

# SOLUNUM FONKSİYON TESTLERİ DEĞERLENDİRMESİ

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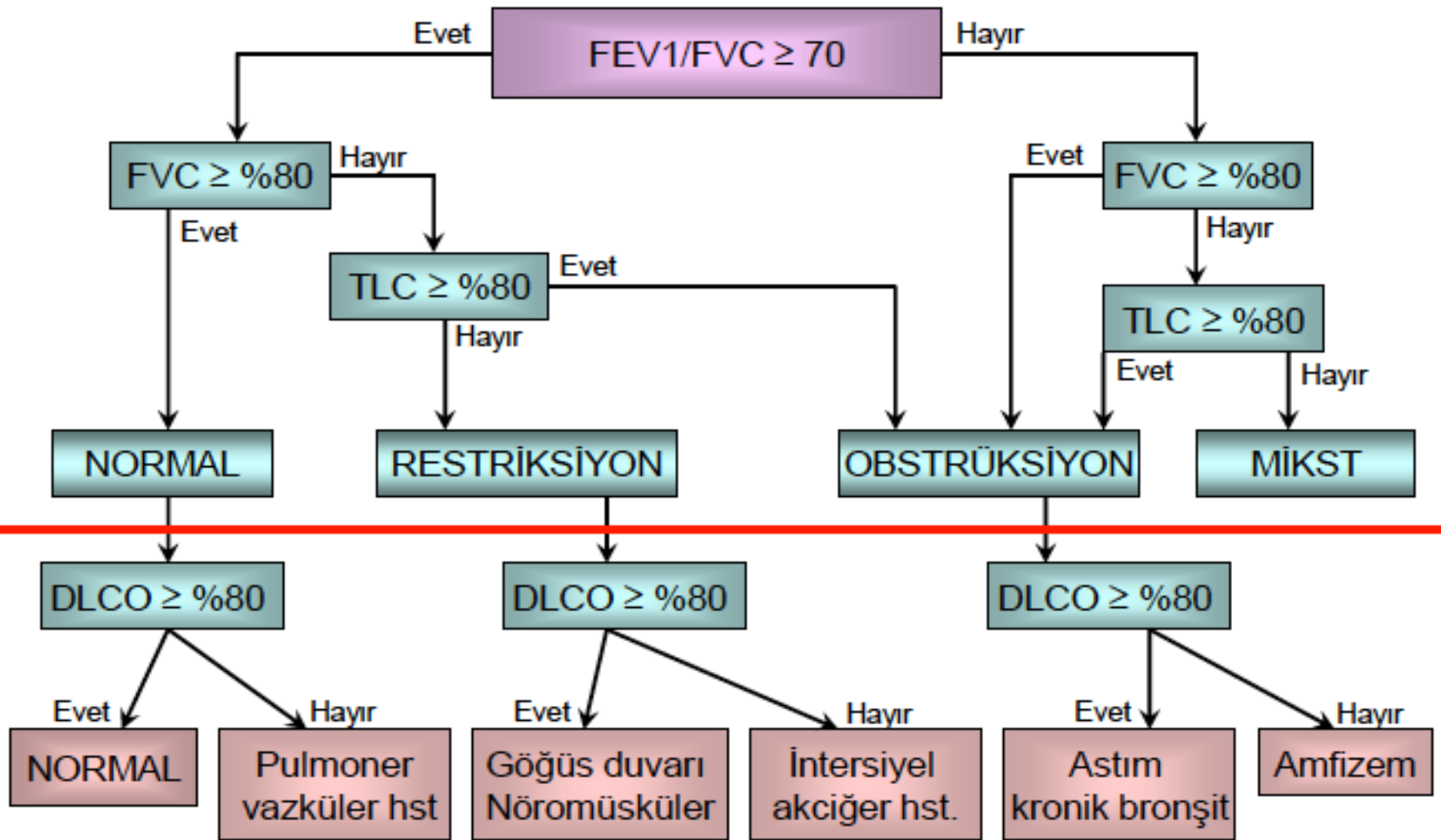
Göğüs Hastalıkları AD

Spirometri üç temel ölçümü sağlar:

- FVC ( Zorlu vital kapasite)
- FEV<sub>1</sub> (bir saniyedeki zorlu ekspiratuar hacim)
- FEV<sub>1</sub> / FVC oranı

Spirometriyi yorumlamak için üçü de gereklidir.

- FVC, FEV<sub>1</sub> ve FEV<sub>1</sub>/FVC oranının deęerlendirmesine gre 4 olasılık vardır
  1. Normal (Tm deęerler normal ise)
  2. Obstrktif (FEV<sub>1</sub>/FVC oranı dşk, FEV<sub>1</sub> dşk ve FVC nispeten korunmuř)
  3. Restriktif (FVC dşk, FEV<sub>1</sub>/FVC oranı normal veya artmıř) (TLC ile konfirmasyon)
  4. Kombine bozukluk (FVC ve FEV<sub>1</sub>/FVC oranı dşk) (TLC ile konfirmasyon)



# SPIROMETRİNİN DEĞERLENDİRİLMESİ

## 1. Basamakta FEV<sub>1</sub>/FVC'ye bakılır

- FEV<sub>1</sub>/FVC > 70 ise obstrüksiyon yoktur
- FEV<sub>1</sub>/FVC < 70 ise obstrüksiyon vardır

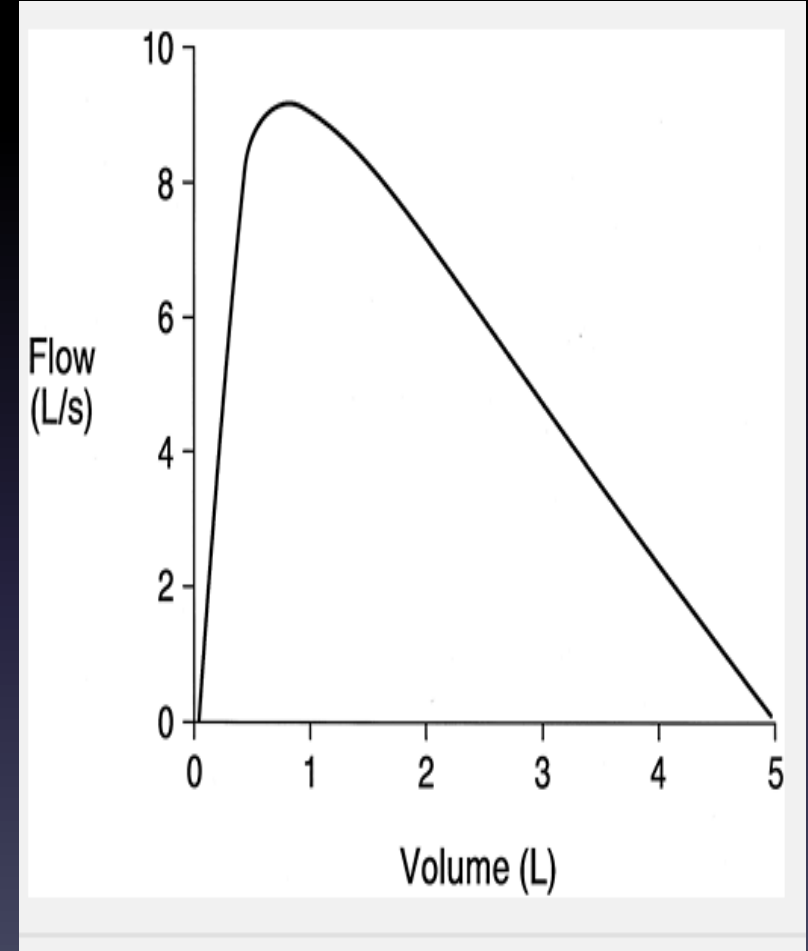
Restriksiyon eşlik edebilir

# SPIROMETRİNİN DEĞERLENDİRİLMESİ

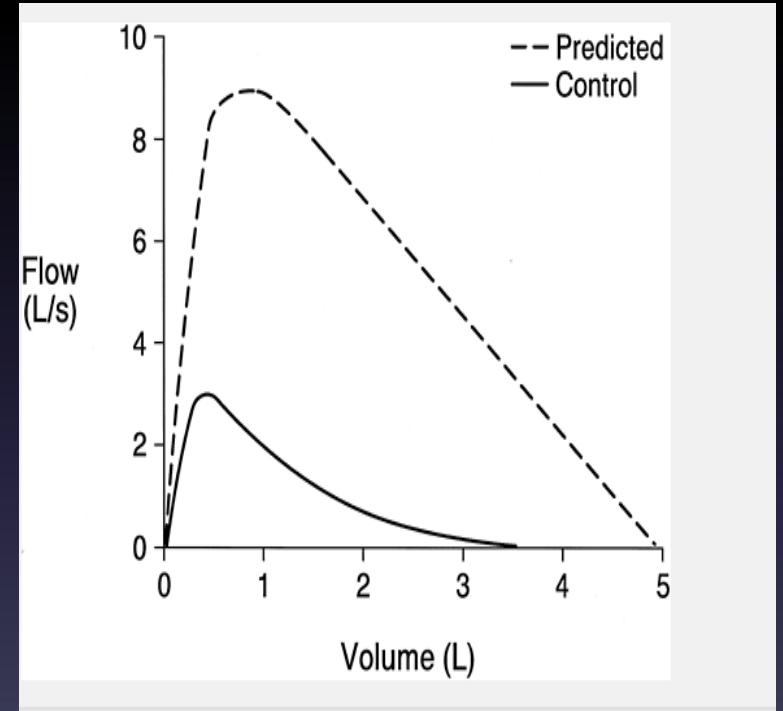
## 2. Basamakta FVC'ye bakılır

- Normal ise restriksiyon ekarte edilir
- Düşükse restriksiyon olabilir akciğer volümlerine (statik) bakmak gerekir

- Akım-volüm eğrisinin şekline bakılır
- FVC normal ve akım volüm eğrisi de normale, test normaldir

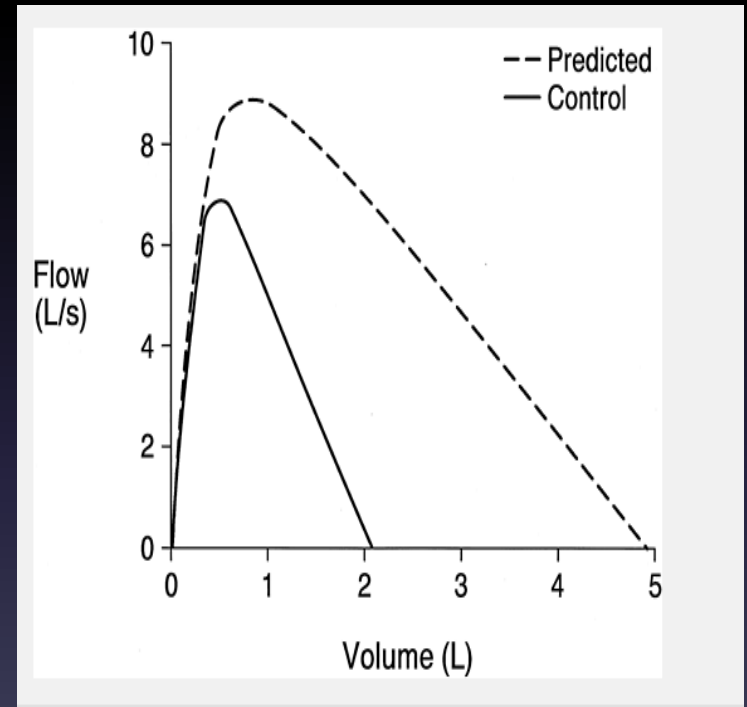


- FVC düşük ve akım volüm eğrisinde;
- Pik ekspiratuar akım azalmış ve eğri konkavlaşmış ise obstruksiyon göstergesidir

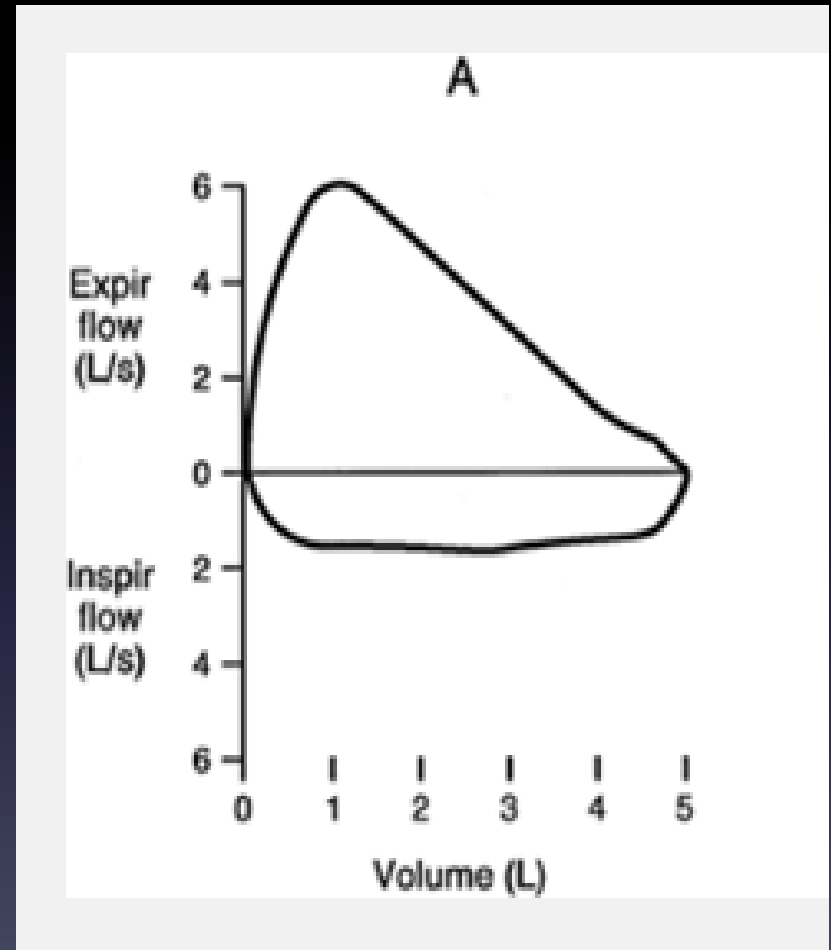




- FVC düşük ve akım volüm eğrisinde;
- Pik ekspiratuar akım azalmış ve eğri daralmış ise restriksiyon göstergesidir



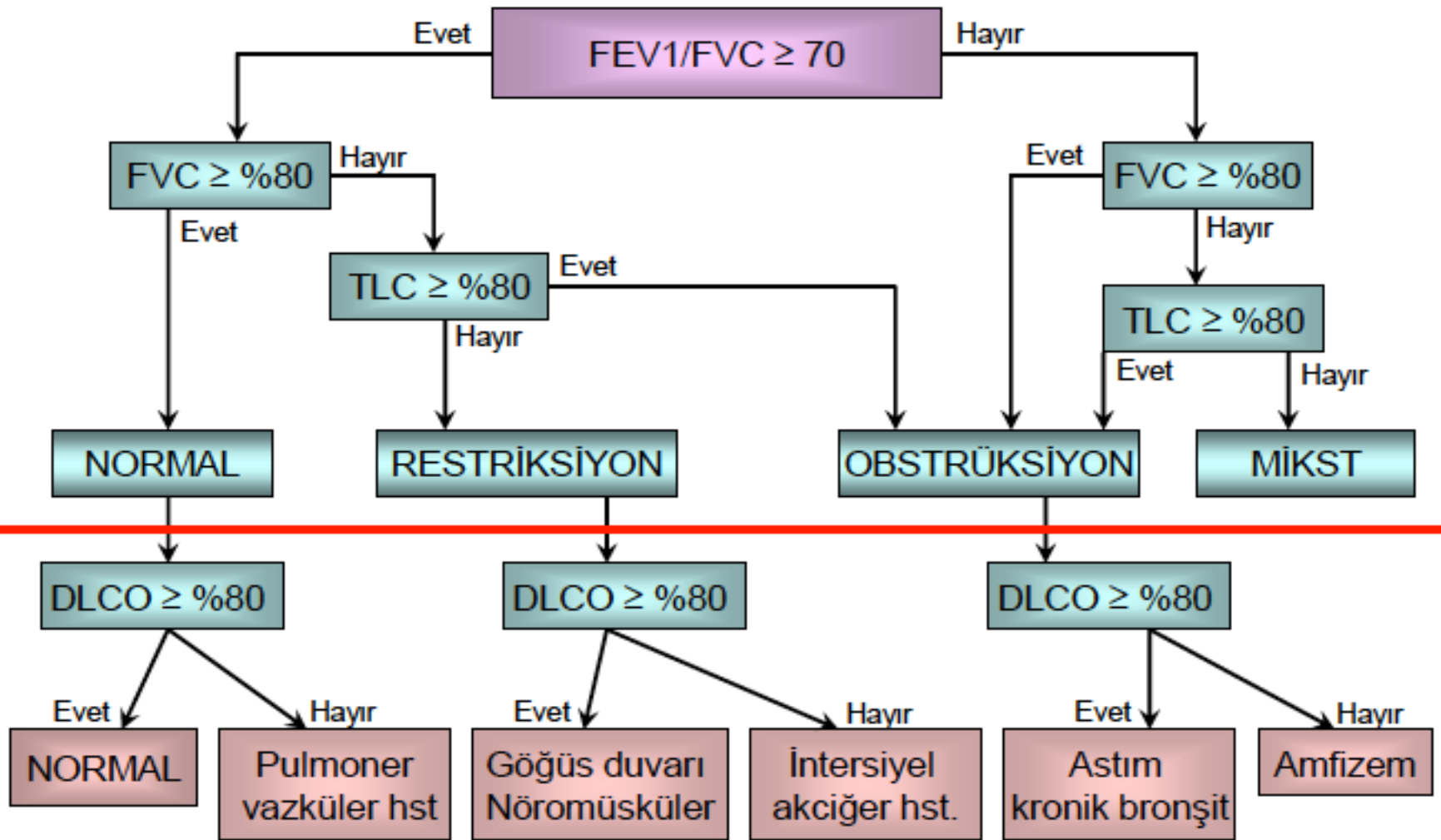
- İkinci basamakta FEV<sub>1</sub> değerine bakılır
- FEV<sub>1</sub> normal ise birkaç istisna dışında test normaldir. (ve FVC normal)
- Örnek: ekstra torasik değişken tıkanıklıklar



- FEV1 düşükse obstruksiyon veya restriksiyon olabilir
- FEV1/FVC deęerine bakılır
- FEV1/FVC deęeri % 70 - 75'in altında ise obstrüksiyondan söz edilir
- FEV1/FVC deęeri normal ise obstrüktif patern büyük olasılıkla ekarte edilir
- FEV1/FVC deęeri normal veya artmış ve FVC düşükse restriktif patolojiyi düşündürür

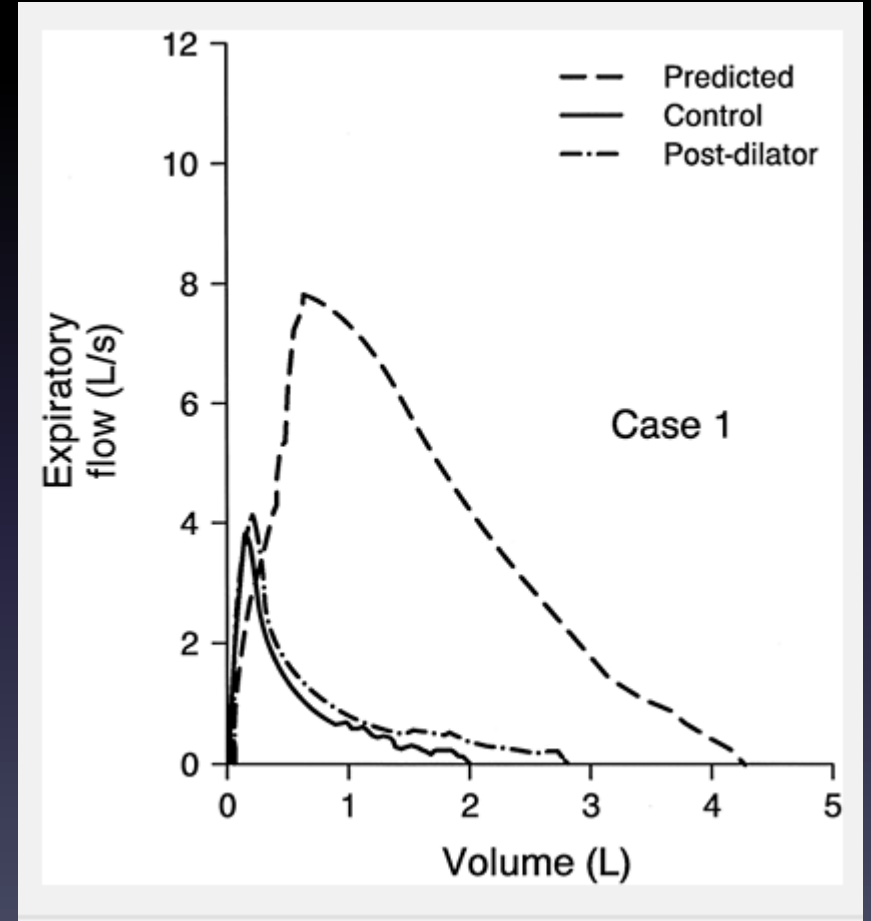
# ÖRNEK OLGULAR

1



# Örnek Olgular (A)

	BEKLENEN	ÖLÇÜLEN	%
FVC (L)	4,29	1,94	45
FEV <sub>1</sub> (L)	3,29	1.03	31
FEV <sub>1</sub> /FVC (%)	77	53	



- FVC düşmüş restriksiyon/ obstruksiyon
- FEV<sub>1</sub> düşük restriksiyon/ obstruksiyon
- FEV<sub>1</sub>/FVC düşmüş obstruksiyon/restriksiyon
  
- İleri testler / AC volümleri
- TLC ve RV artmış obstruksiyon

# Örnek Olgular (B)

	BEKLENEN	ÖLÇÜLEN	%
FVC (L)	6.01	1.12	19
FEV <sub>1</sub> (L)	4,89	1,04	21
FEV <sub>1</sub> /FVC (%)	81	93	

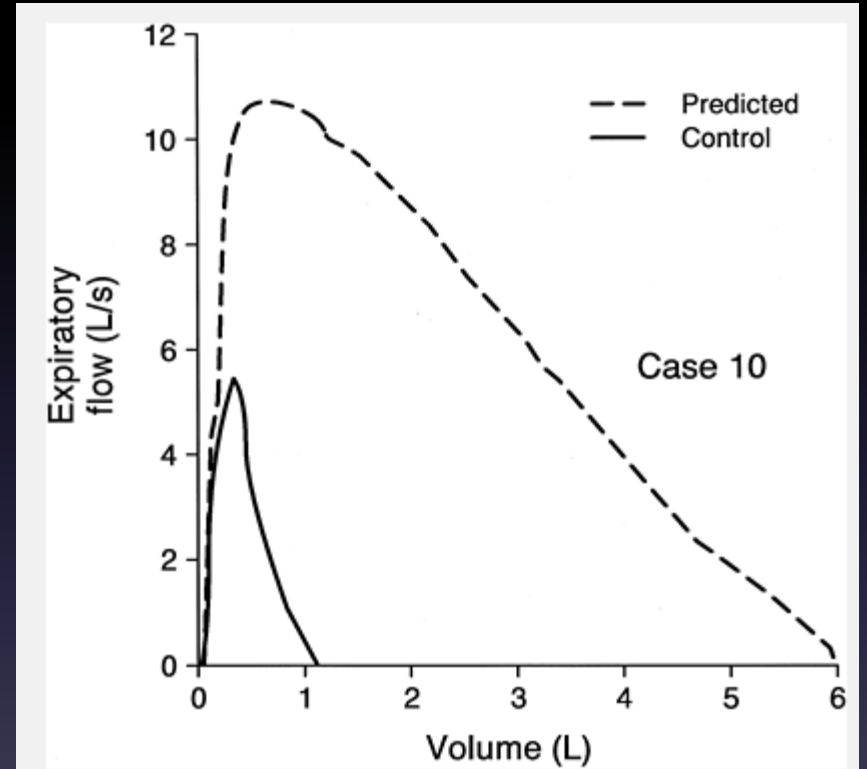
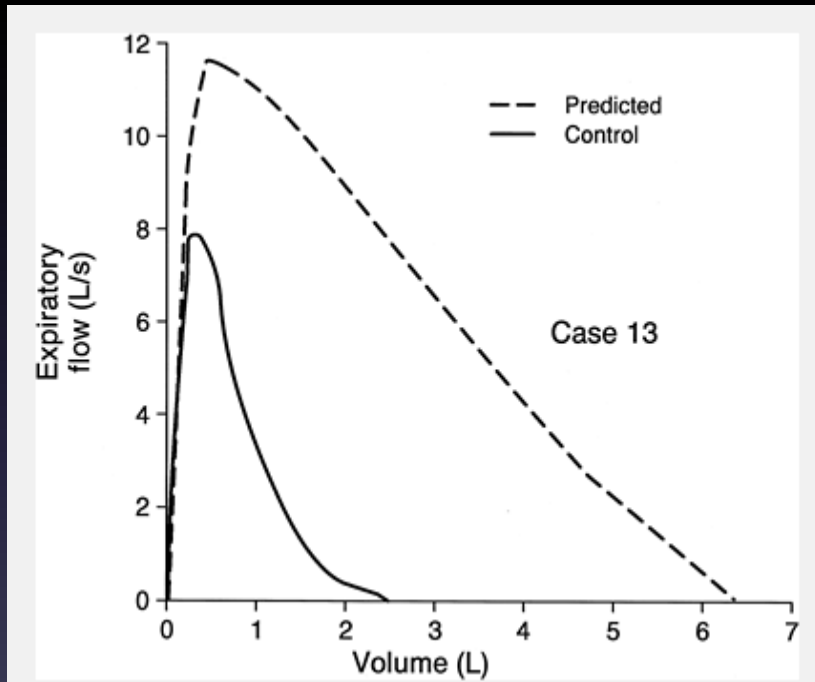


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- FVC düşük restriksiyon/ obstruksiyon
- FEV1 düşük restriksiyon/ obstruksiyon
- FEV1/FVC artmış restriksiyon

# Örnek Olgular (C)



	BEKLENEN	ÖLÇÜLEN	%
FVC (L)	6,32	2,37	38
FEV <sub>1</sub> (L)	5,00	1,94	39
FEV <sub>1</sub> /FVC (%)	79	82	

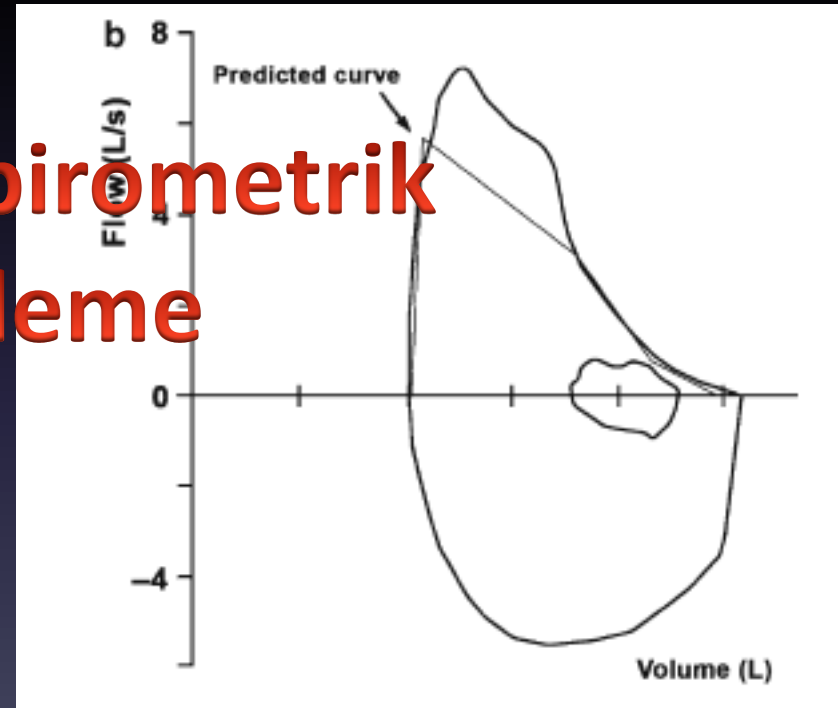
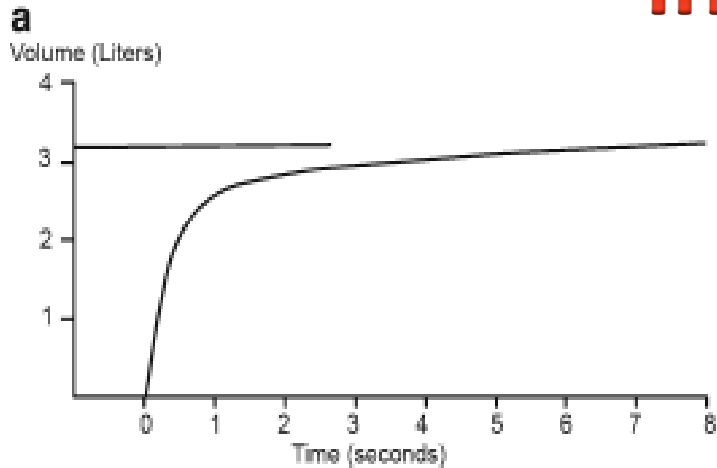
	OBSTRKSİYON	RESTRİKSİYON
FVC	+	+
FEV1	+	+
FEV1/ FVC	-	+

# ÖRNEK OLGU (D)

## 74 yaşında kadın hasta

	Pred.	Pre	% Pred.
FVC	3.21	3.17	99
FEV <sub>1</sub>	2.38	2.57	108
FEV <sub>1</sub> /FVC		81	
FEF <sub>25-75</sub>	1.91	2.65	139

Normal spirometrik  
inceleme

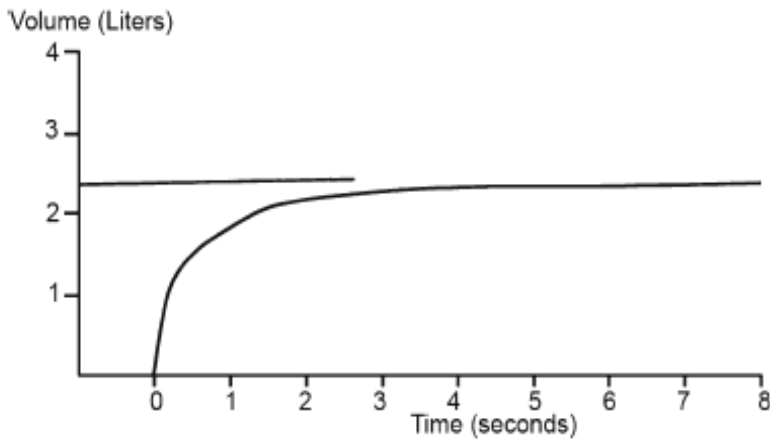
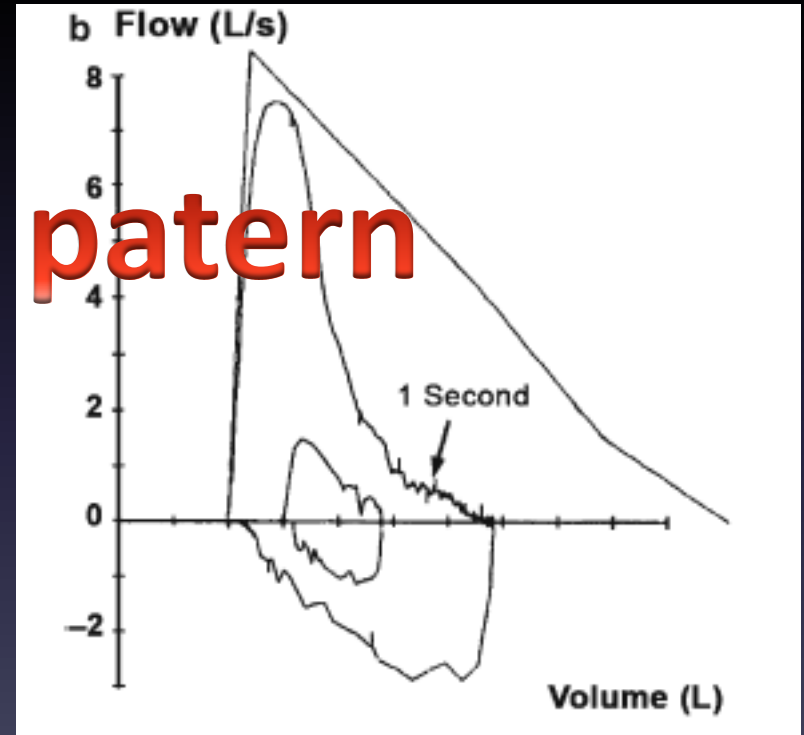


# ÖRNEK OLGU (E)

65 yaşında progresif dispnesi olan kadın hasta

	Pred.	Pre	% Pred.
FVC	4.56	2.43	53
FEV <sub>1</sub>	3.55	1.91	54
FEV <sub>1</sub> /FVC		0.79	
FEF <sub>25-75</sub>	3.27	1.55	47

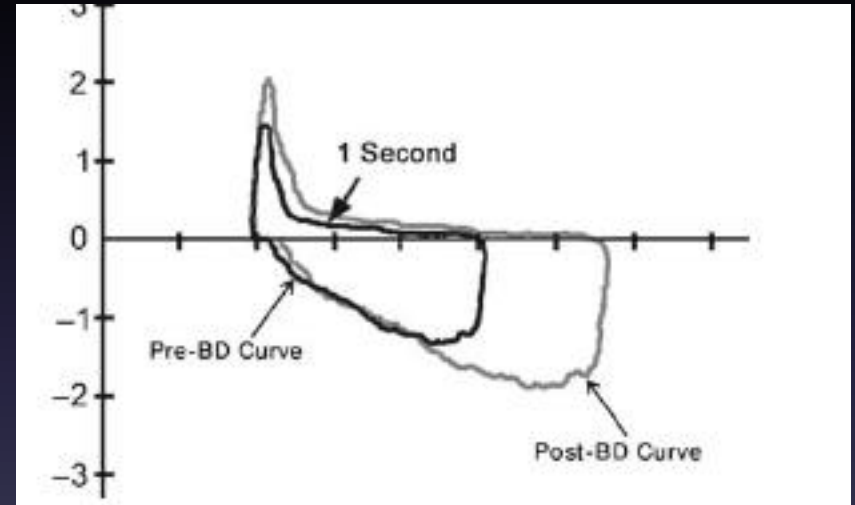
**Restriktif patern**



## ÖRNEK OLGU (E)

52 yaşında dispne şikayeti olan sigara içicisi hasta

	Pred.	Pre	% Pred.	Post	% Change
FVC	3.34	1.53	46	2.31	50
FEV <sub>1</sub>	2.70	0.41	15	0.53	30
FEV <sub>1</sub> /FVC		0.27		0.23	
FEF <sub>25-75</sub>	2.82	0.11	4	0.17	

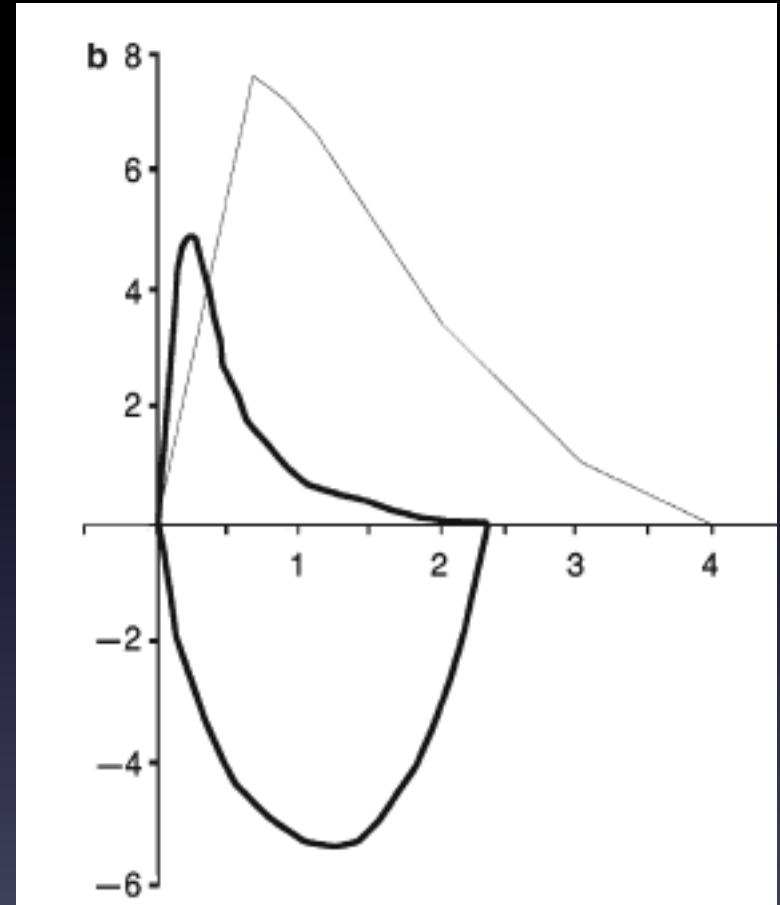
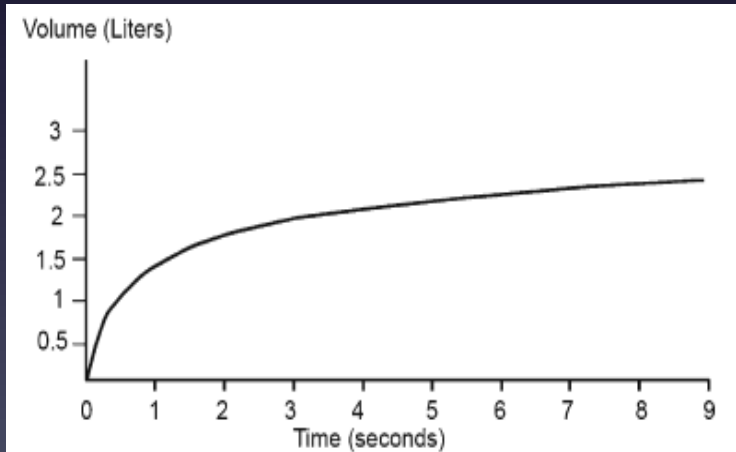


- Obstruksiyon
- Restriksiyon (Hava hapsine bağlı)
  
- Tanı: Amfizem

# ÖRNEK OLGU (F)

## 78 yaşında erkek hasta

	Pred.	Pre	% Pred.
FVC	4.06	2.46	61
FEV <sub>1</sub>	3.07	1.33	43
FEV <sub>1</sub> /FVC		54	
FEF <sub>25-75</sub>	2.70	0.44	16
PEF	7.54	4.88	65



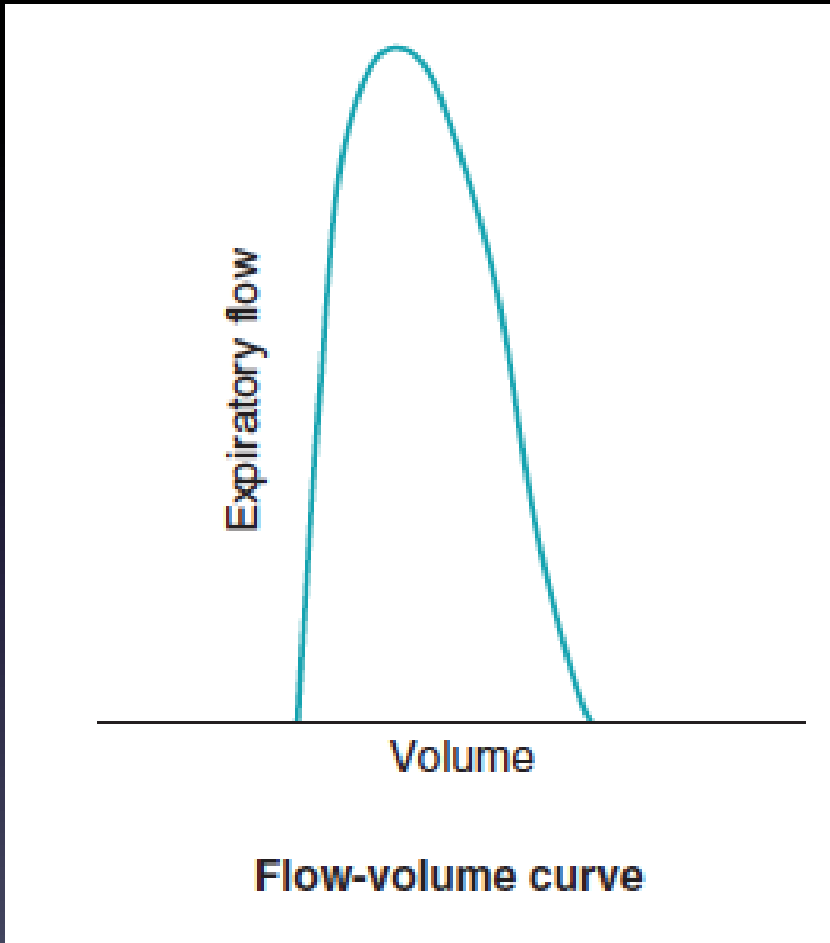


- Obstruksiyon
- Akciğer volümlerine bakıldığında TLC'nin düşük olduğu görülmüş
- Restriksiyon
- Hastanın hikayesinde AC rezeksiyonu mevcut
- Mixt tip ventilatuar bozukluk

	Pred.	Pre	% Pred.
FVC	4.06	2.46	61
FEV <sub>1</sub>	3.07	1.33	43
FEV <sub>1</sub> /FVC		54	
FEF <sub>25-75</sub>	2.70	0.44	16
PEF	7.54	4.88	65

	Pred.	Pre	% Pred.
TLC	6.67	5.00	75
RV	2.51	2.42	97
RV/TLC	38	48	127

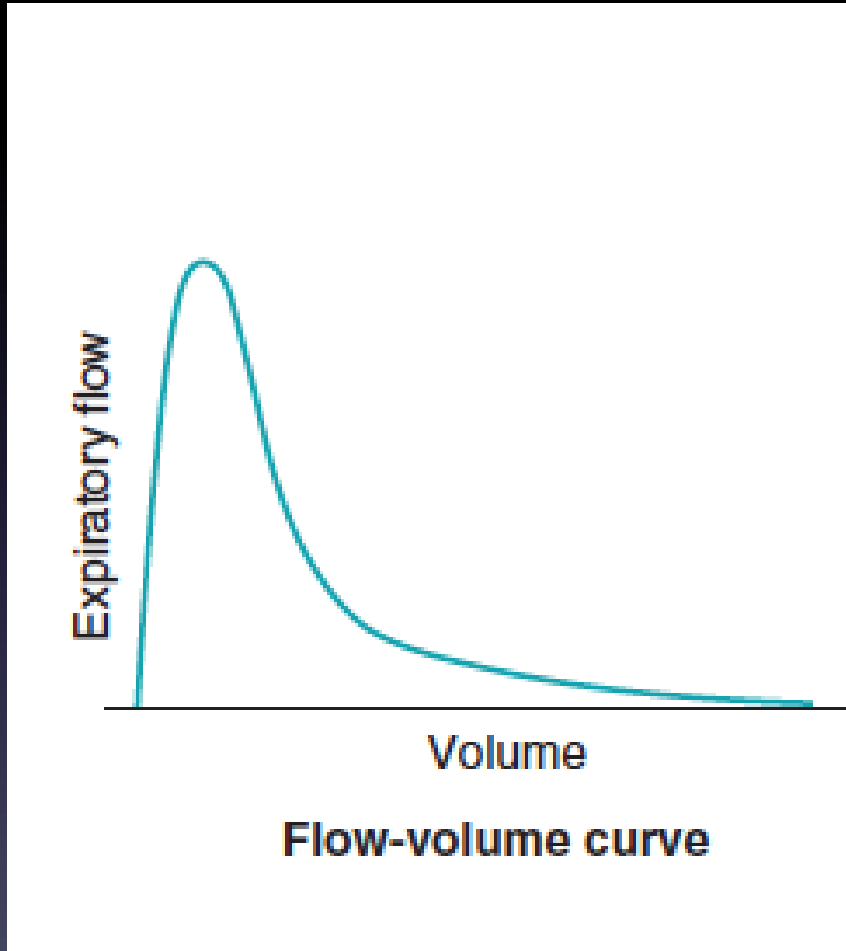
# 32 yaşında kadın



	PRED	ACTUAL	% PRED
FVC	3,86	1.03	27
FEV <sub>1</sub>	3.05	0.97	32
FEV <sub>1</sub> /FVC	79	95	120
VC	3,86	1,07	28
TLC	5,51	1.99	36
RV	1.65	0,92	55
RV/TLC	30	46	153
DLCO	11,4	6.5	57

Tanı :DPAH

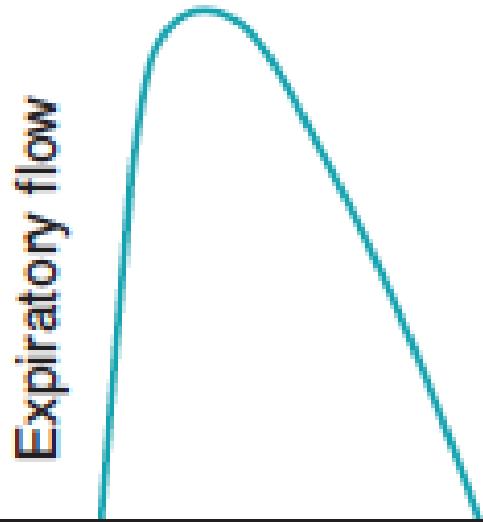
# 60 yaşında erkek



	PRED	ACTAU L	% PRED
FVC	4.62	2,42	52
FEV <sub>1</sub>	3.26	0,78	24
FEV <sub>1</sub> /FVC	71	32	45
VC	4.62	3.23	70
TLC	7.02	6.90	98
RV	2.40	3.67	153
RV/TLC	34	53	156
DLCO	24.5	6.852	28

Tanı : Amfizem

# 55 yaşında kadın



Volume

Flow-volume curve

	PRED	ACTUAL	% PRED
FVC	2.73	0.93	34
FEV <sub>1</sub>	2.03	0.80	39
FEV <sub>1</sub> /FVC	75	86	115
VC	2.73	0.90	33
TLC	4.18	2.14	51
RV	1.46	1.46	85
RV/TLC	35	35	106
DLCO	12.9	14	109

Tanı : Kifoskolyoz

# ÖRNEK OLGULAR II

# Olgu 1

- 61 yaşında erkek
- 40 pak yıl sigara
- Nefes darlığı şikayeti  
mevcut

# Olgu 1

BMI: 22.86

Last Name: [REDACTED]

First Name: [REDACTED]

Date of Birth: 03/20/1952

Sex: male

BMI: 22.86

Weight: 60 kg

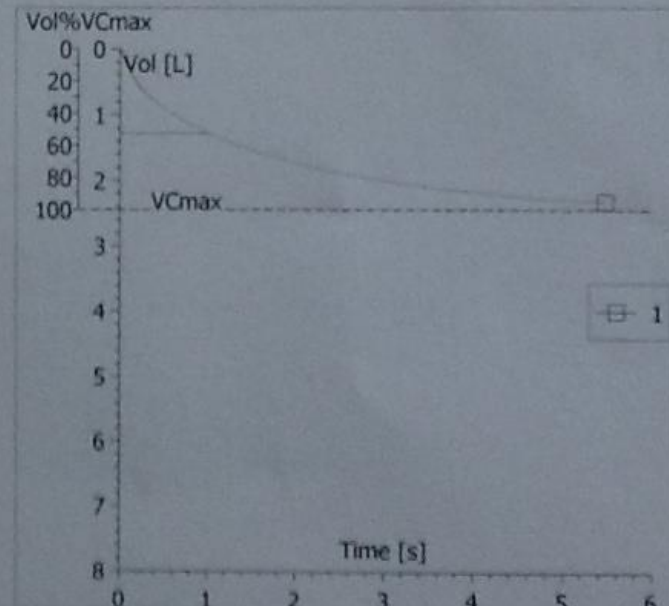
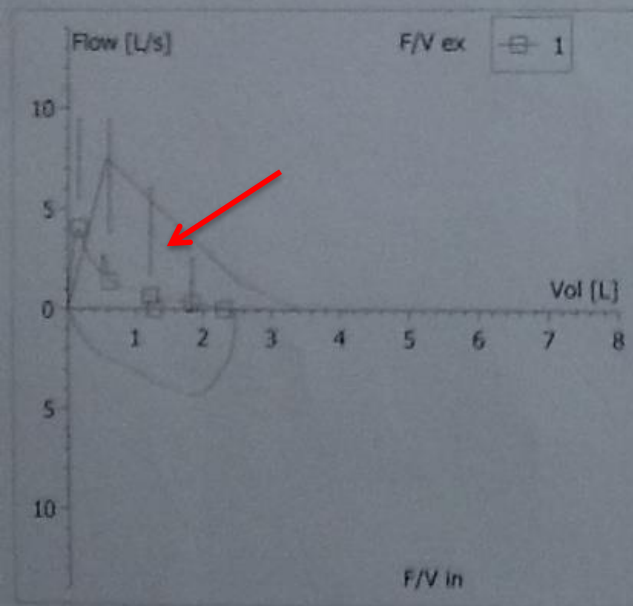
Weight: 60 kg

Identification: 41006

Age: 61 Years

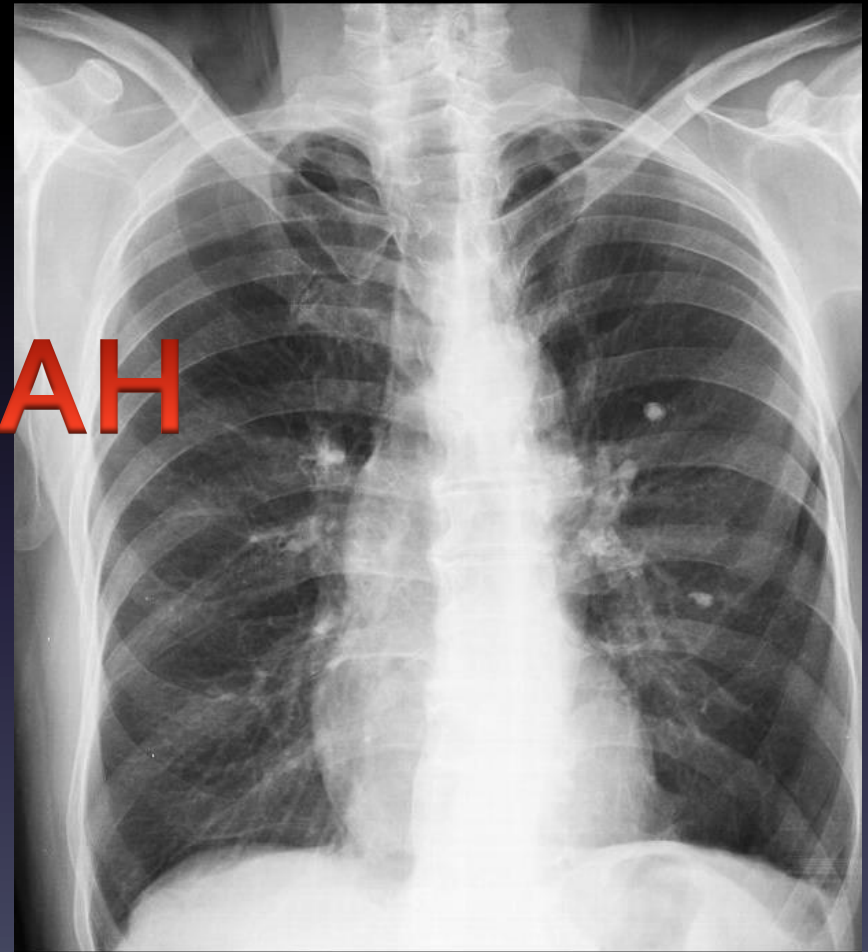
Height: 162 cm

## Pulmonary Function Report



# Olgu 1

	PRED	ACTUAL	% PRED
FVC	3,41	2,32	68
FEV <sub>1</sub>	2,71	1,28	47
FEV <sub>1</sub> /FVC	76	52	69





# Olgu 2

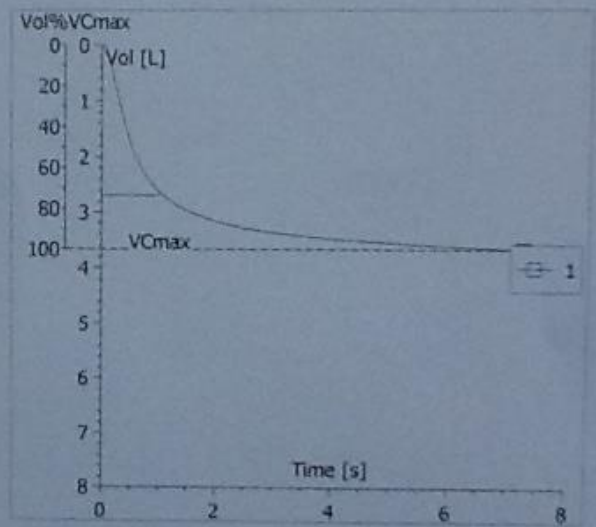
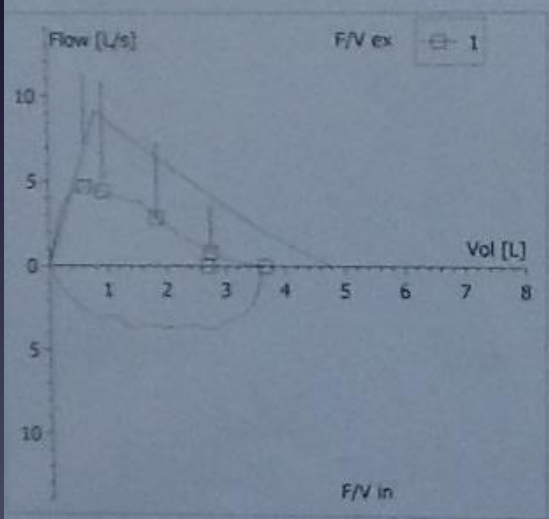
- 44 yaşında erkek hasta
- Nefes darlığı şikayeti  
mevcut

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HASTALIKLARI ANABILMDALI



BMI:		Weight:	96 kg
Last Name:		Identification:	110872
First Name:			
Date of Birth:	06/15/1968	Age:	44 Years
Sex:	male	Height:	178 cm
BMI:	30.3		
Weight:	96 kg		

### Pulmonary Function Report



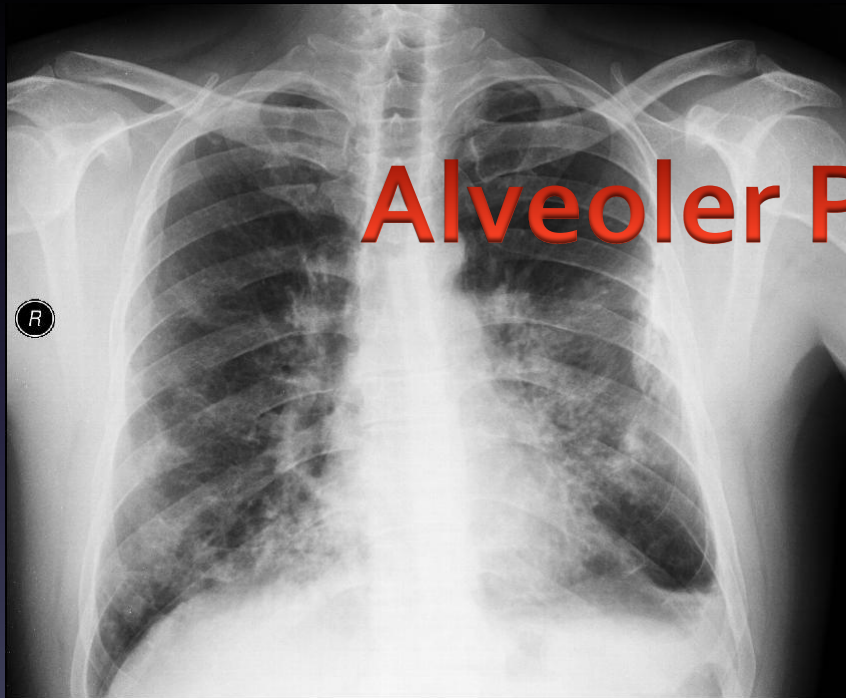
# Olgu 2

	PRED	ACTUAL	% PRED
FVC	4,77	3,66	77
FEV <sub>1</sub>	3,89	2,70	69
FEV <sub>1</sub> /FVC	79	74	94

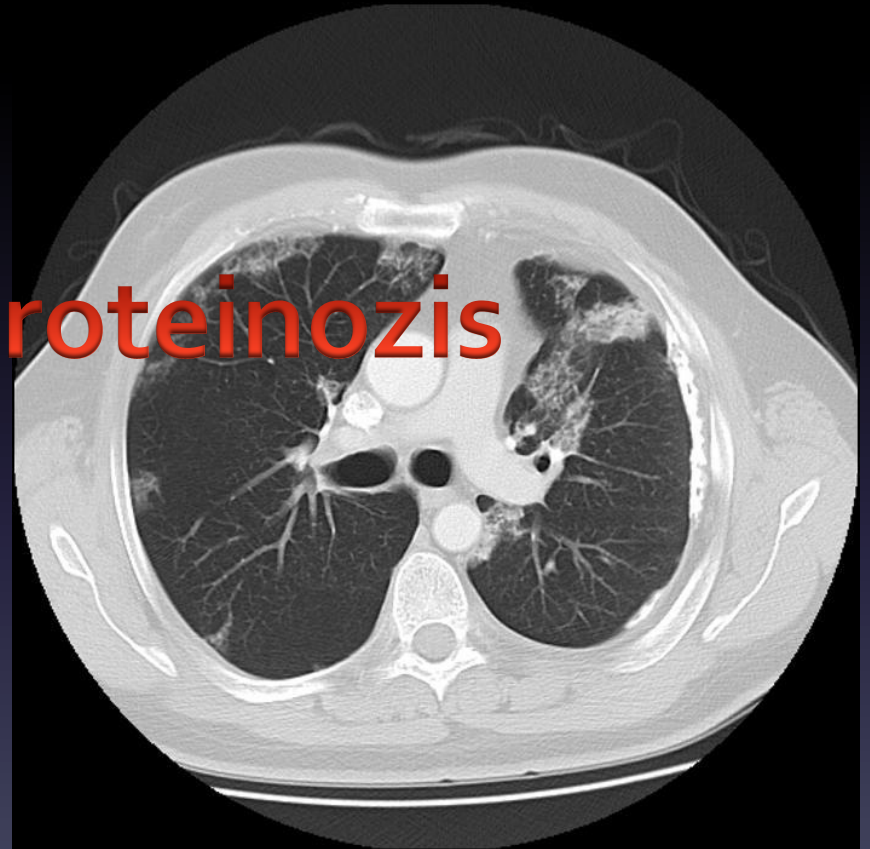
	PRED	ACTUAL	% PRED
TLC	7,14	5,19	73
RV	2,07	1,68	81
RV/TLC	31	32	104

	PRED	ACTUAL	% PRED
DLCO	10,8	7,5	69

# Olgu 2



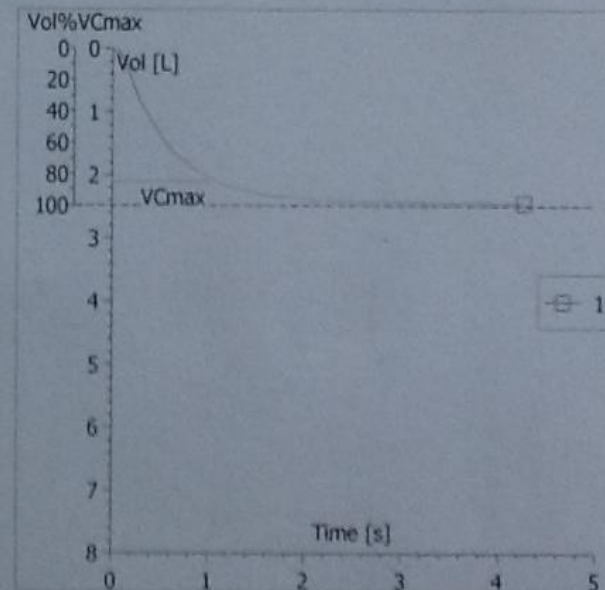
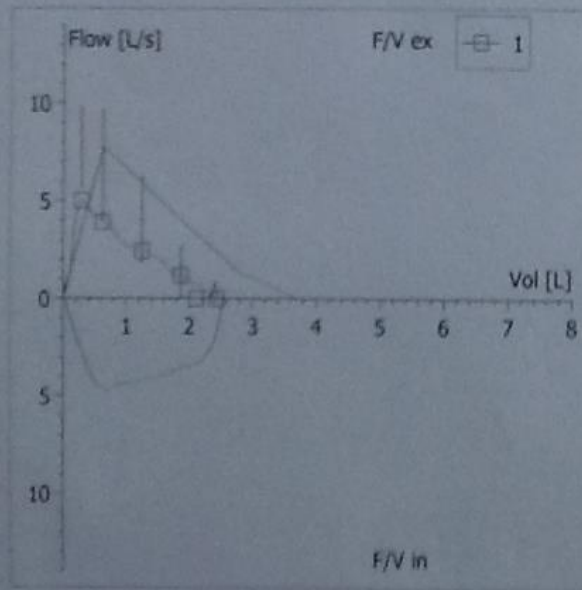
**Alveolar Proteinozis**



# Olgu 3, 67 yaş E

BMI:	27.68	Weight:	80 kg
Last Name:	[REDACTED]	Identification:	129210
First Name:	[REDACTED]		
Date of Birth:	06/02/1945	Age:	67 Years
Sex:	male	Height:	170 cm
BMI:	27.68		
Weight:	80 kg		

## Pulmonary Function Report



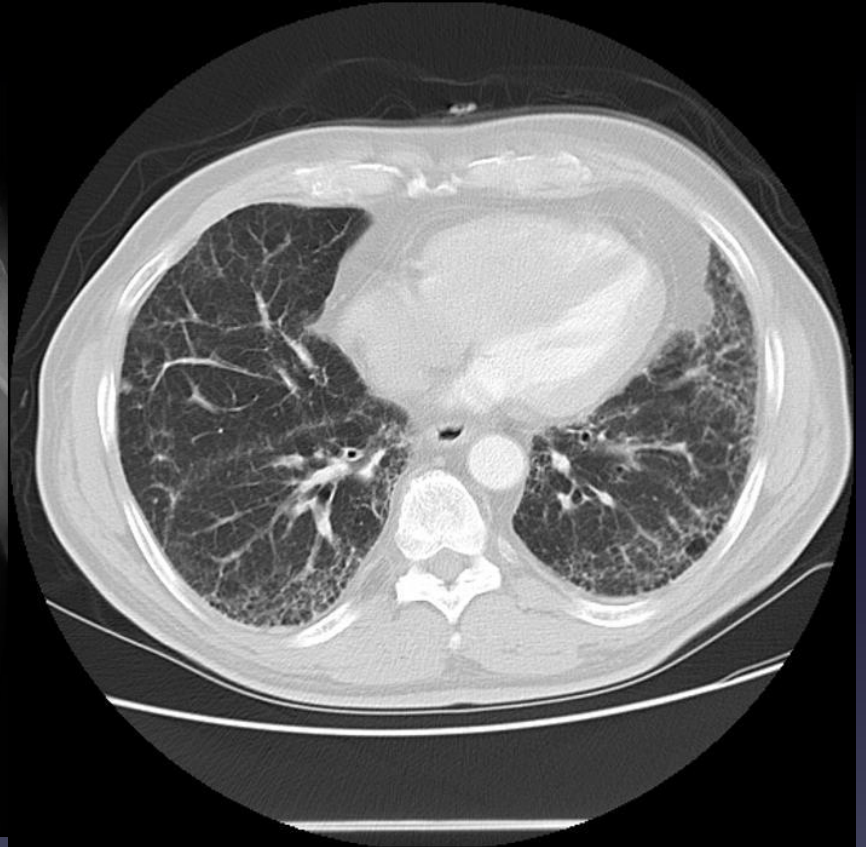
# Olgu 3, 67 yaş E

	PRED	ACTUAL	% PRED
FVC	3,71	2,44	66
FEV <sub>1</sub>	2,88	2,11	73
FEV <sub>1</sub> /FVC	75	84	113

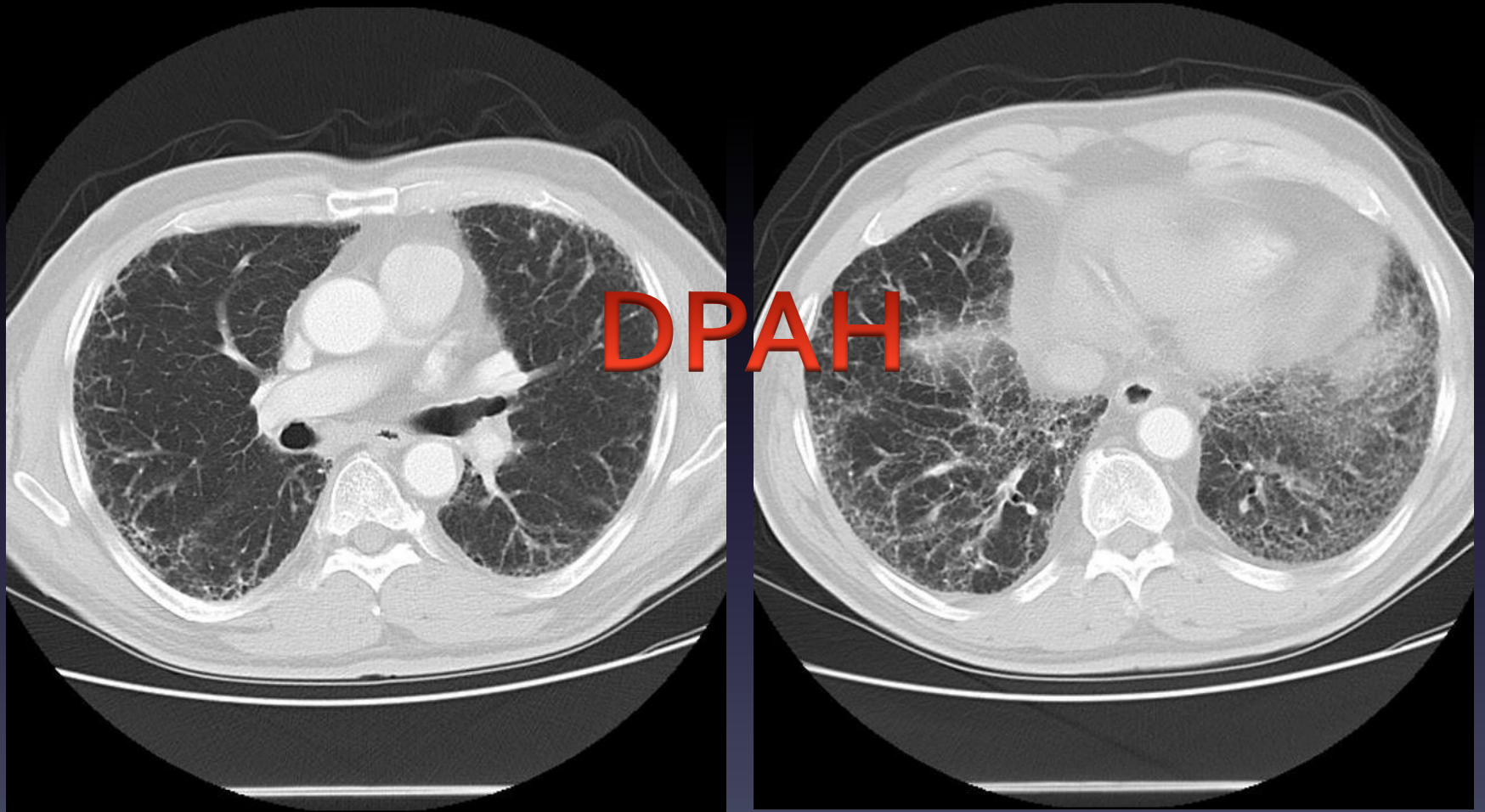
	PRED	ACTUAL	% PRED
TLC	6,50	4,26	65
RV	2,47	1,85	75
RV/TLC	40	43	108

	PRED	ACTUAL	% PRED
DLCO	8,44	2,67	32

# Olgu 3



# Olgu 3





# OLGU 4

- 43 yaşında kadın hasta
- Eforla nefes darlığı şikayeti mevcut

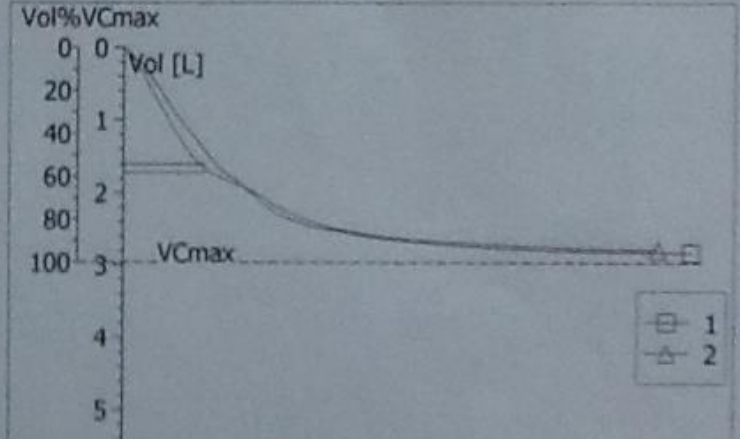
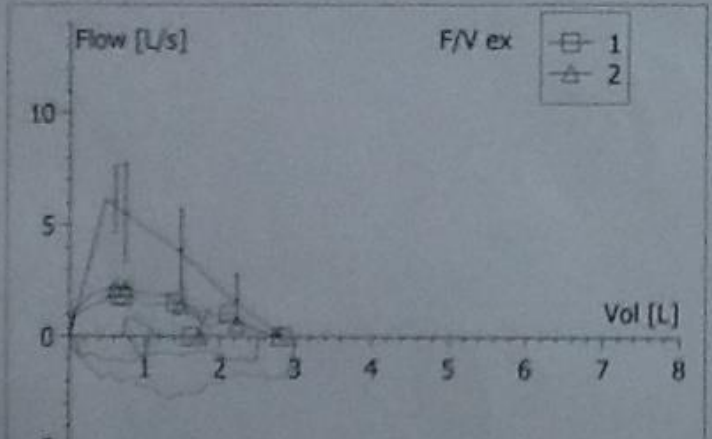
BMI: 28.3  
Last Name: [Redacted]  
First Name: [Redacted]

Weight: 68 kg  
Identification: 106070

Date of Birth: 02/10/1969  
Sex: female  
BMI: 28.3  
Weight: 68 kg

Age: 43 Years  
Height: 155 cm

# Pulmonary Function Report

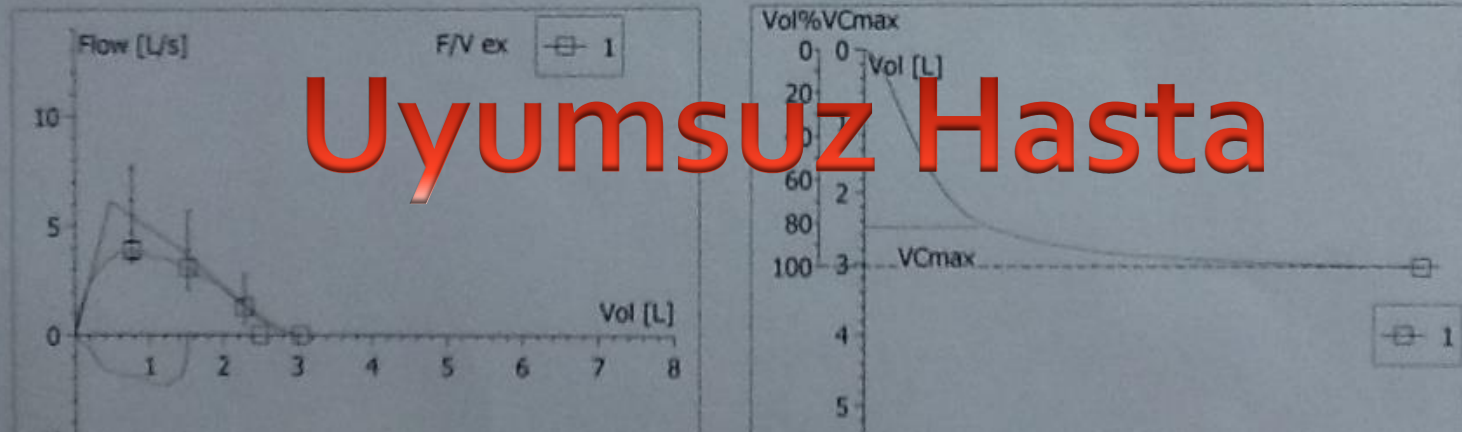


	PRED	ACTUAL	% PRED
FVC	2,86	2,82	99
FEV1	2,45	1,62	66
FEV1/FVC	81	57	71

BMI: 28.3  
Last Name:   
First Name:   
Date of Birth: 02/10/1969  
Sex: female  
BMI: 28.3  
Weight: 68 kg

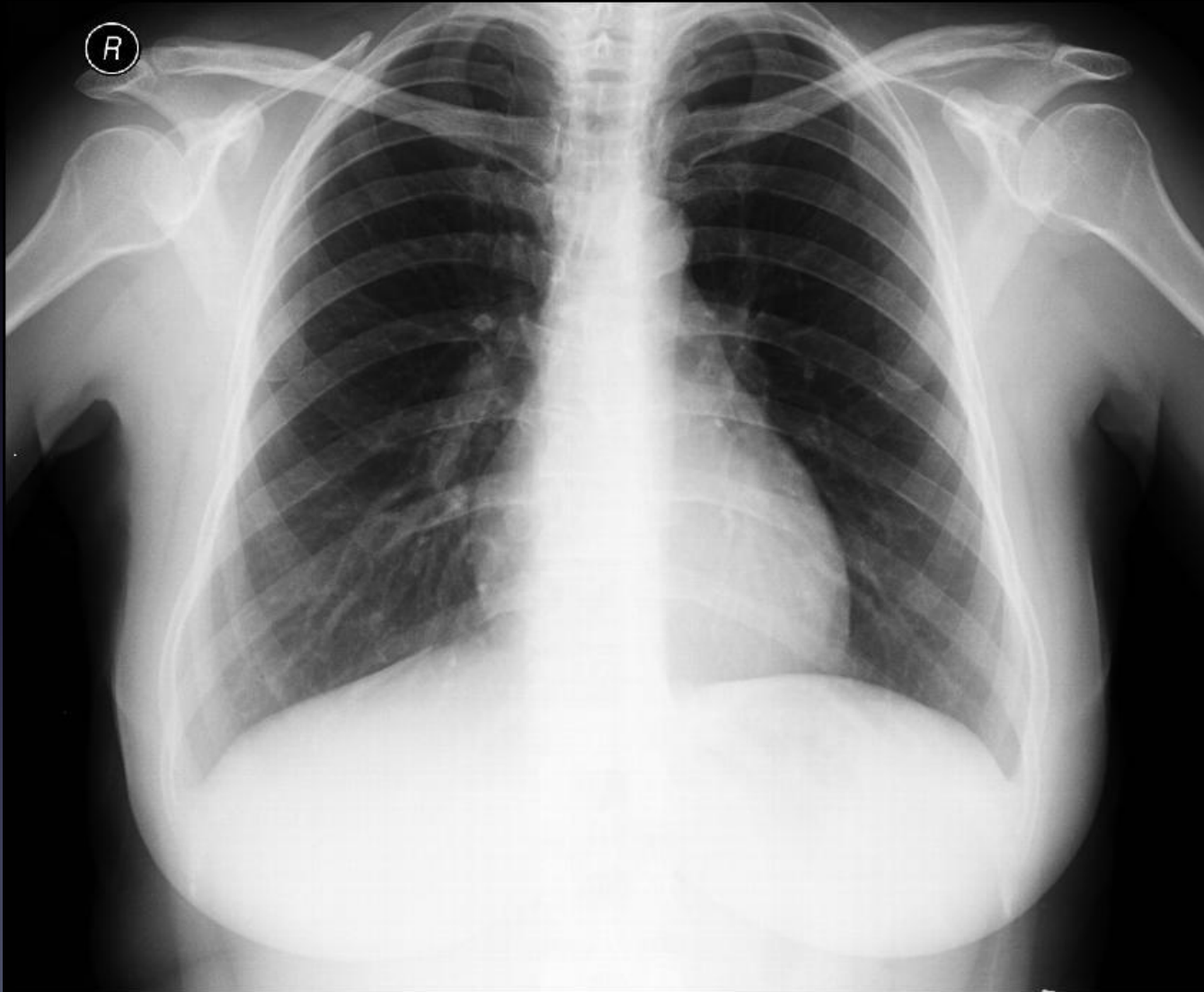
Weight: 68 kg  
Identification: 106070  
Age: 43 Years  
Height: 155 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	2,86	3,04	99
FEV <sub>1</sub>	2,45	2,49	102
FEV <sub>1</sub> /FVC	81	82	101

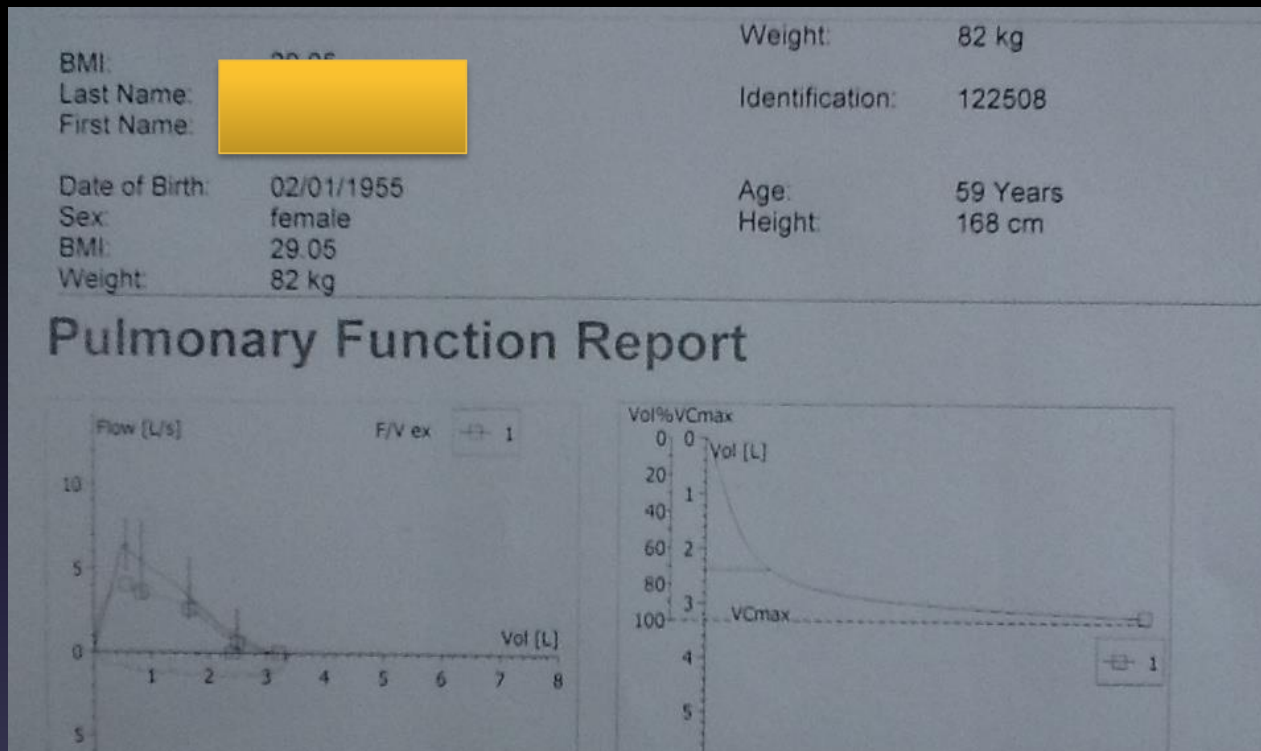
# Olgu 4



# Olgu 5

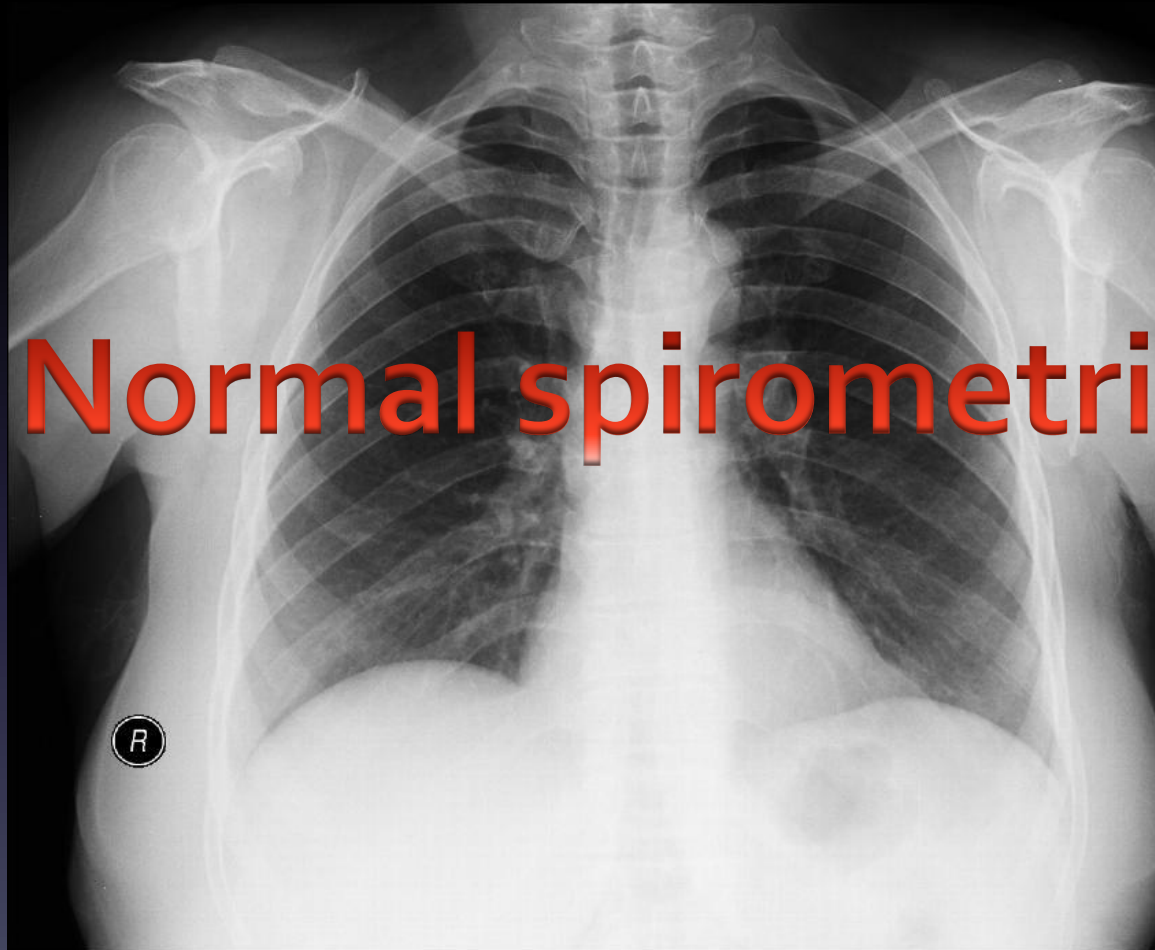
- 59 yaşında kadın hasta
- Eforla nefes darlığı mevcut
- Preoperatif değerlendirme için başvurdu
- Geçirilmiş / bilinen AC hastalığı yok
- Sigara: içmemiş

# Olgu 5



	PRED	ACTUAL	% PRED
FVC	3,02	3,21	106
FEV <sub>1</sub>	2,56	2,40	94
FEV <sub>1</sub> /FVC	78	72	93

# Olgu 5



# Olgu 6

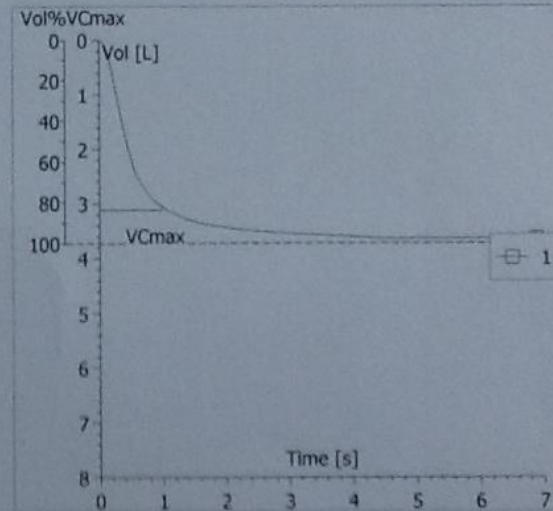
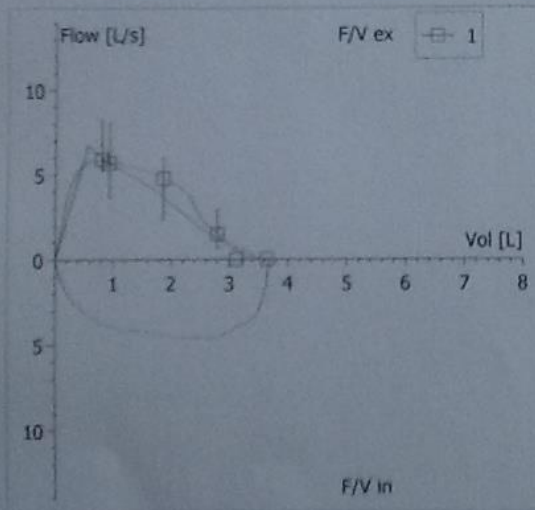
- 41 yaşımda kadın hasta
- Kuru öksürük
- Göğüste baskı hissi



# Olgu 6

Date of Birth: 06/09/1971      Age: 41 Years  
Sex: female      Height: 165 cm  
BMI: 36  
Weight: 98 kg

## Pulmonary Function Report



Spirometry

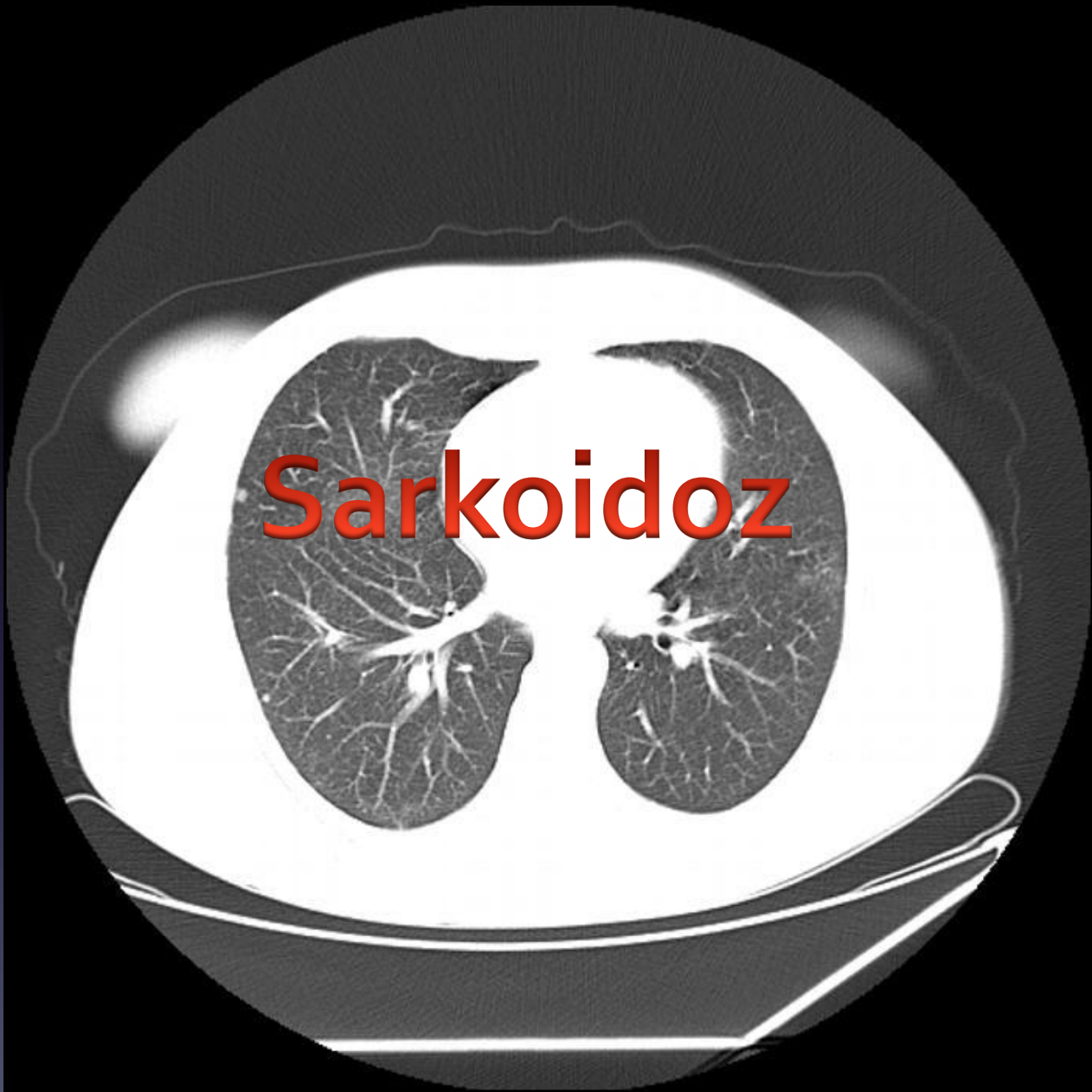
Pred      Pre & Pred

# Olgu6

	PRED	ACTUAL	% PRED
FVC	3,35	3,64	109
FEV <sub>1</sub>	2,89	3,12	108
FEV <sub>1</sub> /FVC	81	84	103

	PRED	ACTUAL	% PRED
TLC	5,10	5,72	112
RV	1,64	2,17	132
RV/TLC	32,90	37,95	115

	PRED	ACTUAL	% PRED
DLCO	8,75	4,74	54



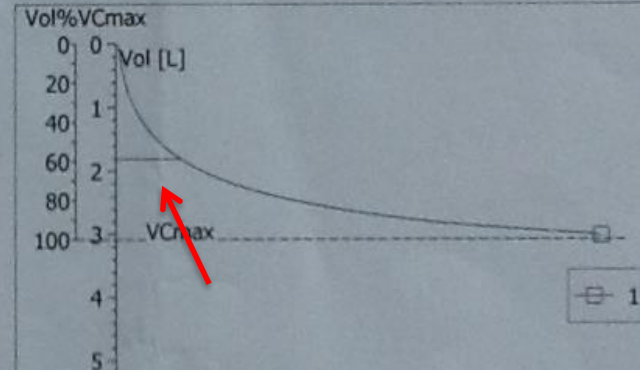
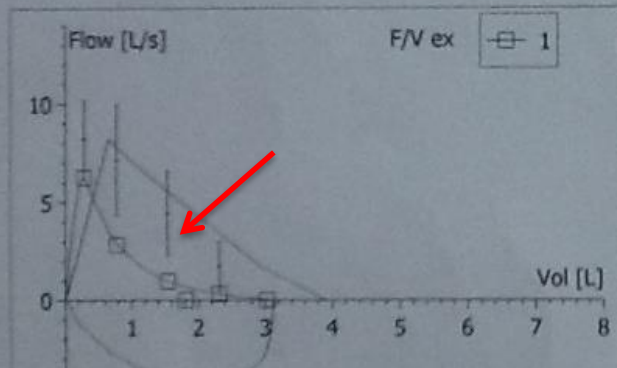
# Olgu 7

- 48 yaşında erkek hasta
- Öksürük, balgam
- Nefes darlığı
- Sigara : 30 pak-yıl

# Olgu 7

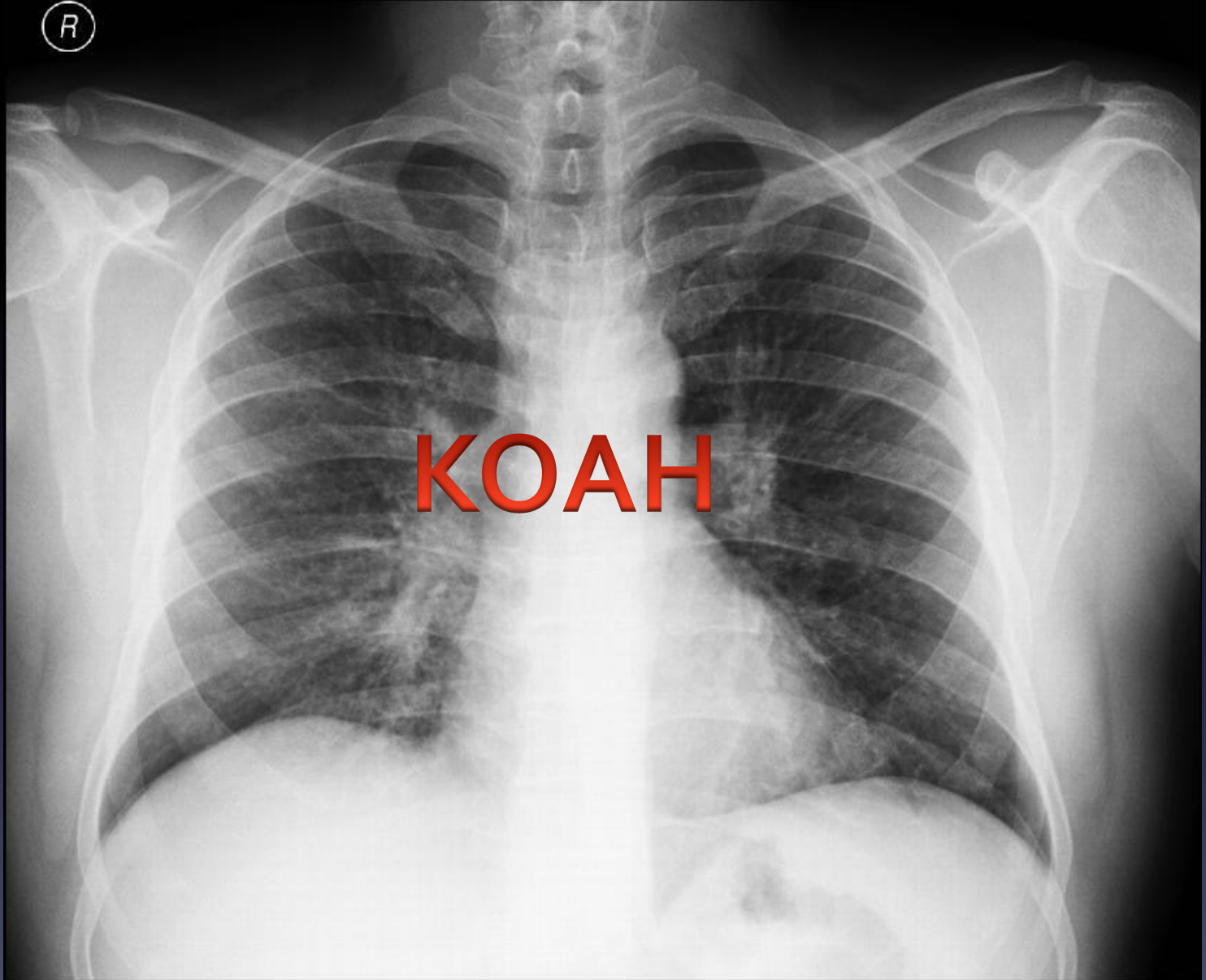
BMI: 31.22  
 Last Name: [REDACTED]  
 First Name: [REDACTED]  
 Date of Birth: 01/01/1964  
 Sex: male  
 BMI: 31.22  
 Weight: 85 kg  
 Weight: 85 kg  
 Identification: 94446  
 Age: 48 Years  
 Height: 165 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	3,92	3,03	77
FEV <sub>1</sub>	3,21	1,81	56
FEV <sub>1</sub> /FVC	78,57	58,69	75

R



10.08.2017

# Olgu 8

- 60 yaşında erkek hasta
- AC CA nedeniyle opere

First Name: [REDACTED]

Date of Birth: 02/02/1952

Age: 60 Years

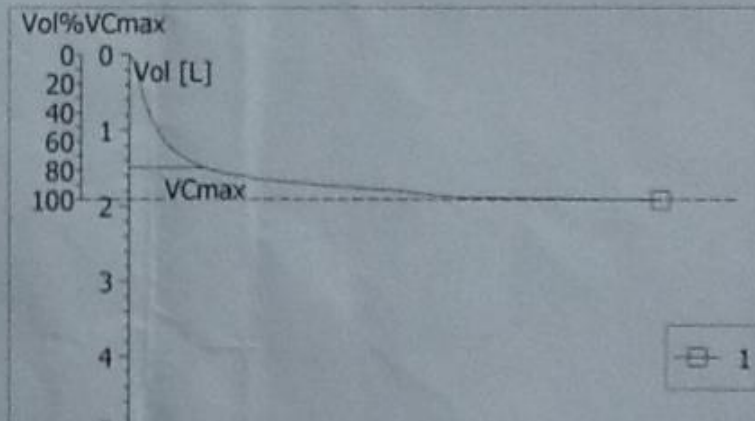
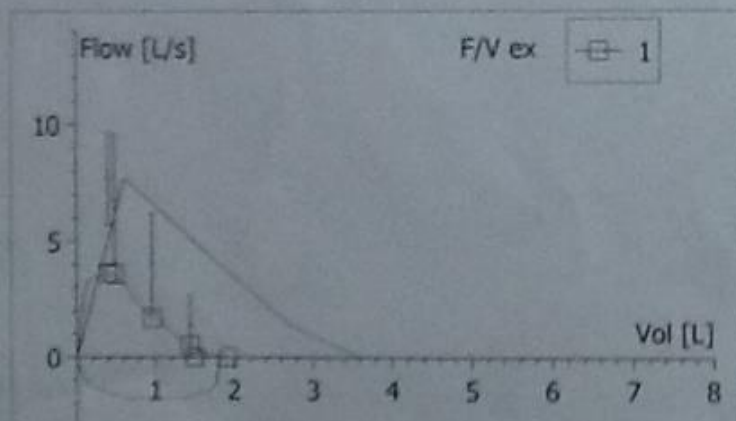
Sex: male

Height: 165 cm

BMI: 22.77

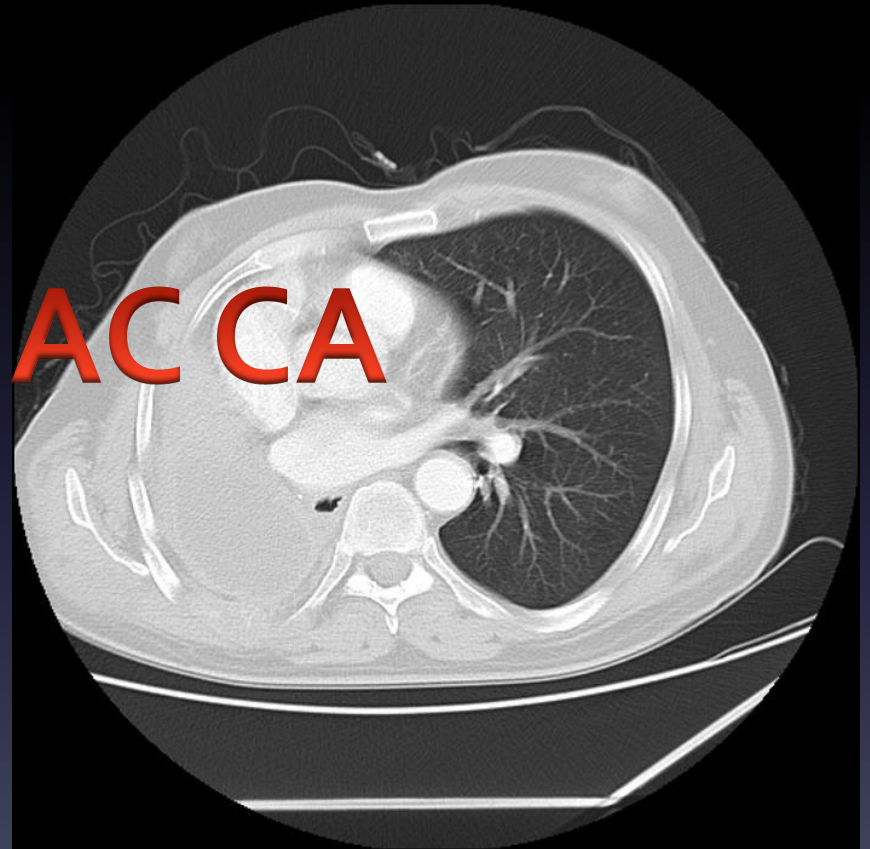
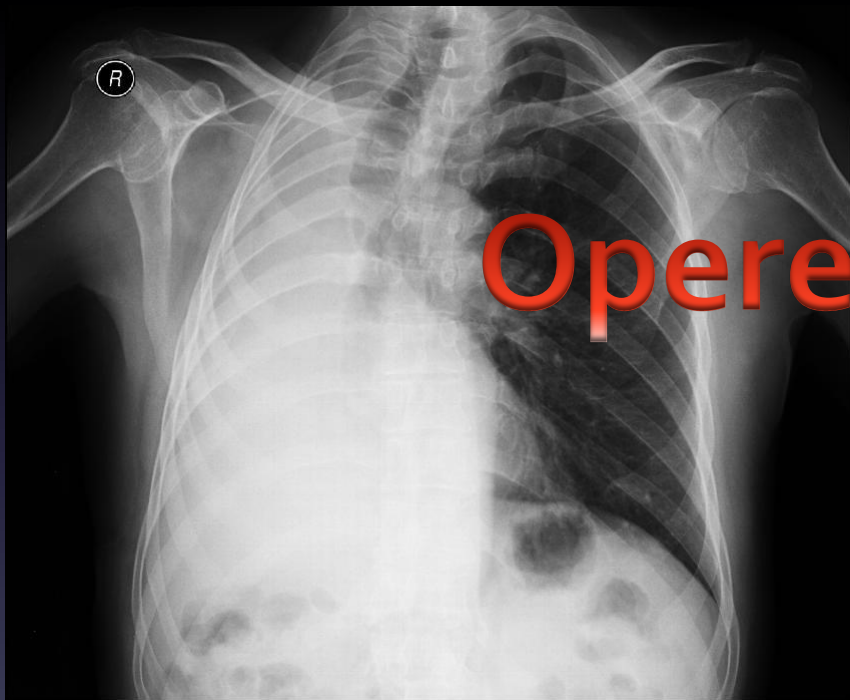
Weight: 62 kg

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	3,60	1,92	53
FEV <sub>1</sub>	2,87	1,49	52
FEV <sub>1</sub> /FVC	76,41	78	102





**Operere AC CA**

# Olgu 9

- 62 yaşında erkek hasta
- Sigara: 96 pak yıl
- KAH + KKY
- AC CA nedeniyle opere

First Name: [REDACTED]

Date of Birth: 08/03/1951

Age: 62 Years

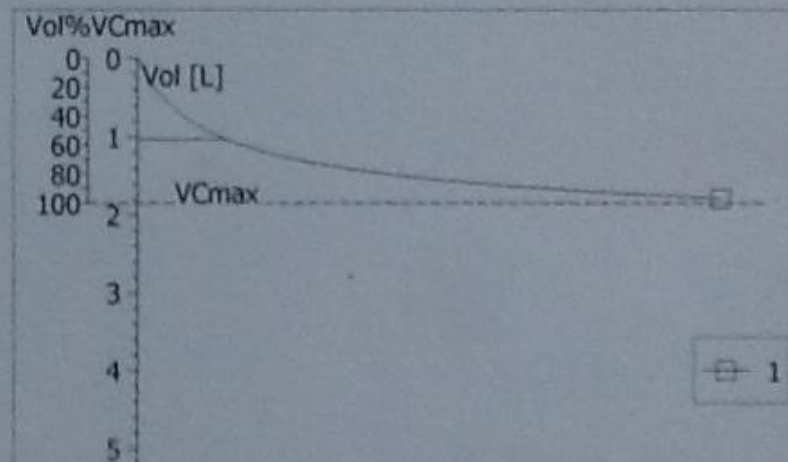
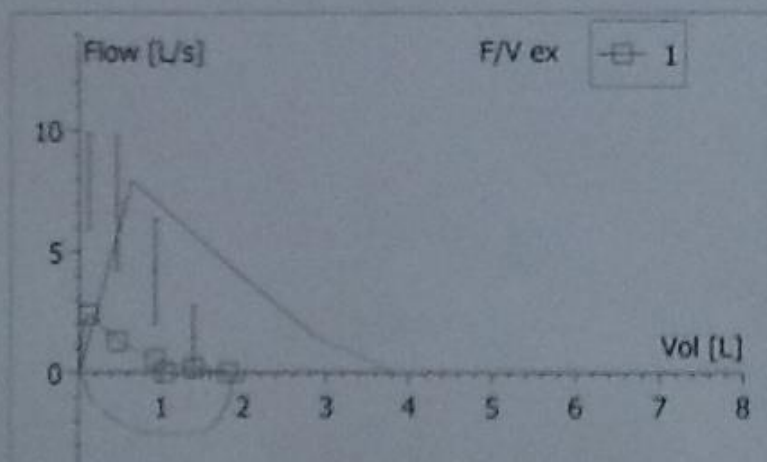
Sex: male

Height: 170 cm

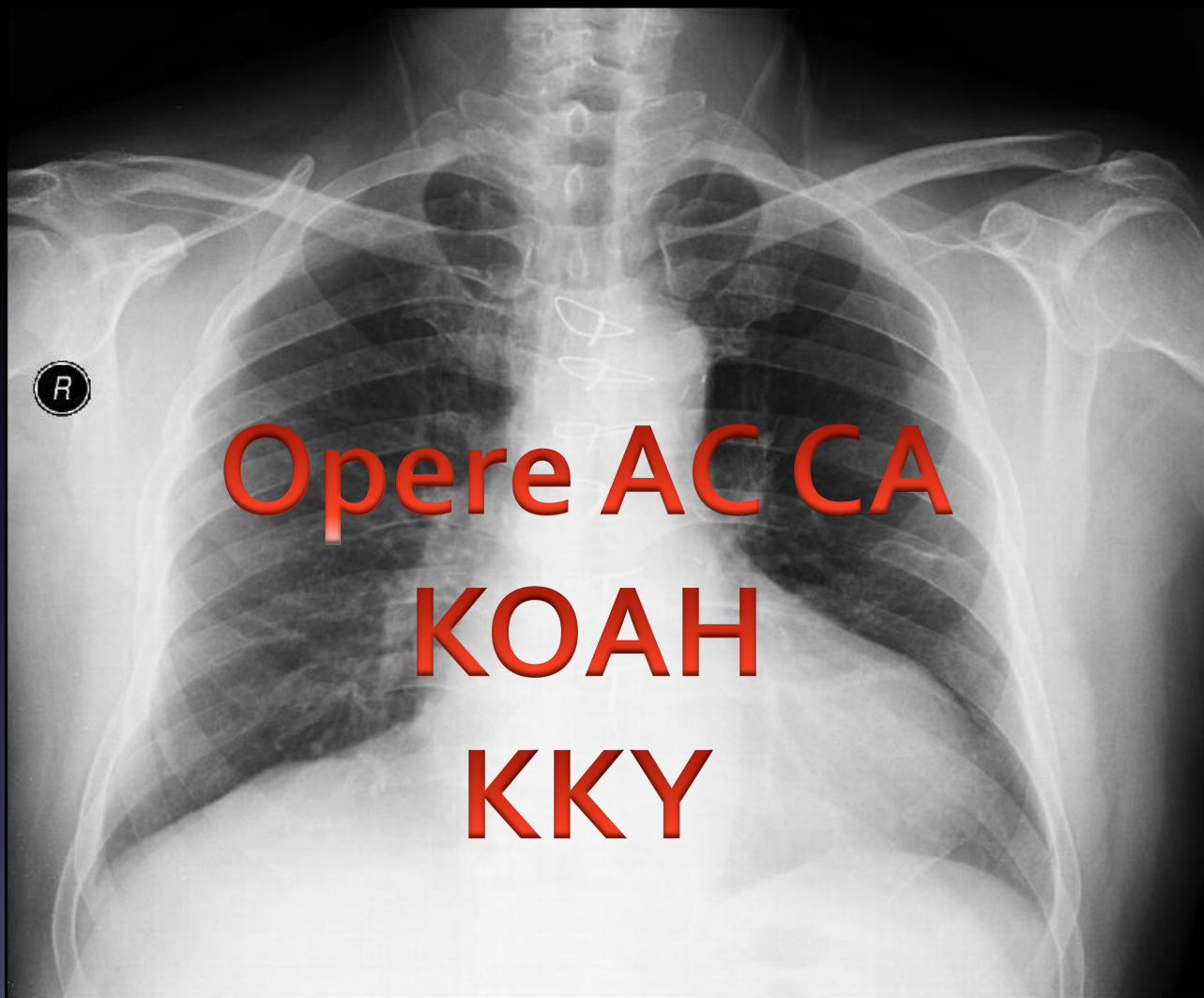
BMI: 31.83

Weight: 92 kg

# Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	3,84	1,81	47
FEV <sub>1</sub>	3,02	1,04	34
FEV <sub>1</sub> /FVC	76,05	55,85	73



# Olgu 10

- 72 yaşında kadın hasta
- Horlama
- Gündüz aşırı uyku hali

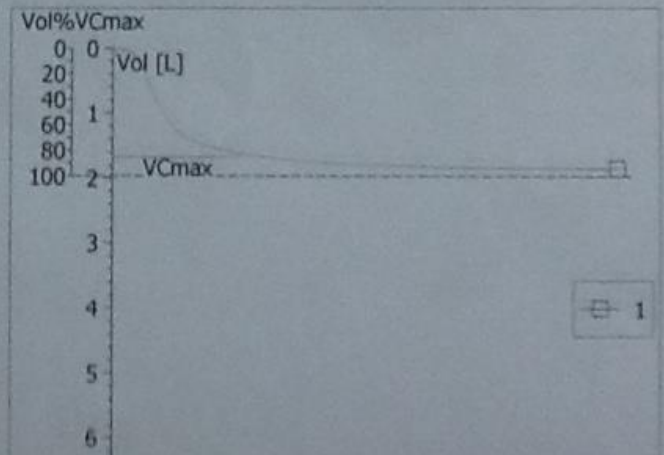
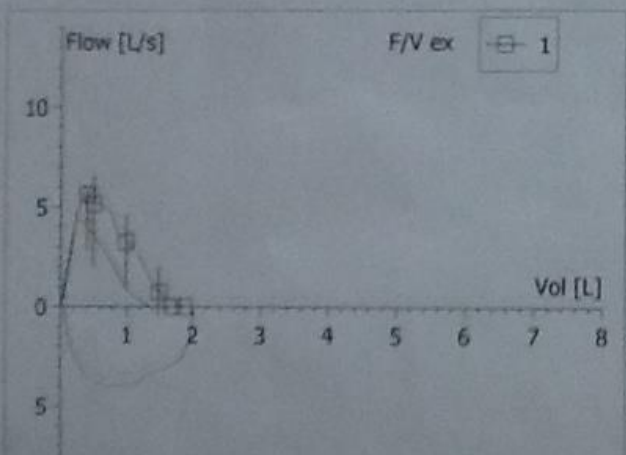
BMI: [REDACTED]  
 Last Name: [REDACTED]  
 First Name: [REDACTED]

Weight: 84 kg  
 Identification: 105779

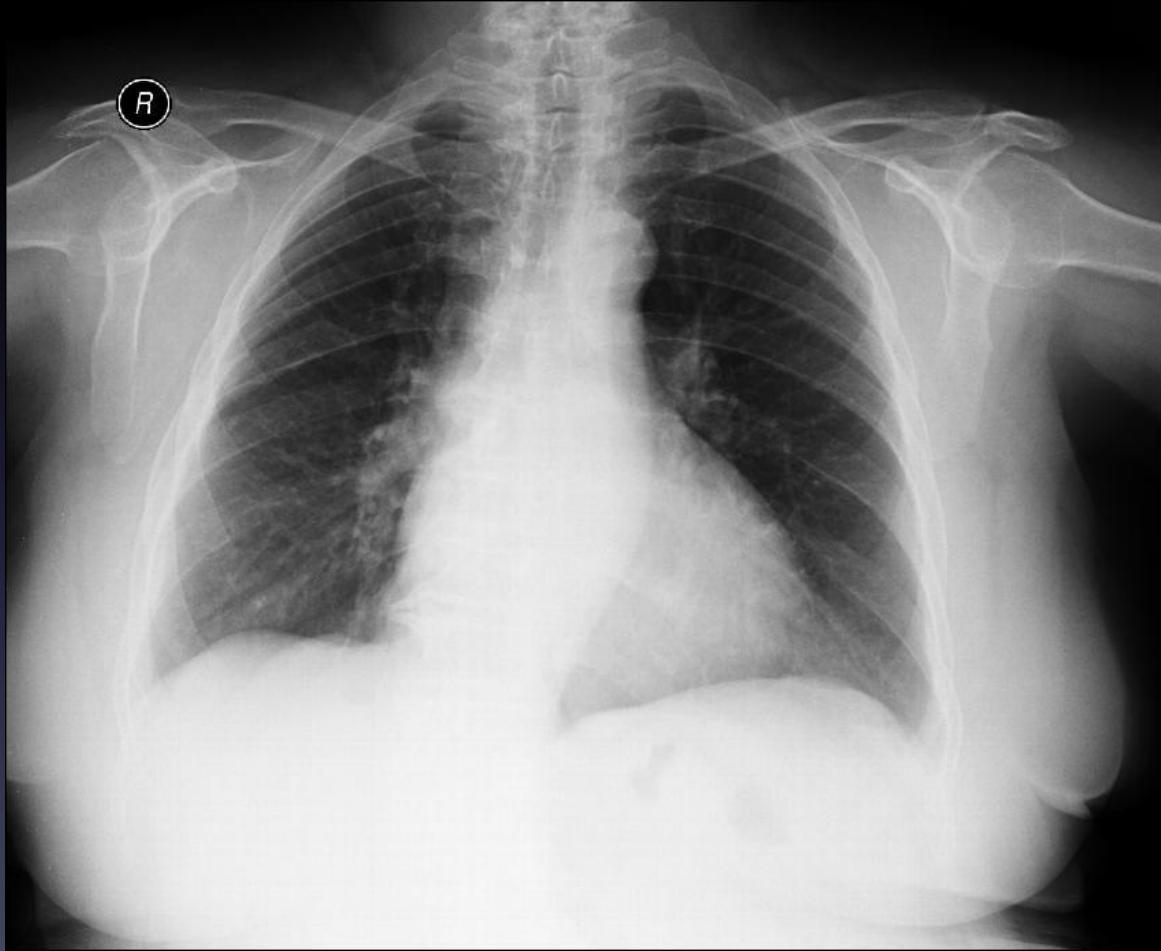
Date of Birth: 03/25/1940  
 Sex: female  
 BMI: 44.11  
 Weight: 84 kg

Age: 72 Years  
 Height: 138 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	1,35	1,85	137
FEV <sub>1</sub>	1,05	1,68	160
FEV <sub>1</sub> /FVC	75,42	85,14	113



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# Olgu 11

- 58 yaşında erkek hasta
- Ortopne
- Efor dispnesi
- Sigara: 38 pak-yıl



First Name:

Date of Birth: 04/21/1954

Sex: male

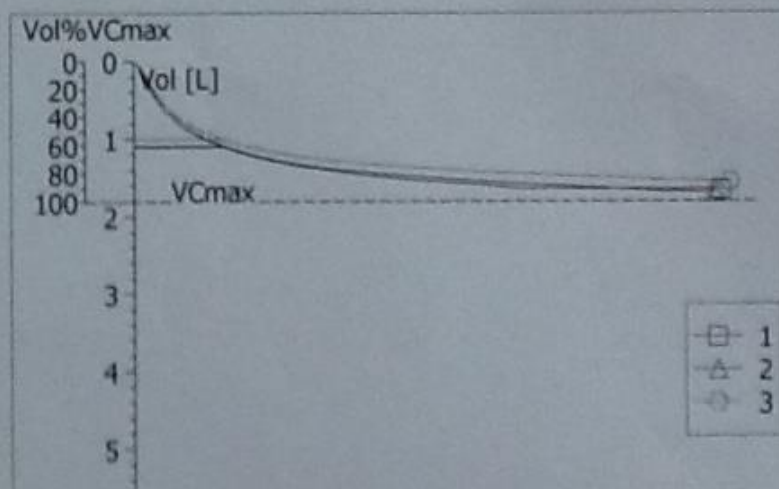
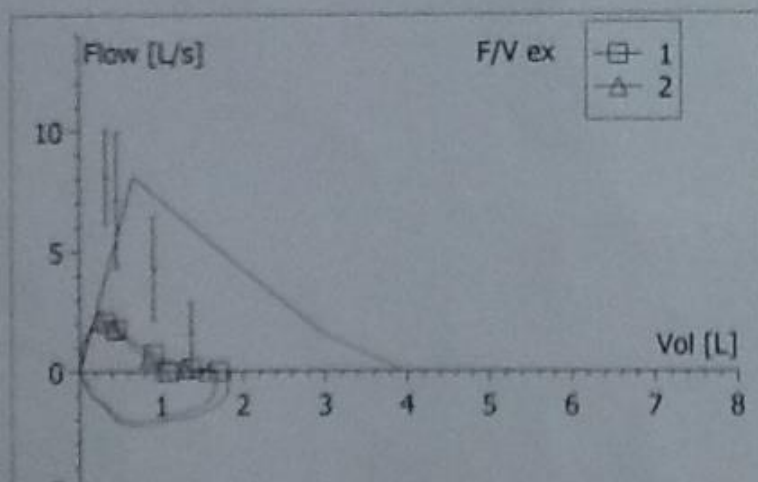
BMI: 33.56

Weight: 97 kg

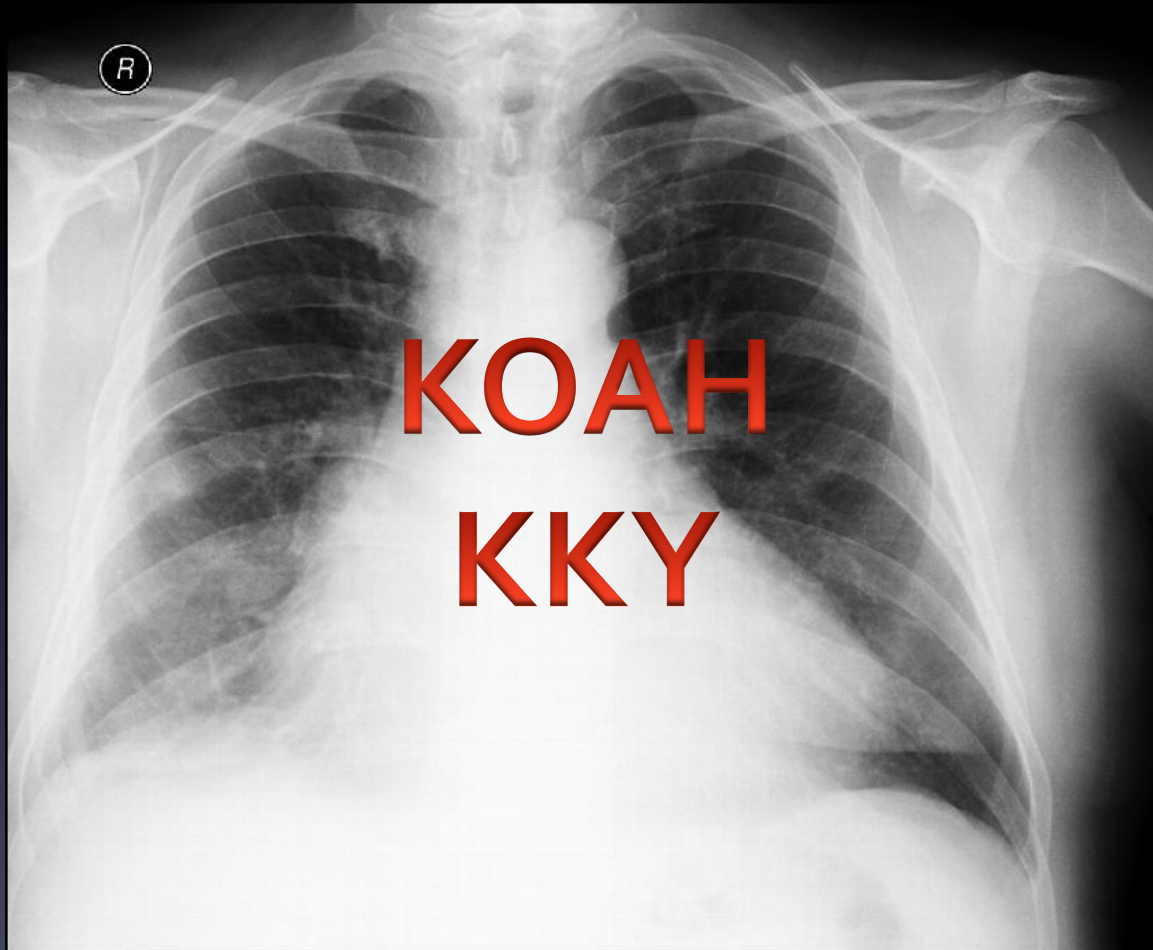
Age: 58 Years

Height: 170 cm

# Pulmonary Function Report



	PRED	ACTUAL	POST	% PRED	%PRE POST
FVC	3,94	1,70	1,57	43	92
FEV1	3,14	1,10	1,01	35	92
FEV1/FVC	76,77	60,36	58,94	79	98

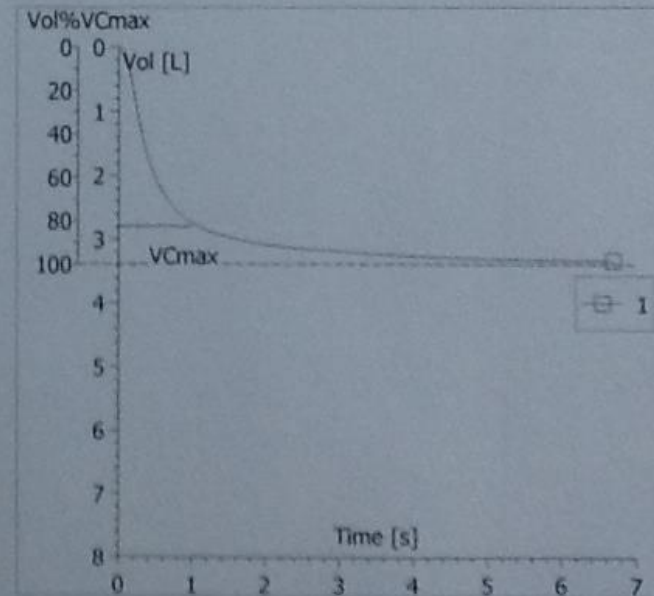
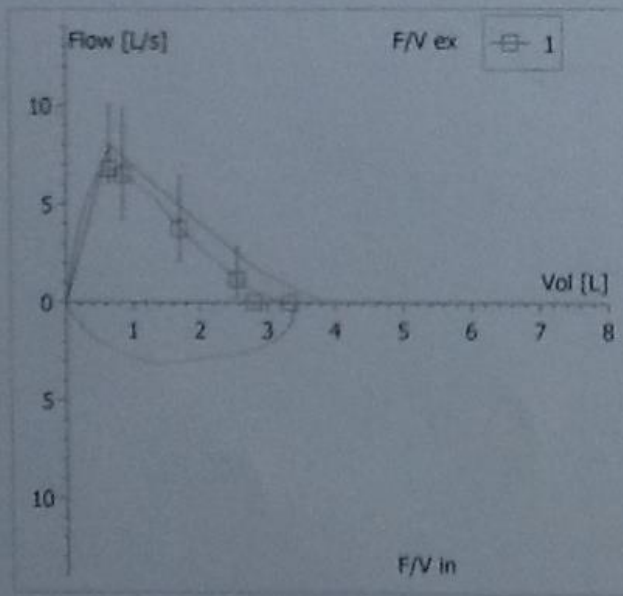


# Olgu 12

- 57 yaşında erkek hasta
- Nefes darlığı
- Öksürük

BMI:	27.28	Weight:	77 kg
Last Name:	[REDACTED]	Identification:	1519
First Name:	[REDACTED]		
Date of Birth:	03/25/1955	Age:	57 Years
Sex:	male	Height:	168 cm
BMI:	27.28		
Weight:	77 kg		

## Pulmonary Function Report



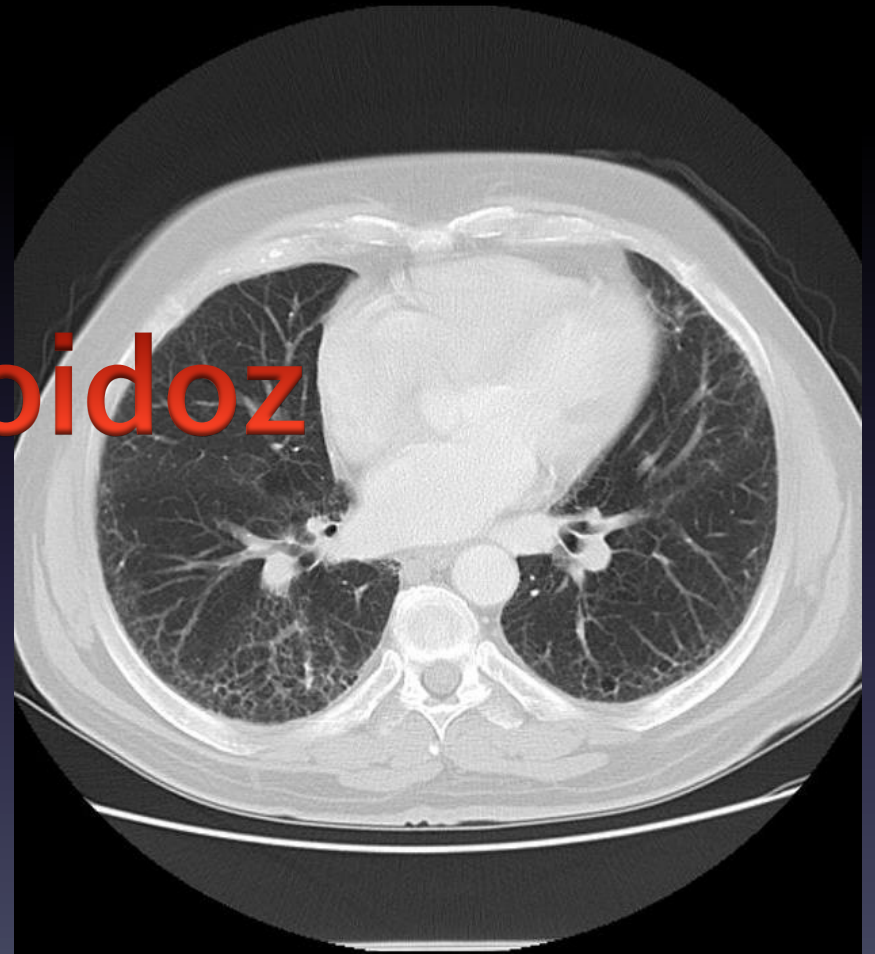
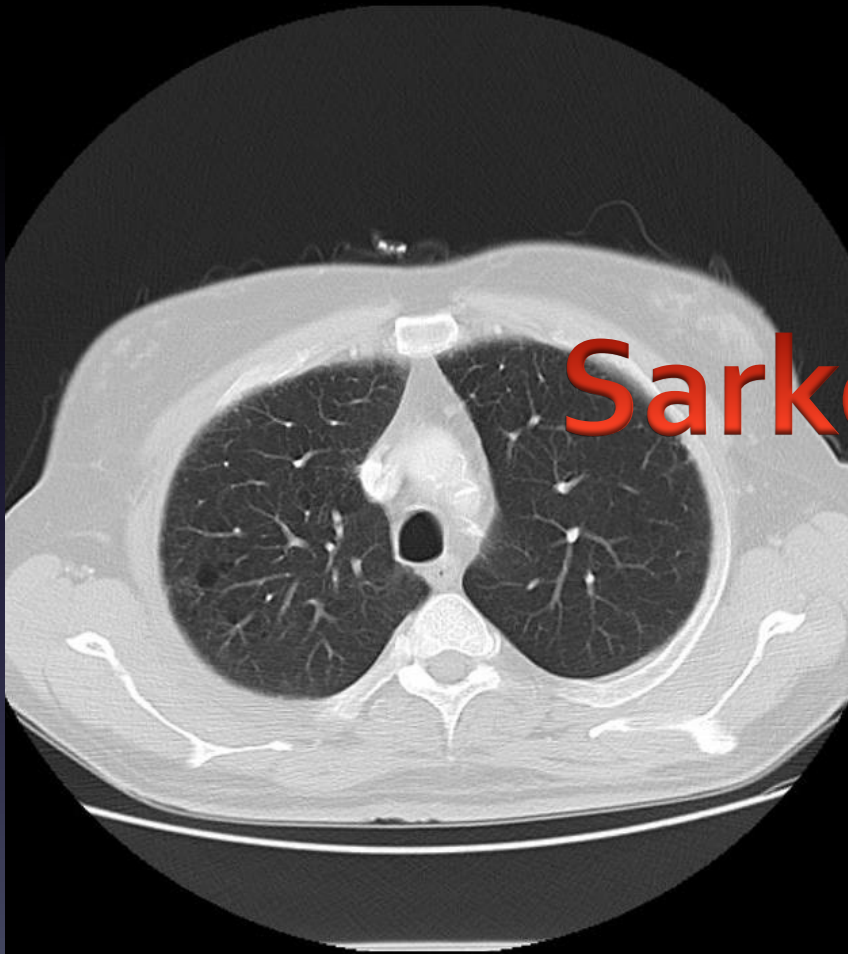
# Olgu 12

	PRED	ACTUAL	% PRED
FVC	3,85	3,33	86
FEV <sub>1</sub>	3,08	2,80	91
FEV <sub>1</sub> /FVC	77	82	107

	PRED	ACTUAL	% PRED
TLC	6,34	4,22	66
RV	2,22	0,91	41
RV/TLC	36,19	21,52	59

	PRED	ACTUAL	% PRED
DLCO	8,87	3,27	37

# Sarkoidoz



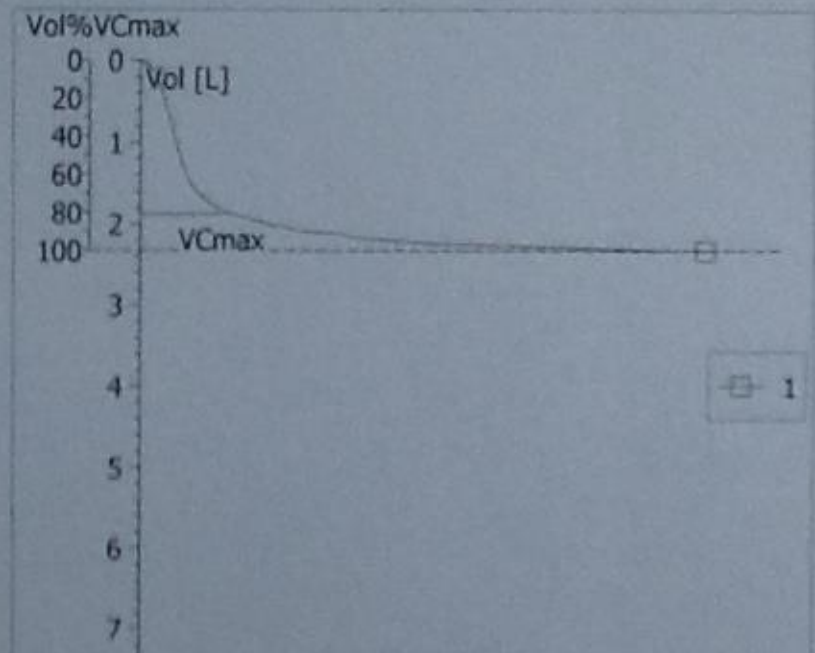
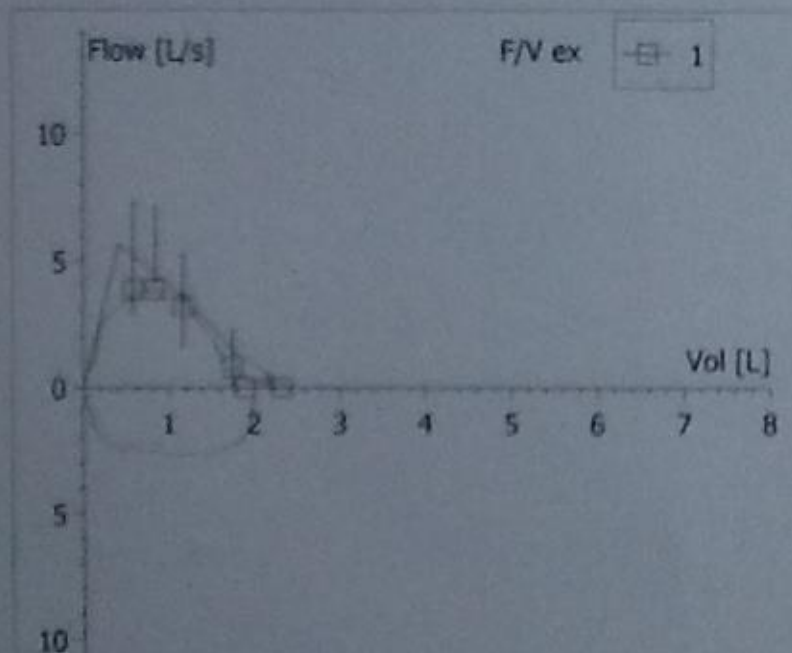
# Olgu 13

- 64 yaşında kadın hasta
- Nefes darlığı
- Pansitopeni nedeniyle Hematolojide takipli hasta, konsülte edildi
- FM'de bilateral ince ralleri mevcut

Date of Birth: 04/20/1948  
Sex: female  
BMI: 29.64  
Weight: 74 kg

Age: 64 Years  
Height: 158 cm

# Pulmonary Function Report



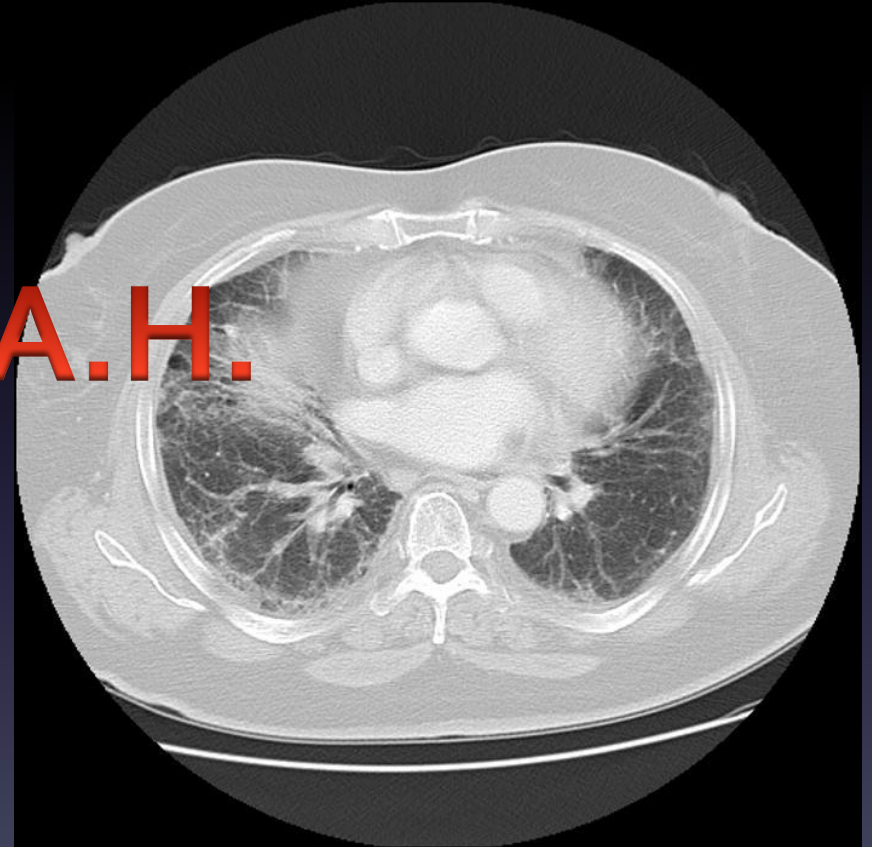
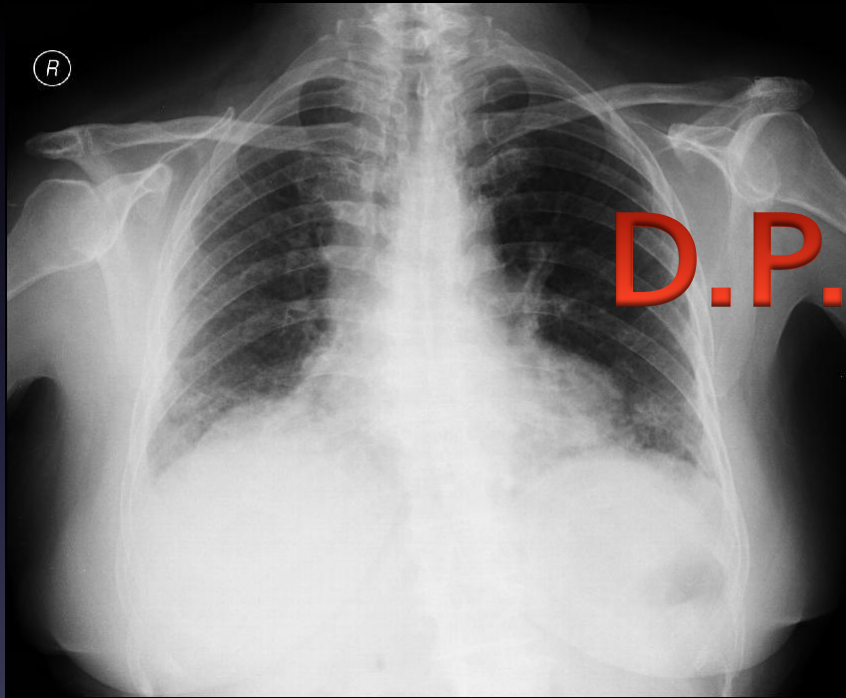


# Olgu 13

	PRED	ACTUAL	% PRED
FVC	2,45	2,33	95
FEV <sub>1</sub>	2,04	1,89	93
FEV <sub>1</sub> /FVC	77	81	105

	PRED	ACTUAL	% PRED
TLC	4,64	3,42	74
RV	1,88	1,36	72
RV/TLC	40,72	39,92	98

	PRED	ACTUAL	% PRED
DLCO	7,05	2,15	31



# Olgu 14

- 39 yaşında erkek hasta
- Sigara : -
- Nefes darlığı

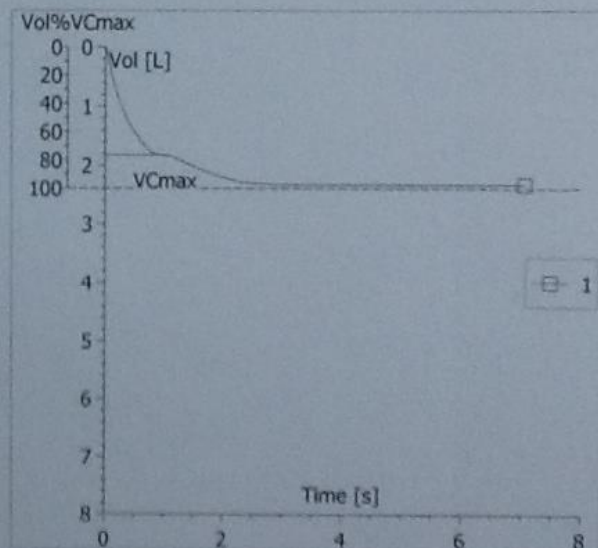
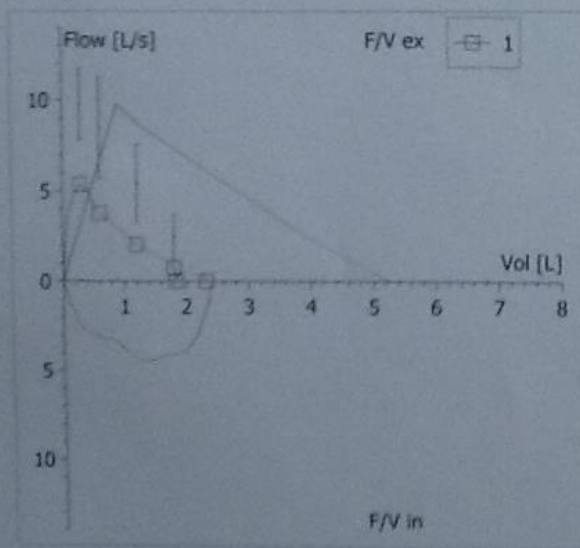
BMI: 23.63  
Last Name: CAN  
First Name: NAZIF

Weight: 80 kg  
Identification: 102859

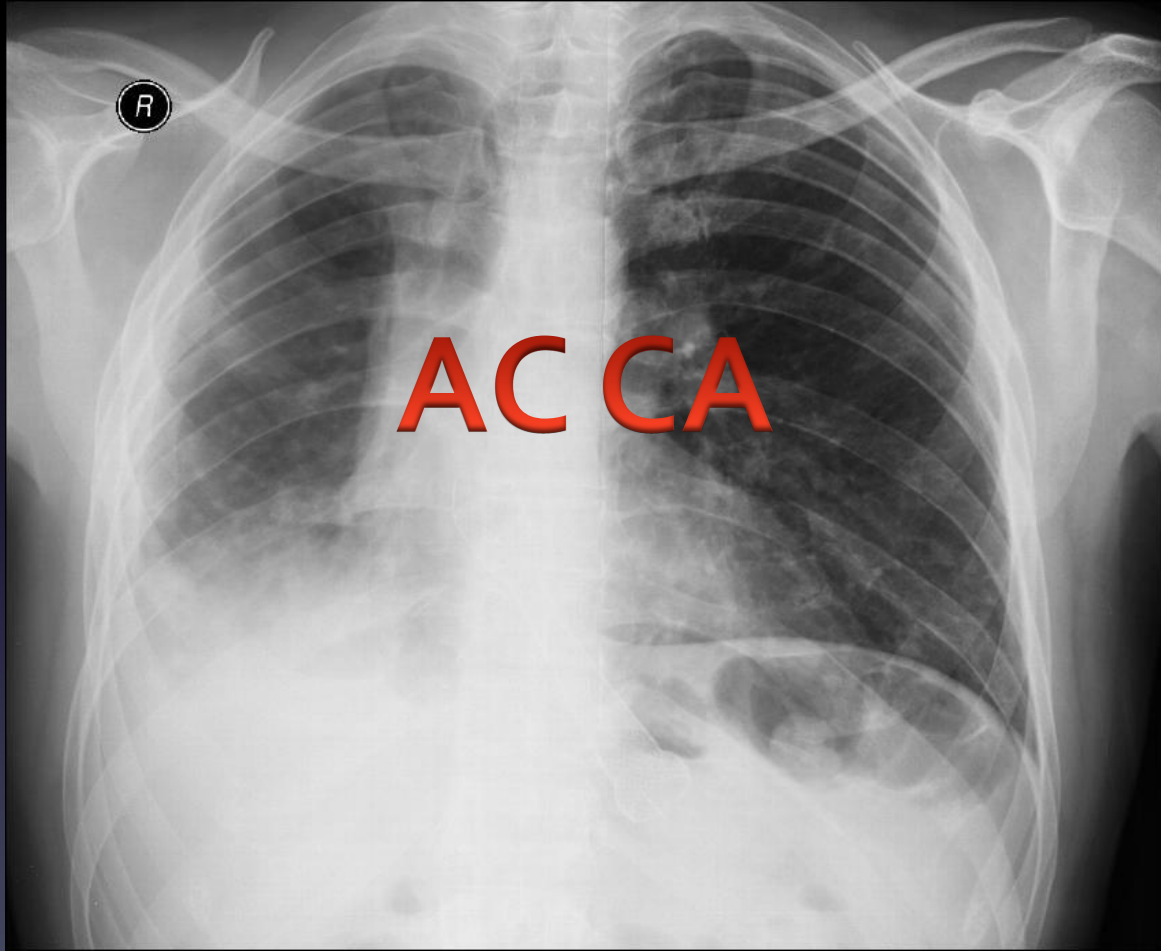
Date of Birth: 04/22/1973  
Sex: male  
BMI: 23.63  
Weight: 80 kg

Age: 39 Years  
Height: 184 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	5,24	2,32	44
FEV <sub>1</sub>	4,29	1,83	43
FEV <sub>1</sub> /FVC	80,19	76,23	95



# Olgu 15

- 75 yaşında erkek hasta
- İnguinal herni operasyonu planlanıyor
- Preoperatif değerlendirme için başvurdu
- Eforla nefes darlığı mevcut
- Sigara: 45 pak yıl / 10 yıldır içmiyor

BMI:   
 Last Name:   
 First Name:

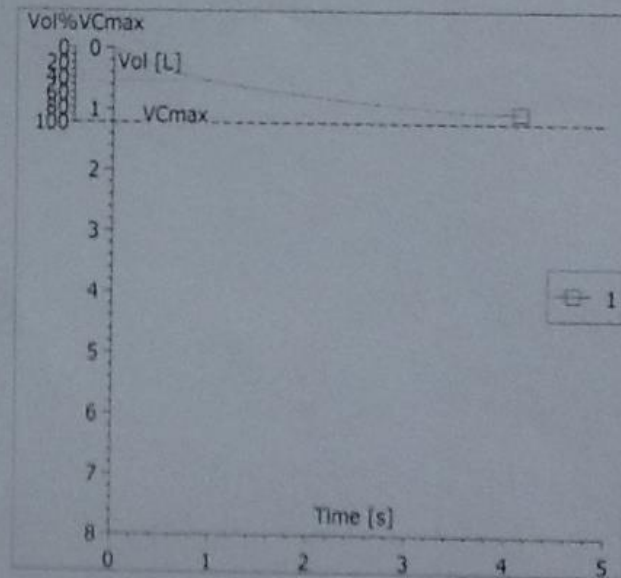
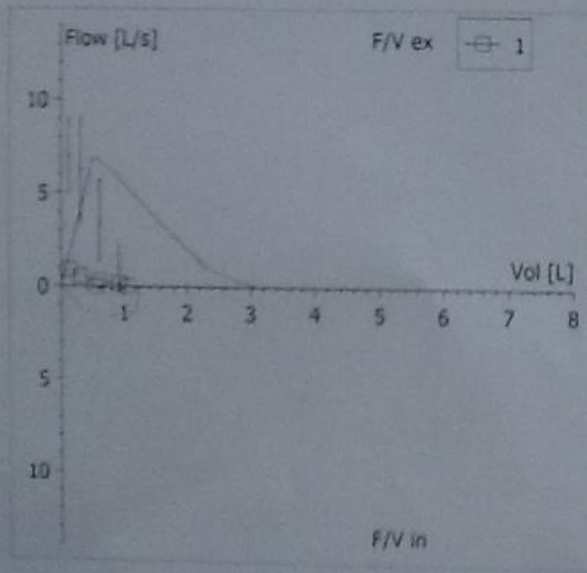
Weight: 51 kg

Identification: 96858

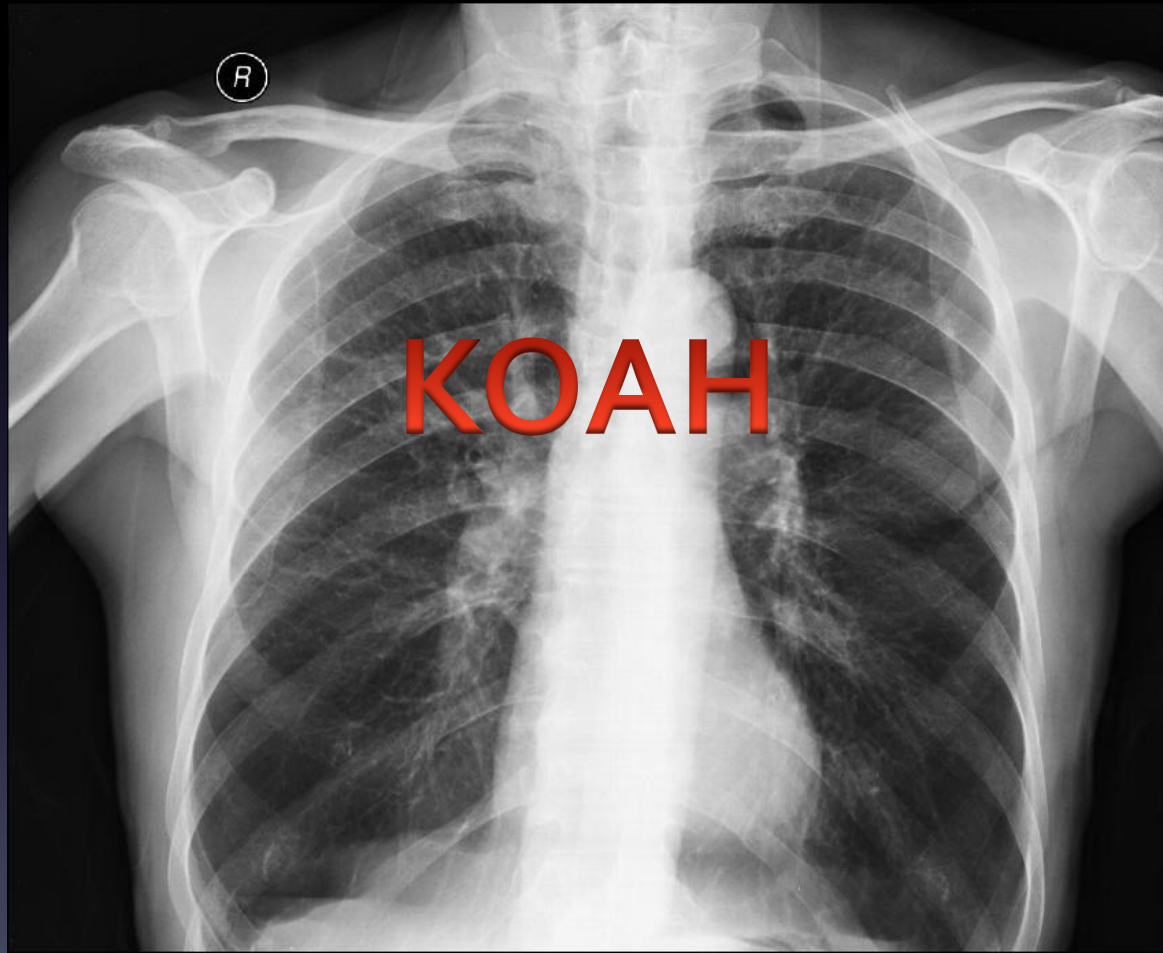
Date of Birth: 09/01/1938  
 Sex: male  
 BMI: 19.2  
 Weight: 51 kg

Age: 75 Years  
 Height: 163 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	3,10	1,05	34
FEV <sub>1</sub>	2,34	0,54	23
FEV <sub>1</sub> /FVC	73,71	44,41	60





# Olgu 16

- 58 yaşında erkek hasta
- Öksürük, balgam
- Nefes darlığı
- Sigara : 40 pak yıl

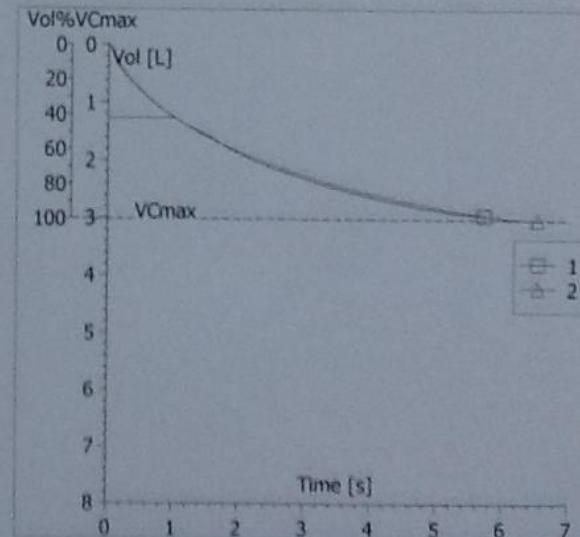
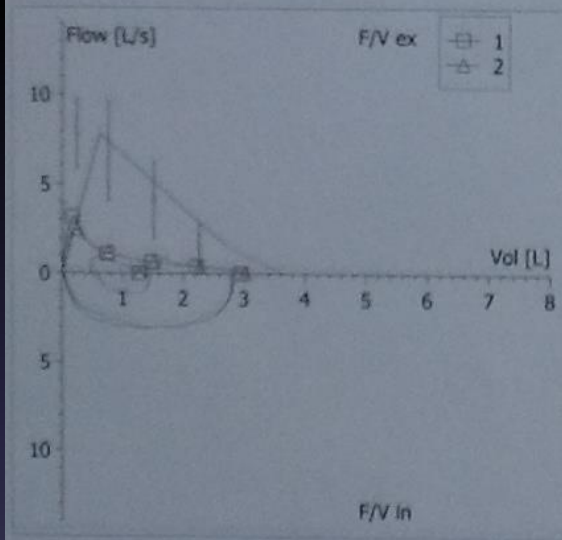
BMI:             
 Last Name:             
 First Name:           

Weight: 53 kg  
 Identification: 106216

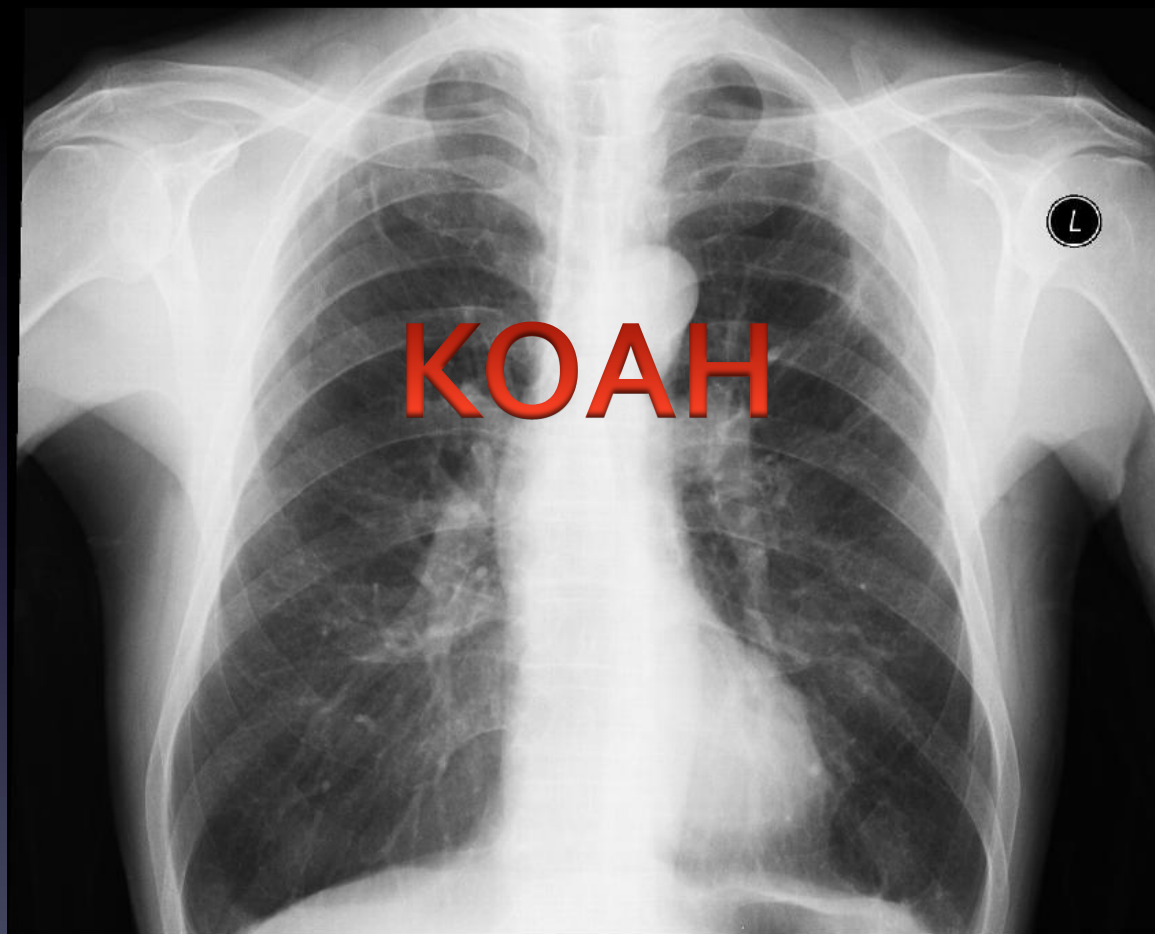
Date of Birth: 11/07/1955  
 Sex: male  
 BMI: 19.47  
 Weight: 53 kg

Age: 58 Years  
 Height: 165 cm

## Pulmonary Function Report



	PRED	ACTUAL	POST	% PRED	%PRE POST
FVC	3,66	2,94	3,02	81	102
FEV <sub>1</sub>	2,92	1,27	1,27	43	100
FEV <sub>1</sub> /FVC	76,77	43	42,10	56	98



# Olgu 17

- 56 yaşında erkek
- Öksürük
- Nefes darlığı

First Name



Date of Birth: 11/24/1957

Age: 56 Years

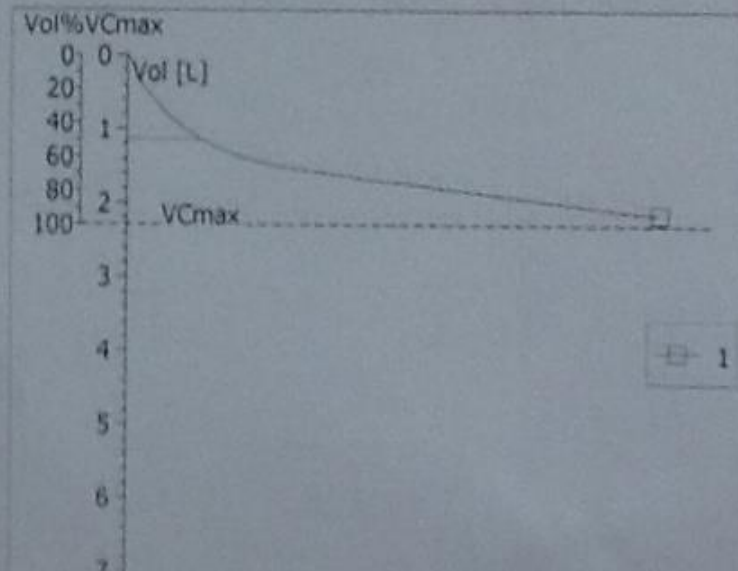
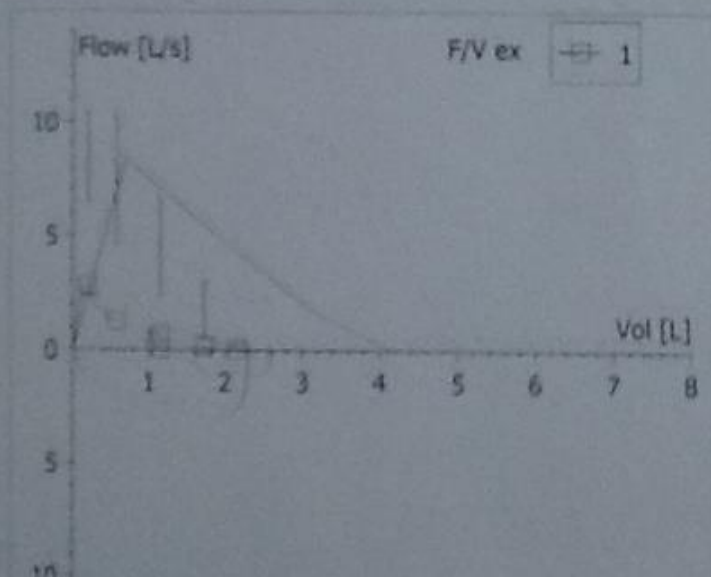
Sex: male

Height: 173 cm

BMI: 25.39

Weight: 76 kg

# Pulmonary Function Report

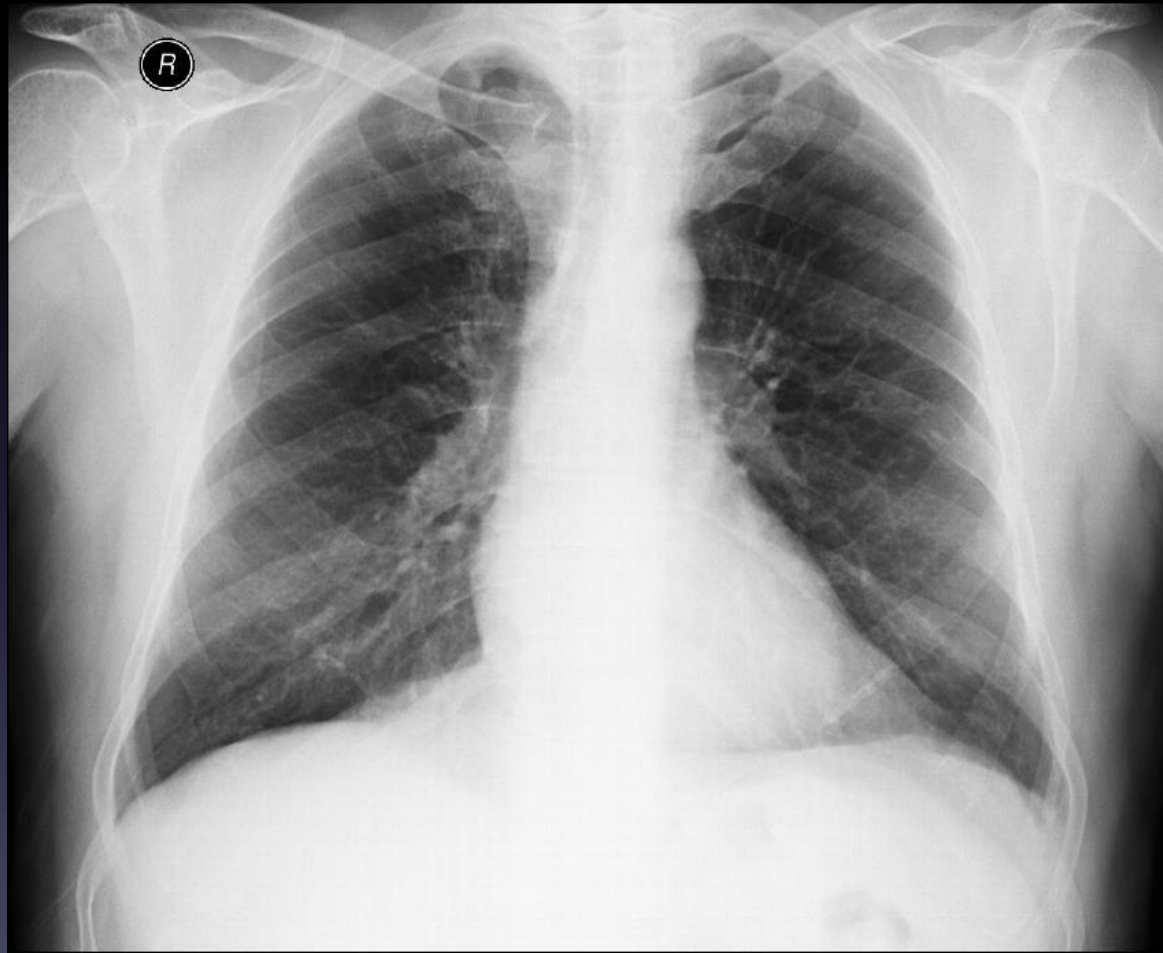


# Olgu 13

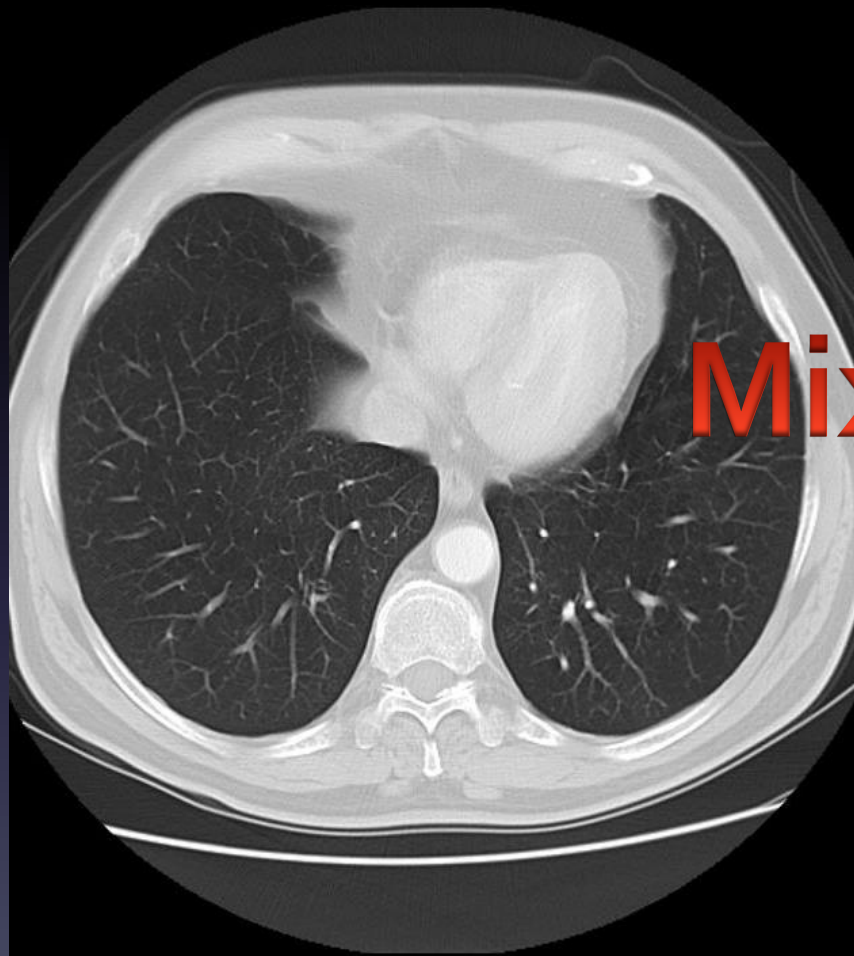
	PRED	ACTUAL	% PRED
FVC	4,17	2,15	52
FEV <sub>1</sub>	3,33	1,15	35
FEV <sub>1</sub> /FVC	77	49,93	65

	PRED	ACTUAL	% PRED
TLC	6,74	4,65	69
RV	2,27	2,88	127
RV/TLC	35,80	61,92	173

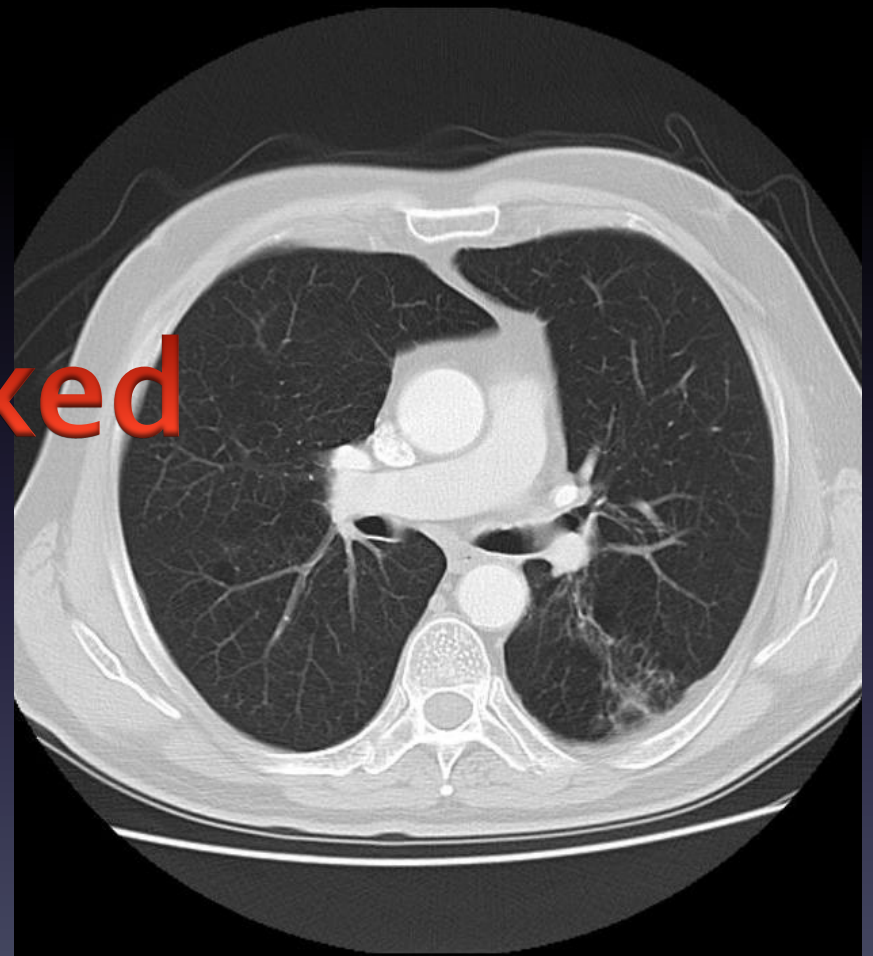
	PRED	ACTUAL	% PRED
DLCO	9,49	3,12	33



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Mixed





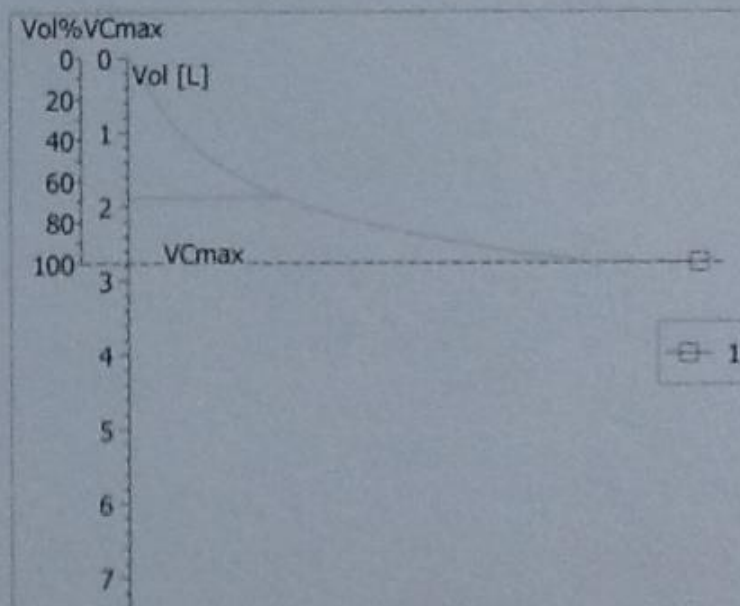
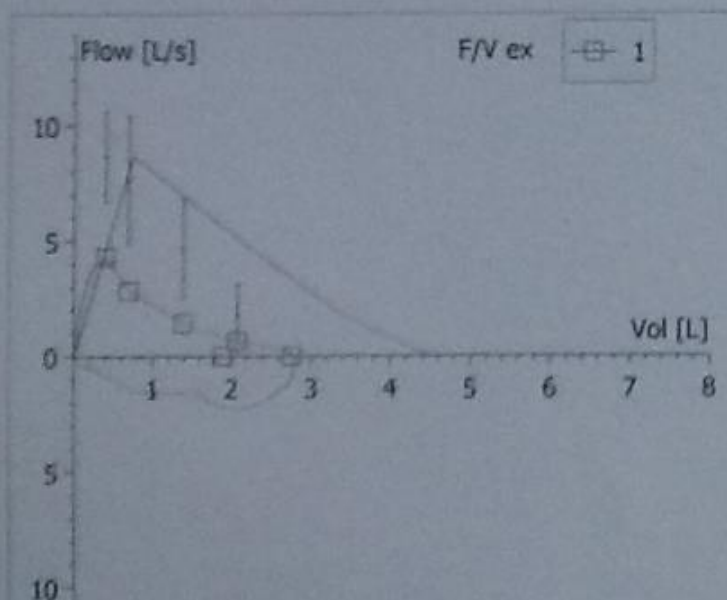
# Olgu 18

- 59 yaşında erkek hasta
- Nefes darlığı

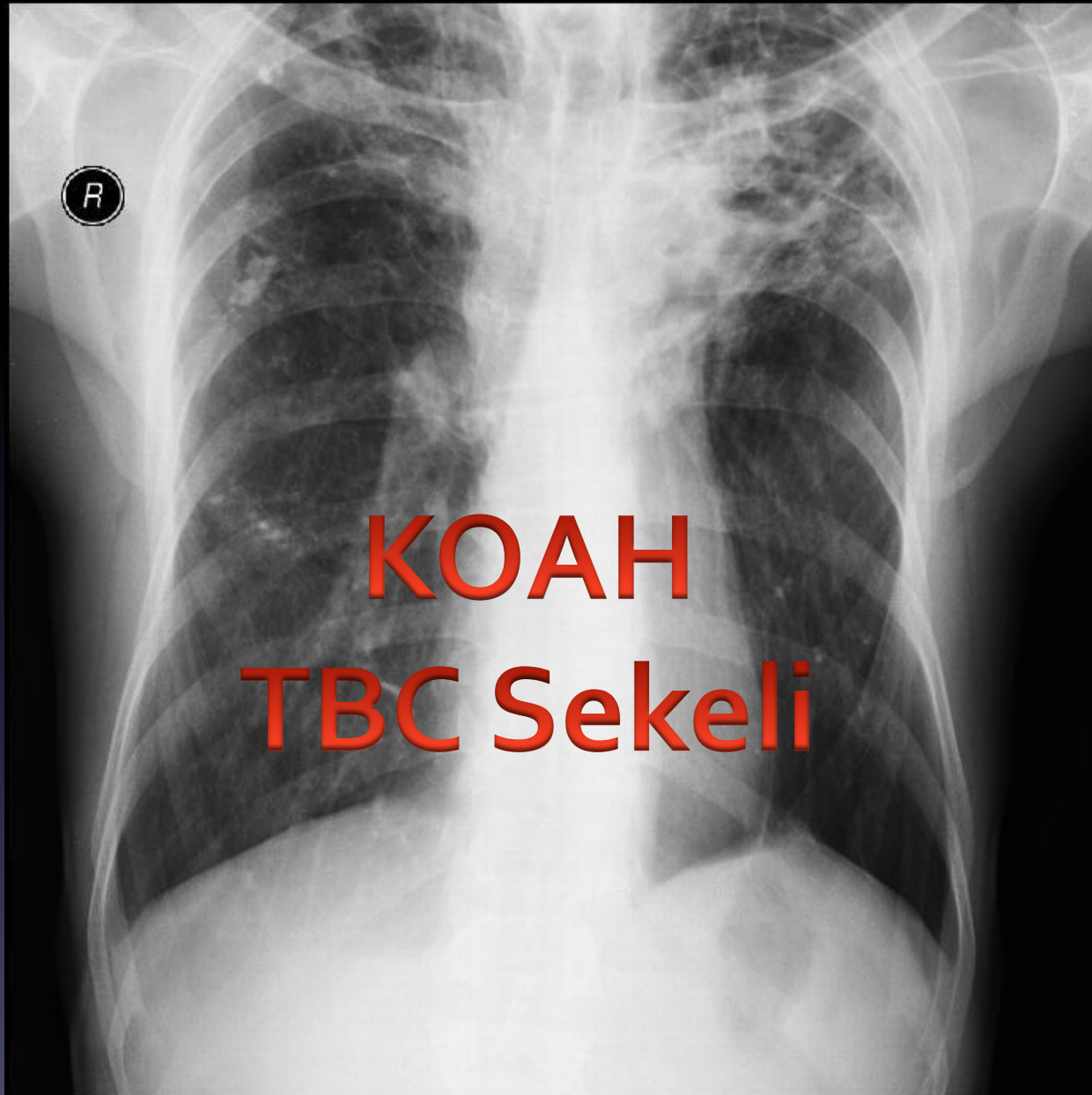
Date of Birth: 05/13/1954  
 Sex: male  
 BMI: 17.9  
 Weight: 58 kg

Age: 59 Years  
 Height: 180 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	4,49	2,76	61
FEV <sub>1</sub>	3,54	1,88	53
FEV <sub>1</sub> /FVC	76,59	67,98	89



**KOAH**  
**TBC Sekeli**

# Olgu 19

- 73 yaşında erkek hasta

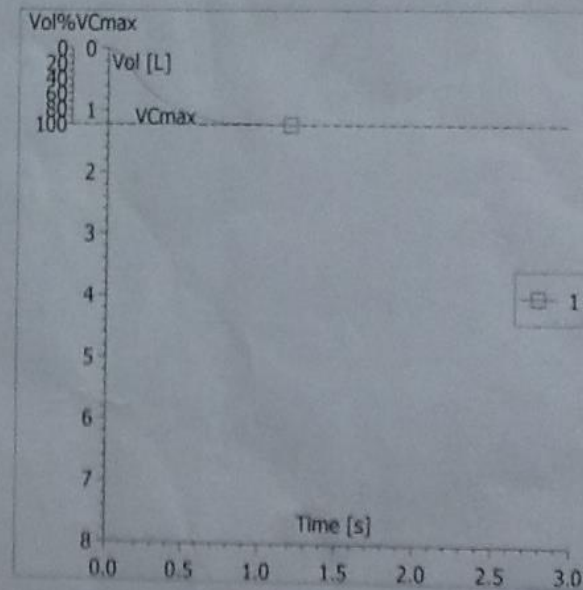
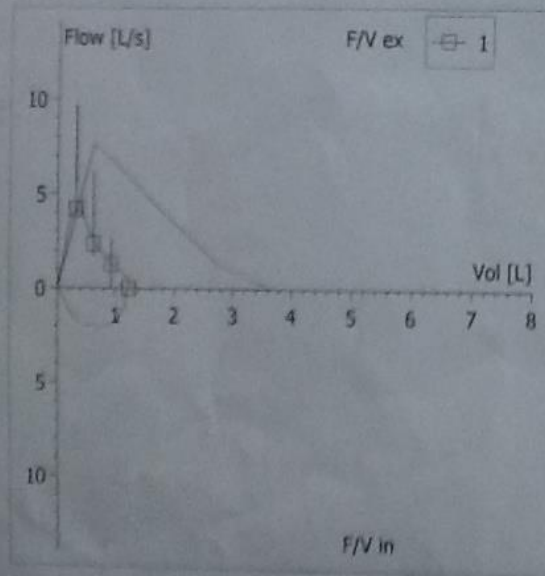
BMI: 18.93  
Last Name: Avci  
First Name: FETHI

Weight: 56 kg  
Identification: 105896

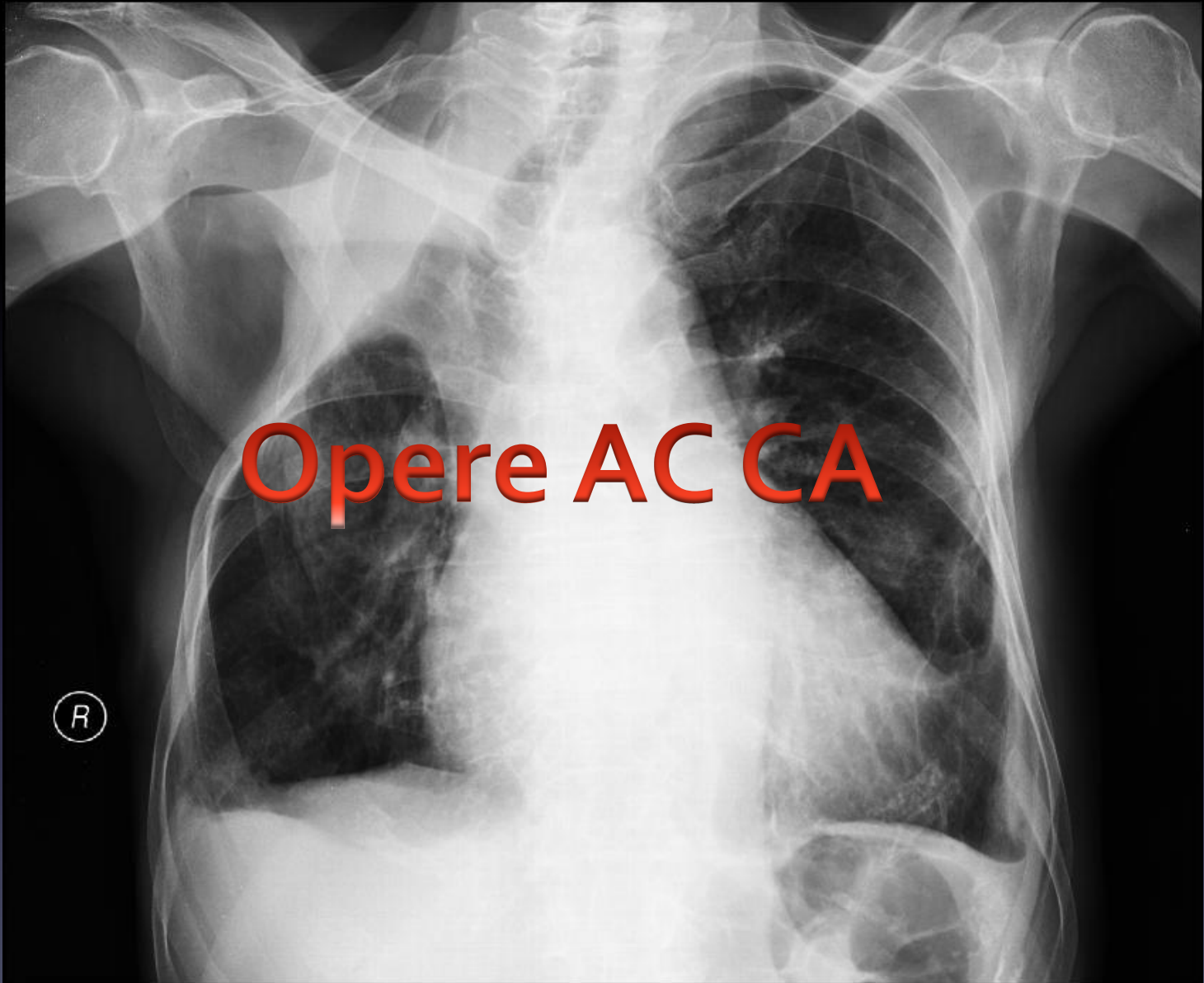
Date of Birth: 01/07/1939  
Sex: male  
BMI: 18.93  
Weight: 56 kg

Age: 73 Years  
Height: 172 cm

## Pulmonary Function Report



	PRED	ACTUAL	% PRED
FVC	3,67	1,23	34
FEV <sub>1</sub>	2,79	1,22	44
FEV <sub>1</sub> /FVC	74,07	99,25	8134



# OLGU 10

- 32 YAINDA KADIN HASTA
- 10 YILDIR ASTİM NEDENİYLE TEDAVİ GÖRÜYÖR
- SİGARA: 7 YIL ÖNCE BIRAKMIS . 4X 1/2 : 2 PAKET/YIL
- MESLEK: EV HANIMI
- GECİİRMİŞ AC HAST: ASTİM , PNÖMONİ 2006
- EK HASTALIK: -

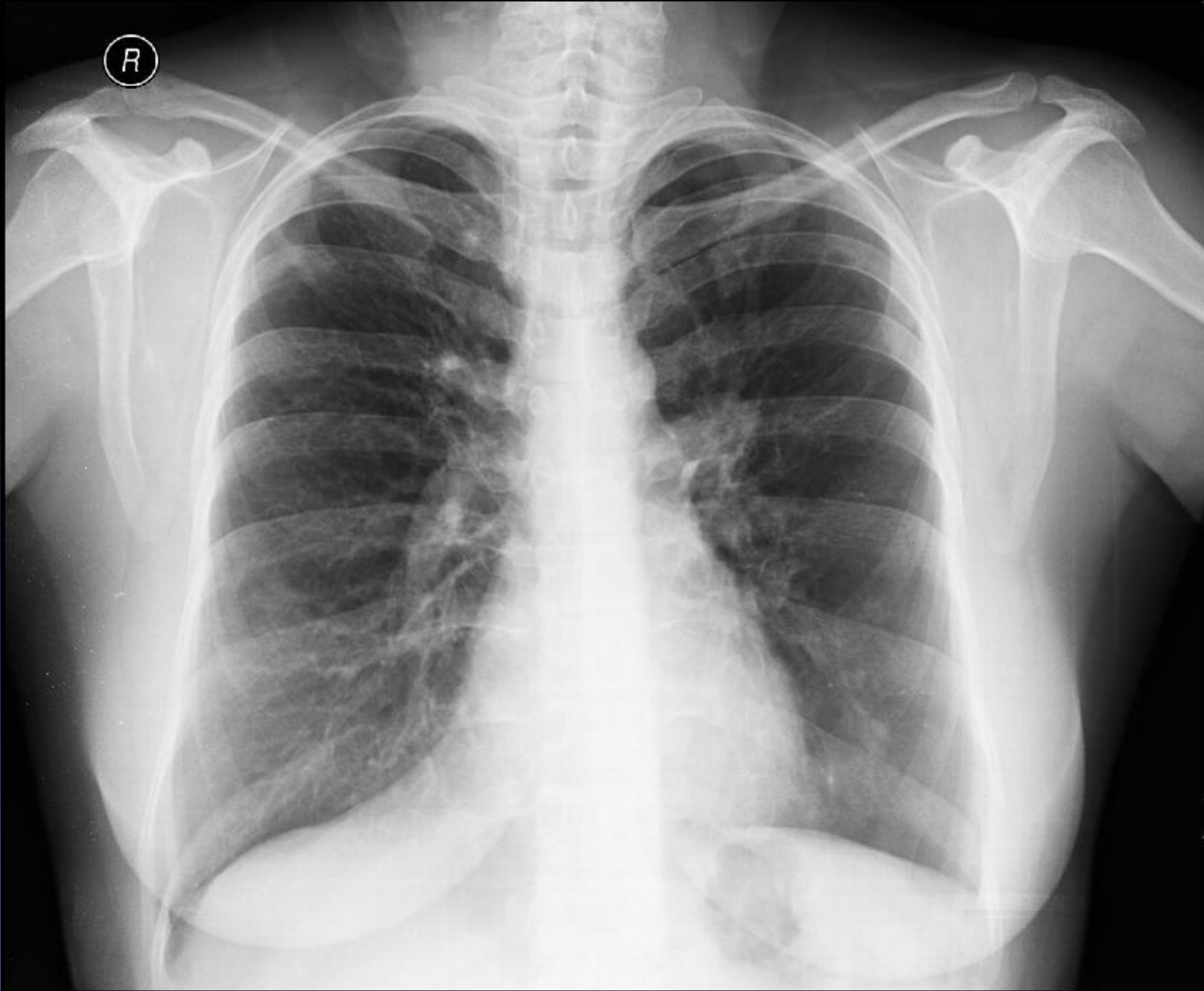
# Olgu SS

	PRED	ACTUAL	% PRED
FVC	3,50	1,68	49
FEV <sub>1</sub>	3,04	1,11	37
FEV <sub>1</sub> /FVC	83	65,41	65,41

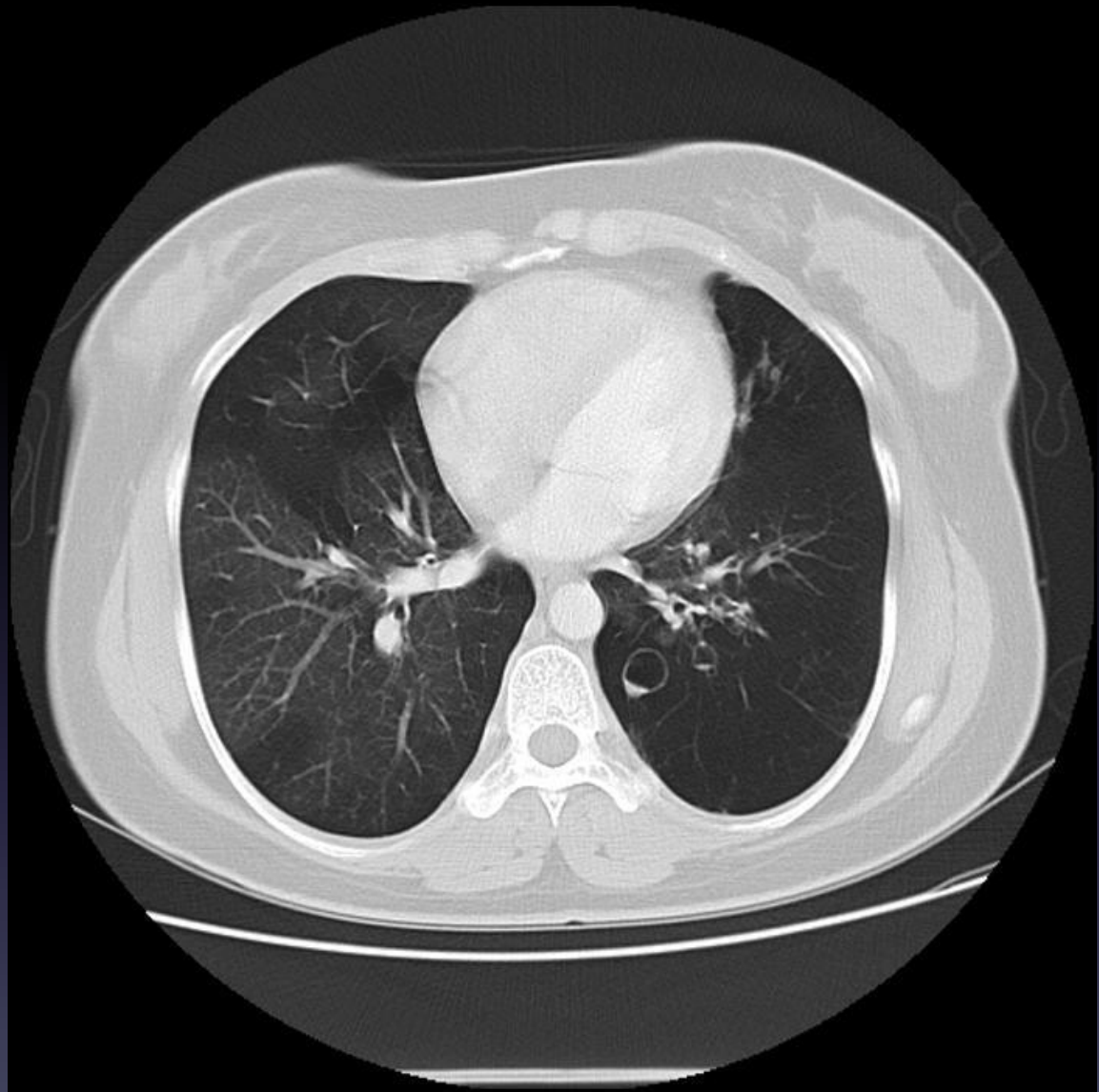
	PRED	ACTUAL	% PRED
TLC	4,97	3,17	69
RV	1,46	1,29	88
RV/TLC	29,84	40,73	136

	PRED	ACTUAL	% PRED
DLCO	9,03	5,52	61

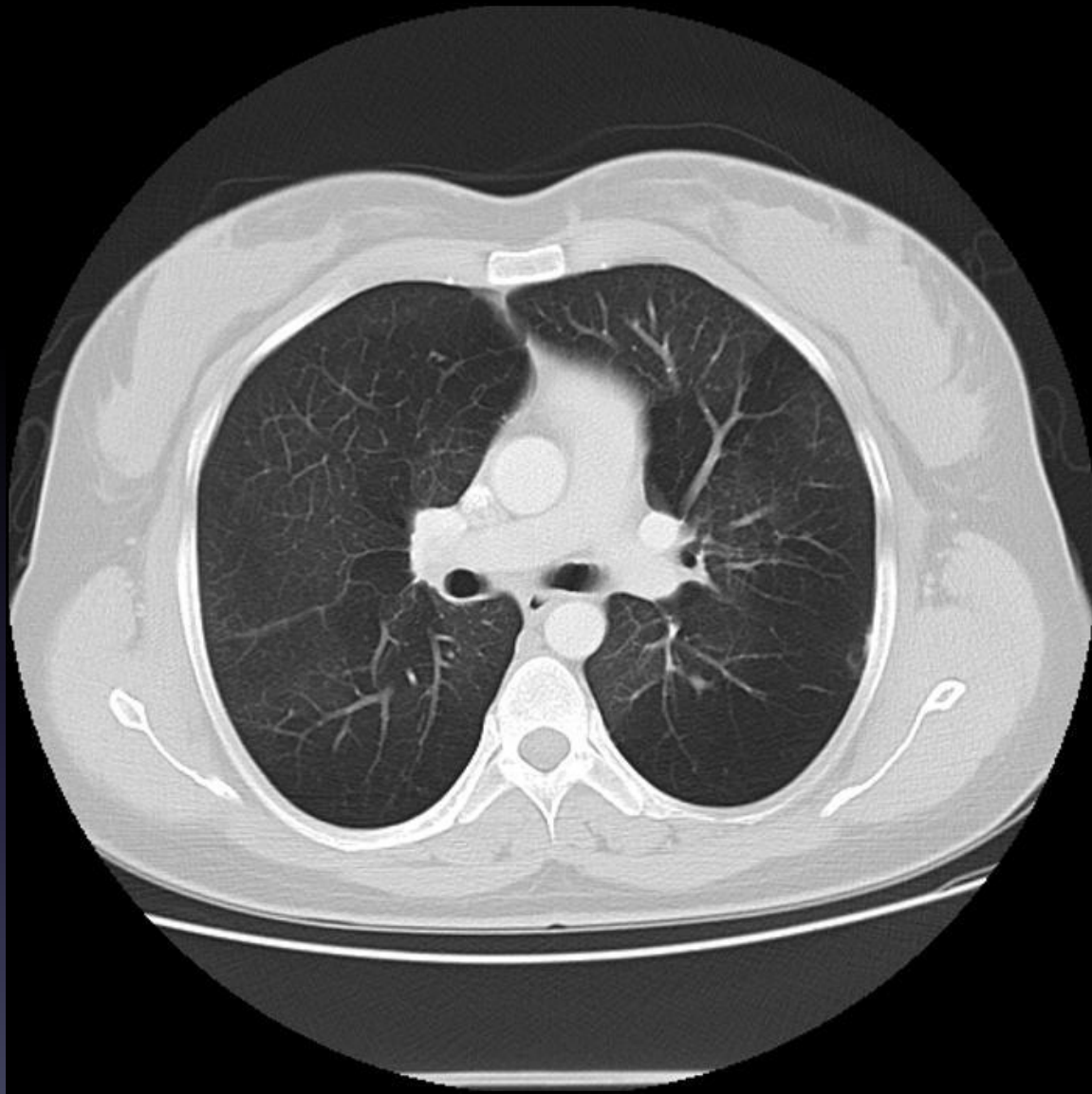




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