Association for Respiratory Technology and Physiology

NATIONAL STANDARDS FOR RESPIRATORY PHYSIOLOGY

Individual Record of Clinical Practice (IRCP)

CLINICAL (LEVEL II)

Contents

Introduction and General Guidelines

Introduction

The NHS workforce is at the heart of quality patient care and the NHS employs over 50,000 healthcare scientists in England. It is necessary to ensure that this workforce is competent to practice against national standards and it is the role of the professional body to develop and maintain these standards.

Educational Aims

- To achieve an understanding of a range of diagnostic and therapeutic respiratory measurement techniques including the rationale for the investigation and modification of the investigation where necessary.
- To become practically competent in specific areas of respiratory measurement with an understanding of the principles underlying the techniques used.
- To be able to interpret full lung function test results and treatment of respiratory disease where appropriate (Practitioner qualification).

Delivery

- Structured in-house training using the knowledge specifications outlined in the IRCP.
- Projects, assignments and case studies.
- ARTP Master class course (held annually).
- Use of other media (library, journals, internet etc).

Organisation of Training

Prior to enrolment onto the Level II professional body qualification, candidates will have successfully completed the Associate (Level I) professional body qualification.

In departments where the full range of investigations/training experiences is not available, **secondments to other departments will be necessary**. This should be arranged by the Work Based Assessor (WBA) in the employing department. The

WBA will be responsible for all aspects of the work based training. The WBA should have a recognised assessment qualification (e.g. D32/D33, A1) and should attend updates as provided. The candidate should be encouraged to attend relevant professional scientific meetings for development of underpinning knowledge.

The Association for Respiratory Technology and Physiology (ARTP) has overall responsibility for:

- Validation of theoretical teaching and practical training for the purposes of the professional qualifications.
- Organisation and performance of the professional examinations.
- Assuring the quality and standards of the professional examinations.
- Awarding of certificates for successful completion of professional examinations to ARTP members.

Competence to practice will be assessed by:

- Completion of the Individual Record of Clinical Practice (IRCP)
- ARTP professional examinations
- Performance evidence
- Verbal question and answer

IRCP requirements:

Clinical Examination (Level II)

It is a mandatory requirement of the Clinical Examination process that students provide an IRCP of evidence of the various assessments that have been performed under supervision during their training.
The IRCP should be no more than **1 lever arch file** and it should contain an index/contents page at the beginning that should enable the evidence to be identified easily.

It must contain the following elements:

1. One A4 page summarising the relevant assessor/training experience of the Work Based Supervisor (WBS) e.g. the Head of Department, the candidates nominated Work Based Assessor (WBA) and any other appropriately qualified staff involved in the assessment process, i.e. all other staff members signing IRCP.
2. A copy of a training plan for each section as required. The individual training plans should identify the core skills that will be developed for each section of the IRCP.
3. A witness testimony from the WBA confirming that the IRCP is the work of the candidate.
4. A fully completed Clinical Competencies Section. In all of the **Clinical Competencies** you must include:
    a. The product of all investigations i.e. all traces, raw data and results, for all assessments
    b. A statement, where relevant, indicating the guidelines that have been used to classify the severity of the patient condition e.g. GOLD, NICE, ARTP/BTS etc.
5. The WBA must ensure that the candidates underpinning knowledge is assessed throughout the IRCP using the defined questions at the end of each assessment. Questions have been designed to ensure that candidates have a level of underpinning knowledge and understanding

that will enable them to successfully undertake their ARTP practical examination. These questions should be asked under examination conditions.

6. Candidates undertaking the Clinical Examination (following successful completion of the Associate Examination) must complete section C of the IRCP.
7. Clinical interpretation by the candidate, with justification, of all investigations undertaken in the Clinical Competency section must be included with the raw data and traces.

IRCP Section Requirements

SECTION C: **CLINICAL COMPETENCIES**	Competently perform full lung function testing and spot check oximetry Competently perform full lung function testing with reversibility to short acting bronchodilators Provide an accurate clinical interpretation of all investigations performed with justifications *The range under which the candidate must be able to demonstrate competence are:* *Airflow obstruction (at least four patients)* *Restrictive ventilatory defect* *Extra thoracic restriction* *A patient aged >70 years* *A patient aged <25 years* *Significant reversibility* <u>This section should contain:</u> • An Assessment plan for each competency assessment (9 in total) • 8 Completed Formal Assessments of full lung function testing with spot check oximetry • 1 Completed Formal Assessment of full lung function testing with reversibility to short acting bronchodilators • Assessor feedback sheets including Q & A

Completing the Formal Assessments

Workplace assessment should only take place when the candidate and the Work Based Assessor (WBA) agree that the candidate is ready. Both the candidate and the WBA must be confident that the candidate has fulfilled their training plan and is ready to be assessed as competent.

The WBA should complete an assessment plan for each assessment which clearly indicates the standards that the student needs to meet. ALL of the performance criteria must be met for a successful outcome.

When a date for an assessment is agreed, the assessor and the candidate should meet to review the assessment plan and they should both sign the record of assessment to document the assessment event. Assessments should be by direct observation; simulations should only be used when direct observation is not possible, or would compromise patient safety.

Assessments

It is essential that sufficient time is allowed for completion of formal assessment and that time for assessment of underpinning knowledge and feedback immediately following the assessment is allocated. All assessments must be performed according to the ARTP/BTS Guidelines for the measurement of respiratory function (Respiratory Medicine 1994), where this does not occur an explanation must be included.

During each assessment, the assessor should observe the student without questioning or intervention, unless an emergency arises, or the patient is put at risk by the actions of the student. When each performance criterion is met during the assessment, a **YES** should be placed in the appropriate box with a suitable comment. If a performance criterion is not met, a **NO** is placed in the box and a comment should be made next to it. The assessor must query this with the student during the questioning session at the end of the investigation. If a performance criterion is not applicable, N/A should be placed in the box.

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. Candidates who do not demonstrate sufficient understanding will not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be

repeated after appropriate training. Where candidates fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Additional supplemental questions are included in each of the formal assessment paperwork. Candidates must be questioned on their underpinning knowledge and understanding following every assessment. Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. The supplemental questions included in each assessment are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their clinical examination. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

SECTION C:

FORMAL ASSESSMENTS OF FULL RESPIRATORY FUNCTION TESTS WITH CLINICAL INTERPRETATION

FORM RP13

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT PLAN

Candidate Name: _____

Assessor Name: _____

Assessment details:

During this assessment I will be looking to see that:

Sources of Evidence:
Direct observation and oral questioning

Signed: _____ **Signed:** _____

(Assessor) (Candidate)

FORM RP14

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 1

Patient Details

Age: _____ **Diagnosis:** _____

Medication: _____

Patient condition as defined in range: **Airflow Obstruction**

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity, Forced Vital Capacity and FEV_1 are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volumes and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: • *Inspired volume >90% VC* • *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* • *Breath hold without straining/leak* • *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		

Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	**Responses**
1. What does the shape of a normal flow volume loop represent physiologically? 2. How may upper airway obstruction be identified when performing dynamic lung volumes? 3. What causes a reduced VA? 4. What influence does anaemia have on gas transfer? 5. How may FRC be reduced? 6. Draw a helium dilution curve for a restrictive patient compared to an obstructive patient. 7. What is a normal heart rate? 8. What is the normal SpO2 response to exertion? 9. What is the mode of action of a $Beta_2$ agonist?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP15

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 2

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: Airflow Obstruction

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volumes and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if FEV/FVC ≥ 50% predicted. within 4 s ≤50% predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	Responses
1. Draw a mixed pattern flow volume loop? 2. How does COPD differ from asthma? 3. How does VA influence TLCO? 4. What is the significance of an elevated TLCO? 5. What is hyperinflation? 6. How does hyperinflation differ from gas trapping? 7. Draw the relationship between SaO2 and PaO2. 8. What do the ARTP/BTS guidelines specify as a significant response to a bronchodilator? 9. How does increasing age influence the response to bronchodilators?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP16

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 3

Patient Details

Age: _____ **Diagnosis:** _____

Medication: _____

Patient condition as defined in range: Airflow Obstruction

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if FEV/FVC ≥ 50% predicted. within 4 s ≤50% predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	**Responses**
1. How may you classify severity of airflow obstruction? Specify guidelines used. 2. Explain the difference, with the use of diagrams, between variable intra and variable extra thoracic upper airway obstruction. 3. What is the significance of a reduced TLCO? 4. How may intra and extra thoracic restriction be identified by gas transfer measurements? 5. How does muscle weakness reduce TLC? 6. What is the relationship between BMI and ERV? 7. How may altitude affect SpO_2? 8. Why does a non significant response in FEV_1 following reversibility studies not preclude the long term use of bronchodilators?	

9. Describe a limitation of the ESCS regression equations.	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT:	**……**
SIGNATURE OF CANDIDATE:	**……**
SIGNATURE OF ASSESSOR:	**……**
NAME OF ASSESSOR: (BLOCK CAPITALS)	**……**

FORM RP17

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 4

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: Airflow Obstruction

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurement of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	Responses
1. Draw a flow volume curve demonstrating mild airflow obstruction. 2. Why may flow be increased with respect to volume in patients with ILD. 3. What is the influence of lung disease on the discard and sample volumes chosen for gas transfer? 4. How may differing obstructive pathology show different gas transfer results? 5. Explain the differences in lung volume measurements in airflow obstruction when using gas dilution techniques and body plethysmography. 6. How does SpO2 influence heart rate? 7. What happens to RV during bronchodilation?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP18

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 5

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: A patient with a restrictive ventilatory defect

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurement of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	Responses
1. Draw a flow volume loop illustrating the effect of muscle weakness. 2. How may cough influence spirometry measurements? 3. What causes a reduced KCO? 4. How may hypovolaemia influence TLCO? 5. What is the significance of a low VA/TLC ratio? 6. What is the most common cause of a raised RV? 7. What respiratory conditions may affect heart rate? 8. How may beta blockers influence reversibility response?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP19

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 6

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: A patient with an extra thoracic restrictive defect

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurement of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	**Responses**
1. What is the Empey Index and how is it calculated? 2. What is a significant smoking history? 3. List three drugs which may have a detrimental effect on gas transfer. 4. What is theta CO and what may affect it? 5. How may hyperinflation affect a subject's SpO2? 6. Why may post bronchodilator spirometry values be less than pre?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP20

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 7

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: A patient aged >70 years of age

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise	.	
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

SECTION SIX: SUPPLEMENTAL PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	**Responses**
1. Explain the difference between FVC and VC max in a severely obstructed patient. 2. How may a slow start during spirometry affect FEV_1? 3. What is the difference between anatomical and physiological dead space? 4. Why should you wait between TLCO measurements? 5. How and why may chronic heart failure affect lung volumes? 6. At what percentage of TLC does tidal breathing occur normally in a 30 year old? 7. What is the normal capillary re-fill time? 8. What is the ratio of drug deposition between an MDI and nebuliser?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP21

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 8

Patient Details

Age: _____ Diagnosis: _____

Medication: _____

Patient condition as defined in range: A patient aged <25 years of age

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

SECTION SIX: SUPPLEMENTAL PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	Responses
1. Draw a flow volume loop of a patient with a restrictive defect (with a raised ratio) and mark the FEV_1. 2. Why may a cough at TLC increase PEF? 3. Would a 5ft female of 50 years of age or a 6ft male of 60 years of age be more likely to have a TLCO measurement of 10mmol/min/kPa? 4. How may exercise before testing increase TLCO results? 5. What is the relationship between FRC and age? 6. How may hyperinflation affect diaphragm function? 7. How may metabolic acidosis affect SpO_2? 8. When would you use a volume holding device over a spacer device?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

FORM RP22

PLAN, PREPARE AND PERFORM FULL RESPIRATORY INVESTIGATIONS

ASSESSMENT FORM

Assessment number: 9

Patient Details

Age: _____ **Diagnosis:** _____

Medication: _____

Patient condition as defined in range: A patient that has a significant bronchodilator response

SECTION ONE: PLAN AND PREPARE FOR THE MEASUREMENT OF FULL RESPIRATORY INVESTIGATIONS

PERFORMANCE CRITERIA *Y (achieved), N (not achieved). Complete comments for very good and very poor performances*	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Ensure that the equipment is in working order in order for the test to be performed		
Equipment faults are accurately identified and reported or rectified		
The system is correctly configured in accordance with the requirements of the test		

SECTION TWO: PERFORM MEASUREMENTS OF DYNAMIC LUNG VOLUMES

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The environment is suitable for the investigation being undertaken		
Patient is given a clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
The patient is correctly positioned		
Measurements of Vital Capacity and Forced Vital Capacity are made in accordance with ARTP/BTS guidelines		
Measurements of PEF are made in accordance with ARTP/BTS guidelines		
Errors in patient technique are identified and corrected		
Poor patient performance is distinguished from technical faults or deterioration in clinical status, which is dealt with promptly and reported in accordance with departmental protocol		
Limit of personal competence to proceed with the test is recognised and criteria for seeking external assistance agreed		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines (within 5% or 100mls)		

SECTION THREE: MEASURE STATIC LUNG VOLUMES HELIUM DILUTION

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction to the patient is accurate, clear and precise		
Initial helium value is within equipment/manufacturer's guidelines		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Accurate recording of helium concentration throughout the test with correct determination of end point according to ARTP/BTS Guidelines.		
Spirometer volume is constant during test through accurate addition of oxygen and removal of carbon dioxide *(Check student understanding if system has automatic oxygen compensation).*		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		

Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING NITROGEN WASHOUT

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is switched into the system in accordance with ARTP/BTS Guidelines (*Check student understanding if system uses automatic switch-in)*		
Correct determination of end point according to ARTP/BTS Guidelines.		
Vital Capacity manoeuvres performed in accordance with ARTP/BTS guidelines and/or equipment/manufacturer's guidelines.		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION THREE: MEASURE STATIC LUNG VOLUMES USING BODY PLETHYSMOGRAPHY

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Patient is correctly positioned with head perpendicular to chest		
Adequate time is allowed for thermal equilibration within the box		
The shutter occludes the mouthpiece at FRC.		
After the panting/quiet breathing manoeuvre, VC efforts are performed		
A minimum of 3 acceptable tests are performed		
Sufficient time allowed between manoeuvres for patient to return to normal tidal breathing.		
Errors in patient technique are identified and corrected.		
Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Malfunctioning of equipment is identified and corrected		

SECTION FOUR: MEASURE CO TRANSFER FACTOR USING AN APPROPRIATE METHOD

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Equipment is correctly prepared according to local procedure and manufacturer's guidelines.		
Appropriate selection of inspired volume, washout volume, sample volume and breath hold time		
Clear and comprehensible description of the nature and purpose of the test. Instruction is accurate, clear and precise		
Achieves the following: ○ *Inspired volume >90% VC* ○ *Inspiration within 1.5-2.0 seconds if $FEV_1/FVC \geq 50\%$ predicted. within 4 s $\leq 50\%$ predicted* ○ *Breath hold without straining/leak* ○ *Minimum of 2 acceptable tests performed with adequate rest between*		
Accurate measurements of V_{in}, breath-hold time, inhaled and exhaled gas concentrations are obtained		
Errors in patient technique are identified and corrected. Poor patient performance is distinguished from technical faults or deterioration in clinical status.		
Indications to stop or revise the test protocol are known and recognised in order to maintain the safety of the patient during the test		

SECTION FIVE: **PREPARE ANY NECESSARY EQUIPMENT FOR THE ADMINISTRATION OF BRONCHODILATOR AND THE MEASUREMENT OF THE RESPONSE**

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
Any consumables for the test are available and in adequate supply		
The correct bronchodilator and device are selected and are ready for use		
Any sources of compressed gas or oxygen are checked for functionality		

SECTION SIX: **MEASURE THE RESPONSE TO A SHORT ACTING BRONCHODILATOR**

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The bronchodilator/device is prepared in accordance with departmental procedure and manufacturer's instruction		
The correct bronchodilator and device are selected and are ready for use		
Instruction given to the patient is clear, understanding is checked and instructions repeated if necessary.		
Patient is positioned optimally		

The bronchodilator is administered to the patient (or the patient self-administers)		
If the patient self-administers the technique is monitored and evaluated, errors are recognised and corrected where possible or reported		
The patient is allowed to rest for the appropriate time following administration of bronchodilator		
The correct tests are re-called/selected for use as pre bronchodilator measurement		
Patient performs post bronchodilator tests in the same manner as baseline tests		
Appropriate results are selected and saved for use in the final report		

SECTION SEVEN: COMPLETE INVESTIGATION OF RESPONSE TO BRONCHODILATOR

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The patient is reassured and given appropriate time to recover from the test or administration of the bronchodilator		
Patient is clearly and accurately informed of the procedure for notification of the results		

All used consumables are dealt with in accordance with local procedure and health and safety at work act		
Any required transportation and escort is made available to coincide with the completion of the investigation and the readiness of the patient to leave		
Bronchodilators are returned to the storage facility		
Equipment is cleaned and left in a suitable condition for reuse		

SECTION EIGHT: PRODUCE A TECHNICAL REPORT OF THE RESULTS OBTAINED

PERFORMANCE CRITERIA ***Y (achieved), N (not achieved). Complete comments for very good and very poor performances***	**ACHIEVED YES/NO**	**ASSESSORS COMMENTS**
The results are recorded accurately in an appropriate format together with any technical comments that may influence the test outcome		
Results for reporting are correctly selected in accordance with ARTP/BTS guidelines or recognised appropriate guidelines		
A suitable report is generated		
Recognition of the requirement for further testing is made		

ASSESSMENT QUESTIONS

It is essential that candidates are questioned on any of the range that was not achieved i.e. a No or N/A was entered above. These questions should be asked under examination conditions. Candidates who do not demonstrate sufficient understanding would not have fulfilled the requirements of the formal assessment and therefore this assessment should not be passed and should be repeated after appropriate training. Where candidate fail to achieve the required competency in five or more performance criteria, the assessment should be terminated and repeated after further training.

Questions	**Responses**

UNDERPINNING KNOWLEDGE QUESTIONS

Candidates must demonstrate adequate underpinning knowledge of the principles in which they are deemed as competent. These questions are designed to assess the candidate's knowledge of respiratory physiology measurements and prepare them for their practical examination. These questions should be asked under examination conditions. All questions must be asked and the response documented by the WBA. Areas for development that are identified must be documented and specified as subsequent areas for review on future assessment plans.

Questions	**Responses**
1. Is a PEF of 250 measured in l/sec or l/min? 2. What is the difference between PEF and FEV_1? 3. In a normal subject does the RV/TLC% increase or decrease with age? Explain why this occurs. 4. Given the following information, calculate FRC: RV = 2.6L, VC = 5.1L, IC = 3.8L 5. How does smoking immediately prior to testing reduce TLCO? 6. Over what PaO_2 range are SpO_2 measurements relatively insensitive?	

ASSESSMENT OUTCOME	
PASS (All competencies met)	
FAIL (Insufficient competences met at this stage)	

ASSESSORS FEEDBACK (*WITH PLAN IF REQUIRED*)

DATE OF ASSESSMENT: **……..**

SIGNATURE OF CANDIDATE: **……**

SIGNATURE OF ASSESSOR: **……**

NAME OF ASSESSOR: **……**
(BLOCK CAPITALS)

ARTP
c/o Executive Business Support Ltd
City Wharf, Davidson Road
Lichfield, Staffs. WS14 9DZ
Tel: 01543 442141
Fax: 0121 355 2420
Email: admin@artp.org.uk
www.artp.org.uk