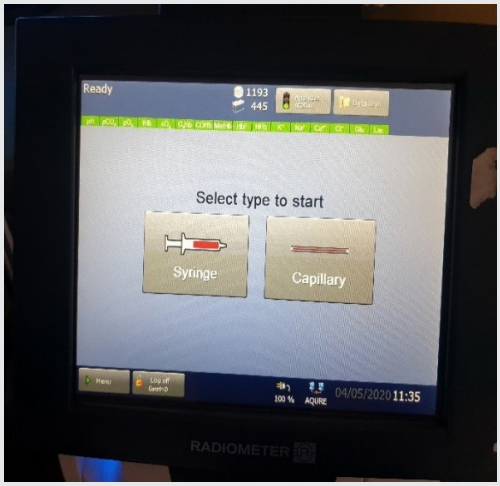
6. CBG analysis

- Present the CBG sample to the blood gas analyser as quickly as is safely possible. Enter you user code (Pic 6). All samples presented to the Radiometer ABL 90 Flex system need a 'clot catcher' applied to one end of the capillary tube.
- Please refer to instructions of the blood gas analyser in use in your own practice area i.e. 'Radiometer' ABL 800 Flex system or Abbott i-stat, portable blood gas analyser.
- Occasionally the analyser refuses to analyse the sample. This may be for a number of reasons:
  - There has been a clot formation in the tube which effectively blocks the further flow of blood into the analyser
  - The sample is too small
  - There is an air bubble in the system
- These are impossible to remedy once the sample has been processed by the analyser. The only solution is for the operator to take another sample.
- The analyser will indicate once the sample has been accepted. Remove the capillary tube and clot catcher. The sample port will then retract back into the machine.
- After entering the sample scan the patient bar code which is found on the patient identity label. Also input the patient's oxygen prescription.
- The analyser now takes approximately 1 minute to analyse the sample.

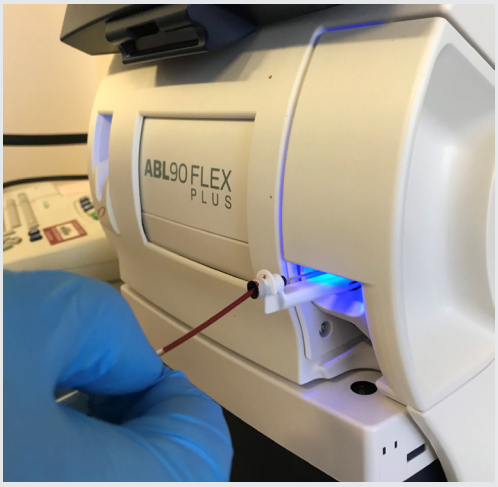
- Press result box in right corner when it appears. The analyser will eventually show the screen below (Pic 9). One printed copy of the results will automatically be printed out. Further copies can be requested by pressing the "print" button on the touch screen of the analyser.
- The blood gas result should be noted by the practitioner processing the CBG. The result then recorded in the patient's NIV documentation and the patient's medical notes. Action must be taken in respect of gas levels and in relation to NIV settings and oxygen flow rate. Seek assistance from the ward doctor if necessary.



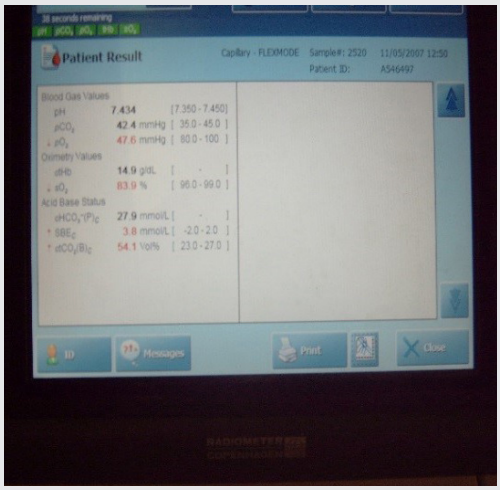
Picture 6



Picture 7



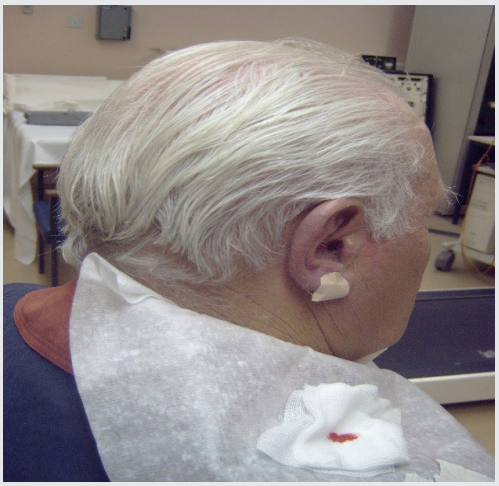
Picture 8



Picture 9

7. Complete procedure ensuring patient comfort and safety

- Finally address the patient's ear. The patient may now release their grip from the wad of swabs, and providing that the ear lobe has stopped bleeding a small Elastoplast can be applied to the patient (Pic 10). This will stop the patient picking at the ear, keep the ear clean, and in some circumstances stem a small leak of blood.



Picture 10

- Ensure the patient has no sensitivity to Elastoplast's dressings.
- It may be necessary sometimes to apply a swab soaked on cold water to stem the flow of blood. This can often be the case when patient are prescribed aspirin, DOAC e.g. apixaban or warfarin.
- Clean any area in which they have been working. Clean any drops of blood from work top surfaces by use of an alcohol wipe. Any plastic kidney dishes should have their contents emptied.
- Sharps must be disposed of in the yellow sharps box, and clinical waste i.e., swabs, gloves etc. should be placed in the yellow sacks. Wipe and wash any blood form the analyser's surface periodically.

Adapted from CAV Lung Function Department University Hospital Llandough Earlobe Capillary Gas Sampling Protocol (2018)

Overview of Interpreting blood gases

CBG samples taken from an earlobe that has been 'arterialised' by use of a gauze saturated in hot water. The earlobe can then be pinpricked to collect 35-95ul of blood. CBG gives the same range of data values gases, glucose electrolytes and lactate (Moran et al 2013).

The results of a blood gas test can help your doctor diagnose various diseases or determine how well treatments are working for certain conditions, including lung diseases. It also shows whether or not your body is compensating for the imbalance.

Due to the potential for compensation in some values that will cause the correction of other values, it's essential that the person interpreting the result be a trained healthcare provider with experience in blood gas interpretation.

The test measures:

1. **Hydrogen ion concentration (pH)**, which indicates the amount of hydrogen ions in blood. A pH of less than 7.35 is called acidic, and a pH greater than 7.45 is called basic, or alkaline. A lower blood pH may indicate that your blood is more acidic and has higher carbon dioxide levels. A higher blood pH may indicate that your blood is more basic and has a higher bicarbonate level.
2. **Bicarbonate (**$HC0_3$-**),** which is a chemical that helps prevent the pH of blood from becoming too acidic or too basic.
3. **Pa0$_2$**, which is a measure of the pressure of oxygen dissolved in the blood. It determines how well oxygen is able to flow from the lungs into the blood.
4. **(PaC0$_2$)**, which is a measure of the pressure of carbon dioxide dissolved in the blood. It determines how well carbon dioxide is able to flow out of the body.
5. **Oxygen saturation (S0$_2$)**, which is a measure of the amount of oxygen being carried by the hemoglobin in the red blood cells.

In general, normal values include:

- pH 7.35 to 7.45
- $HC0_3$- 22 to 26 mmol/L
- $Pa0_2$ 10 to 13 kPa
- $PaC0_2$ 4.5 -6.0 kPa
- S02 parameters for Type 2 respiratory failure 88-92%

*1kPa = 7.5mmHg

Adapted from CAV Lung Function Department University Hospital Llandough Earlobe Capillary Gas Sampling Protocol (2018)

Respiratory failure

Respiratory failure can be split into Type 1 or Type 2 respiratory failure. These are differentiated by the $PaC0_2$.

Type 1 Respiratory failure (T1RF) or hypoxic respiratory failure

- Type one respiratory failure is defined as a PaO_2 less than 8 and a $PaCO_2$ which is low or normal.
- T1RF is caused by pathological processes which reduce the ability of the lungs to exchange oxygen, without changing the ability to excrete carbon dioxide.
- Examples of T1RF are pulmonary embolus, pneumonia, asthma and pulmonary oedema.

Type 2 respiratory failure (T2RF) or hypercapnic respiratory failure

- This is defined as a PaO_2 of less than 8 and a raised $PaCO_2$.
- You can think of it as being caused by a problem with the lungs or by a problem with the mechanics or control of respiration.

Pulmonary problems	**Mechanical problems**	**Central problems**
COPD	Chest wall trauma	Opiate overdose
Pulmonary oedema	Muscular dystrophies	Acute CNS disease
Pneumonia	Motor neurone disease	
	Myasthenia Gravis	
	Obesity Hypoventilation	

pH

- pH is a logarithmic scale of the concentration of hydrogen ions in a solution. It is inversely proportional to the concentration of hydrogen ions.
- When a solution becomes more acidic the concentration of hydrogen ions increases and the pH falls.
- Normally the body's pH is closely controlled between 7.35 – 7.45. This is achieved through buffering and excretion of acids. Buffers include plasma proteins and bicarbonate (extracellular) and proteins, phosphate and haemoglobin (intracellularly).
- Hydrogen ions are excreted via the kidney and carbon dioxide is excreted via the lungs
- Changes in ventilation are the primary way in which the concentration of H+ ions is regulated. Ventilation is controlled of the concentration of carbon dioxide in the blood.
- If the buffers and excretion mechanisms are overwhelmed and acid is continually produced, then the pH falls. This creates a metabolic acidosis.
- If the ability to excrete carbon dioxide is compromised this creates a respiratory acidosis.
- Note that a normal pH doesn't rule out respiratory or metabolic pathology. This why you must always look at all the values other than pH as there may be a compensated or mixed disorder.

Partial pressure (PP)

- Partial pressure is a way of assessing the number of molecules of a particular gas in a mixture of gases. It is the amount of pressure a particular gas contributes to the total pressure. For example, we normally breathe air which at sea level has a pressure of 100kPa, oxygen contributes 21% of 100kPa, which corresponds to a partial pressure of 21kPa.
- When used in blood gases, Henry's law is used to ascertain the partial pressures of gases in the blood. This law states that when a gas is dissolved in a liquid the partial pressure (i.e. concentration of gas) within the liquid is the same as in the gas in contact with the liquid. Therefore you can measure the partial pressure of gases in the blood.
- PaO_2 is the partial pressure of oxygen in arterial blood
- $PaCO_2$ is the partial pressure of carbon dioxide in arterial blood.

Base excess (BE)

- This is the amount of strong base which would need to be added or subtracted from a substance in order to return the pH to normal (7.35-7.45).
- A value outside of the normal range (-2 to +2 mmol/L) suggests a metabolic cause for the acidosis or alkalosis.
- In terms of basic interpretation
- A base excess more than +2 mmol/L indicates a metabolic alkalosis.
- A base excess less than -2 mmol/L indicates a metabolic acidosis.

Bicarbonate ($HC0_3$-)

- Bicarbonate is produced by the kidneys and acts as a buffer to maintain a normal pH. The normal range for bicarbonate is 22 – 26mmol/l.
- If there are additional acids in the blood the level of bicarbonate will fall as ions are used to buffer these acids. If there is a chronic acidosis additional bicarbonate is produced by the kidneys to keep the pH in range.
- It is for this reason that a raised bicarbonate may be seen in chronic type 2 respiratory failure where the pH remains normal despite a raised $PaCO_2$.

Compensated or Uncompensated?	Respiratory or Metabolic?	Acidic or Alkalotic?	pH	$PaCO_2$	HCO_{3-}
	Respiratory	Acidosis	Low	High	
	Respiratory	Alkalosis	High	Low	
	Metabolic	Acidosis	Low		Low
	Metabolic	Alkalosis	High		Low
Compensated	Respiratory	Acidosis	Normal	High	
Compensated	Respiratory	Alkalosis	Normal		
Compensated	Metabolic	Acidosis	Normal		Low
Compensated	Metabolic	Alkalosis	Normal		

Respiratory Compensation

- If a metabolic acidosis develops, the change is sensed by chemoreceptors centrally in the medulla oblongata and peripherally in the carotid bodies.
- The body responds by increasing depth and rate of respiration therefore increasing the excretion of $PaCO_2$ to try to keep the pH constant.
- The classic example of this is 'Kussmaul breathing' the deep sighing pattern of respiration seen in severe acidosis including diabetic ketoacidosis. Here you will see a low pH and a low $PaCO_2$ which would be described as a metabolic acidosis with partial respiratory compensation (partial as a normal pH has not been reached).

Metabolic Compensation

- In response to a respiratory acidosis, for example in $PaCO_2$ retention secondary to COPD, the kidneys will start to retain more HCO_3- in order to correct the pH.
- Here you would see a low normal pH with a high $PaCO_2$ and high bicarbonate.
- This process takes place over days.
- It is important to ensure that the compensation that you see is appropriate, i.e. as you would expect. If not then you should start to think about mixed acid base disorders.

How to interpret an ABG/CBG

A systematic approach to blood gas interpretation leads to easy interpretation. Here is one such system:

1. Look at the patient. Review history and examination findings.
2. What is the PaO_2 – how much oxygen was your patient on when the gas was taken?
3. What is the pH? Is the patient acidaemic or alkalaemic.
4. What is the $PaCO_2$?
5. What is the HCO_3- and base excess?
6. Is the patient compensating?What are the other values? Ensure that you look at all other figures on the gas.

How to present a CBG

1. State that this is a CBG sample (rather than an ABG).
2. State the patients name and outline history/pertinent examination findings.
3. State the time the sample was taken and how much oxygen the patient was on at the time. Whether the patient was on NIV or off NIV.
4. Present your findings e.g. this sample result indicates type two respiratory failure with accompanying acidosis. PaO_2 of 7kPa (below 8kPa) and $PaCO_2$ of 9kPa (above 6kPa) with a corresponding low pH of 7.20 (below 7.35)
5. Present any abnormal findings or important negatives from the rest of the values.
6. A one line summary of your findings.

Type 2 respiratory failure acidosis

Findings:

- $PaCO_2$ retention
- pH < 7.35
- HCO_3- > 28 mmol/L (if compensating)
- $PaCO_2$ > Possible Causes:
  - Hypoventilation due to pulmonary (COPD), cardiac, musculoskeletal, or neuromuscular disease
  - CNS depression from drugs, injury, or disease
  - Asphyxia

Signs and Symptoms:

- increased work of breathing
- reduced tidal volumes
- diaphoresis
- headache
- tachycardia
- confusion
- restlessness
- anxiety

Source - Arterial Blood Gas (ABG) interpretation for medical students (2020). OSCEs and MRCP OME OXFORD MEDICAL EDUCATION

Assessment of Competency for Ear Lobe Capillary Blood Gas Sampling

Competency in this procedure is assessed through earlobe CBG gas sampling and supervised practice. Completion of the associated performance criteria and the candidate observing two CBG and five supervised procedures are required, prior to final competency sign off before they can act independently. Please refer to the competency forms below for details.

Note: Any practitioner acting under this policy must expect to perform at least 5 capillary samples per month in order to maintain their level of competence.

Note: Practitioners working under this protocol are allowed a maximum of three attempts on each ear lobe at blood gas sampling – if unsuccessful the patient must be referred to medical staff.

Assessment of Competency for Ear Lobe Capillary Blood Gas Sampling

Assessment Specification: The candidate should be able to demonstrate competence in ear lobe capillary blood gas sampling using the following knowledge evidence and performance criteria

Knowledge Evidence:

The candidate should be able to:

a) Demonstrate skill in the technique of ear lobe capillary blood gas sampling

b) Discuss the principles of safe practice with regards to ear lobe capillary blood gas sampling

c) Discuss the role, responsibility and accountability with reference to the Code of Professional Conduct.

d) Know the normal ranges for blood gas values

e) Demonstrate a systematic approach to blood gas interpretation

f) Know some of the common causes of blood gas abnormalities and what to do about them.

You need a mentor who is competent in ear lobe blood gas sampling who has a completed a recognised teaching and assessing course. If the candidate still feels they lack competence after supervised practice of at least five CBG samples, they should seek further training or supervised practice.

Clinical Supervisor (please print): .....

Signature: .....

Date: .....

Candidate (please print): .....

Signature: .....

Date: .....

Ward/Department: .....

Location of training: .....

Performance Criteria	**Competent - Mentor Initial and Date**									
CBG sample type	1 Observed	2 Observed	3 Supervised sample	4 Supervised sample	5 Supervised sample	6 Supervised sample	7 Supervised sample	8 Further supervised sample	9 Further supervised sample	10 Further supervised sample
Identifies need for capillary blood gas sampling										
Explains procedure to patient and obtains consent.										
Prepares necessary equipment										
Identifies and prepares appropriate site										
Applies hot gauze to ear lobe										
Stabilises ear lobe and stabs fleshy part of lobe to a depth of 2mm										
Collects blood sample in a heparinised capillary tube										
Prepares sample for analysis										
Notes patients inspired 0_2 concentration (FI02										
Analyses sample according to biochemistry protocol										
Shows knowledge of arterial blood gas interpretation and acts appropriately on results										
Clinical Supervisor Name ..... Signed ..... Date	Candidate Name ..... Signed ..... Date									

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