Unit 60: Measurement of Single Breath Gas Transfer

Level:	**4**
Unit type:	**Optional (Respiratory Physiology)**
Credit value:	**15**
Guided learning hours:	**120**

Unit summary

In this unit, you will gain the understanding and skills needed to perform the quality-assured measurement of single breath gas transfer safely and accurately. You will also be expected to interpret technical data from individuals and generate a technical report. In addition, you will be able to undertake routine maintenance, calibration and quality-assurance procedures on the equipment used. You will be expected to build your patient-centred professional practice and practise safely in the workplace.

Unit assessment requirements

There are no specific assessment requirements for this unit. Please refer to the assessment strategy in *Annexe B*.

Additional information

AC1.5 includes:

- the communicable diseases and microbiological hazards in a respiratory department
- risks and hazards in compliance with health and safety policies
- control of infection risks pre, during and post investigations, including decontamination of equipment
- importance of hand washing
- adherence to appropriate standards of professional practice as defined in Good Scientific Practice.

Learning outcome 2 – in a range of individuals with respiratory and non-respiratory disorders in accordance with Standard Operating Procedures.

AC2.1 includes:

- greeting the individual and check patient identification
- communicating with individuals in a way that respects their dignity, rights, privacy and confidentiality
- introducing self and own role
- reviewing the request form
- explaining the investigation to the individual in appropriate language, addressing any investigation-related questions
- providing information on how the individual will be informed of the results
- evaluating the risks and benefits of undertaking the investigation
- gaining and documenting informed consent
- explaining the principles, guidance and law for gaining informed consent, including the limits of consent
- obtaining and reviewing relevant individual information:
    - medication
    - smoking history
    - recent change in condition
    - any previous test results
- explaining potential special requirements of individuals referred for investigations
- treating the individual with respect, compassion and dignity
- acting on any special individual requirements and, if necessary, discuss with senior staff and carers, e.g. learning disabilities.

AC2.2 includes:

- identifying the potential risks of using defective equipment and measures to resolve problems
- the factors influencing the choice of equipment for the investigation
- selecting the correct equipment.

AC2.3 includes:

- the requirements for the investigation environment
- checking the equipment
- calibrating the equipment
- preparing the equipment
- explaining the principles of measurement for the range of equipment used
- identifying common faults
- taking remedial action
- the potential special needs of individuals referred for investigation and the relevant action required

- the measurements that may be required pre and post investigation
- measuring height, weight and other appropriate measurements in accordance with standardised procedures, adapting them where necessary
- the impact of incorrect positioning or non-cooperation on the individual, the investigation and the results.

AC2.4 includes in accordance with recommended guidelines and patient capability and:

- identifying errors in individual's technique
- correcting errors in individual's technique
- providing reassurance to the individual
- allowing sufficient time to enable an individual to recover between or from the test
- recording the results accurately in an appropriate format
- the relevance of investigations to referral request and differential diagnosis
- supporting individuals and encouraging them to perform within their capability
- how to distinguish between poor individual performance, technical faults and deterioration in clinical status
- the reasons a test may be stopped to maintain the safety of the individual
- documenting any technical comments that may influence the test outcome.

LO 4 to include

- selection of appropriate results for the reports including recognising poor test performance, correction of values for haemoglobin, volume/time and concentration/time graphs and collection of sample volume.

AC5.1 includes:

- safety testing
- routine maintenance.

Learning outcomes and assessment criteria

To pass this unit, learners need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements that the learner is expected to meet **in own area of work and in accordance with Standard Operating Procedures (SOPs)** to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the principles and application of single breath gas transfer	1.1	Explain the structure-function relationships determining gas exchange and carbon monoxide (CO) transfer factor			
		1.2	Explain the methods available for estimating CO transfer factor by single breath			
		1.3	Explain the concepts of the subdivisions of CO transfer factor			
		1.4	Explain the clinical indications and contraindications for single breath gas transfer			
		1.5	Evaluate the Standard Operating Procedure for performing quality-assured single breath gas transfer			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Be able to measure the uptake of carbon monoxide (CO) using the single breath technique as a guide to the gas exchange function	2.1	Gain informed consent for the measurement of the uptake of carbon monoxide (CO) using the single breath technique			
		2.2	Select suitable equipment for the investigation in accordance with the requirements of the test			
		2.3	Prepare the environment, equipment and patient for investigations			
		2.4	Perform the measurement of the uptake of carbon monoxide (CO) using the single breath technique			
3	Be able to clean and decontaminate equipment used to measure the uptake of carbon dioxide (CO)	3.1	Evaluate the protocols for cleaning and decontaminating equipment for measuring the uptake of carbon monoxide (CO) using the single breath technique			
		3.2	Clean and decontaminate equipment and leave in a suitable condition for reuse			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
4	Be able contribute to the production of a technical report for single breath gas transfer	4.1	Demonstrate the ability to use reference ranges for single breath gas transfer			
		4.2	Describe the typical patterns and results for single breath gas transfer common respiratory diseases			
		4.3	Demonstrate the contribution made to the production of a technical report for single breath gas transfer			
5	Be able to perform routine maintenance, calibration and quality-assurance procedures on the equipment used to undertake single breath gas transfer	5.1	Justify current safety standards underpinning the measurement of single breath gas transfer			
		5.2	Justify the requirements for accurate completion of equipment maintenance records			
		5.3	Perform routine maintenance and accurately complete equipment maintenance records			
		5.4	Perform alveolar volume and transfer test measurements on a physiological control			
		5.5	Explain the purpose of calibration logs			
		5.6	Discuss the purpose of quality assurance in respiratory physiology testing			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)