

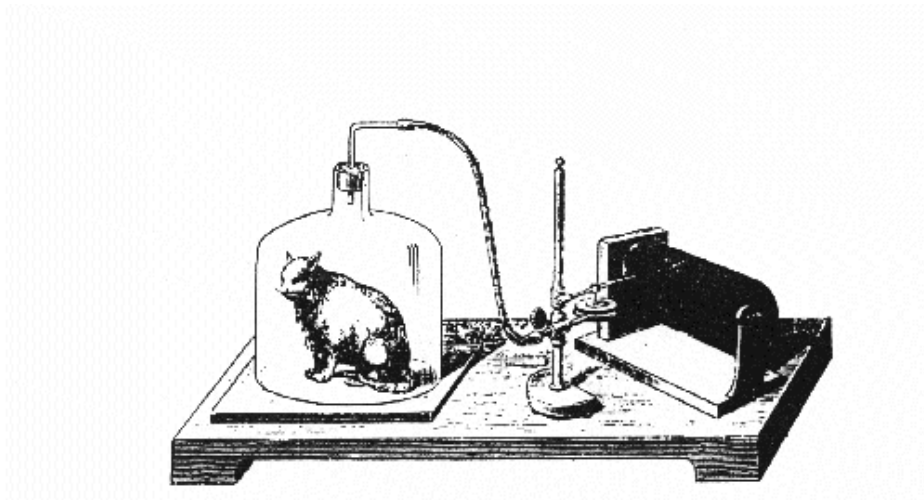
Online Supplement 2: Lung function tests interpretation, lessons from French training in respiratory medicine

English translation of questionnaire used during the survey:

E P R I

*Enquête sur la Physiologie Respiratoire et les Internes en pneumologie
Study on Respiratory Physiology and Respiratory Residents*

NATIONAL STUDY ON THE TRAINING AND THE KNOWLEDGE OF RESPIRATORY RESIDENTS IN RESPIRATORY PHYSIOLOGY



COORDINATED BY:

Société de Pneumologie de Langue Française - Groupe Fonction

Société Française de Physiologie - Groupe Respiratoire

Collège des Enseignants de Pneumologie

Association des Jeunes Pneumologues

Association des Jeunes praticiens et Internes pour la Recherche dans le domaine Respiratoire

General training

General information

In which country did you go to medical school:

France Belgium Other (specify)

Currently, you are in your semesters of training:

1 2 3 4 5 6 7 8

What is your gender : Male Female

What is your year of birth:19...

At the end of your medical school, how did you assess your knowledge in lung function tests interpretation?

No knowledge Minimal knowledge Basic knowledge
 Good knowledge

What was your ranking at the final national medical school test?

1 - 500 501 - 1000 1001 - 2000 2001 - 3000 3001 - 4000

Have you done a Masters in Science :

Yes No Currently Planned

How many semesters on a respiratory ward have you done (including this semester)?

1 2 3 4 5 6 7 8

What kind of practice are you planning to enter after your training?

Private Private hospital Consultant in a hospital Consultant in a teaching hospital
 Part private - part consultant Professor / Reader
 Consultant in a lung function test laboratory

Practical training in respiratory physiology

During your placement on respiratory wards, did you take time to interpret lung function tests?

No

Yes

Have you done an internship in a lung function tests laboratory (including this semester)

Yes

No

Currently

Planned

In your teaching hospital, a placement in a lung function tests laboratory is :

Mandatory

Recommended

Possible

Impossible

In your teaching hospital, do all the residents have the opportunity to access a placement in a lung function tests laboratory?

Yes

Majority of them
Only a minority

Half of them

In your teaching hospital, the placement in a lung function tests laboratory is...

Stand alone placement

Associated with a respiratory ward
Associated with a bronchoscopy unit
Associated to a clinic

In your teaching hospital, generally, when do residents have access to the lung function tests laboratory?

Beginning of training

Mid training

End of training

How would you rate the interest of a placement in a lung function test laboratory?

0

1

2

3

4

5

6

7

8

9

10

In your opinion, what is the most adequate length for a placement in a lung function tests laboratory (in months) ?

1

2

3

4

5

6

Do you think that a placement in a lung function tests laboratory should be associated to a placement in a bronchoscopy unit?

Yes

No

No opinion

At the end of your training, what kind of lung function tests do you think that you will be able to interpret?

None

Only simple ones

Ones with intermediate difficulty

All lung function tests

How would you rate your current practical training on lung function tests?

0

1

2

3

4

5

6

7

8

9

10

Theoretical training in respiratory physiology:

Did you attend an academic teaching seminar on lung function tests interpretation?

Yes No Currently

How useful do you think that such training is?

(0 : Useless / 10 : Essential)

0 1 2 3 4 5 6 7 8 9 10

Did you attend a teaching seminar (not organised by the academic district) on lung function tests interpretation?

Never Once Several times

Have you read a textbook on respiratory physiology? (If yes, which one?)

Yes No

Respiratory physiology text book read :

.....
.....
.....

Are you planning to apply to for additional university training on respiratory physiology?

Yes No Currently Planned

Do you think your training in medical school provided you with sufficient knowledge for lung function tests interpretation?

(0 : Not at all / 10 : Yes, totally)

0 1 2 3 4 5 6 7 8 9 10

How would you rate your current theoretical training on lung function tests?

0 1 2 3 4 5 6 7 8 9 10

Comments:

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Questionnaire

Multiple Choice Questions

Select correct answers

One or multiple answers are possible

MCQ1 : Spirometry normal values published in ERJ 1993 suppl 16 are valid:

- | | |
|--|--|
| <input type="checkbox"/> Between 18 and 60 years old | <input type="checkbox"/> Between 18 and 70 years old |
| <input type="checkbox"/> Between 18 and 80 years old | <input type="checkbox"/> For caucasians |
| <input type="checkbox"/> For women with a height between 145 and 180cm | <input type="checkbox"/> For eurasians |
| <input type="checkbox"/> For women with a height between 150 and 185cm | <input type="checkbox"/> For all ethnicity |

MCQ2 : Regarding lung volume measurements?

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Helium dilution is the reference technique |
| <input type="checkbox"/> | Plethysmography is the reference technique |
| <input type="checkbox"/> | Plethysmography is not adequate for patients with obstructive diseases |
| <input type="checkbox"/> | Helium dilution is not adequate for patients with obstructive diseases |

	Norm.	Pre Beta 2		Post Beta 2		
		Measured	%Norm.	Measured	Dif Pre%	%Norm.
Flow / volumes						
FVC(L)	2.56	2.15	84	2.36	10	92
FEV1 (L)	1.91	0.77	40	0.77	0	40
FEV1/VC (%)	73	32	44	33	2	45
MEF (L/S)	2.35	0.26	11	0.23	-8	10
FEF75 (L/S)	5.73	0.56	10	0.55	-2	10
FEF50 (L/S)	3.11	0.26	11	0.23	-13	8
FEF35 (L/S)	0.68	0.15	22	0.11	-36	16
PEF (L/S)	6.31	2.53	40	2.8	10	44
Lung volumes						
VC (L)	2.62	2.39	91			
TLC (L)	5.3	4.49	85			
RV (L)	2.52	2.1	83			
RV/TLC (%)	44	47	105			
FRC (L)	3.24	2.89	89			
ERV (L)	0.86	0.79	91			

MCQ3 : Using above LFT, you diagnose an obstruction that:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Is not reversible according to ERS 2005 criteria |
| <input type="checkbox"/> | Is reversible according to ERS 2005 criteria |
| <input type="checkbox"/> | Is compatible with stage 2 COPD (GOLD 2010) |
| <input type="checkbox"/> | Is compatible with stage 3 COPD (GOLD 2010) |

MCQ4 : Regarding maintenance of the plethysmography cabin:

- It is not necessary to adjust temperature and atmospheric pressure every day
- Pneumotachograph must be calibrated every morning using a 3L syringe
- During the day, recalibration is useless
- Once setup, it is not necessary to control cabin calibrated leaks
- Guidelines commands monthly « biological » calibration with 2 healthy subjects.

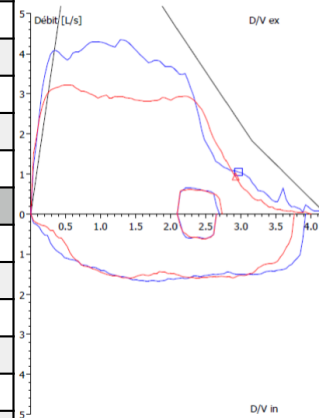
MCQ5: Regarding validity of plethysmography results:

- Needs at least 2 measures of FRC and TLC within 20% of variability
- Needs at least 2 measures of FRC and TLC within 10% of variability
- Needs at least to RV measure within 20% of variability
- Needs at least to RV measure within 10% of variability
- The best FRC is selected

Clinical case 2 :

This patient is referred for pre-operative assessment. He mentions to you « some throat problems ». He is a 50 year-old ex-smoker (25PY). He weights 63 kg. His height is 171cm.

	Norm.	Pre Beta 2		Post Beta 2		
		Measured	%Norm.	Measured	Dif Pre%	%Norm.
Flow / volumes						
FVC(L)	4.21	4.28	102	4.18	1	
FEV1 (L)	3.41	2.94	86	2.88	-6	
FEV1/FVC (%)		68.67		69.03	-15	
FEV1/VC (%)		67.37		65.03	-10	
MEF (L/S)	3.36	4.63	138		-8	
FEF75 (L/S)	7.42	4.35	59	2.95	-32	
FEF50 (L/S)	4.58	3.48	76	2.91	-16	
FEF35 (L/S)	1.82	0.67	37	0.46	-31	
PEF (L/S)	8.5	4.35	51	3.22	-26	
Lung volumes						
VC (L)	4.38	4.36	99	4.38	1	100
TLC (L)	6.58	7.29	111	6.87	-6	104
RV (L)	2.11	2.93	139	2.49	-15	116
RV/TLC (%)	33.46	40.22	120	36.19	-10	108
FRC (L)	3.36	4.63	138	4.25	-8	126
VT (L)	0.45	0.57	127	0.53	-8	117
ERV (L)	1.25	1.7	135	1.76	4	141
Diffusion						
TLCO SB	28.87	21.73	75	-	-	-
AV	6.43	5.6	87	-	-	-
TLCO/AV	4.38	3.88	89	-	-	-



Question 1 : What is (are) your diagnosis?

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Clinical case 4 :

This 66 year-old gentleman is referred to you for followup of diffuse interstitial pneumonitis. His breathlessness has increased. CT performed showed stable interstitial lesions. His height is 165cm, his weight is 69kg.

	Pre Beta 2			Norm.	Pre Beta 2		
	Norm.	Measured	%Norm.		Norm.	Measured	%Norm.
Flow / volumes				Lung volumes			
FVC(L)	3.45	2.46	71	VC (L)	3.57	2.46	69
FEV1 (L)	2.69	1.92	71	TLC (L)	6.1	3.91	64
FEV1/FVC (%)		77.73		RV (L)	2.38	1.44	61
FEV1/VC (%)	75.33	77.73	103	RV/TLC (%)	39.7	36.94	93
MEF (L/S)	3.06	2.11	69	FRC (L)	3.37	1.82	54
FEF75 (L/S)	6.63	6.7	101	VT (L)	0.49	1.04	211
FEF50 (L/S)	3.86	3.48	90	ERV (L)	0.98	0.37	38
FEF35 (L/S)	1.25	0.57	46				
PEF (L/S)	7.44	6.7	90				
Diffusion							
TLCO SB (ml/min/mmHg)				23.73	6.56	28	
AV (L)				5.95	3.68	62	
TLCO/AV (ml/min/mmHg/L)				3.89	1.78	46	
Vin (L)				3.57	2.47	69	

Question 1 : What is (are) your diagnosis? What is its severity?

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Question 2 : Arterial blood gas results are pH 7.47 PaCO2 29.8mmHg (3.9kPa) PaO2 57.3mmHg (6.64kPa) HCO3- 21.4mmol/l. What is your interpretation?

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Question 3 : You perform a new arterial blood gas with a FiO2 of 100%: pH 7.44 PaCO2 32.3mmHg (4,03kPa) PaO2 428mmHg (57kPa) HCO3- 21.9mmol/l with an estimated shunt at 14%. Select correct answers (Multiple answers possible)

- This result is abnormal
- This result is normal
- Physiological shunt is between 5 and 20%
- A shunt is abnormal only if PaO2 is not above 300mmHg (40kPa) during hyperoxia
- A shunt above 6% is abnormal

Question 4 : What test do you recommend to identify this patients problem(s)?

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Clinical case 5 :

You see this 44 years old patient following a respiratory failure secondary to legionnaires disease. After acute illness recovery, his daytime PaCO2 is 47mmHg (6,3kPa). His weight is 50kg, his height is 171cm.

	Norm.	Pre Beta 2		Norm.	Pre Beta 2		
		Measured	%Norm.		Measured	%Norm.	
Flow / volumes				Lung volumes			
FVC(L)	4.37	2.63	60	VC (L)	4.55	2.69	59
FEV1 (L)	3.59	2.44	68	TLC (L)	6.58	7.11	108
FEV1/FVC (%)		92.56		RV (L)	4.41	4.41	223
FEV1/VC (%)	79.29	90.6	114	RV/TLC (%)	31.12	62	200
MEF (L/S)	4.13	3.82	93	FRC (L)	3.31	4.98	150
FEF75 (L/S)	7.59	6.18	81	VT (L)	0.36	0.98	260
FEF50 (L/S)	4.77	4.42	93	ERV (L)	0.56	0.56	22
FEF35 (L/S)	1.98	1.57	79				
PEF (L/S)	8.76	6.33	72				
Diffusion							
TLCO SB (ml/min/mmHg)					30.05	18.03	60
AV (L)					6.43	4.49	77
TLCO/AV (ml/min/mmHg/L)					4.57	3.64	80

Question 1 : What is (are) your diagnosis?

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Question 2 : You suggest an assessment of respiratory muscle strength. Justify and give your interpretation of its results.

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Respiratory muscle strength	Norm.	Measured	%Norm.
VC (L)	4.51		
PI max (cmH2O)	105	21.75	20.71
PE max (cmH2O)	146.5	43.56	29.73
SNIP max (cmH2O)	105	41.92	39.92

Question 3 : You perform a cough peak flow: 357L/min. Is your patient's cough normal? What is the threshold of cough peak flow for cough weakness?

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Question 4 : You perform spirometry whilst lying flat. What is your interpretation? What value from this test is the most important?

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Lying Flow/ volume curves	Measured
FVC(L)	2.22
FEV1 (L)	2.07
FEV1/FVC (%)	93.03
MEF (L/S)	2.91
FEF75 (L/S)	4.62
FEF50 (L/S)	3.24
FEF35 (L/S)	1.64
PEF (L/S)	4.72