

BRONCHOSCOPY ASSESSMENT TOOLS

COMPREHENSIVE MANUAL

BSTAT • BSTAT-TBLB/TBNA • EBUS-STAT • BRadSTAT • BSAT



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Scoring Recommendations for Bronchoscopy Assessment Tools

(BSTAT, BSTAT-TBLB/TBNA, BSAT)

The goal of these assessment tools is to be able to monitor a learner's progress along the learning curve from *novice* (Score < 60) to *advanced beginner* (Score 60-79), *intermediate* (score 80-99), and *competent* (score 100). The instructor should be able to ascertain, by observing the learner's performance (For BSTAT tools, this could be done on a once or twice a year basis) that each of the ten elements in each tool are covered satisfactorily. Repeated testing will demonstrate increases in knowledge and technical skill acquisition as the student climbs the learning curve from novice to advanced beginner, intermediate and competent bronchoscopist for the procedure being assessed.

To maximize objective scoring, each task has been defined explicitly in this user manual for each checklist and assessment tool. Participation in specially-designed Train-the-Trainers courses is encouraged to assist with standardization and to help instructors use this program to its fullest potential.

Scores can be plotted on a graph, and each institution or training program can choose its own cut-offs for a PASS grade, although we recommend that a final PASS grade be achieved with a score of 100. In the absence of a large pilot study demonstrating standard normograms as is done for high-stakes testing, consensus of world renowned experts was obtained to delineate cut-off scores for the following four categories.

Category	Score
Novice	< 60
Advanced Beginner	60-79
Intermediate	80-99
Competent	100

Specific instructions marked by an asterisk (*) are provided for each of the tools.

Instructions: To administer the BSTAT, learners are asked to perform a complete diagnostic flexible bronchoscopy, while at all times stating what they are doing and where they are navigating in the airway. Thus, items 1, 2, 5, 6, and 7 are scored. They are then asked to go from the neutral position at the main carina to segments RB-4, 5, 6 and LB-8, 9, 10, and items 3 and 4 are scored. Items 8 and 9 are scored using the associated quiz images. Finally, item 10 is scored while the learner performs a BAL, brushing and mucosal biopsy. The BSTAT-TBLB/TBNA is also administered with a full diagnostic bronchoscopy, followed by a conventional TBNA and TBLB procedure (not necessarily all in the same patient, if assessment is being done in a patient). Items 5 and 10 are quiz-based images.

Bronchoscopy Skills and Tasks Assessment Tool (BSTAT)

Learner: _____ Training Year _____

Faculty _____ Date _____

Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. Identification of Right sided anatomy (2 points each, target 20 points) ☐ RB1 apical ☐ RB2 posterior ☐ RB3 anterior ☐ RB4 lateral ☐ RB5 medial ☐ RB6 superior ☐ RB7 mediobasal ☐ RB8 anterobasal ☐ RB9 laterobasal ☐ RB10 posterobasal	Yes / No Score ____/20
2. Identification of Left sided anatomy (2 points each, target 16 points) ☐ LB1+2 apical/posterior ☐ LB3 anterior ☐ LB4 superior ☐ LB5 inferior ☐ LB6 superior ☐ LB8 anterobasal ☐ LB9 laterobasal ☐ LB10 posterobasal	Yes / No Score ____/16
3. Identify and enter RB 4+5+6 on demand (All three segments must be entered to earn 5 points, no partial points given, target 5 points) ☐ RB 4+5+6	Yes / No Score ____/5
4. Identify and enter LB 8+9+10 on demand (All three segments must be entered to earn 5 points, no partial points given, target 5 points) ☐ LB 8+9+10	Yes / No Score ____/5
5. Posture/Hand positions/Equipment safety (3 points each, target 9 points) ☐ Body posture ☐ Hand positions ☐ Equipment handling	Yes / No Score ____/9
6. Scope centered and kept in midline (5 points, no partial points given) ☐ Scope centered in airway lumen	Yes / No Score ____/5
7. Airway wall trauma avoided (5 points, no partial points given) ☐ Airway wall trauma avoided	Yes / No Score ____/5
8. Nomenclature: secretions descriptions (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10	Yes / No Score ____/10
9. Nomenclature: Mucosal descriptions (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10	Yes / No Score ____/10
10. Tasks: (5 points each, target 15 points) ☐ BAL ☐ Mucosal biopsy ☐ Brush	Yes / No Score ____/15

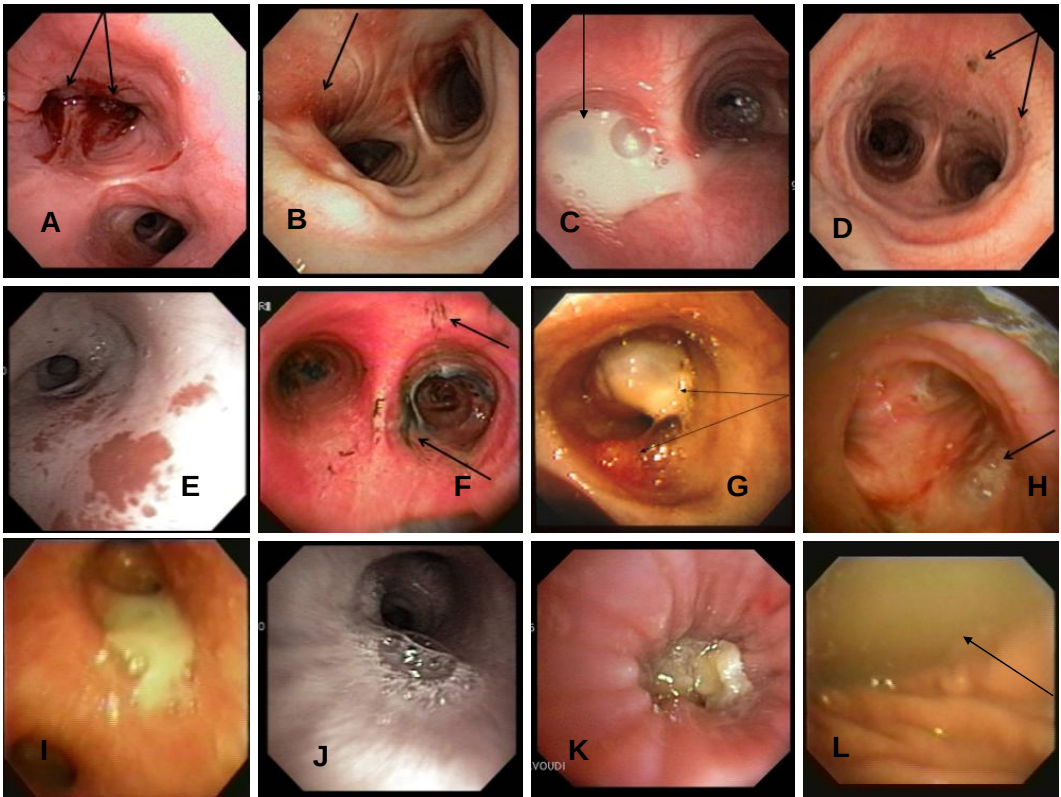
* The combined use of the 10 items pertains to technical skills needed to climb learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to perform flexible bronchoscopy with lavage, brushing and endobronchial biopsy independently.

FINAL GRADE

PASS

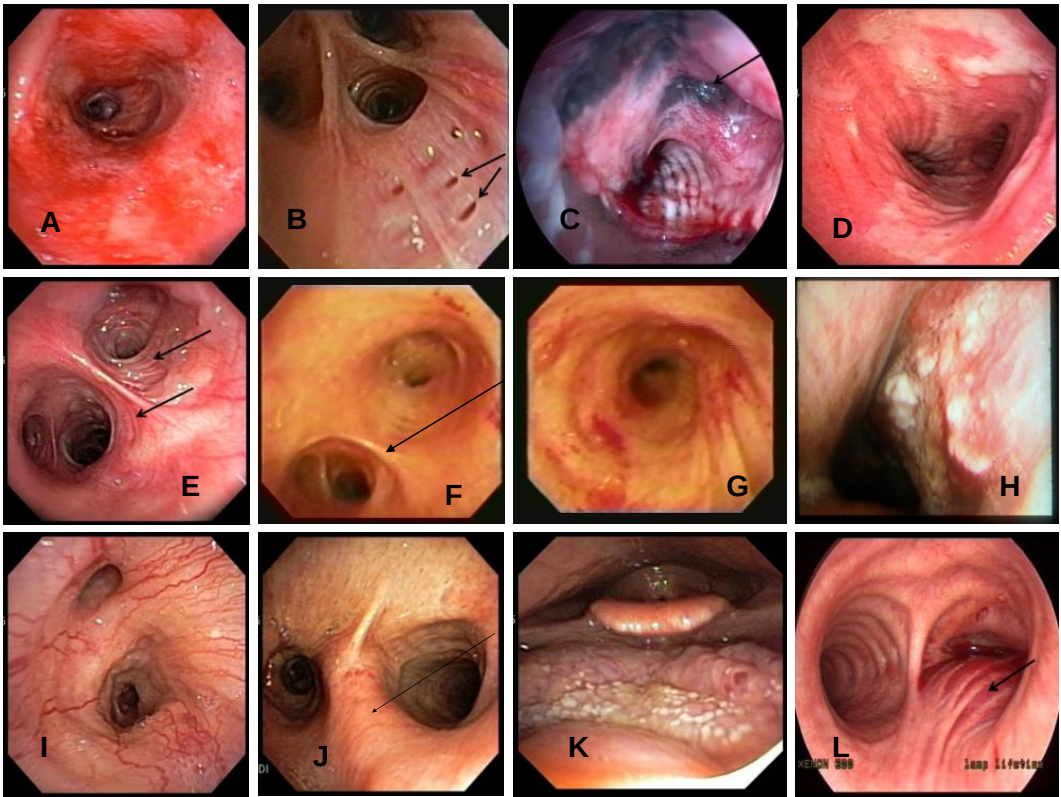
FAIL

SCORE _____/100



Item 8: Match the photo (A-L) to the corresponding 10 secretion descriptions (Only one response per description)

_____ Sooty-burns	_____ Bloody	_____ Necrotic debris	_____ Yellow purulent
_____ White creamy	_____ Normal clear	_____ Tar-stained smoker's phlegm	_____ Frothy covering TE fistula
_____ Pink frothy edema	_____ Scope trauma	NO RESPONSE	



Item 9: Match the photo (A-L) to the corresponding 10 mucosal descriptions (Only one response per description)

_____	_____	_____	_____
Exophytic cancer	Necrotic tracheitis	Bronchial pits	Chronic bronchitis
_____	_____	_____	_____
Hypervascularity	Tumor infiltrated carina	Extrinsic compression	Anthracosis
_____	_____	NO RESPONSE	
Oral candidiasis	Acute bronchitis		

User Instructions

Bronchoscopy Skills and Tasks Assessment Tool (BSTAT)

Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. Identification of Right sided anatomy (2 points each, target 20 points) ☐ RB1 apical ☐ RB2 posterior ☐ RB3 anterior ☐ RB4 lateral ☐ RB5 medial ☐ RB6 superior ☐ RB7 mediobasal ☐ RB8 anterobasal ☐ RB9 laterobasal ☐ RB10 posterobasal *Each segment correctly identified AND entered scores TWO points.	Yes / No Score ____/20
2. Identification of Left sided anatomy (2 points each, target 16 points) ☐ LB1+2 apical/posterior ☐ LB3 anterior ☐ LB4 superior ☐ LB5 inferior ☐ LB6 superior ☐ LB8 anterobasal ☐ LB9 laterobasal ☐ LB10 posterobasal *Each segment correctly identified AND entered scores TWO points	Yes / No Score ____/16
3. Identify and enter RB 4+5+6 on demand (All three segments must be entered to earn 5 points, no partial points given, target 5 points) ☐ RB 4+5+6 * All THREE of these segments must be identified and entered correctly using appropriate flexion/extension of the bronchoscope in order to obtain FIVE points. No partial points are given. This is an “All or None” exercise.	Yes / No Score ____/5
4. Identify and enter LB 8+9+10 on demand (All three segments must be entered to earn 5 points, no partial points given, target 5 points) ☐ LB 8+9+10 All THREE of these segments must be identified and entered correctly using appropriate manipulation of the bronchoscope in order to obtain FIVE points. No partial points are given. This is an “All or None” exercise.	Yes / No Score ____/5
5. Posture/Hand positions/Equipment safety (3 points each, target 9 points) ☐ Body posture ☐ Hand positions ☐ Equipment handling *Procedures are taught different ways. In general however, students should be able to refrain from moving around the patient, they should avoid placing their hands into a patients eyes or exerting too much pressure onto a patient’s head. The scope should be kept relatively straight, and should not be twisted at the insertion site. The hand holding the scope should be relaxed, and assistant should be able to easily access the hand being used to hold and manipulate accessory instruments. The bronchoscopist should be able to protect the scope from trauma (biting, slamming against a cart, dropping onto the floor). For each of the items, THREE points (or none) are given.	Yes / No Score ____/9
6. Scope centered and kept in midline (5 points, no partial points given) ☐ Scope centered in airway lumen In general, the scope should be kept centered so that it does not rub up against the airway wall. This is especially important when inserting the scope to the larynx, passing the vocal cords, and examining segmental bronchi. A scope that is not well-centered decreases overall visualization and may cause airway wall trauma or cough. If the scope is centered in the airway throughout most of the	Yes / No Score ____/5

procedure, a score of FIVE points is achieved. No partial points are given. This is an “All or None” exercise.	
7. Airway wall trauma avoided (5 points, no partial points given) ☐ Airway wall trauma avoided * In general, airway wall trauma causes erythema, swelling or cough. During the procedure, the scope should be kept “off the wall” using careful manipulation of the lateral as well as flexion/extension function of the scope and appropriate identification and entry into segmental bronchi. If airway wall trauma is avoided during most of the procedure, a score of FIVE points is achieved. No partial points are given. This is an “All or None” exercise.	Yes / No Score ____/5
8. Nomenclature: secretions descriptions (1 point each, target 10 points) ☐ Sooty-burn ☐ Bloody ☐ Necrotic debris ☐ Yellow purulent ☐ White creamy ☐ Normal clear ☐ Tar-stained smoker’s phlegm ☐ Frothy covering TE fistula ☐ Pink frothy edema ☐ Scope trauma * This is a written test for which 1 point is given for each correct answer; to be used with associated slide-show.	Yes / No Score ____/10
9. Nomenclature: Mucosal descriptions (1 point each, target 10 points) ☐ Exophytic cancer ☐ Necrotic tracheitis ☐ Bronchial pits ☐ Chronic bronchitis ☐ Hypervascularity ☐ Tumor infiltrated carina ☐ Extrinsic compression ☐ Anthracosis ☐ Oral candidiasis ☐ Acute bronchitis *This is a written test for which 1 point is given for each correct answer; to be used with associated slide-show.	Yes / No Score ____/10
10. Tasks: (5 points each, target 15 points) ☐ BAL ☐ Mucosal biopsy ☐ Brush * This is an “All or None” exercise for which FIVE points are given to each of the 3 items if performed correctly. No partial points are given within each item.	Yes / No Score ____/15

* The combined use of these 10 items pertains to technical skills needed to climb learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to perform flexible bronchoscopy with BAL, brushing and mucosal biopsy.

FINAL GRADE

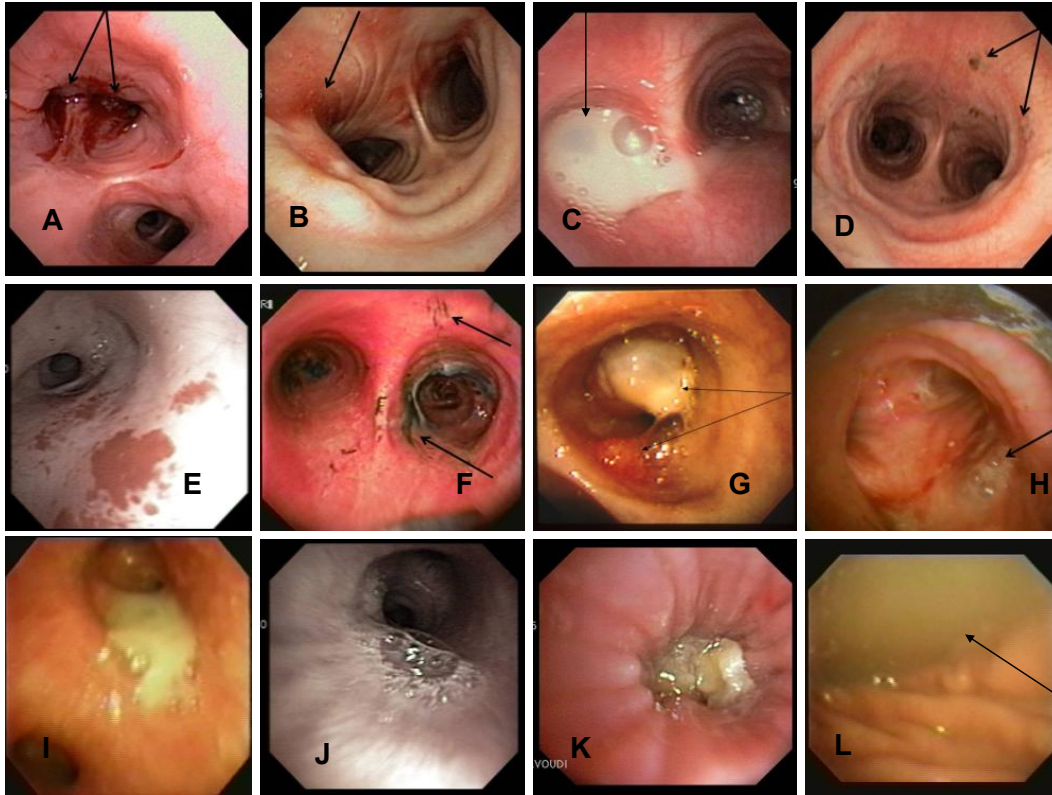
PASS

FAIL

SCORE ____/100

Bronchoscopy Skills and Tasks

Answers...

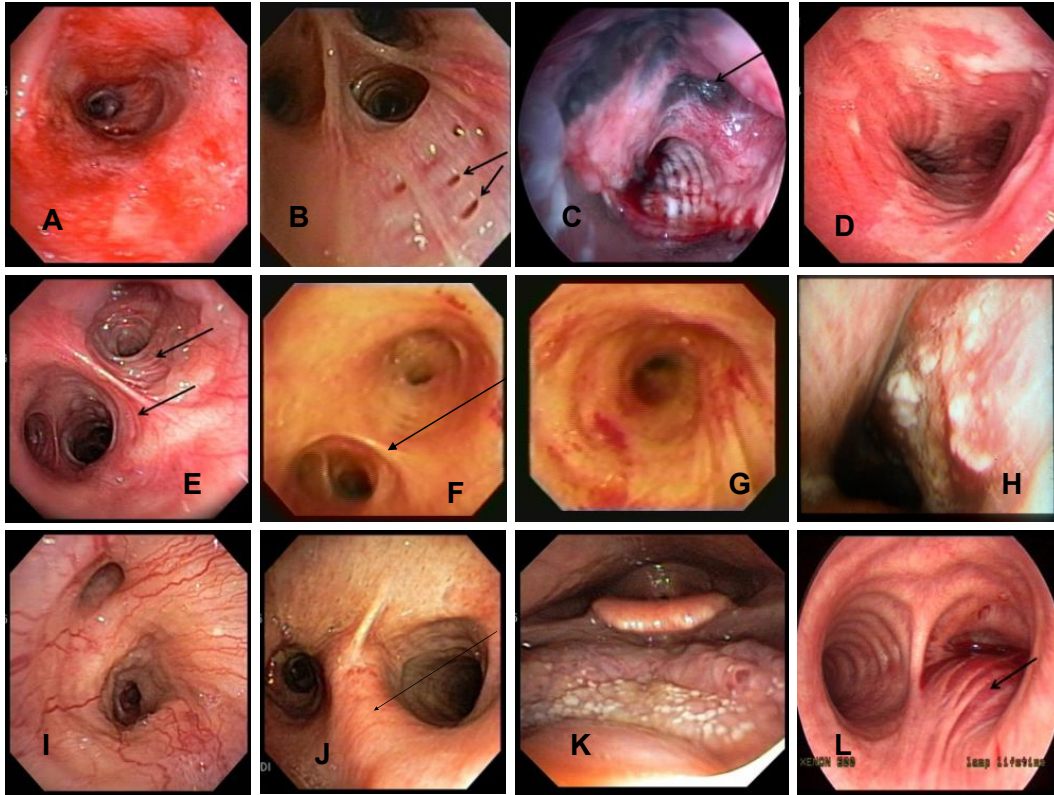


Item 8: Match the photo (A-L) to the corresponding 10 secretion descriptions (Only one response per description)

__F__ Sooty-burns	__A__ Bloody	__K__ Necrotic debris	__I__ Yellow purulent
__C__ White creamy	__J__ Normal clear	__D__ Tar-stained smoker's phlegm	__H__ Frothy covering TE fistula
__B__ Pink frothy edema	__E__ Scope trauma	NO RESPONSE	

Bronchoscopy Skills and Tasks

Answers



Item 9: Match the photo (A-L) to the corresponding 10 mucosal descriptions (Only one response per description)

__H__ Exophytic cancer	__D__ Necrotic tracheitis	__B__ Bronchial pits	__E__ Chronic bronchitis
__I__ Hypervascularity	__J__ Tumor infiltrated carina	__L__ Extrinsic compression	__C__ Anthracosis
__K__ Oral candidiasis	__A__ Acute bronchitis	NO RESPONSE	

**Bronchoscopy Skills and Tasks Assessment Tool for Transbronchial Lung
Biopsy and Transbronchial Needle Aspiration (BSTAT-TBLB/TBNA)**

Learner: _____ Training Year _____

Faculty _____ Date _____

Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. TBLB: Airway inspection without trauma (no partial points) ☐ Complete inspection done properly	Yes / No Score ____/5
2. TBLB technique (no partial points) ☐ Wedge scope into target segment ☐ Visualize target with fluoroscopy ☐ Advance forceps under fluoroscopy guidance to target ☐ Open forceps at target ☐ Advance and close forceps at target ☐ Remove forceps from scope	Yes / No Score ____/10
3. TBLB Complications: Pneumothorax (no partial points) ☐ Perform panoramic view of hemithorax using fluoroscopy ☐ Recognize signs and symptoms ☐ Demonstrate easy access to small or large bore chest tube	Yes / No Score ____/10
4. TBLB: Complications: Bleeding (no partial points) ☐ Scope wedged into target segment ☐ Move patient into lateral decubitus safety position ☐ Access upper airway with oral suction ☐ Demonstrate access and use of bite block and endotracheal tube	Yes / No Score ____/10
5. TBLB: Decision making (5 points each , target score 15 points) ☐ Image 1 ☐ Image 2 ☐ Image 3	Yes / No Score ____/15
6. TBNA: Airway inspection and imaging interpretation (5 points each) ☐ Complete inspection done properly ☐ Imaging studies correctly interpreted	Yes / No Score ____/10
7. TBNA Technique - Jab (no partial points) ☐ Advance catheter towards target area ☐ Advance needle to target area without airway trauma ☐ Jab needle through airway wall at target region while scope is fixed at nose or mouth ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope	Yes / No Score ____/10
8. TBNA Technique-Hub against wall (no partial points) ☐ Advance catheter towards target area ☐ Touch catheter to target area without airway trauma ☐ Penetrate airway wall with needle while holding scope firmly ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope	Yes / No Score ____/10
9. TBNA Technique -Piggyback: (no partial points) ☐ Secure catheter and scope simultaneously with one hand ☐ Advance scope and catheter as a single unit to target region ☐ Penetrate airway wall at target region ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope	Yes / No Score ____/10
10. TBNA: Decision making: (5 points each, target 10 points) ☐ Image 4 ☐ Image 5	Yes / No Score ____/10

* The combined use of the 10 items pertains to technical skills needed to climb learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to perform flexible bronchoscopy with transbronchial lung biopsy and transbronchial needle aspiration independently.

FINAL GRADE

PASS

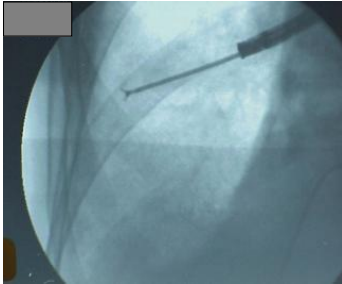
FAIL

SCORE ____/100

NAME _____

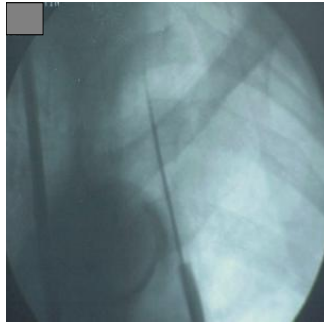
ITEM 5: Choose **One** best answer for each question

1. The target region is most likely (A) RB1, (B) RB6, (C) RB9, (D) RB10,



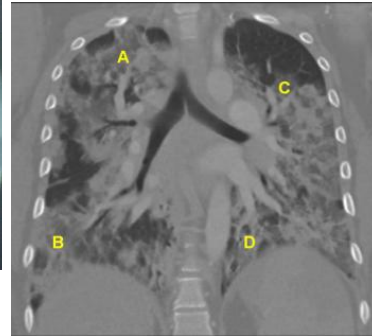
Answer _____

2. The target region is the (A) apical-posterior segment left upper lobe, (B) Lingula, (C) Right upper lobe



Answer _____

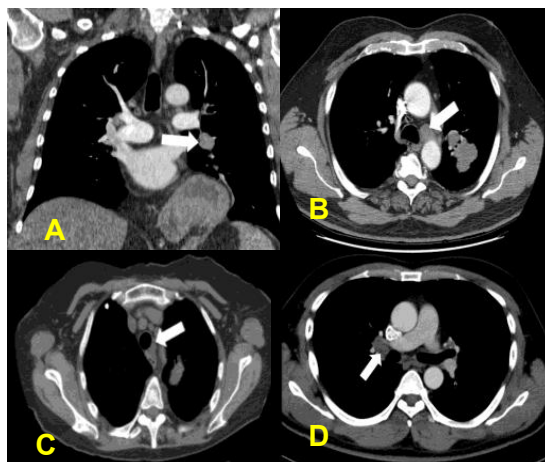
3. Which region should be biopsied in this immuno-suppressed patient with suspected fungal disease ?



Answer _____

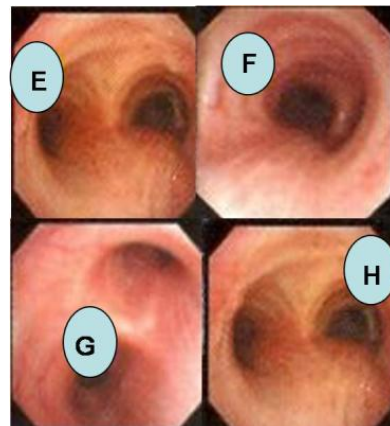
ITEM 10: Choose **One** best answer for each question

4. During conventional TBNA, which of the following lymph nodes will likely offer the highest diagnostic yield for nonsmall cell lung cancer ?



Answer _____

5. Where is the node located (needle insertion site E, F,G, or H)?



Answer _____

User Instructions

Bronchoscopy Skills and Tasks Assessment Tool, for Transbronchial Lung Biopsy and Transbronchial Needle Aspiration (BSTAT-TBLB/TBNA)

Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. TBLB: Airway inspection without trauma (no partial points) ☐ Complete inspection done properly *It goes without saying that the student should be able to perform inspection bronchoscopy and be able to identify and enter all bronchial segments.	Yes / No Score ____/5
2. TBLB technique (no partial points) ☐ Wedge scope into target segment ☐ Visualize target with fluoroscopy ☐ Advance forceps under fluoroscopy guidance to target ☐ Open forceps at target ☐ Advance and close forceps at target ☐ Remove forceps from scope *Many techniques exist for TBLB, but the instructor should focus on certain universal principles. The student should be able to wedge and unwedge the scope, and go through the various motions for TBLB including use of expiration and inspiration. Proper use of fluoroscopy requires a passing grade on the fluoroscopy test. Communication is key with instructions such as open and close forceps. If all six steps are completed satisfactorily, the student receives 10 points.	Yes / No Score ____/10
3. TBLB Complications: Pneumothorax (no partial points) ☐ Perform panoramic view of hemithorax using fluoroscopy ☐ Recognize signs and symptoms ☐ Demonstrate easy access to small or large bore chest tube *The student should be able to demonstrate the ability to respond quickly to this adverse event. Team communication is key, and the instructor should ascertain that the student is able to give appropriate instructions to nursing staff.	Yes / No Score ____/10
4. TBLB: Complications: Bleeding (no partial points) ☐ Scope wedged into target segment ☐ Move patient into lateral decubitus safety position ☐ Access upper airway with oral suction ☐ Demonstrate access and use of bite block and endotracheal tube *The student should be able to demonstrate the ability to respond quickly to this adverse event. Team communication is key, and the instructor should ascertain that the student is able to give appropriate instructions to nursing staff.	Yes / No Score ____/10
5. TBLB: Decision making (5 points each , target score 15 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 *The written test also serves as the answer sheet; to be used with associated slide-show. Tests should be collected. Students can be given their scores, but should not be provided with the correct answers so that they can take the test at a later date	Yes / No Score ____/15
6. TBNA: Airway inspection and imaging interpretation (5 points each) ☐ Complete inspection done properly ☐ Imaging studies correctly interpreted Imaging studies should be reviewed prior to bronchoscopy. Instructor should be certain that the student can justify the procedure and has formulated a plan.	Yes / No Score ____/10
7. TBNA Technique - Jab (no partial points)	Yes / No

☐ Advance catheter towards target area ☐ Advance needle to target area without airway trauma ☐ Jab needle through airway wall at target region while scope is fixed at nose or mouth ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope *While there are many ways to perform TBNA these universal principles and instructions are well described by experts. The student should understand these principles and be able to perform each of the three techniques because each one may be necessary in a different setting. The student should be using appropriate safety measures in regards to needle in, needle out instructions, handling the needle catheter, and while withdrawing the catheter from the scope. No partial points are given for any of the techniques.	Score ____/10
8. TBNA Technique-Hub against wall (no partial points) ☐ Advance catheter towards target area ☐ Touch catheter to target area without airway trauma ☐ Penetrate airway wall with needle while holding scope firmly ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope	Yes / No Score ____/10
9. TBNA Technique -Piggyback: (no partial points) ☐ Secure catheter and scope simultaneously with one hand ☐ Advance scope and catheter as a single unit to target region ☐ Penetrate airway wall at target region ☐ Move needle back and forth inside node while suctioning ☐ Release suction prior to needle withdrawal from target region ☐ Retract needle into the catheter ☐ Observe that needle is completely retracted inside catheter ☐ Withdraw catheter from scope	Yes / No Score ____/10
10. TBNA: Decision making: (5 points each, target 10 points) ☐ Image 4 ☐ Image 5 *The written test serves as the answer sheet; to be used with associated slide-show. Tests should be collected. Learners are given their scores, but should not be provided with the correct answers so that they can take the test at a later date	Yes / No Score ____/10

* The combined use of these 10 items pertains to technical skills needed to climb learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to perform flexible bronchoscopy with transbronchial lung biopsy and transbronchial needle aspiration independently.

FINAL GRADE

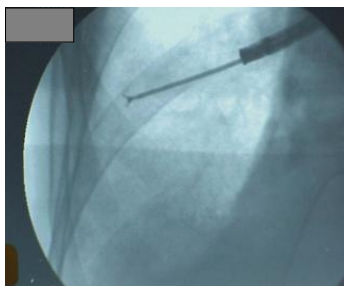
PASS

FAIL

SCORE ____/100

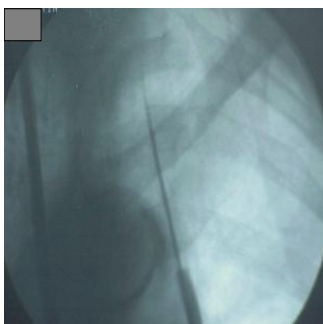
ITEM 5: Choose **One** best answer for each question

1. The target region is most likely (A) RB1, (B) RB6, (C) RB9, (D) RB10,



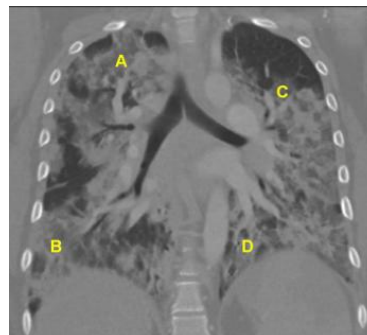
Answer C

2. The target region is the (A) apical-posterior segment left upper lobe, (B) Lingula, (C) Right upper lobe



Answer A

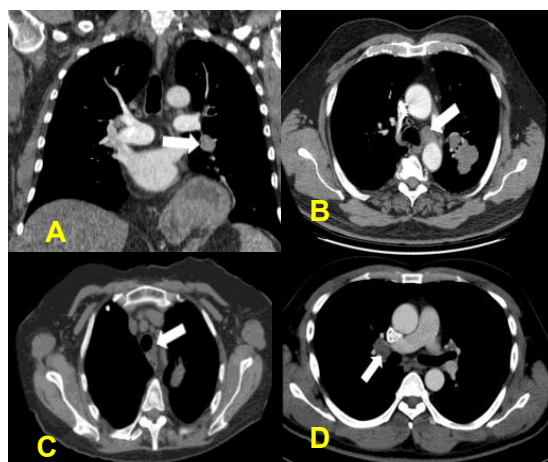
3. Which region should be biopsied in this immuno-suppressed patient with suspected fungal disease ?



Answer B

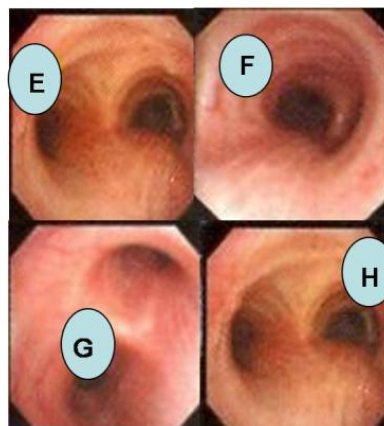
ITEM 10: Choose **One** best answer for each question

4. During conventional TBNA, which of the following lymph nodes will likely offer the highest diagnostic yield for nonsmall cell lung cancer ?



Answer B

5. Where is the node located (needle insertion site E, F,G, or H)?



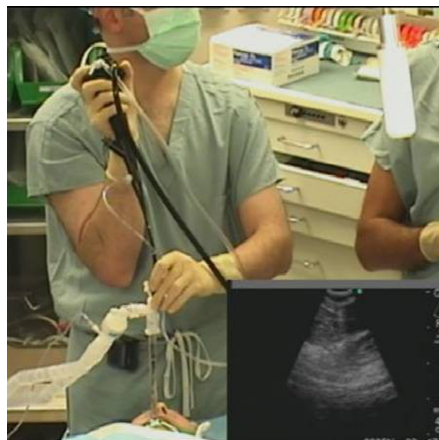
Answer E

EBUS Skills and Tasks

Assessment Tool (EBUS-STAT)



- Items 1-10 may be scored separately.
- A passing score of 100 is expected to reflect competency.
- Scores >100 should initiate instructor-learner feedback
- Assessments may be performed in models or in patients.
- Knowledge of nomenclature (common language) for EBUS imaging can be assessed using the quiz. Recognition of findings can also be assessed during procedures, in which case instructors may prefer to use the quiz as a learning guide.
- The combined use of the 10 items pertains to technical skills needed to climb the learning curve from novice to competent bronchoscopist able to independently perform EBUS and EBUS-TBNA.
- This assessment tool is complementary to other methods of assessment such as practical approach exercises, checklists, logbooks of numbers of procedures performed, and outcomes.



EBUS-STAT 10 Point Assessment Tool

Learner _____

Training Year _____

Faculty _____

Date _____

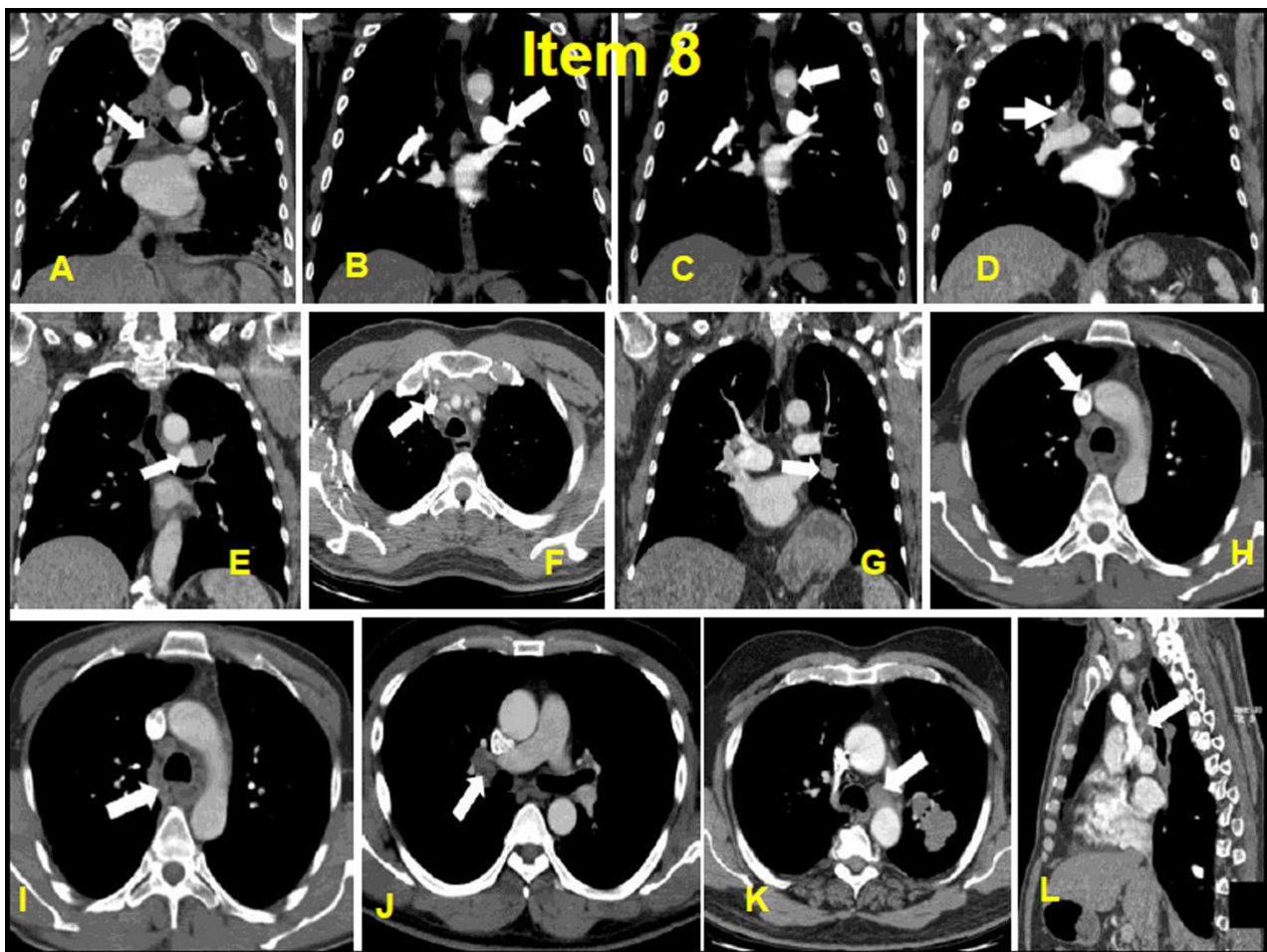
Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. Able to maneuver the scope through upper airway into trachea, without trauma or difficulty (5 points for single item tested) ☐ Mouth and Vocal cords ☐ ET Tube ☐ Laryngeal mask airway	Yes / No Score ____ /5
2. Able to maneuver scope using white light bronchoscopy within tracheobronchial tree without trauma (4 points, no partial points) ☐ Scope centered in airway lumen avoiding airway wall trauma	Yes / No Score ____ /4
3. Ultrasound image obtained without artifacts (5 points, no partial points) ☐ Absence of artifacts on image, any target	Yes / No Score ____ /5
4. Identify major mediastinal vascular structures (4 points per item) ☐ Aorta ☐ Pulmonary artery ☐ Superior vena cava ☐ Azygos vein ☐ Left atrium	Yes / No Score ____ /20
5. Identify lymph node station (Select 3 targets, 5 points each) ☐ 2R ☐ 2L ☐ 4R ☐ 10R ☐ 7 ☐ 4L ☐ 10L ☐ 11L ☐ 11Rs ☐ 11Ri	Yes / No Score ____ /15
6. Able to operate EBUS processor (2 points each item) ☐ Gain ☐ Depth ☐ Doppler	Yes / No Score ____ /6
7. Performance of EBUS-TBNA (1 point each, target 15 points) ☐ Advance needle through working channel (neutral position) ☐ Secure needle housing by sliding the flange ☐ Release sheath screw ☐ Advance and lock sheath when it touches wall ☐ Release needle screw ☐ Advance needle using jab technique ☐ Visualize needle entering target node ☐ Move stylet in and out a few times ☐ Remove stylet ☐ Attach syringe ☐ Apply suction ☐ Pass needle in and out of node 10-15 times ☐ Release suction ☐ Retract needle into sheath ☐ Unlock and remove needle and sheath	Yes / No Score ____ /15
8. Image analysis: CT scans (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10	Yes / No Score ____ /10
9. Image analysis: EBUS views (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10	Yes / No Score ____ /10
10. Decision-making tasks: (2 points each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5	Yes / No Score ____ /10

* The combined use of the 10 items tests competencies needed to climb the learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to independently perform EBUS-TBNA.

FINAL GRADE **PASS** **FAIL** **SCORE** ____/100

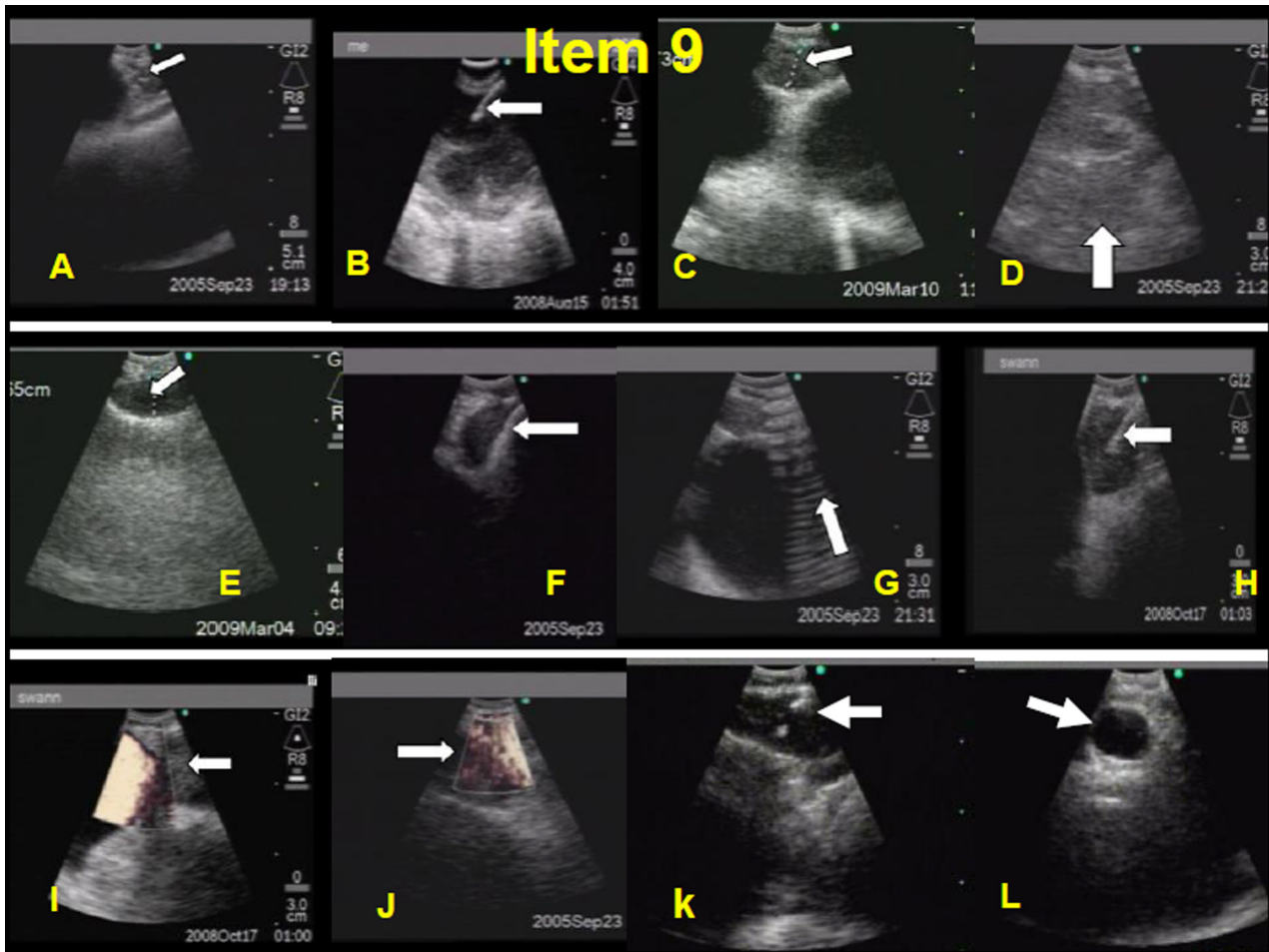
EBUS-STAT Questions

NAME _____



ITEM 8: Match the photo (A-L) to the corresponding 10 CT scan descriptions (Only one response per description)			
_____ Superior vena cava adjacent to 4R	_____ Inominate vein adjacent to 2R	_____ Pulmonary artery adjacent to 4L	_____ Aortic arch adjacent to 4L
_____ Azygos vein adjacent to 4R	_____ Station 7 adjacent to left atrium	_____ Station 11L with adjacent lung	_____ Station 10R
_____ Station 4L in axial view	_____ Pulmonary artery adjacent to 10L	NO RESPONSE	

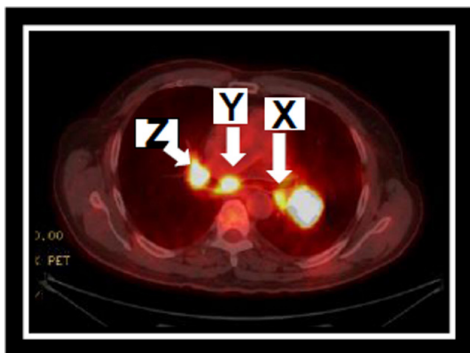
EBUS-STAT Questions



ITEM 9: Match the photo (A-L) to the corresponding 10 EBUS views (Only one response per description)			
_____	_____	_____	_____
Station 4R adjacent to pulmonary artery superior vena cava and ascending aorta	Needle penetrating through and through	Needle missing target node	Station 4L adjacent to aorta and pulmonary artery
_____	_____	_____	_____
Station 4L adjacent to pulmonary artery	Needle within lymph node	Normal lung	Reverberation artifact
_____	_____	NO RESPONSE	
Station 7 adjacent to left atrium	Hilar node adjacent to normal lung		

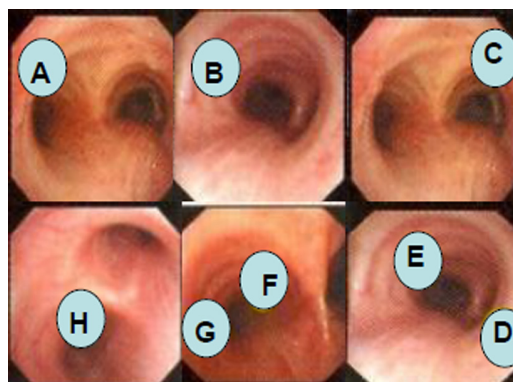
ITEM 10: Choose **One** best answer for each question

1. Three FDG avid nodes are noted on Fusion PET-CT in a patient with a Left Upper Lobe PET positive mass. Which node (x, y or z) should be sampled first ?



Answer _____

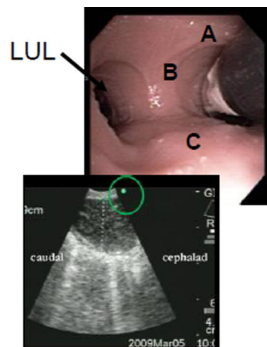
2. Where is the node located (needle insertion site A, B, C, D, E, F, G, or H) using white light bronchoscopy ?



Answer _____

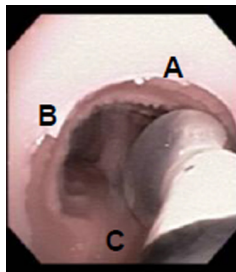
ITEM 10: Choose **One** best answer for each question

3. To sample level 11L, point the scope towards (A), (B), (C)



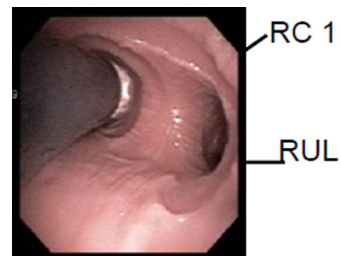
Answer _____

4. When sampling level 4R, consider pointing the scope towards A, B or C.



Answer _____

5. The Interlobar Pulmonary Artery is most likely seen when sampling level (A) 10R, (B) 11R, or (C) 12R



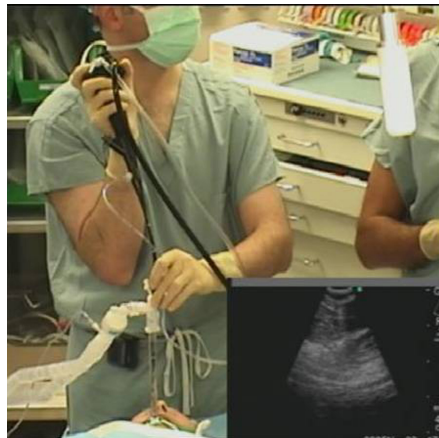
Answer _____

INSTRUCTIONS AND ANSWERS

EBUS Skills and Tasks Assessment Tool (EBUS-STAT)



- Items 1-10 may be scored separately.
- A passing score of 100 is expected to reflect competency.
- Scores >100 should initiate instructor-learner feedback
- Assessments may be performed in models or in patients.
- Knowledge of nomenclature (common language) for EBUS imaging can be assessed using the quiz. Recognition of findings can also be assessed during procedures, in which case instructors may prefer to use the quiz as a learning guide.
- The combined use of the 10 items pertains to technical skills needed to climb the learning curve from novice to competent bronchoscopist able to independently perform EBUS and EBUS-TBNA.
- This assessment tool is complementary to other methods of assessment such as practical approach exercises, checklists, logbooks of numbers of procedures performed, and outcomes.



USER INSTRUCTIONS

EBUS-STAT 10 Point Assessment Tool

Learner _____ Training Year _____
 Faculty _____ Date _____

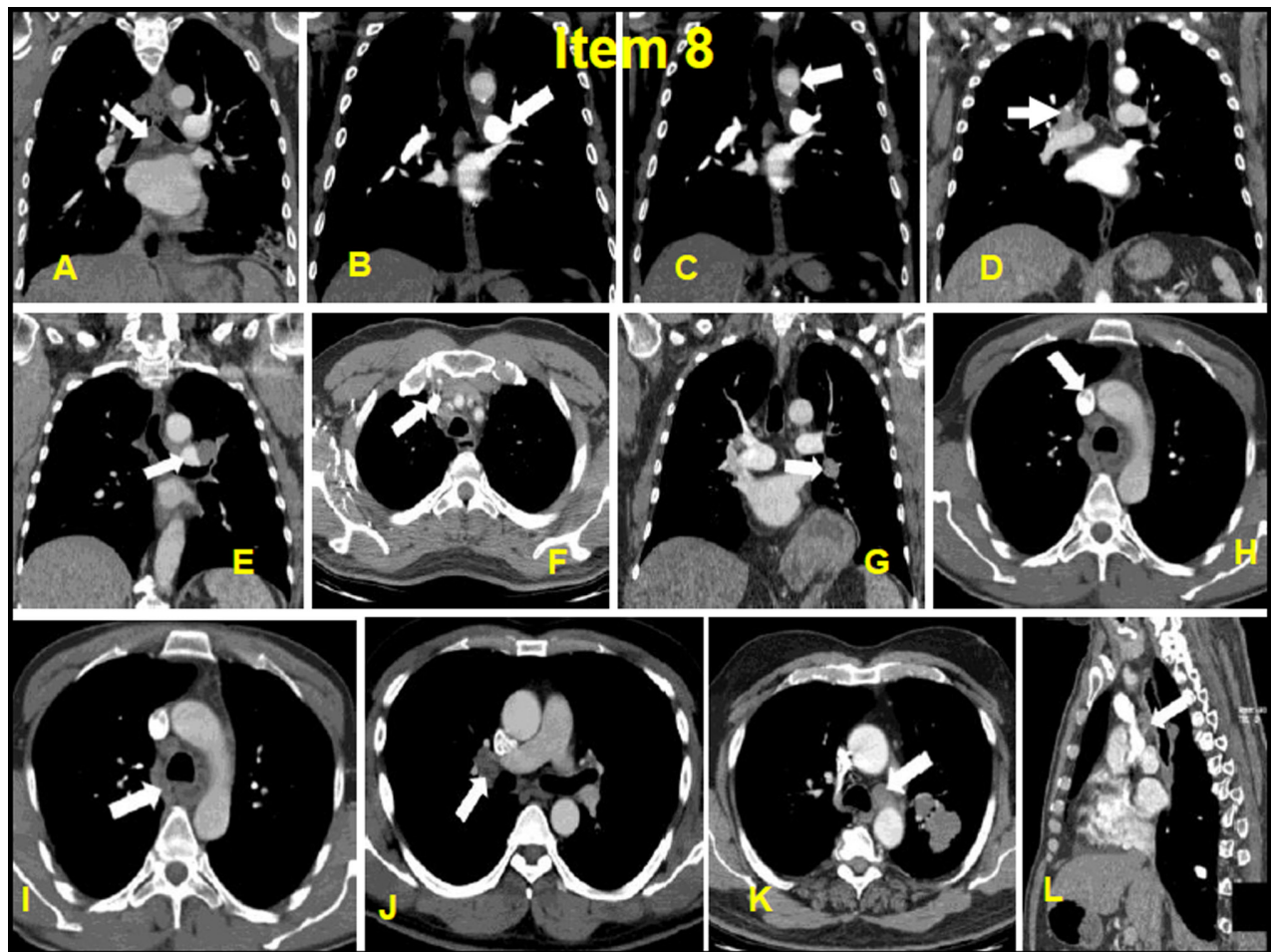
Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. Able to maneuver the scope through upper airway into trachea, without trauma or difficulty (5 points for single item tested) ☐ Mouth and Vocal cords ☐ ET Tube ☐ Laryngeal mask airway * Educators may wish to “test” only one technique applicable to their institution. This is an “All or None” exercise. No partial points are given. When EBUS-STAT is used as a learning instrument, all THREE techniques should be demonstrated in order to obtain FIVE points.	Yes / No Score ____ /5
2. Able to maneuver scope using white light bronchoscopy within tracheobronchial tree without trauma (4 points, no partial points) ☐ Scope centered in airway lumen avoiding airway wall trauma *The learner should be able to maneuver between lateral and medial walls without traumatizing main and minor carinas.	Yes / No Score ____ /4
3. Ultrasound image obtained without artifacts (5 points, no partial points) ☐ Absence of artifacts on image, any target *Targeting any nodal station, a sharp image without artifacts should be obtained.	Yes / No Score ____/5
4. Identify major mediastinal vascular structures (4 points per item) ☐ Aorta ☐ Pulmonary artery ☐ Superior vena cava ☐ Azygos vein ☐ Left atrium *Each of the vascular structures should be identified on demand. It may be necessary to score this item in several patients.	Yes / No Score ____/20
5. Identify lymph node station (Select 3 targets, 5 points each) ☐ 2R ☐ 2L ☐ 4R ☐ 10R ☐ 7 ☐ 4L ☐ 10L ☐ 11L ☐ 11Rs ☐ 11Ri * Target stations are selected based on indication, anatomy, and instructor preference. To identify all nodal stations, more than one patient may be necessary. In this case, instructors may choose to readminister EBUS-STAT. Stations 2, 4, and 7 can be scored in a low-fidelity model.	Yes / No Score ____/15

6. Able to demonstrate EBUS processor functions (2 points each item) ☐ Gain ☐ Depth ☐ Doppler *Except for Doppler, these functions can be tested in either a low-fidelity model <u>or</u> patient.	Yes / No Score ____/6
7. Performance of EBUS-TBNA (1 point each, target 15 points) ☐ Advance needle through working channel (neutral position) ☐ Secure needle housing by sliding the flange ☐ Release sheath screw ☐ Advance and lock sheath when it touches wall ☐ Release needle screw ☐ Advance needle using jab technique ☐ Visualize needle entering target node ☐ Move stylet in and out a few times ☐ Remove stylet ☐ Attach syringe ☐ Apply suction ☐ Pass needle in and out of node 10-15 times ☐ Release suction ☐ Retract needle into sheath ☐ Unlock and remove needle and sheath *Ideally, while performing EBUS-TBNA, steps should be listed in order by the learner, according to the product manual. As needles and techniques evolve, the steps may change, but principles remain the same to assure equipment, operator, and patient safety, and obtain an adequate specimen.	Yes / No Score ____/15
8. Image analysis: CT scans (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10 * This is a written test for which 1 point is given for each correct answer, to be used with associated slide-show or print-out.	Yes / No Score ____/10
9. Image analysis: EBUS views (1 point each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 ☐ Image 6 ☐ Image 7 ☐ Image 8 ☐ Image 9 ☐ Image 10 * This is a written test for which 1 point is given for each correct answer, to be used with associated slide-show or print-out.	Yes / No Score ____/10
10. Decision-making tasks: (2 points each, target 10 points) ☐ Image 1 ☐ Image 2 ☐ Image 3 ☐ Image 4 ☐ Image 5 This is a written test for which 2 points are given for each correct answer, to be used with associated slide-show or print-out.	Yes / No Score ____/10

* The combined use of the 10 items tests competencies needed to climb the learning curve from novice to advanced beginner to intermediate to competent bronchoscopist able to independently perform EBUS-TBNA.

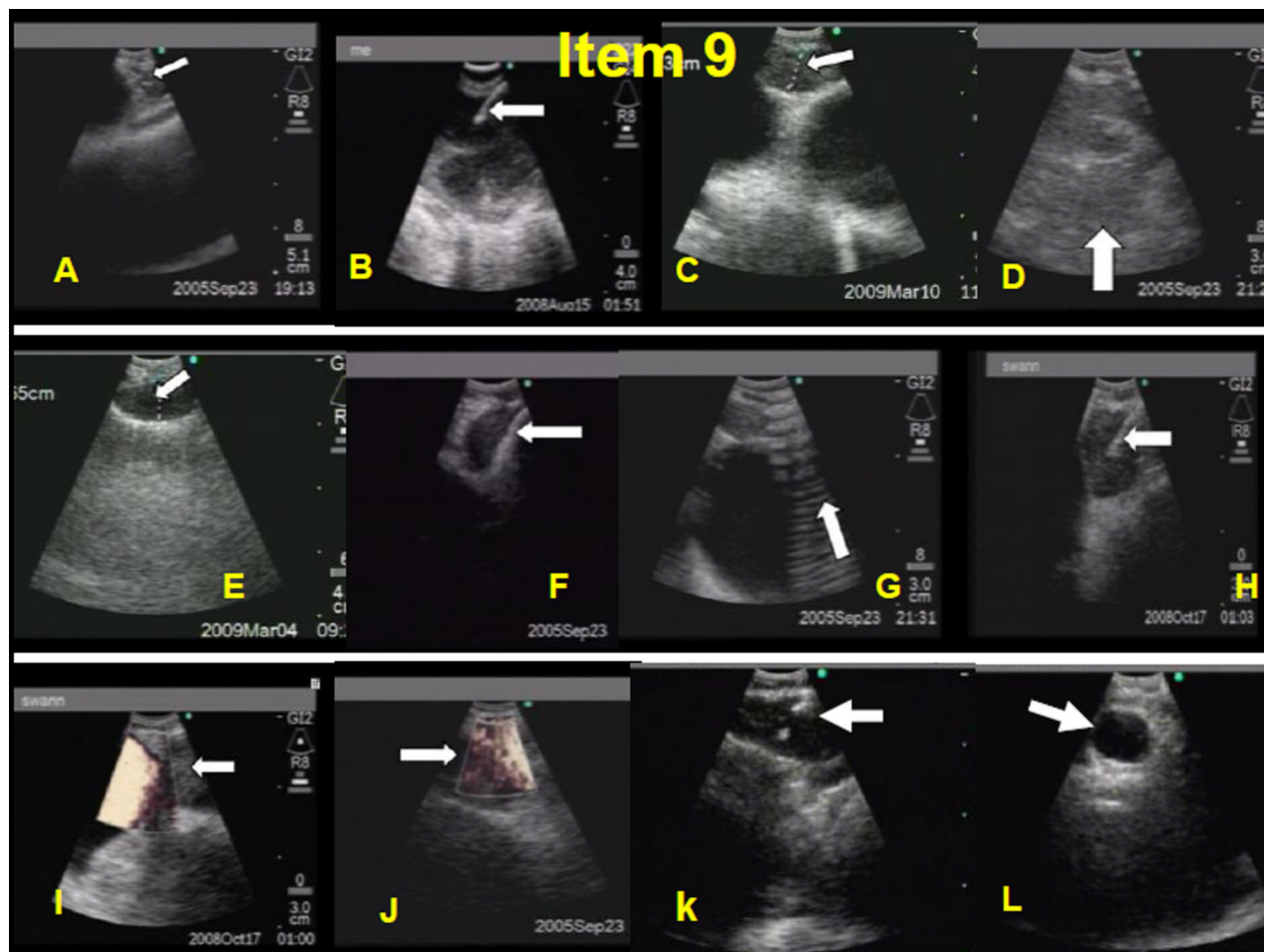
FINAL GRADE PASS FAIL **SCORE** ____/100

EBUS Skills and Tasks Quiz Answers



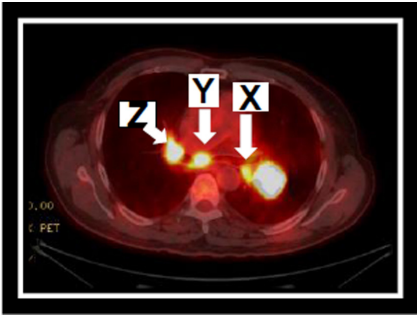
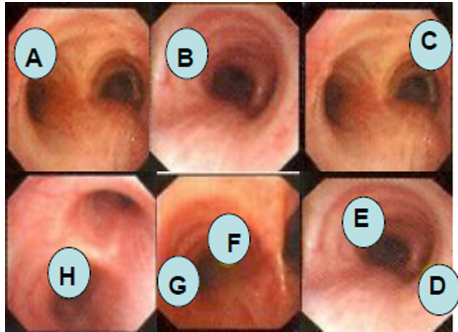
ITEM 8: Match the photo (A-L) to the corresponding 10 CT scan descriptions (Only one response per description)			
H Superior vena cava adjacent to 4R	F Inominate vein adjacent to 2R	B Pulmonary artery adjacent to 4L	C Aortic arch adjacent to 4L
I Azygos vein adjacent to 4R	A Station 7 adjacent to left atrium	G Station 11L with adjacent lung	D Station 10R
K Station 4L in axial view	E Pulmonary artery adjacent to 10L	NO RESPONSE	

EBUS Skills and Tasks Quiz Answers

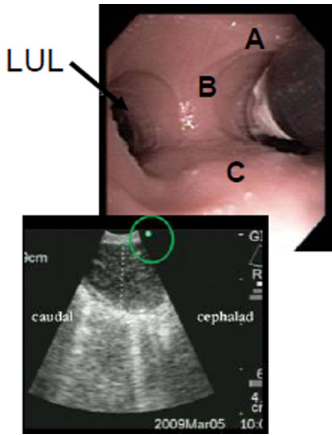
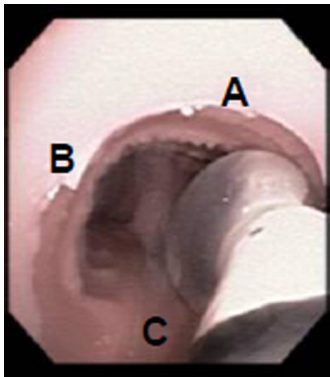
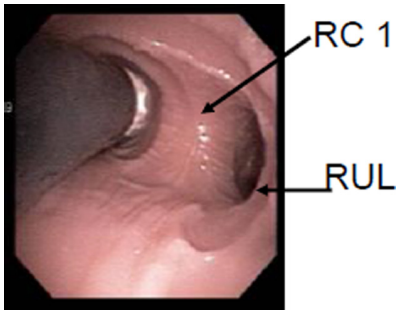


ITEM 9: Match the photo (A-L) to the corresponding 10 EBUS views (Only one response per description)			
A Station 4R adjacent to pulmonary artery superior vena cava and ascending aorta	F Needle penetrating through and through	B Needle missing target node	C Station 4L adjacent to aorta and pulmonary artery
I Station 4L adjacent to pulmonary artery	H Needle within lymph node	D Normal lung	G Reverberation artifact
J Station 7 adjacent to left atrium	E Hilar node adjacent to normal lung	NO RESPONSE	

ITEM 10: Choose **One** best answer for each question

1. Three FDG avid nodes are noted on Fusion PET-CT in a patient with a Left Upper Lobe PET positive mass. Which node (x, y or z) should be sampled first ?	2. Where is the node located (needle insertion site A, B, C, D, E, F, G or H) using white light bronchoscopy ?
	
Answer Z	Answer H

ITEM 10: Choose **One** best answer for each question

3. To sample level 11L, point the scope towards (A), (B), (C).	4. When sampling level 4R, consider pointing the scope towards A, B or C).	5. The Interlobar Pulmonary Artery is most likely seen when sampling level (A) 10R, (B) 11R, or (C) 12R
		
Answer B	Answer A	Answer B

END

BRadSTAT

Scoring Instructions

Bronchoscopy - Radiology Skills and Tasks Assessment Tool

BRadSTAT is designed to measure knowledge and skills required for competent and accurate bronchoscopic access to peripheral airways. This assessment tool can also be used as a teaching tool that monitors the learner's progress over time. Prior to using BRadSTAT, learners must complete and pass the Bronchoscopy Skills and Tasks Assessment Tool (BSTAT). This ensures they have satisfactory knowledge of bronchoscopic airway anatomy and bronchoscope handling.

BRadSTAT contains TEN questions. Questions 1-8 are paper based assessments. Questions 9-10 address technical skills performed on a simulator, inanimate airway model, or patient. Question-specific instructions are available at the start of each question.

- Questions 1-6 address the learner's ability to identify lobes, bronchopulmonary segments and airways of the right and left lung on CXR and CT.
- Questions 7-8 address the learner's ability to identify lobar or segmental abnormality on CXR. They address the learner's ability to verbally identify the lobar or segmental abnormality before navigating the bronchoscope to the correct lung location.

Scoring BRadSTAT: Each question is scored from 0-10, with a maximum possible BRadSTAT score of 100 after completing all ten questions. Items contained in questions 9 & 10 are scored as "incorrect" if either verbal or manoeuvring portions are erroneous.

BRadSTAT Scoring Categories:

Category	Score
Beginners	≤67
Intermediate	68-80
Experienced	81-88
Expert	≥89

Bronchoscopy/Radiology Skills and Tasks Assessment Tool (BRadSTAT)

Name: _____ Training Year _____ Date _____

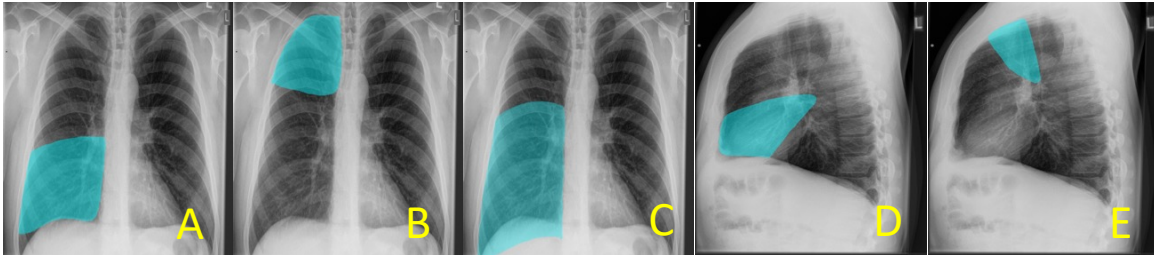
Educational Item Tick ☒ each correct answer	Score
1. Chest radiograph – identify lobe or segment: Right lung (match images) ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
2. Chest radiograph – identify lobe or segment: Left lung (match images) ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
3. CT – identify airways: Right lung (match images) ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
4. CT – identify airways: Left lung (match images) ☐ Image F ☐ Image G ☐ Image H ☐ Image I ☐ Image J	Each answer 2 points Score ____/10
5. CT- identify bronchopulmonary segments: Right lung (match images) ☐ RB1 apical RUL ☐ RB2 posterior RUL ☐ RB3 anterior RUL ☐ RB4 lateral RML ☐ RB5 medial RML ☐ RB6 superior RLL ☐ RB7 mediobasal RLL ☐ RB8 anterobasal RLL ☐ RB9 laterobasal RLL ☐ RB10 posterobasal RLL	Each answer 1 point Score ____/10
6. CT- identify bronchopulmonary segments: Left lung (match images) ☐ LB1+2 apical/posterior LUL ☐ LB3 anterior LUL ☐ LB1+2 apical/posterior LUL ☐ LB3 anterior LUL ☐ LB4 superior lingula ☐ LB5 inferior lingula ☐ LB6 superior ☐ LB7/8 anteromedial ☐ LB9 laterobasal ☐ LB10 posterobasal	Each answer 1 point Score ____/10
7. Circle the response that correctly identifies these five CXR lesions ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
8. Circle the response that correctly identifies these five CT lesions ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
9. CT: Correctly identify the location of these lesions and maneuver the bronchoscope to the correct segment: Right lung ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 points Score ____/10
10. CT: Correctly identify the location of these lesions and maneuver the bronchoscope to the correct segment: Left lung ☐ Image A ☐ Image B ☐ Image C ☐ Image D ☐ Image E	Each answer 2 point Score ____/10

SCORE ____/100

Question 1

INSTRUCTIONS

Match each highlighted chest radiograph to its corresponding right lung lobe. There is one correct response to each image (ie there will be one incorrect response remaining)

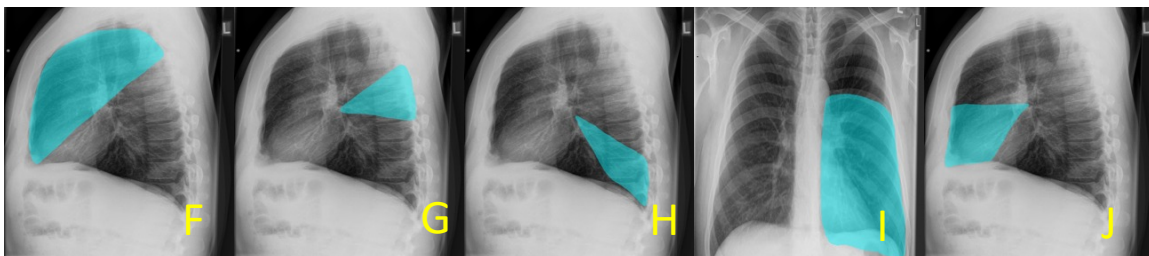


_____	_____	_____	_____	_____	_____
Right middle lobe	Right lower lobe	Right upper lobe anterior	Right middle lobe	Right upper lobe apical	Right upper lobe

Question 2

INSTRUCTIONS

Match each highlighted chest radiograph to its corresponding left lung lobe. There is one correct response to each image (ie there will be one incorrect response remaining)

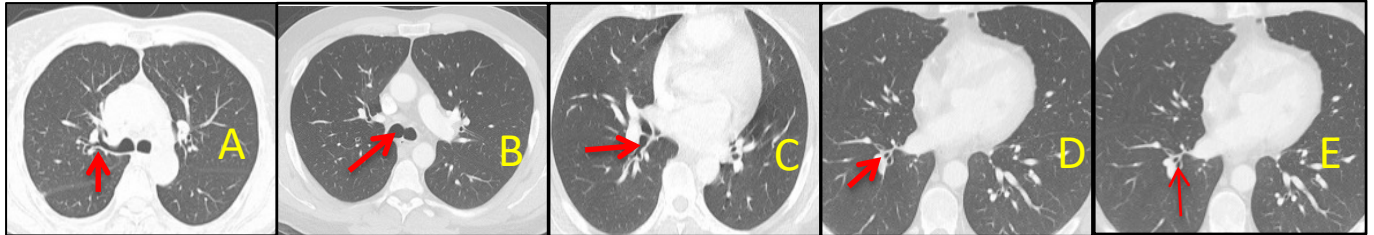


_____	_____	_____	_____	_____	_____
Left lower lobe superior	Left upper lobe	Left lower lobe posterior	Left <u>lingula</u>	Left lower lobe lateral	Left lower lobe

Question 3

INSTRUCTIONS

Match each computed tomography image to it's corresponding RIGHT lung airway*
There is one correct response for each image (ie there will be one incorrect response remaining)

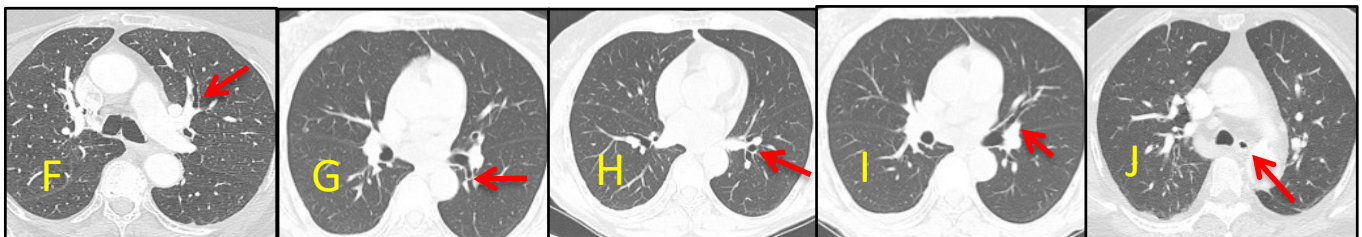


_____	_____	_____	_____	_____	_____
Right main bronchus	Right lower lobe superior (RB6)	Right upper lobe posterior (RB2)	Right middle lobe lateral (RB4)	Right lower lobe lateral (RB9)	Right lower lobe posterior (RB10)

Question 4

INSTRUCTIONS

Match each computed tomography image to it's corresponding LEFT lung airway*
There is one correct response for each image (ie there will be one incorrect response remaining)



_____	_____	_____	_____	_____	_____
Left lower lobe lateral (LB9)	Left upper lobe anterior (LB3)	Left lower lobe posterior (LB10)	Left <u>lingula</u>	Esophagus	Left lower lobe superior (LB6)

*Jackson-Huber nomenclature and Japanese system numbering are used throughout BRadSTAT

Question 5.

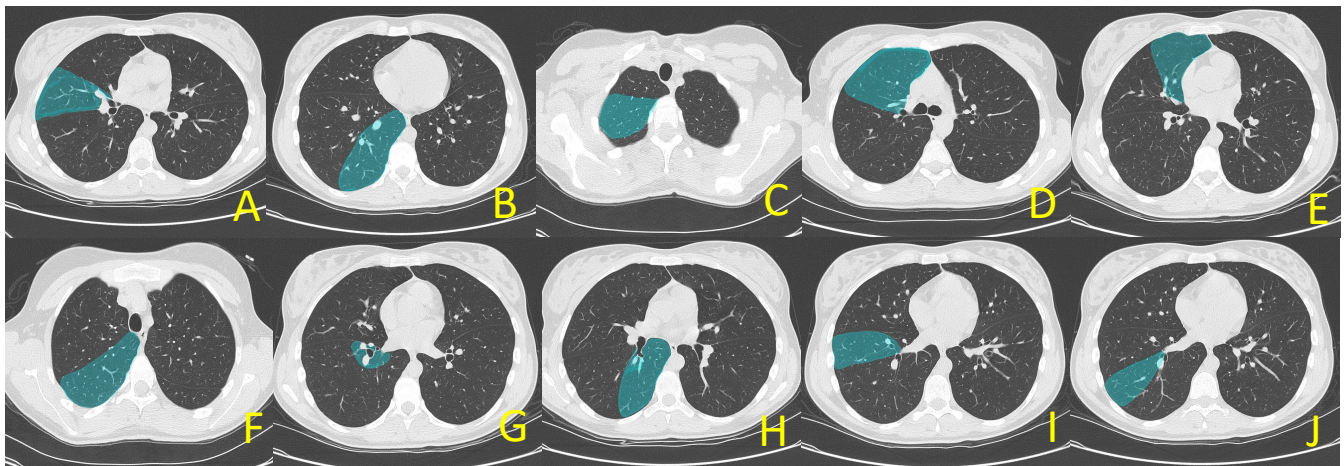
Right lung bronchopulmonary segments

INSTRUCTIONS

Match the images (A-J) to the corresponding 10 CT segments*

There is one correct response for each image

Refer to Appendix S2 for supporting CT slides



_____	_____	_____	_____	_____
Right upper lobe apical (RB1)	Right upper lobe posterior (RB2)	Right upper lobe anterior (RB3)	Right middle lobe lateral (RB4)	Right middle lobe medial (RB5)
_____	_____	_____	_____	_____
Right lower lobe superior (RB6)	Right lower lobe medial (RB7)	Right lower lobe anterior (RB8)	Right lower lobe lateral (RB9)	Right lower lobe posterior (RB10)

Question 6.

Left lung bronchopulmonary segments

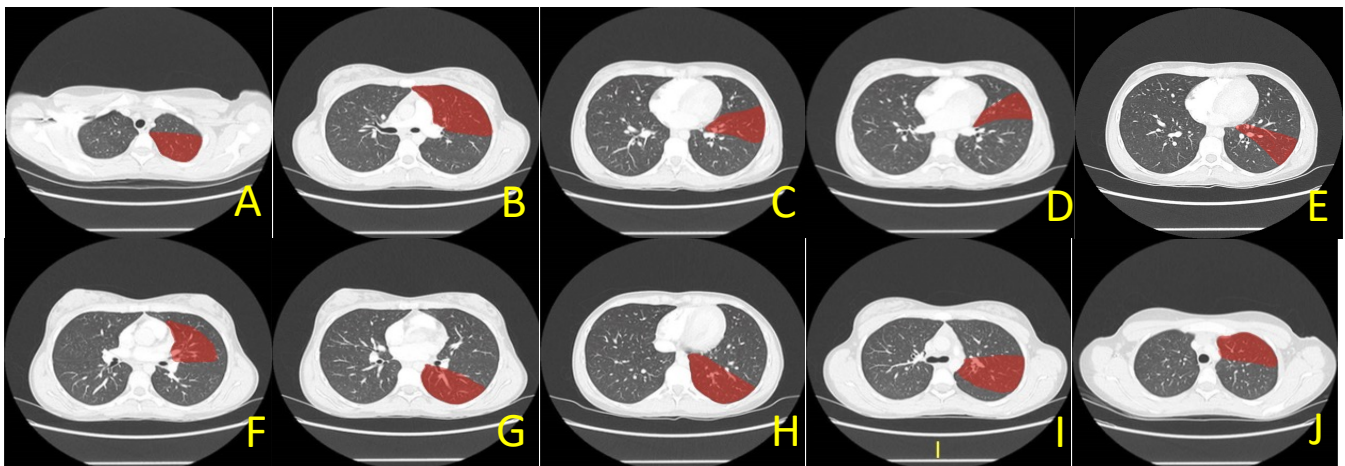
INSTRUCTIONS

Match the images (A-J) to the corresponding 10 CT segments*

There is one correct response for each image

Note: There are 4 images corresponding to left upper lobe

Refer to Appendix S3 for supporting CT slides



_____	_____	_____	_____	_____
Left upper lobe apicoposterior (LB1+2)	Left upper lobe anterior (LB3)	Left upper lobe apicoposterior (LB1+2)	Left upper lobe anterior (LB3)	Superior lingula (LB4)
_____	_____	_____	_____	_____
Inferior lingula (LB5)	Left lower lobe superior (LB6)	Left lower lobe anteromedial (LB7/8)	Left lower lobe lateral (LB9)	Left lower lobe posterior (LB10)

Question 7

Each CXR has a lobar or segmental abnormality.
Circle the response that corresponds to each CXR abnormality

A



Left lower lobe

Or

Lingula

B

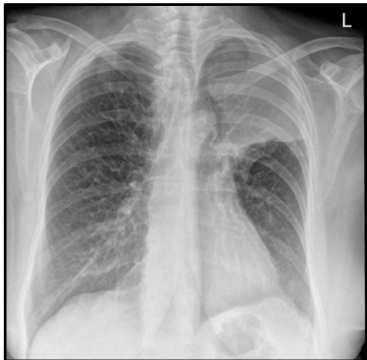


Right lower lobe

Or

Right middle lobe

C



Left upper lobe

Or

Superior lingula

D



Right upper lobe anterior

Or

Right middle lobe

E



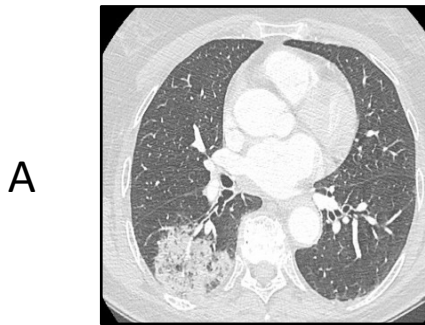
Left lower lobe

Or

Lingula

Question 8

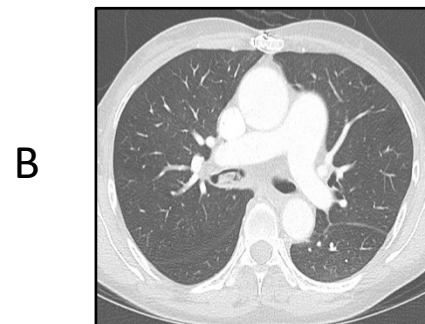
Each CT has a lobar or segmental abnormality.
Circle the correct answer corresponding to each CT abnormality



Right lower lobe lateral

Or

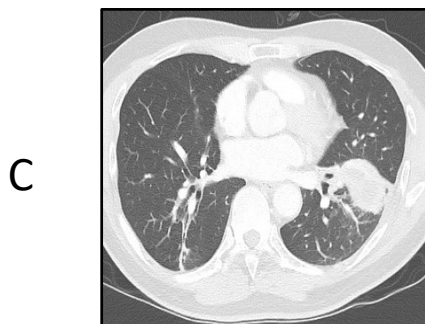
Right lower lobe superior



Right lower lobe common basal

Or

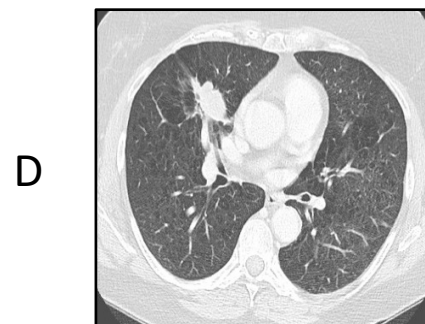
Bronchus intermedius



Inferior lingula

Or

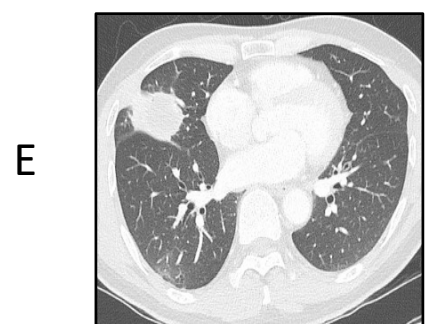
Left lower lobe



Right middle lobe medial

Or

Right upper lobe anterior



Right middle lobe medial

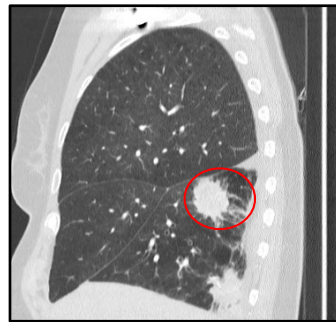
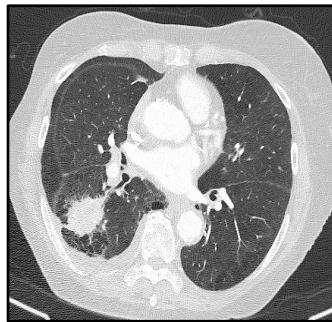
Or

Right middle lobe lateral

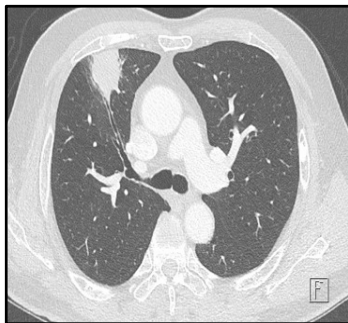
Question 9

Identify the abnormal segment on CT, then navigate the bronchoscope to the correct segment in the simulator/model

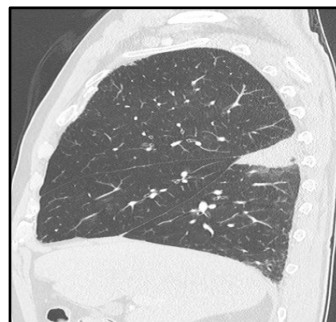
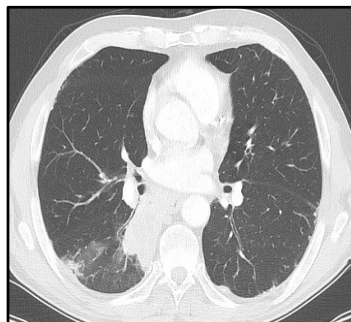
A



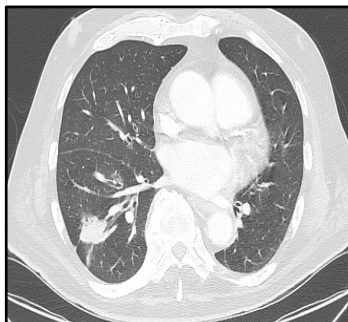
B



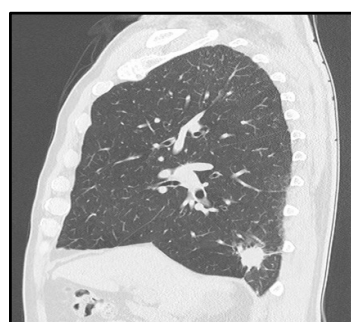
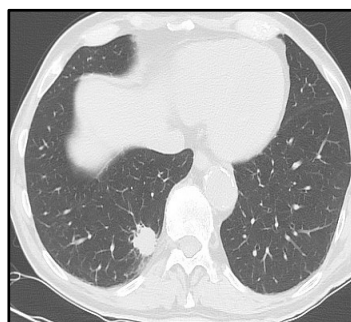
C



D



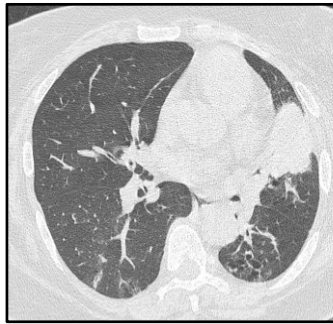
E



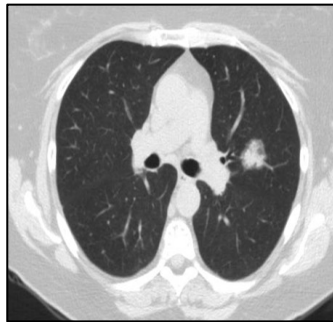
Question 10

Identify the abnormal segment on CT, then navigate the bronchoscope to the correct segment in the simulator/model

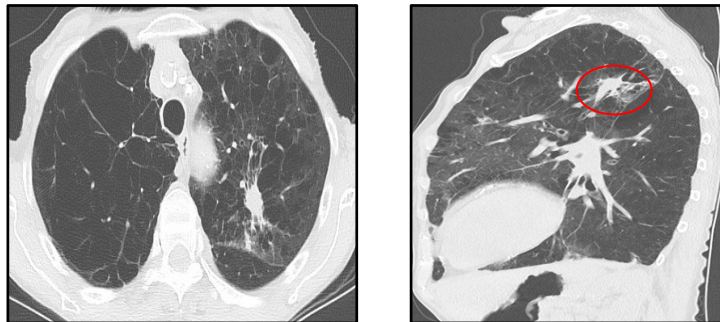
A



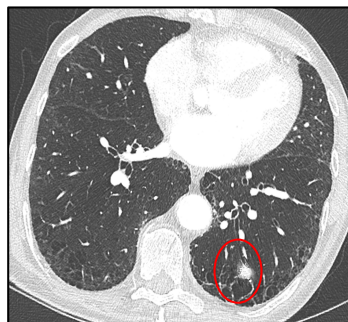
B



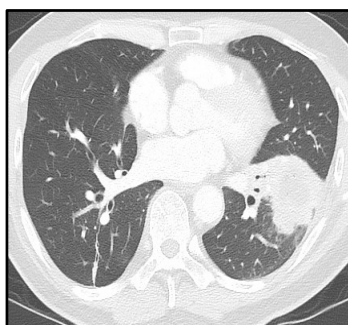
C



D



E



Bronchoscopy/Radiology Skills and Tasks Assessment Tool (BRadSTAT)

Name: _____ Training Year _____ Date _____



Educational Item* Items 1-10 each scored separately	Satisfactory Yes/No
1. Chest radiograph-identify lobe or segment: Right lung (match images) Image A Image B Image C Image D Image E	Yes / No Score ____/10
2. Chest radiograph- identify lobe or segment: Left lung (match images) Image F Image G Image H Image I Image J	Yes / No Score ____/10
3. CT – identify airways: Right lung (match images) Image A Image B Image C Image D Image E	Yes / No Score ____/10
4. CT – identify airways: Left lung (match images) Image F Image G Image H Image I Image J	Yes / No Score ____/10
5. CT- identify segments: Right lung (match images) RB1 apical RB2 posterior RB3 anterior RB4 lateral RB5 medial RB6 superior RB7 mediobasal RB8 anterobasal RB9 laterobasal RB10 posterobasal	Yes / No Score ____/10
6. CT- identify segments: Left lung (match images) LB1+2 apical/posterior LB3 anterior (LB 1+2 and LB3 have 2 corresponding images each) LB4 superior LB5 inferior LB6 superior LB8 anterobasal LB9 laterobasal LB10 posterobasal	Yes / No Score ____/10
7. Circle the response that correctly identifies these five CXR lesions Image A Image B Image C Image D Image E	Yes / No Score ____/10
8. Circle the response that correctly identifies these five CT lesions Image A Image B Image C Image D Image E	Yes / No Score ____/10
9. CT: Correctly identify the location of these lesions and maneuver the bronchoscope to the correct segment: Right lung Image A Image B Image C Image D Image E	Yes / No Score ____/10
10. CT: Correctly identify the location of these lesions and maneuver the bronchoscope to the correct segment: Left lung Image F Image G Image H Image I Image J	Yes / No Score ____/10

FINAL GRADE

PASS

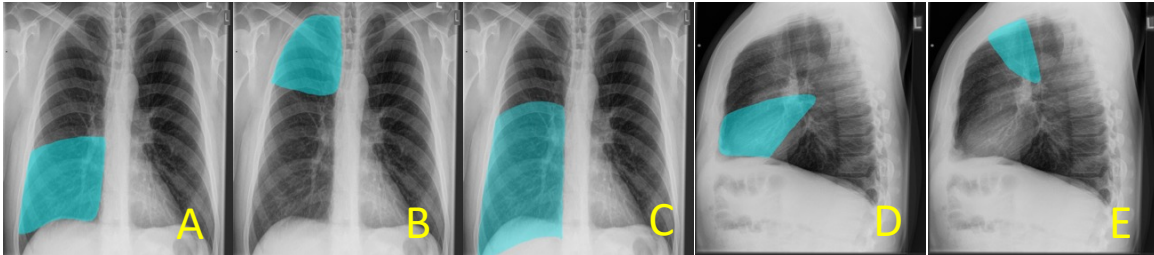
FAIL

SCORE ____/100

Question 1

INSTRUCTIONS

Match each highlighted chest radiograph to its corresponding right lung lobe. There is one correct response to each image (ie there will be one incorrect response remaining)

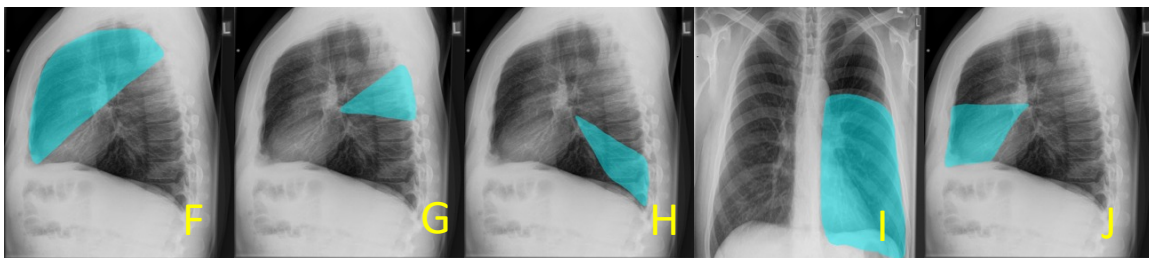


<u>D/A</u>	<u>C</u>	<u> </u>	<u>D/A</u>	<u>E</u>	<u>B</u>
Right middle lobe	Right lower lobe	Right upper lobe anterior	Right middle lobe	Right upper lobe apical	Right upper lobe

Question 2

INSTRUCTIONS

Match each highlighted chest radiograph to its corresponding left lung lobe. There is one correct response to each image (ie there will be one incorrect response remaining)

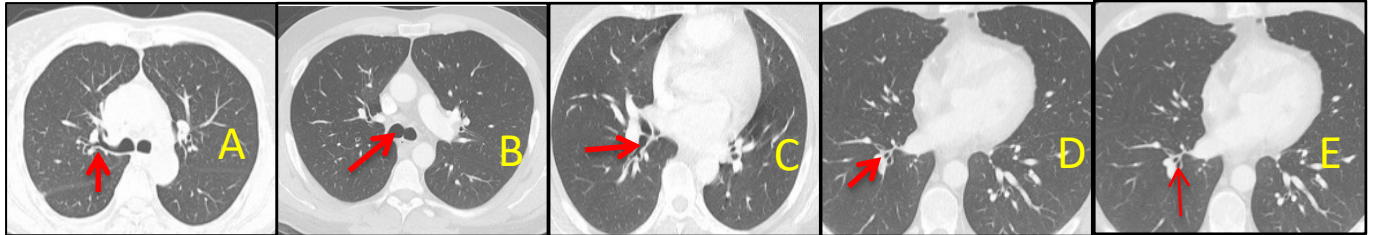


<u>G</u>	<u>F</u>	<u>H</u>	<u>J</u>	<u> </u>	<u>I</u>
Left lower lobe superior	Left upper lobe	Left lower lobe posterior	Left <u>lingula</u>	Left lower lobe lateral	Left lower lobe

Question 3

INSTRUCTIONS

Match each computed tomography image to it's corresponding RIGHT lung airway*
There is one correct response for each image (ie there will be one incorrect response remaining)

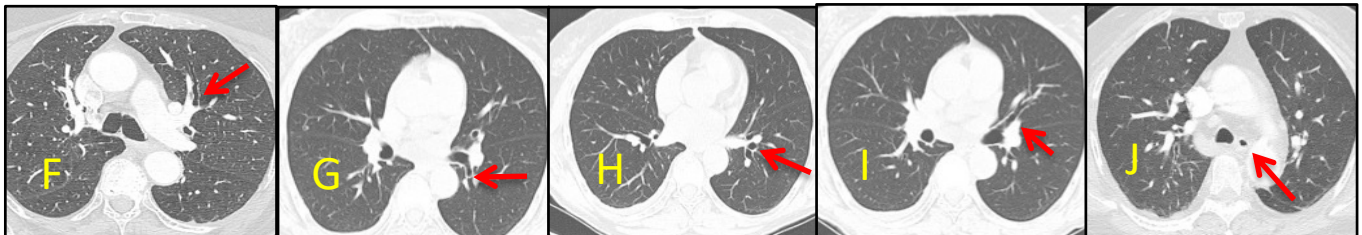


<u>B</u>	<u>C</u>	<u>A</u>	<u>_____</u>	<u>D</u>	<u>E</u>
Right main bronchus	Right lower lobe superior (RB6)	Right upper lobe posterior (RB2)	Right middle lobe lateral (RB4)	Right lower lobe lateral (RB9)	Right lower lobe posterior (RB10)

Question 4

INSTRUCTIONS

Match each computed tomography image to it's corresponding LEFT lung airway*
There is one correct response for each image (ie there will be one incorrect response remaining)



<u>H</u>	<u>F</u>	<u>_____</u>	<u>I</u>	<u>J</u>	<u>G</u>
Left lower lobe lateral (LB9)	Left upper lobe anterior (LB3)	Left lower lobe posterior (LB10)	Left <u>lingula</u>	Esophagus	Left lower lobe superior (LB6)

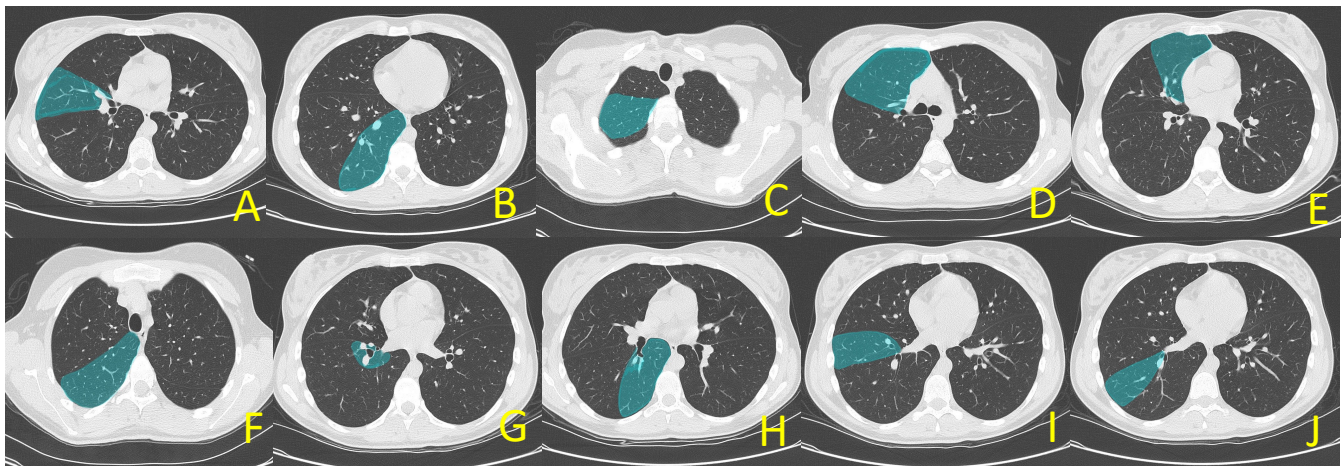
*Jackson-Huber nomenclature and Japanese system numbering are used throughout BRadSTAT

Question 5.
Right lung bronchopulmonary segments

INSTRUCTIONS

Match the images (A-J) to the corresponding 10 CT segments*
There is one correct response for each image

Refer to Appendix A for supporting CT slides



<u>C</u> Right upper lobe apical (RB1)	<u>F</u> Right upper lobe posterior (RB2)	<u>D</u> Right upper lobe anterior (RB3)	<u>A</u> Right middle lobe lateral (RB4)	<u>E</u> Right middle lobe medial (RB5)
<u>H</u> Right lower lobe superior (RB6)	<u>G</u> Right lower lobe medial (RB7)	<u>I</u> Right lower lobe anterior (RB8)	<u>J</u> Right lower lobe lateral (RB9)	<u>B</u> Right lower lobe posterior (RB10)

Question 6.

Left lung bronchopulmonary segments

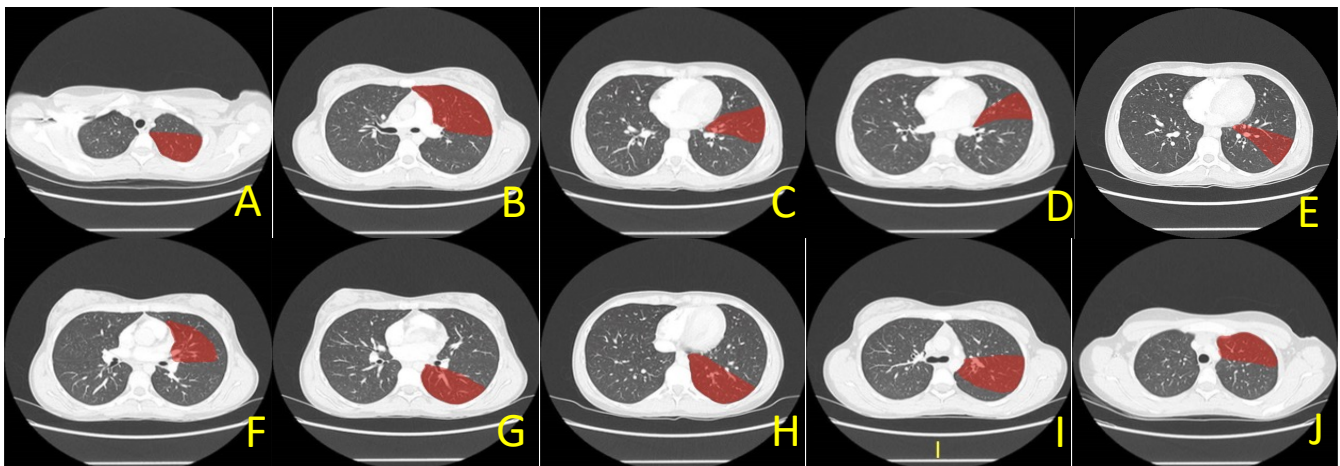
INSTRUCTIONS

Match the images (A-J) to the corresponding 10 CT segments*

There is one correct response for each image

Note: There are 4 images corresponding to left upper lobe

Refer to Appendix B for supporting CT slides

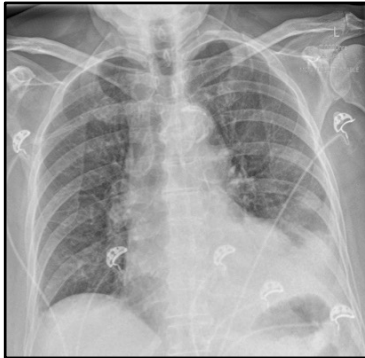


<u>A/I</u> Left upper lobe apicoposterior (LB1+2)	<u>B/J</u> Left upper lobe anterior (LB3)	<u>A/I</u> Left upper lobe apicoposterior (LB1+2)	<u>B/J</u> Left upper lobe anterior (LB3)	<u>F</u> Superior lingula (LB4)
<u>D</u> Inferior lingula (LB5)	<u>G</u> Left lower lobe superior (LB6)	<u>C</u> Left lower lobe anteromedial (LB8)	<u>E</u> Left lower lobe lateral (LB9)	<u>H</u> Left lower lobe posterior (LB10)

Question 7

Each CXR has a lobar or segmental abnormality.
Circle the response that corresponds to each CXR abnormality

A



Left lower lobe

Or

Lingula

B

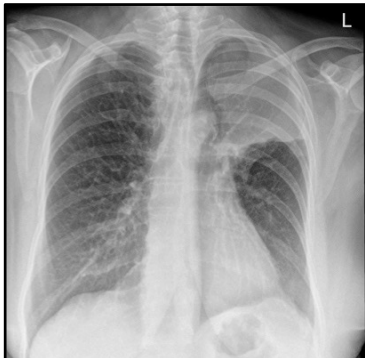


Right lower lobe

Or

Right middle lobe

C



Left upper lobe

Or

Superior lingula

D



Right upper lobe anterior

Or

Right middle lobe

E



Left lower lobe

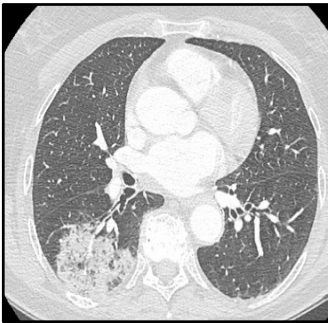
Or

Lingula

Question 8

Each CT has a lobar or segmental abnormality.
Circle the correct answer corresponding to each CT abnormality

A

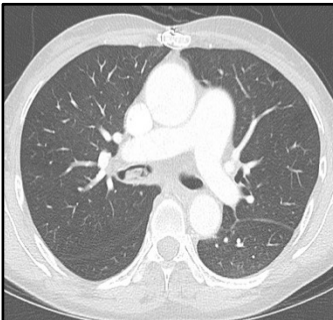


Right lower lobe lateral

Or

Right lower lobe superior

B

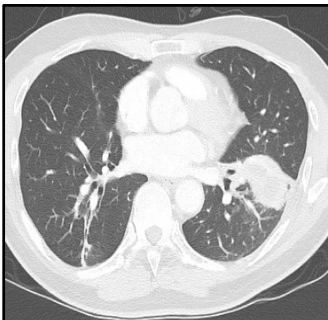


Right lower lobe common basal

Or

Bronchus intermedius

C

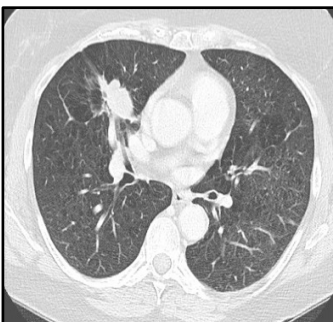


Inferior lingula

Or

Left lower lobe

D

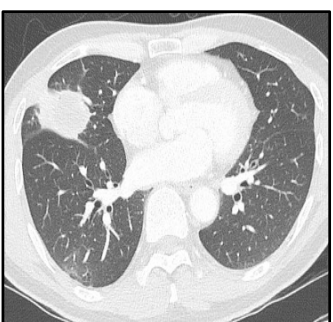


Right middle lobe medial

Or

Right upper lobe anterior

E



Right middle lobe medial

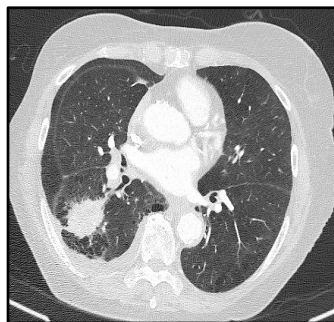
Or

Right middle lobe lateral

Question 9

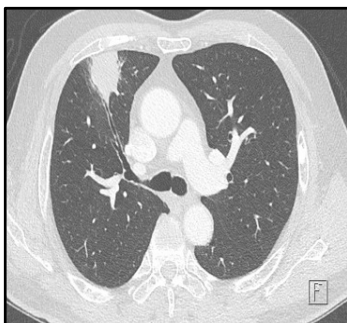
Identify the abnormal segment on CT, then navigate the bronchoscope to the correct segment in the simulator/model

A



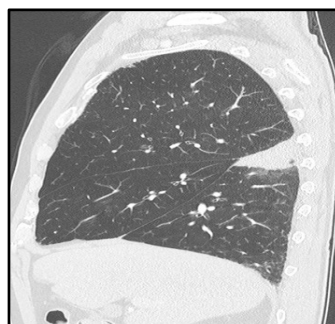
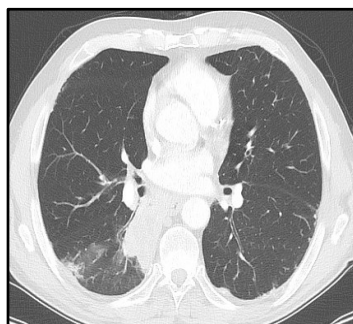
RLL superior
RB6

B



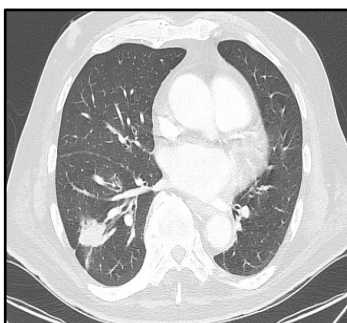
RUL anterior
RB3

C



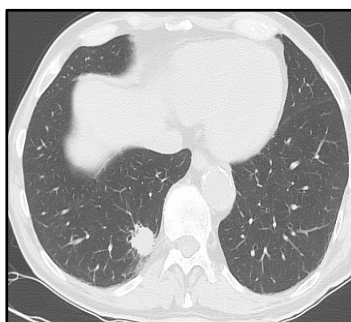
RLL superior
RB6

D



RLL lateral
RB9

E

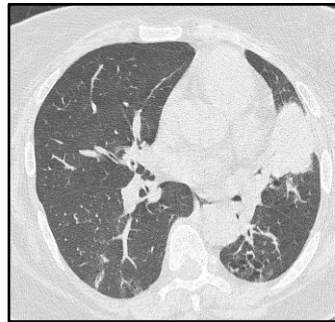


RLL posterior
RB10

Question 10

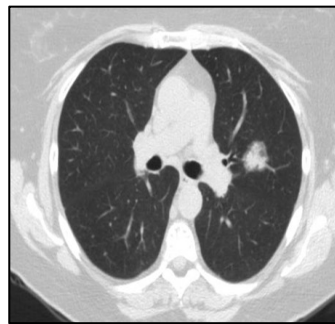
Identify the abnormal segment on CT, then navigate the bronchoscope to the correct segment in the simulator/model

A



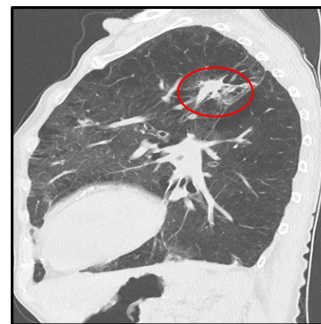
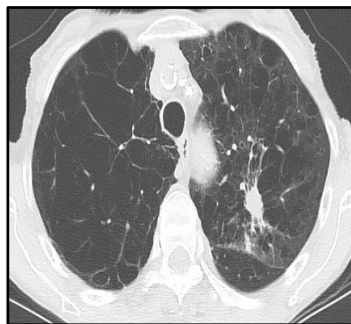
lingula

B



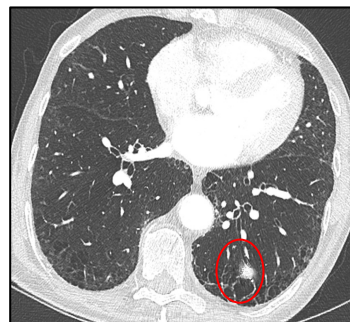
LUL anterior
LB3

C



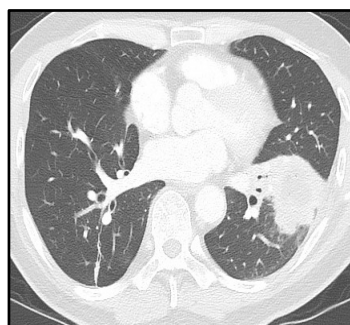
LUL apicoposterior
LB1+2

D



LLL posterior
LB10

E



LLL anterior or lateral
LB8 or LB9

Bronchoscopy Self Assessment Tool (BSAT)

The purpose of this assessment tool is to provide bidirectional feedback between learner and instructor. There are no wrong answers. Well performed, this interaction will allow opportunities to ascertain strengths and weaknesses of a training program and educational methodologies. In addition, an open discussion will allow both learner and instructor to identify the learner's zones of proximal development and reflective capacity ¹. Educators may wish to ask learners to complete the BSAT prior to the encounter, and to then review each element of the questionnaire with the learner in order to identify which areas might warrant additional concentration.

	1 Not comfortable	2	3 Comfortable	4	5 Very comfortable	
1.	I am able to identify airway anatomy					_____
2.	I am able to identify airway mucosal abnormalities					_____
3.	I am able to describe secretions and other airway abnormalities					_____
4.	I am able to maneuver the flexible bronchoscope					_____
5.	I am able to do a BAL through the flexible scope					_____
6.	I am able to use a brush through the flexible bronchoscope					_____
7.	I am able to use biopsy forceps through the scope					_____
8.	I am able to perform transbronchial lung biopsy					_____
9.	I am able to perform conventional transbronchial needle aspiration					_____
10.	I now feel comfortable performing this case in a patient					_____

Anatomy Abnormalities Technique Equipment Interpretation of findings

I would like to learn more about (circle all that apply above)

	1 Poor	2 Below average	3 Average	4 Good	5 Excellent
--	-----------	--------------------	--------------	-----------	----------------

Using the above scale please rate your training as (please circle one of the above)

I have the following comments

¹ The constructivist psychologist Lev Vygotsky (1896-1934) believed that learning and development depend on social interaction. Focusing primarily on how children learn, he described a zone of proximal development (ZPD) as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (L.S. Vygotsky: *Mind in Society: Development of Higher Psychological Processes*, p. 86, John-Steiner, Cole, Scribner, and Soubberman Editors, Harvard University Press, 1980). Tinsley and Lebak expanded on this theory, describing a zone of reflective capacity in which adults increased their ability for critical reflection through feedback, analyses, and evaluation of one another's work in a collaborative working environment (Lebak, K. & Tinsley, R. Can inquiry and reflection be contagious? Science teachers, students, and action research. *Journal of Science Teacher Education*;2010;21;953-970).



Bronchoscopy International

Bronchoscopy International is a transnational charitable organization whose members are devoted to bronchoscopy education. Our vision is that patients need not suffer the burden of medical procedure-related training. Our mission is to help physicians become skilled practitioners, and to make bronchoscopy more readily available to patients so that we might defeat the effects of lung disease around the world.

Bronchoscopy International partners with national, regional, and international medical societies to train physicians and their health care teams, donate equipment, and implement learning programs that support the democratization of knowledge. The Bronchoscopy Education Project provides standardized educational resources, including books and training manuals, instructional videos, patient-centered problem-based exercises, simulation scenarios, assessment tools, and faculty development programs for educators around the world.