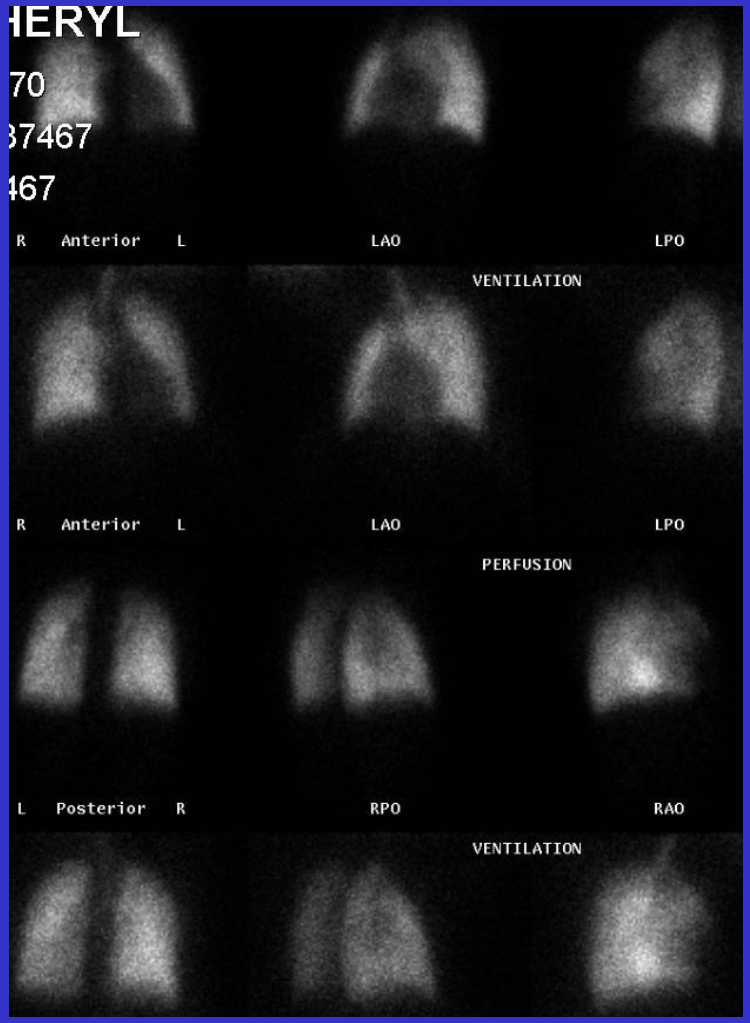
Lungs

J.R.Buscombe

V/Q lung imaging

- Perfusion imaging with Tc-99m MAA
- Ventilation imaging
  - Kr-81m
  - Tc-99m aerosol
  - Tc-99m smoke technegas
- New work with SPECT

Normal V/Q


HERYL
70
37467
467
R Anterior L
LAO
LPO
VENTILATION
R Anterior L
LAO
LPO
PERFUSION
L Posterior R
RPO
RAO
VENTILATION

Criteria for diagnosis Biello, PIODED

- Normal
- Low probability
  - 1x segmental V/Q defect
  - <5%
- Inderminate
  - 2x segmental V/Q defects
  - Abnormal ventialation
  - 5-95%

High

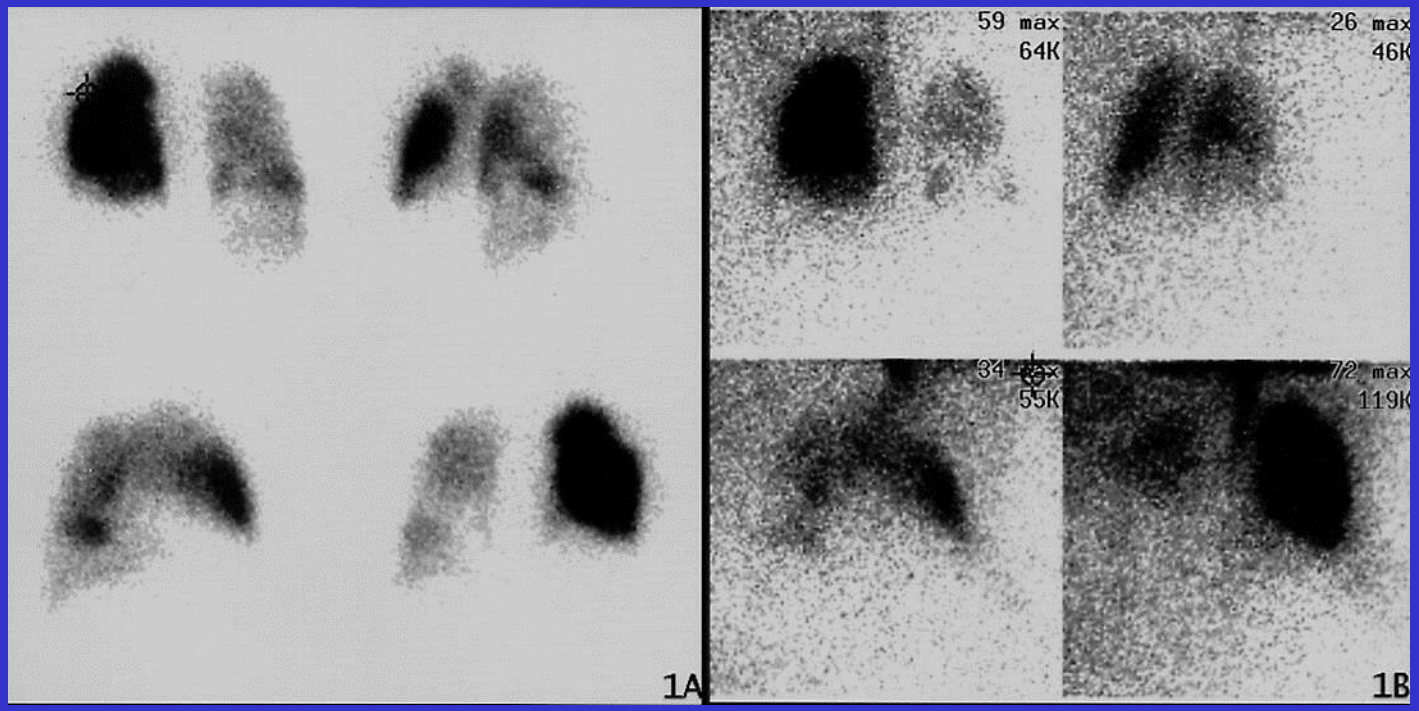
more than 2 segments V/Q defects

in both lungs

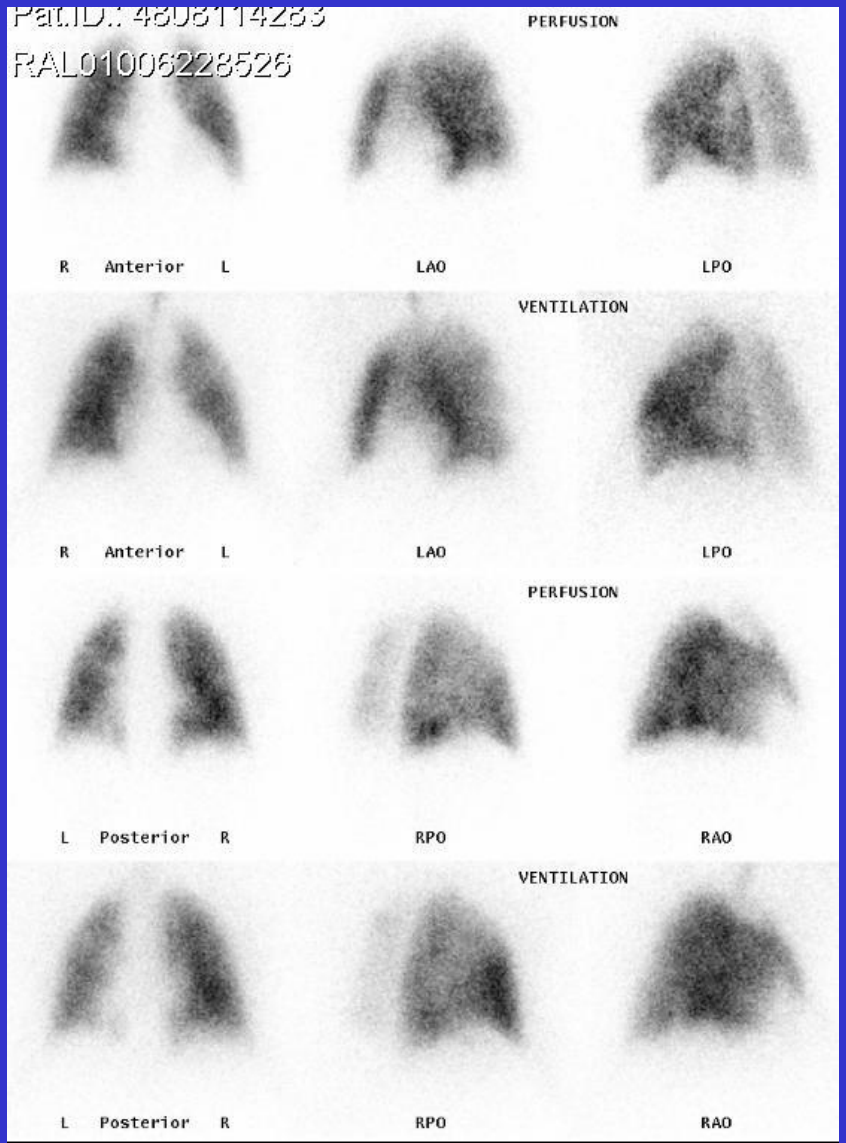
Lobar V/Q defect

>95%

V/Q scan ?PE



? PE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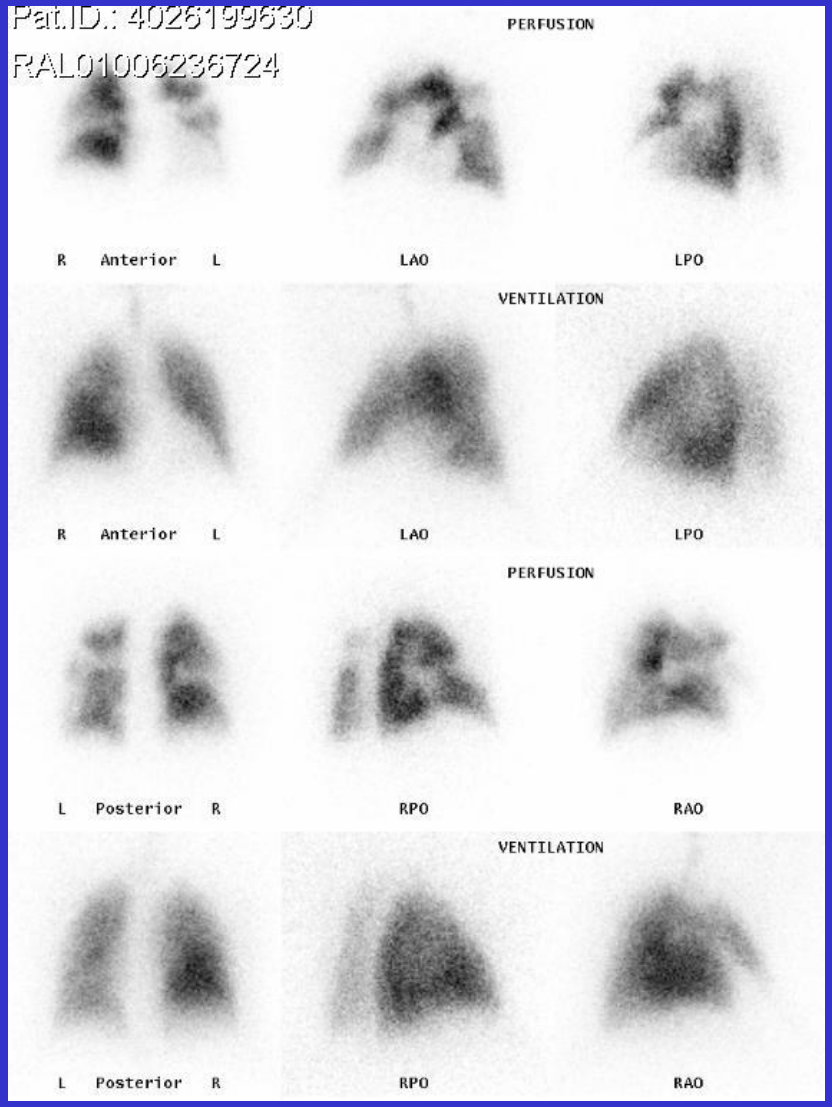
RAL01006228526
PERFUSION
R Anterior L
LAO
LPO
VENTILATION
R Anterior L
LAO
LPO
PERFUSION
L Posterior R
RPO
RAO
VENTILATION
L Posterior R
RPO
RAO

? PE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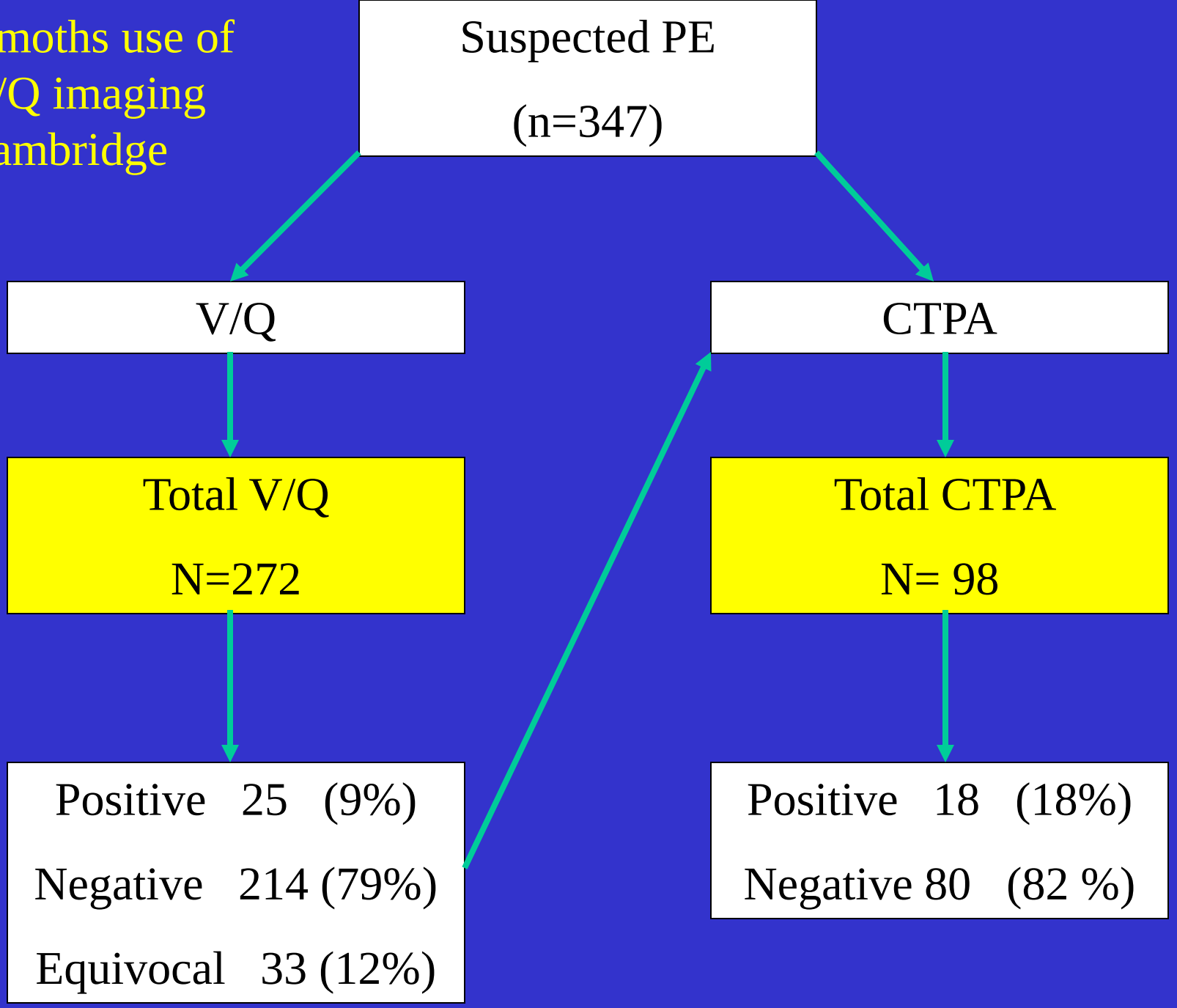
PERFUSION
R Anterior L
LAO
LPO
VENTILATION
R Anterior L
LAO
LPO
PERFUSION
L Posterior R
RPO
RAO
VENTILATION
L Posterior R
RPO
RAO

CTPA or V/Q

- CT Radiologists concerned at being inundated with requests for CTPA
- Concern over radiation dose (CTPA breast dose 4mSv, V/Q <1mSv)
- During normal working hours nuclear medicine acts as ‘gate keeper’ for CTPA
- Those with equivocal V/Q, known lung disease or abnormal CXR are considered for CTPA

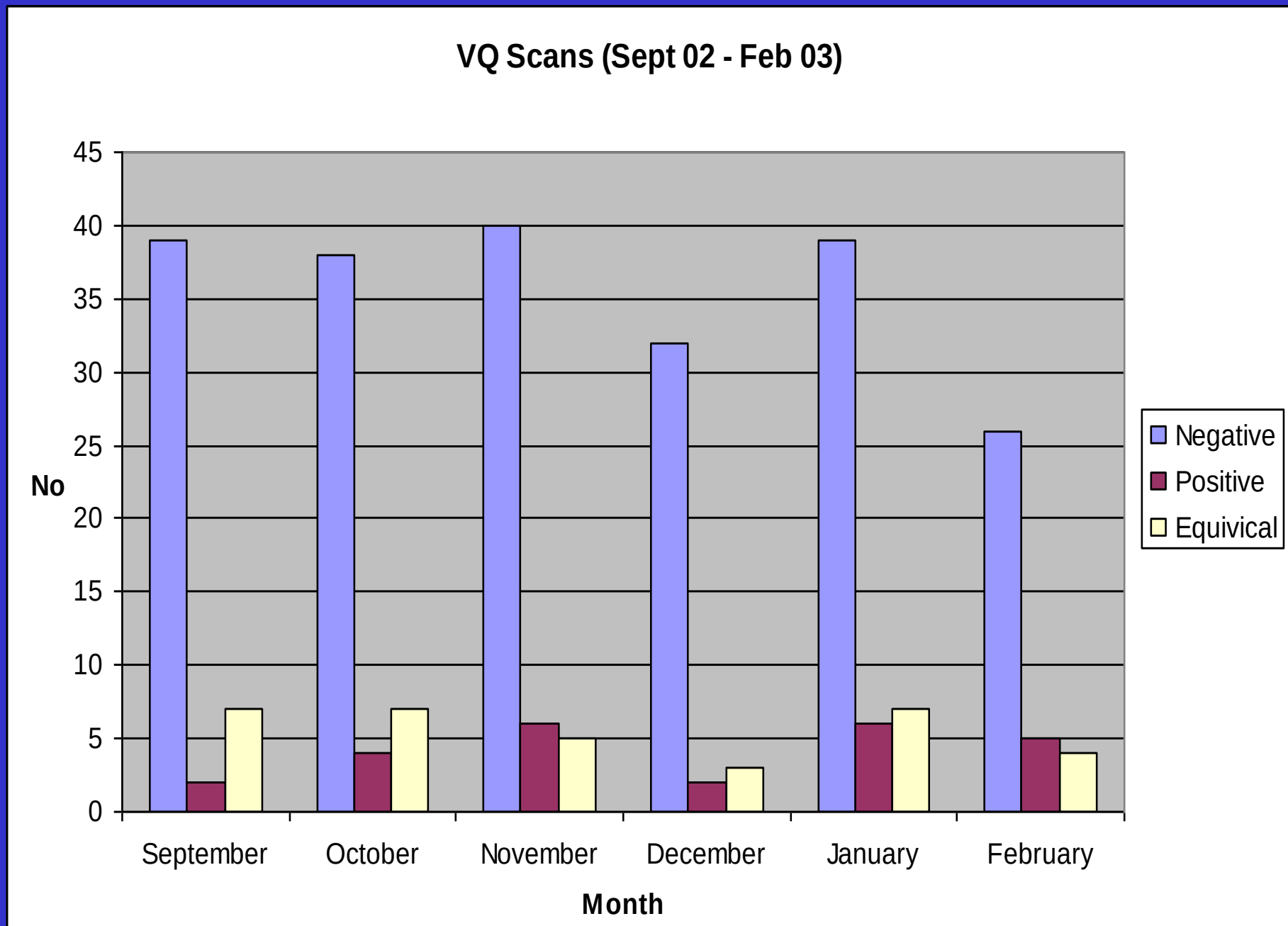
6 moths use of V/Q imaging Cambridge

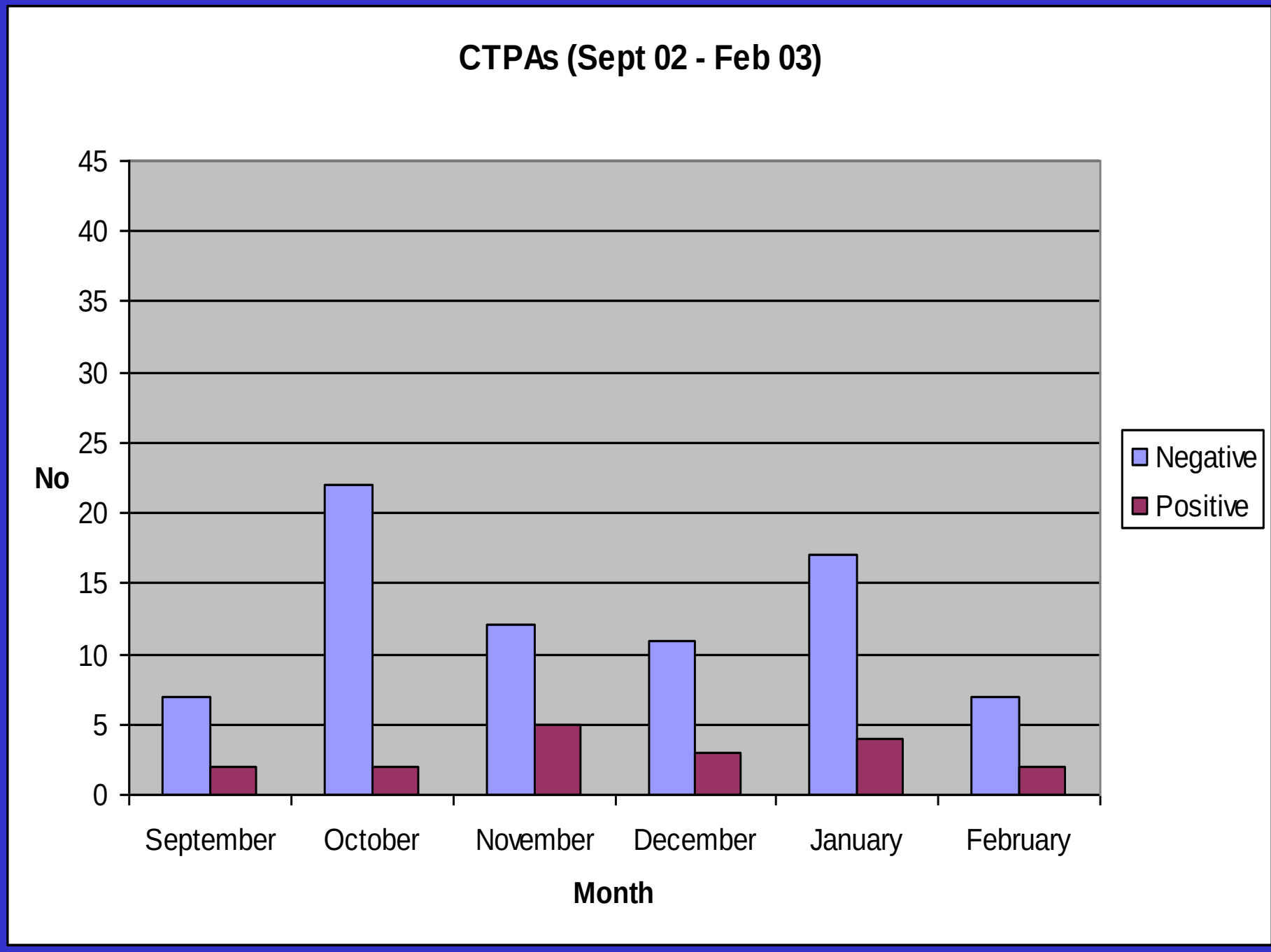


Results

39 PEs diagnosed (1.5 per week)

- 25 diagnosed by initial V/Q
- 9 diagnosed by initial CTPA
- 6 diagnosed by CTPA after initial V/Q
- 1 False positive on V/Q v CTPA

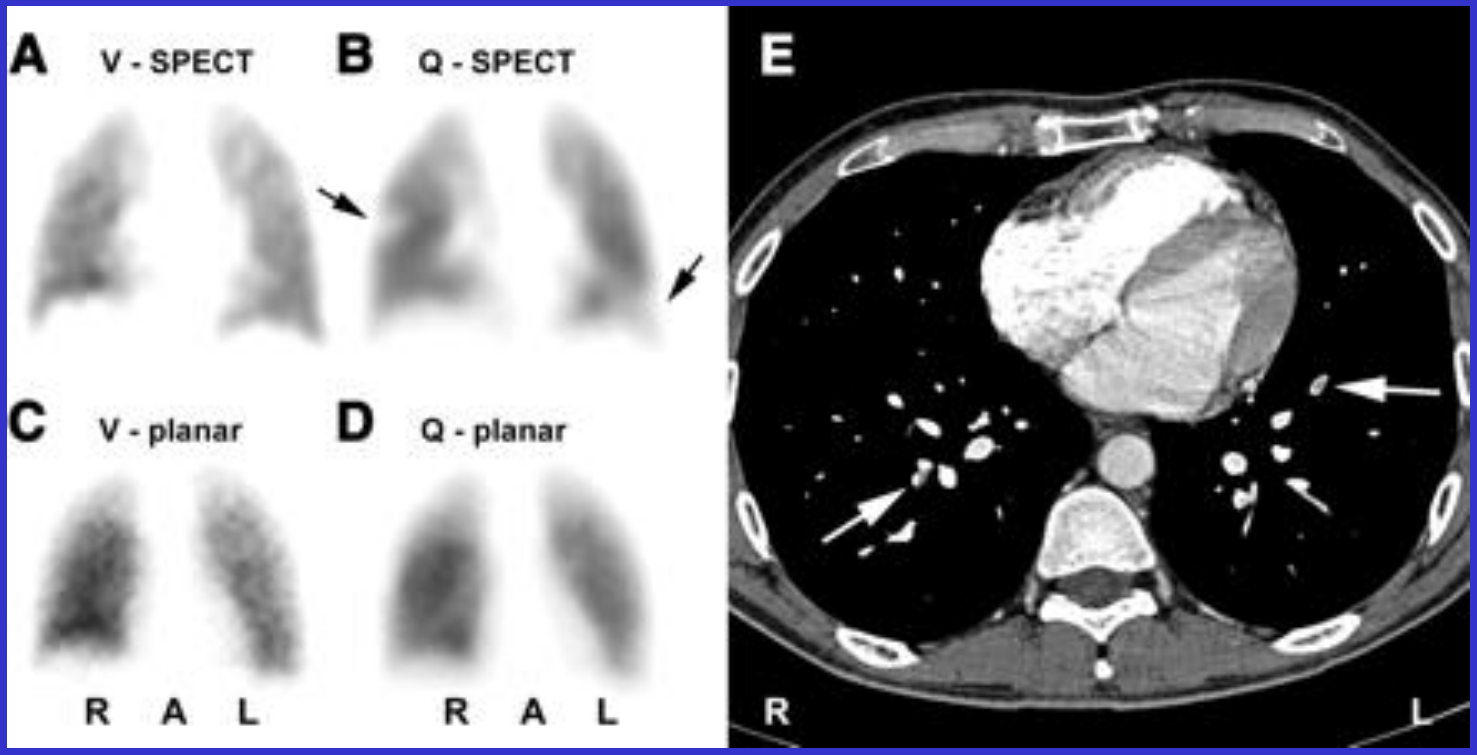

VQ Scans (Sept 02 - Feb 03)
45
40
35
30
25
20
15
10
5
0
No
September
October
November
December
January
February
Month
Negative
Positive
Equivical


CTPAs (Sept 02 - Feb 03)
45
40
35
30
25
20
15
10
5
0
No
September
October
November
December
January
February
Month
Negative
Positive

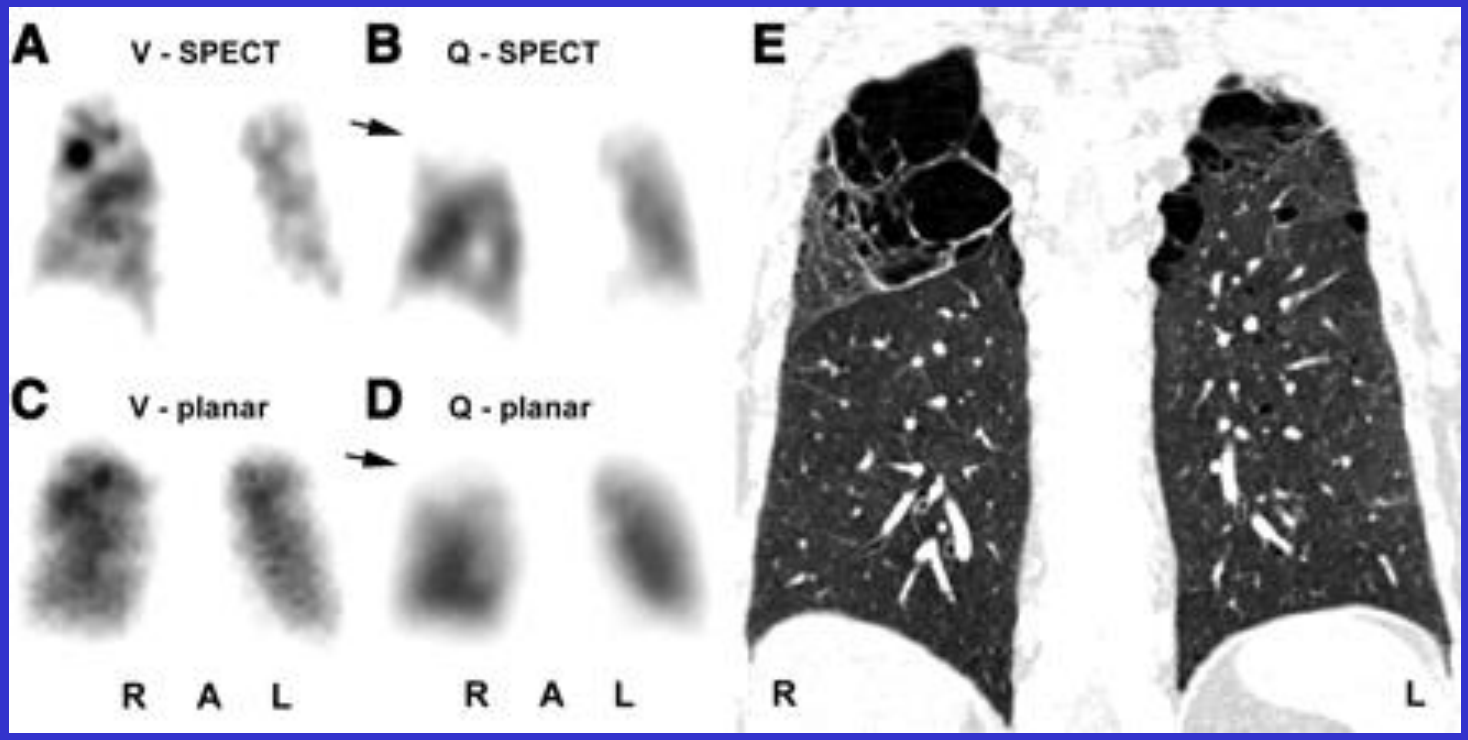
V/Q SPECT

- Recommended by EANM for diagnosing PEs
- Developed by Baljic et al
- Reduces the rate of equivocal results
- However technically difficult
- High dose with Kr-81m

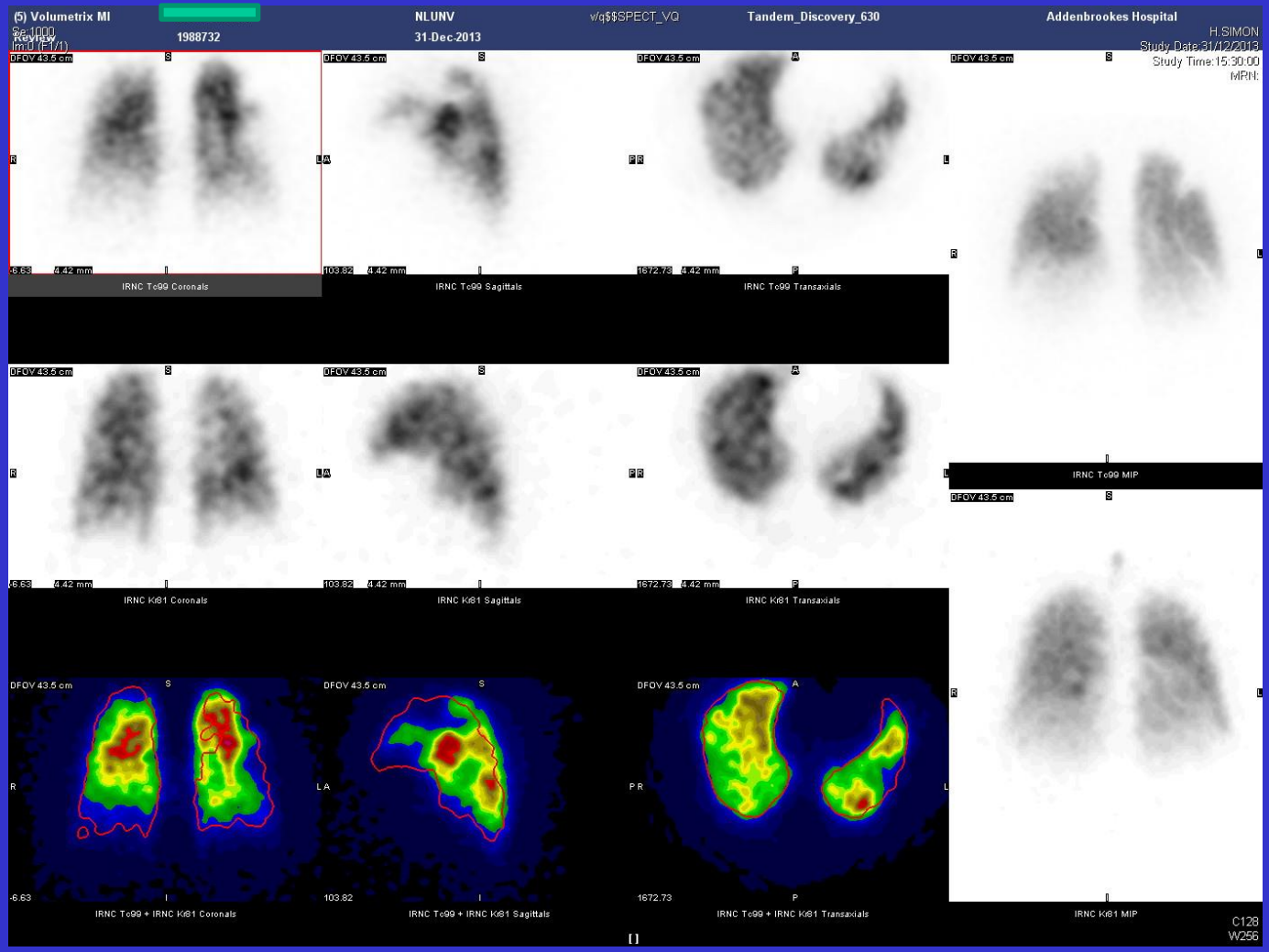
PE



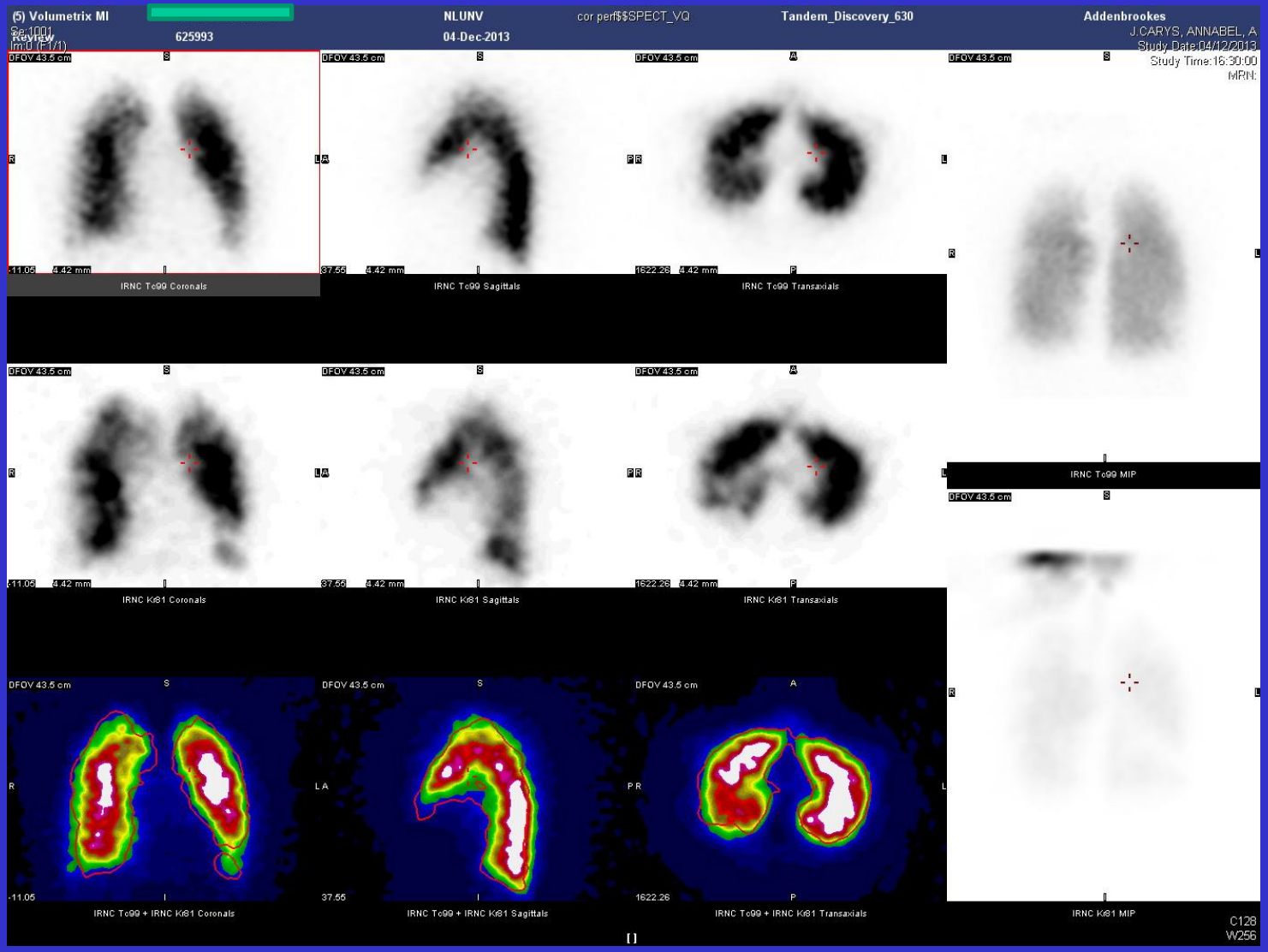
COAD



V/Q SPECT with Kr-81m-PE



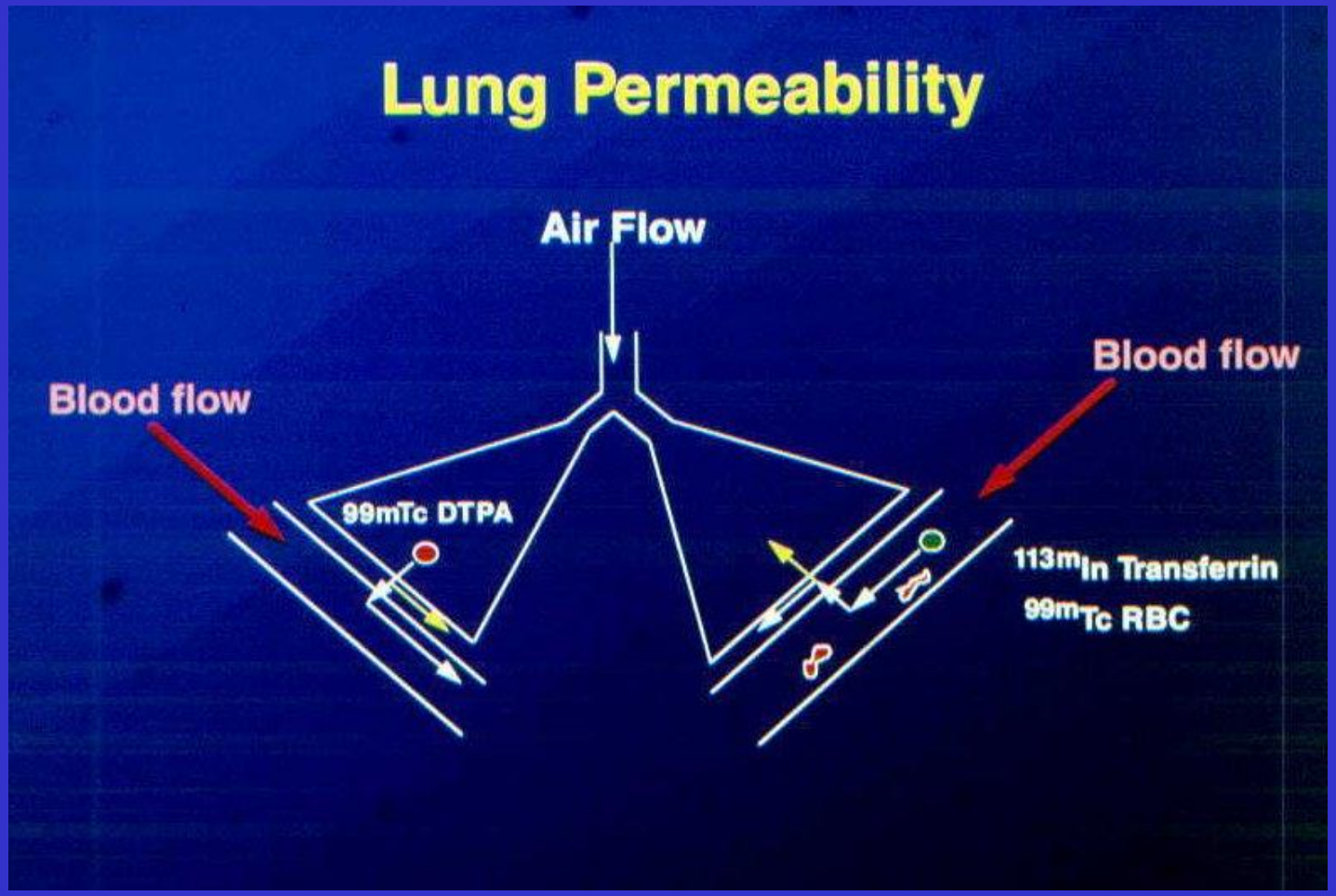
V/Q SPECT with Kr-81m flu



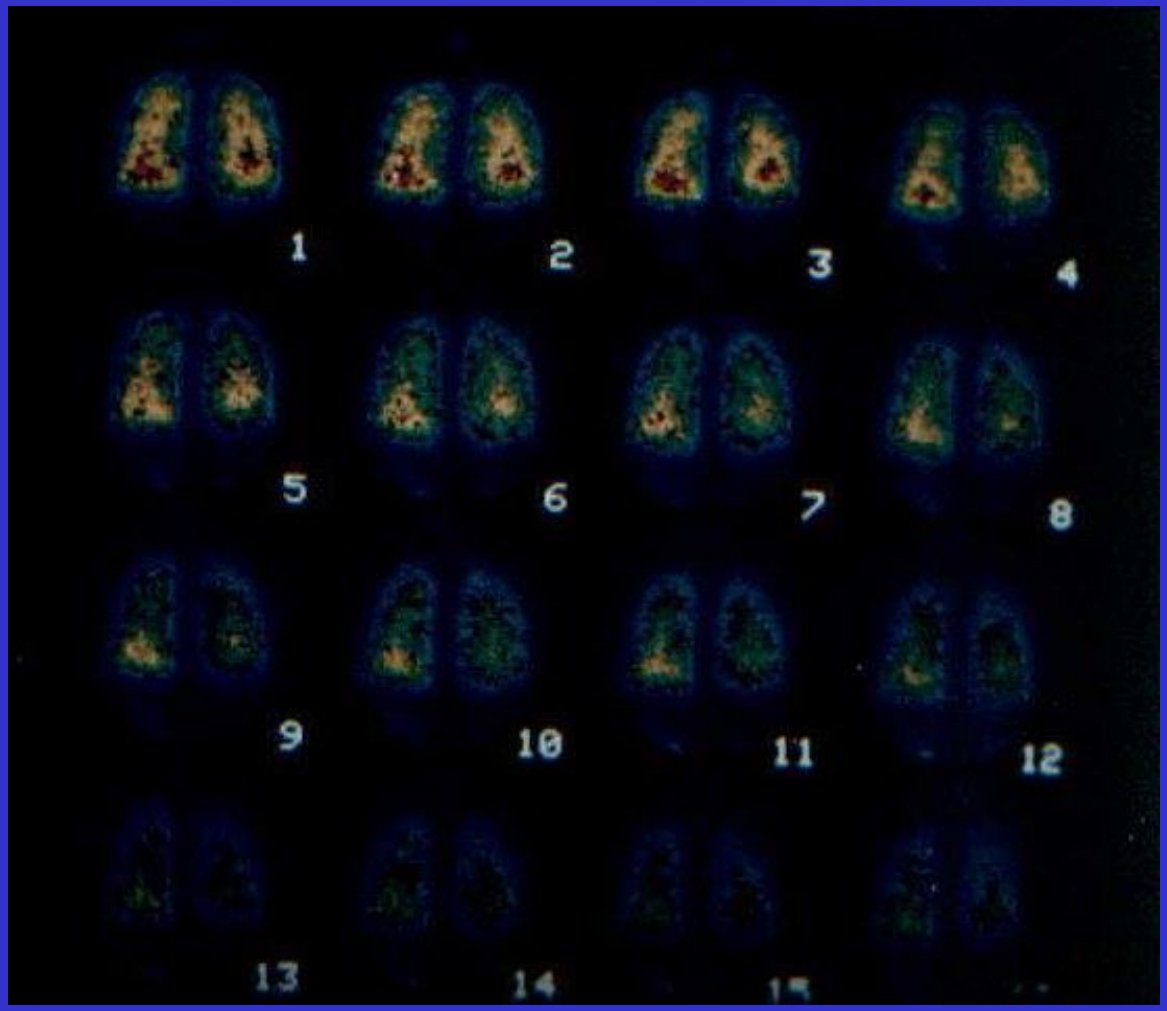
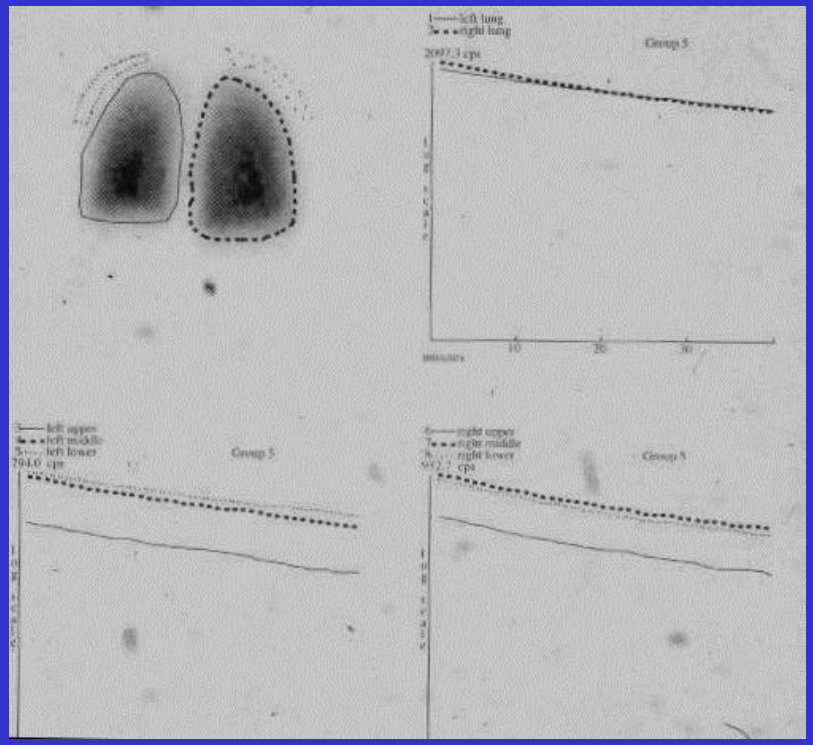
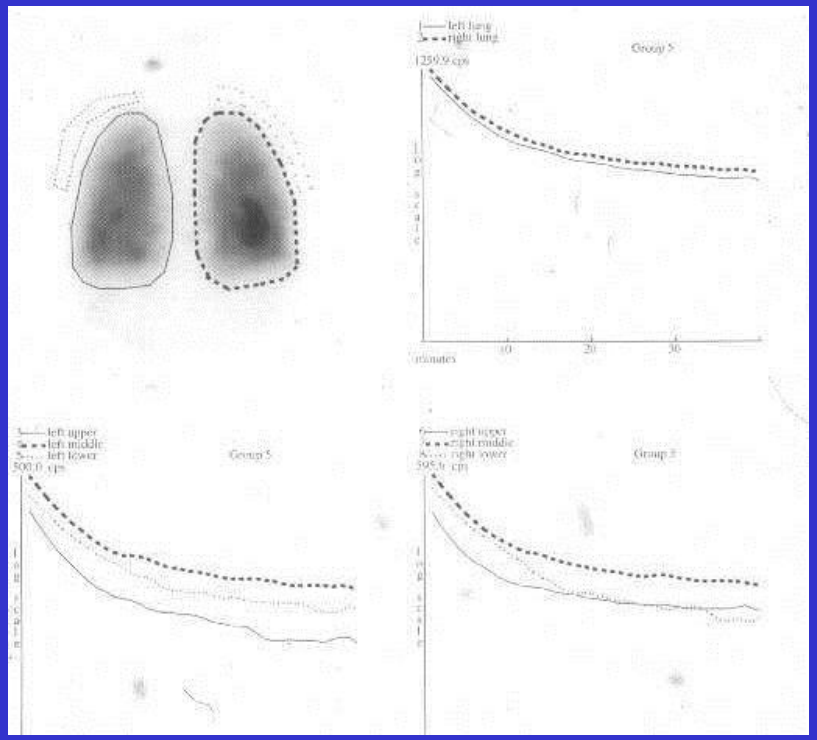
DTPA aerosol

- Developed by O'Doherty
- Works of the principle of increased permeability if alveolar wall damaged
- Permeability is defined as
  - Flow of molecules/unit area
  - Conc gradient across membrane

Lung permeability



DTPA clearance



Abnormal and normal