]	ltems	
ROO	Credential Maintenance Program		itive	
Pu	lmonary Function Technology Assessment	Le	vel	
	Detailed Content Outline		Int	T
	Multiple-choice items are linked to open cells.	Recall	tegra	Total
MATORY *	*Test takers will be asked to integrate (apply or analyze) information.	all	Integration*	
First Quarter of the O	Calendar			5
I. INSTRUMENTAT	TION / EQUIPMENT	1	4	5
A. Set Up, Mai	ntain, Calibrate	1	2	3
1. Blood g	as analyzers			
2. CO-oxir	meters / hemoximeters			
3. Spirome	eters (for example, diagnostic, screening, portable)			
4. Peak flo	ow meters			
_	delivery devices (for example, bronchodilator / bronchial ge, dosimeters)			
6. Metered	d dose or dry powder inhalers			
7. Valves (for example, directional, demand)			
8. Gas ana	llyzers			
	LCO (for example, gas chromatograph, infrared)			
b. ga	ns dilution techniques (for example, nitrogen, helium,			
	tercise (for example, CO_2 , O_2)			
	ethysmographs			
	e equipment (for example, treadmill, cycle or arm			
	onitors (for example, 3-lead, 12-lead)			
	lic measurement systems for exercise testing			
	ivery systems (for example, blenders, flowmeters)			
14. Pressure	e measuring devices (for example, manometers, cers, strain gauges)			
	I water absorbers (for example, Drierite®, Permapure®			
	ncy management equipment (for example, defibrillator,			
	bronchoscopes and associated equipment			
· · · · · · · · · · · · · · · · · · ·	/ venous blood collection equipment			
	ition systems equipment (for example, computers, data			
backup,	networks, printers, security) control devices (for example, calibration syringes,			
manom	eters, isothermal lung analog)			
21. Gas exc	hange validation device or DLCO simulator			

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Credential Maintenance Program		nitive	
Pulmonary Function Technology Assessment	Le	vel	
Detailed Content Outline		Int	T
Multiple-choice items are linked to open cells.	Recall	egra	Total
Test takers will be asked to integrate (apply or analyze) information.		ntegration	
22. Infection control materials / methods (for example, sterilization devices, gowns, gloves, masks, filters)			
23. Monitors			
a. pulse oximeters			
b. blood pressure (for example, manual cuff, automated)			
B. Troubleshoot	O	1	1
1. Blood gas analyzers			
2. CO-oximeters / hemoximeters			
3. Spirometers (for example, diagnostic, screening, portable)			
4. Peak flow meters			
 Aerosol delivery devices (for example, bronchodilator / bronchial challenge, dosimeters) 			
6. Metered dose or dry powder inhalers			
7. Valves (for example, directional, demand)			
8. Gas analyzers			
a. DLCO (for example, gas chromatograph, infrared)			
b. gas dilution techniques (for example, nitrogen, helium, oxygen)			
c. exercise (for example, CO ₂ , O ₂)			
9. Body plethysmographs			
 Exercise equipment (for example, treadmill, cycle or arm ergometer) 			
11. ECG monitors (for example, 3-lead, 12-lead)			
12. Metabolic measurement systems for exercise testing			
13. Gas delivery systems (for example, blenders, flowmeters)			
14. Pressure measuring devices (for example, manometers, transducers, strain gauges)			
15. Gas and water absorbers (for example, Drierite®, Permapure® tubing)			
16. Emergency management equipment (for example, defibrillator, crash cart)			
17. Flexible bronchoscopes and associated equipment			
18. Arterial / venous blood collection equipment			
19. Information systems equipment (for example, computers, data backup, networks, printers, security)			
20. Quality control devices (for example, calibration syringes, manometers, isothermal lung analog)			

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Credential Maintenance Program		itive	
Pulmonary Function Technology Assessment	_	vel	
Detailed Content Outline		In]
	R	ıteg	Total
Multiple-choice items are linked to open cells.	Recall	gra	al
Test takers will be asked to integrate (apply or analyze) information.		Integration	
21. Gas exchange validation device or DLCO simulator			
22. Infection control materials / methods (for example, sterilization devices, gowns, gloves, masks, filters)			
23. Monitors			
a. pulse oximeters			
b. blood pressure (for example, manual cuff, automated)			
C. Perform Quality Control	0	1	1
1. Blood gas analyzers			
2. CO-oximeters / hemoximeters			
3. Spirometers (for example, diagnostic, screening, portable)			
4. Peak flow meters			
 Aerosol delivery devices (for example, bronchodilator / bronchial challenge, dosimeters) 			
6. Metered dose or dry powder inhalers			
7. Valves (for example, directional, demand)			
8. Gas analyzers			
a. DLCO (for example, gas chromatograph, infrared)			
b. gas dilution techniques (for example, nitrogen, helium, oxygen)			
c. exercise (for example, CO ₂ , O ₂)			
9. Body plethysmographs			
 Exercise equipment (for example, treadmill, cycle or arm ergometer) 			
11. ECG monitors (for example, 3-lead, 12-lead)			
12. Metabolic measurement systems for exercise testing			
Second Quarter of the Calendar			5
II. PROCEDURES	2	6	8
A. Select Test Protocols and Equipment	1	2	3
 Spirometry (for example, VC, FVC, FEV₁, MVV, flow-volume loop) 			
Bronchodilator delivery (for example, MDI, DPI, small volume nebulizers)			
3. End tidal CO₂			
4. Blood sample collection (for example, arterial, capillary)			
5. Sputum sample collection			

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Credential Maintenance Program		nitive	
Pulmonary Function Technology Assessment	Le	vel	
Detailed Content Outline		Int	To
Multiple-choice items are linked to open cells.	Recali	egra	Total
Test takers will be asked to integrate (apply or analyze) information.	all	Integration	
6. Blood gas analysis (for example, pH, PO ₂ , PCO ₂)			
7. CO-oximetry / hemoximetry			
8. Static lung volumes			
a. gas dilution methods			
b. body plethysmography			
9. DLCO			
10. Smoking cessation counseling			
 Patient education (for example, medication delivery, travel, asthma) 			
12. Oxygen titration at rest and / or exercise			
13. Exercise (stress) testing			
a. timed walking test (for example, 6MWT, shuttle walk)			
b. monitored (for example, ECG, blood pressure, SpO ₂)			
c. cardiopulmonary exercise test (for example, VO_{2max} anaerobic threshold, VO_2 , VCO_2 , V_D / V_T)			
 d. inspiratory capacity and flow-volume loops during cardiopulmonary exercise testing 			
14. 12-lead ECG at rest			
15. Pulse oximetry			
16. Airway responsiveness			
a. bronchodilation studies			
 b. bronchial provocation studies (for example, methacholine, exercise, EVH, mannitol) 			
17. Airways resistance / conductance measurements by plethysmography			
18. Respiratory muscle strength (for example, MIP, MEP)			
19. Flexible bronchoscopy assistance (for example, patient monitoring, specimen preparation, topical anesthesia)			
20. Patient safety (for example, standard precautions, adverse events / incidents, cross contamination)			
B. Perform the Procedure	1	2	3
 Spirometry (for example, VC, FVC, FEV₁, MVV, flow-volume loop) 			
 Bronchodilator delivery (for example, MDI, DPI, small volume nebulizers) 			
3. End tidal CO₂			

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	Detailed Content Outline		Int	To
ATTOON	Multiple-choice items are linked to open cells.	Recall	egra	Total
WIOK!	*Test takers will be asked to integrate (apply or analyze) information.	E	ntegration*	
4.	Blood sample collection (for example, arterial, capillary)			
5.	Sputum sample collection			
6.	Blood gas analysis (for example, pH, PO ₂ , PCO ₂)			
7.	CO-oximetry / hemoximetry			
8.	Static lung volumes			
	a. gas dilution methods			
	b. body plethysmography			
9.	DLCO			
10.	Smoking cessation counseling			
11.	Patient education (for example, medication delivery, travel, asthma)			
12.	Oxygen titration at rest and / or exercise			
13.	Exercise (stress) testing			
	a. timed walking test (for example, 6MWT, shuttle walk)			
	b. monitored (for example, ECG, blood pressure, SpO ₂)			
	c. cardiopulmonary exercise test (for example, VO_{2max} anaerobic threshold, VO_{2} , VCO_{2} , V_{D} / V_{T})			
	d. inspiratory capacity and flow-volume loops during cardiopulmonary exercise testing			
14.	12-lead ECG at rest			
15.	Pulse oximetry			
16.	Airway responsiveness			
	a. bronchodilation studies			
	b. bronchial provocation studies (for example, methacholine, exercise, EVH, mannitol)			
17.	Airways resistance / conductance measurements by plethysmography			
18.	Respiratory muscle strength (for example, MIP, MEP)			
Third Quarte	r of the Calendar			5
19.	Flexible bronchoscopy assistance (for example, patient monitoring, specimen preparation, topical anesthesia)			
20.	Patient safety (for example, standard precautions, adverse events / incidents, cross contamination)			

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Credential Maintenance Program	Cogr	itive	
Pulmonary Function Technology Assessment	Le	vel	
Detailed Content Outline		Im	Т
Multiple-choice items are linked to open cells.	Recall	tegra	Total
Test takers will be asked to integrate (apply or analyze) information.	all	ntegration	
C. Evaluate Validity of Result	0	2	2
 Spirometry (for example, VC, FVC, FEV₁, MVV, flow-volume loop) 			
Bronchodilator delivery (for example, MDI, DPI, small volume nebulizers)			
3. End tidal CO₂			
4. Blood sample collection (for example, arterial, capillary)			
5. Sputum sample collection			
6. Blood gas analysis (for example, pH, PO ₂ , PCO ₂)			
7. CO-oximetry / hemoximetry			
8. Static lung volumes			
a. gas dilution methods			
b. body plethysmography			
g. DLCO			
10. Smoking cessation counseling			
11. Patient education (for example, medication delivery, travel, asthma)			
12. Oxygen titration at rest and / or exercise			
13. Exercise (stress) testing			
a. timed walking test (for example, 6MWT, shuttle walk)			
b. monitored (for example, ECG, blood pressure, SpO ₂)			
c. cardiopulmonary exercise test (for example, VO_{2max} anaerobic threshold, VO_2 , VCO_2 , V_D / V_T)			
d. inspiratory capacity and flow-volume loops during cardiopulmonary exercise testing			
14. 12-lead ECG at rest			
15. Pulse oximetry			
16. Airway responsiveness			
a. bronchodilation studies			
b. bronchial provocation studies (for example, methacholine, exercise, EVH, mannitol)			
17. Airways resistance / conductance measurements by plethysmography			
18. Respiratory muscle strength (for example, MIP, MEP)			

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BO4R	Credential Maintenance Program Pulmonary Function Technology Assessment	Cogr	nitive vel	
MATORY	Detailed Content Outline Multiple-choice items are linked to open cells. *Test takers will be asked to integrate (apply or analyze) information.	Recall	Integration*	Total
			on*	
	Flexible bronchoscopy assistance (for example, patient monitoring, specimen preparation, topical anesthesia)			
	Patient safety (for example, standard precautions, adverse events / incidents, cross contamination)			
III. DATA MA	NAGEMENT	1	6	7
A. Calcu	ulate Results, Select Reference Ranges and Data	1	1	2
1.	Blood gas results (for example, pH, PO ₂ , PCO ₂)			
2.	CO-oximetry / hemoximetry results (Hb, O₂Hb, COHb, MetHb)			
_	Spirometry data (for example, VC, FVC, FEV1, MVV, flow-volume loops)			
4.	Static lung volumes			
	a. gas dilution			
	b. body plethysmography			
	DLCO			
	Home pulmonary function data (for example, spirometry, peak flow)			
•	Oxygen titration at rest and / or exercise			
8.	Exercise (stress) test			
	a. timed walking test (for example, 6 MWT, shuttle walk)			
	 b. monitored (for example, ECG, blood pressure, SpO₂) c. cardiopulmonary exercise test (for example, VO_{2max} 			
	anaerobic threshold, VO_2 , VCO_2 , V_D/V_T)			
	d. inspiratory capacity and flow-volume loops during cardiopulmonary exercise testing			
9.	Blood pressure monitoring			
_	ECG analysis (for example, arrhythmia, rate, pattern)			
11.	Pulse oximetry			
12.	Airway responsiveness			
	a. bronchodilation studies			
	 b. bronchial provocation studies (for example, methacholine, exercise, EVH, mannitol) 			
	Airways resistance / conductance measurements by plethysmography			

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	Detailed Content Outline		Iı	. 1
	Detailed Content Outline	×	ıte	Total
ATORY	Multiple-choice items are linked to open cells.	Recall	grai	al
	Test takers will be asked to integrate (apply or analyze) information.	11	ntegration	
14.	Respiratory muscle strength (for example, MIP, MEP)			
15.	Safety data (for example, hand hygiene compliance, event management)			
16.	Quality control procedures (for example, mechanical or biologic)			
17.	Serial pulmonary function testing (for example, trending a single patient)			
18.	Clinical history and demographics (for example, age, race, sex, smoking history, medication, clinical indication)			
19.	Laboratory quality management (for example, customer satisfaction, inventory control, standard operating procedures, department records)			
Fourth Quart	ter of the Calendar			5
*				,
	luate Reliability of Results	0	2	2
1.	Blood gas results (for example, pH, PO ₂ , PCO ₂)			
2.	CO-oximetry / hemoximetry results (Hb, O ₂ Hb, COHb, MetHb)			
3.	Spirometry data (for example, VC, FVC, FEV ₁ , MVV, flow-volume loops)			
4.	Static lung volumes			
	a. gas dilution			
	b. body plethysmography			
5.	DLCO			
6.	Home pulmonary function data (for example, spirometry, peak flow)			
7.	Oxygen titration at rest and / or exercise			
8.	Exercise (stress) test			
	a. timed walking test (for example, 6 MWT, shuttle walk)			
	b. monitored (for example, ECG, blood pressure, SpO ₂)			
	c. cardiopulmonary exercise test (for example, VO _{2max}			
	anaerobic threshold, VO_2 , VCO_2 , V_D / V_T)			
	d. inspiratory capacity and flow-volume loops during			
	cardiopulmonary exercise testing			
9.	Blood pressure monitoring			
10.	ECG analysis (for example, arrhythmia, rate, pattern)			
11.	Pulse oximetry			

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	Technology Assessment ontent Outline		I	
Detaned Co	ontent Outime	\mathbf{z}	ıte	Total
Multiple-choice ite	ems are linked to open cells.	Recall	gra	al
Test takers will be asked to	o integrate (apply or analyze) information.	all	Integration	
12. Airway responsiveness				
a. bronchodilation studies				
b. bronchial provocation stu exercise, EVH, mannitol)	udies (for example, methacholine,			
13. Airways resistance / conductar plethysmography	nce measurements by			
14. Respiratory muscle strength (f	or example, MIP, MEP)			
15. Safety data (for example, hand management)	d hygiene compliance, event			
16. Quality control procedures (for	r example, mechanical or biologic)			
17. Serial pulmonary function test patient)	ing (for example, trending a single			
18. Clinical history and demograph smoking history, medication, o	hics (for example, age, race, sex, clinical indication)			
19. Laboratory quality manageme satisfaction, inventory control, department records)	ent (for example, customer , standard operating procedures,			
C. Evaluate Clinical Implications		0	3	3
1. Blood gas results (for example	, pH, PO ₂ , PCO ₂)			
2. CO-oximetry / hemoximetry re	esults (Hb, O₂Hb, COHb, MetHb)			
 Spirometry data (for example, flow-volume loops) 	VC, FVC, FEV ₁ , MVV,			
4. Static lung volumes				
a. gas dilution				
b. body plethysmography				
5. DLCO				
6. Home pulmonary function dat flow)	a (for example, spirometry, peak			
7. Oxygen titration at rest and / o	or exercise			
8. Exercise (stress) test				
5	xample, 6 MWT, shuttle walk)			
• •	ECG, blood pressure, SpO₂)			
anaerobic threshold, VO				
d. inspiratory capacity and t cardiopulmonary exercis	flow-volume loops during e testing			

Credential Maintenance Program Pulmonary Function Technology Assessment		Items Cognitive Level	
Detailed Content Outline Multiple-choice items are linked to open cells. *Test takers will be asked to integrate (apply or analyze) information.	Recall	Integration*	Total
9. Blood pressure monitoring			
10. ECG analysis (for example, arrhythmia, rate, pattern)			
11. Pulse oximetry			
12. Airway responsiveness			
a. bronchodilation studies			
 b. bronchial provocation studies (for example, methacholine, exercise, EVH, mannitol) 			
 Airways resistance / conductance measurements by plethysmography 			
14. Respiratory muscle strength (for example, MIP, MEP)			
15. Safety data (for example, hand hygiene compliance, event management)			
16. Quality control procedures (for example, mechanical or biologic)			
17. Serial pulmonary function testing (for example, trending a single patient)			
18. Clinical history and demographics (for example, age, race, sex, smoking history, medication, clinical indication)			
 19. Laboratory quality management (for example, customer satisfaction, inventory control, standard operating procedures, department records) 			
Totals	4	16	20

Specifications by Patient Age

Patient	Maximum items per form
Pediatric	2
General	balance
Total	20