

SCANNER ULTRA-LOW DOSE

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ALARA

Indication ?
Examen antérieur ?

Imagerie personnalisée

S/B excellent

S/B moyen

S/B faible

L'objectif doit être atteint !!!

Reduced dose: 1-3 mSv
Ultra-low-dose CT < 1 mSv

Contrôles

Pneumopathies infiltrantes
Nodules pulmonaires
Infections

Détails de grande taille

COMPARAISONS DE DOSE

CTDI_{vol}

DLP: $CTDI_{vol} \times \text{longueur}$

Ne tient pas compte des dimensions ni de la région examinée

Pas indicateur de dose individuelle

Approximation dose individuelle absorbée
> CT donné

Diamètre effectif

American Association of Physicists in Medicine Task Group 204

Topogramme, coupe axiale

$\sqrt{\text{diamètre AP} \times \text{Diamètre transverse}}$

Tables: facteur de conversion *fsize*

SSDE . Size specific dose estimate

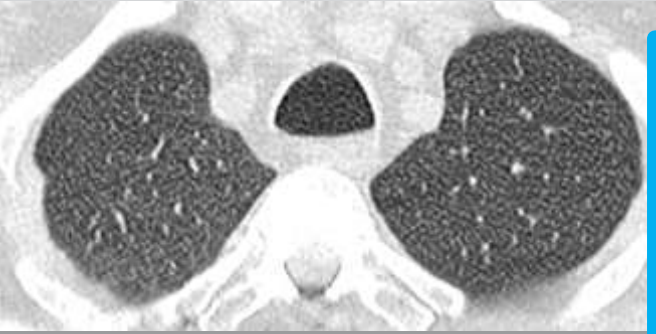
$fsize \times CTDI_{vol}$

Approche plus individuelle
des risques

Coefficient de pondération:
0,017 chez l'homme et 0,020 chez la femme

ATTENTION

Dose insuffisante / Bruit trop élevé

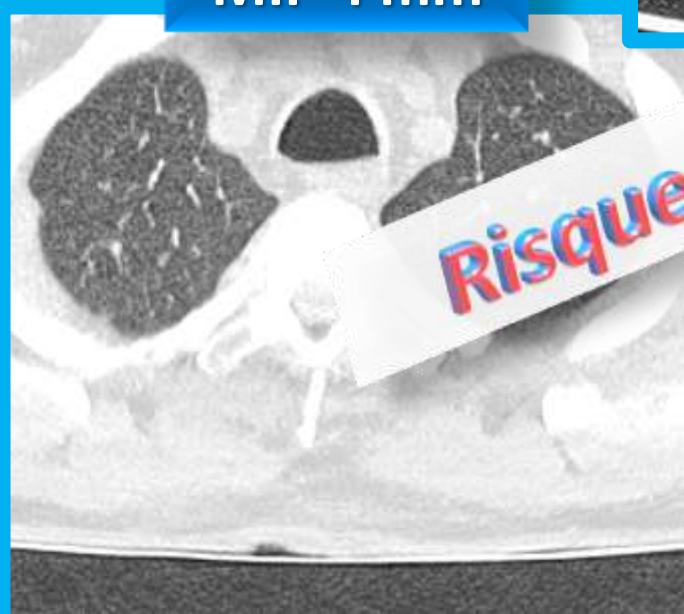


Miliaire tuberculeuse



Risque de sur- ou sous-estimation lésionnelle

MIP 4 mm



Fièvre chez un sujet immunodéprimé ...

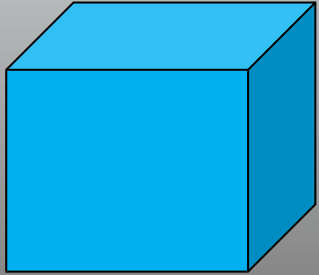
PHS

MIP 4 mm

Perruches à domicile
Contact pigeons 30 mn
Dyspnée progressive

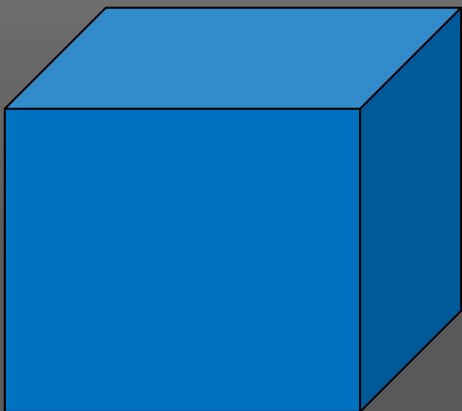
Filtres de reconstruction

Filtre lung



Résolution spatiale
Plus de détails
Plus de bruit

Filtre soft



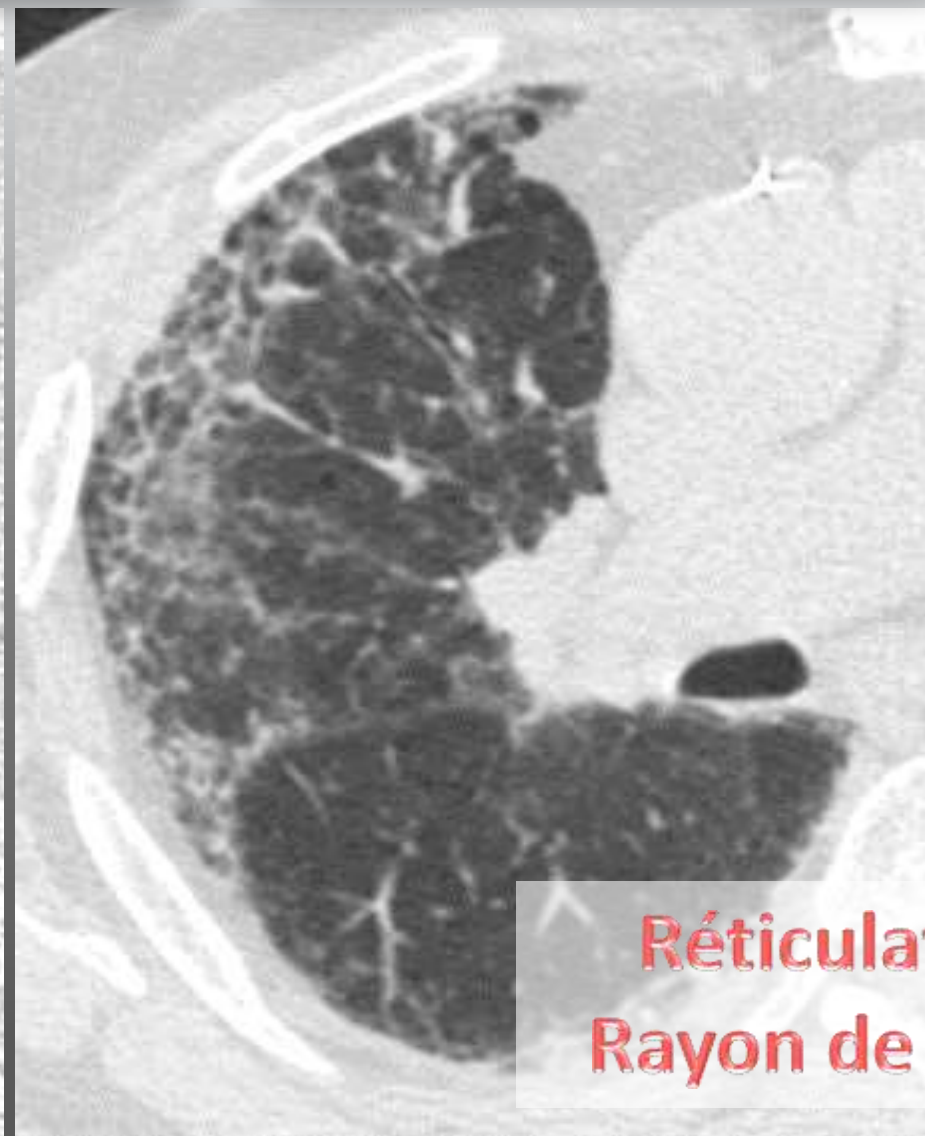
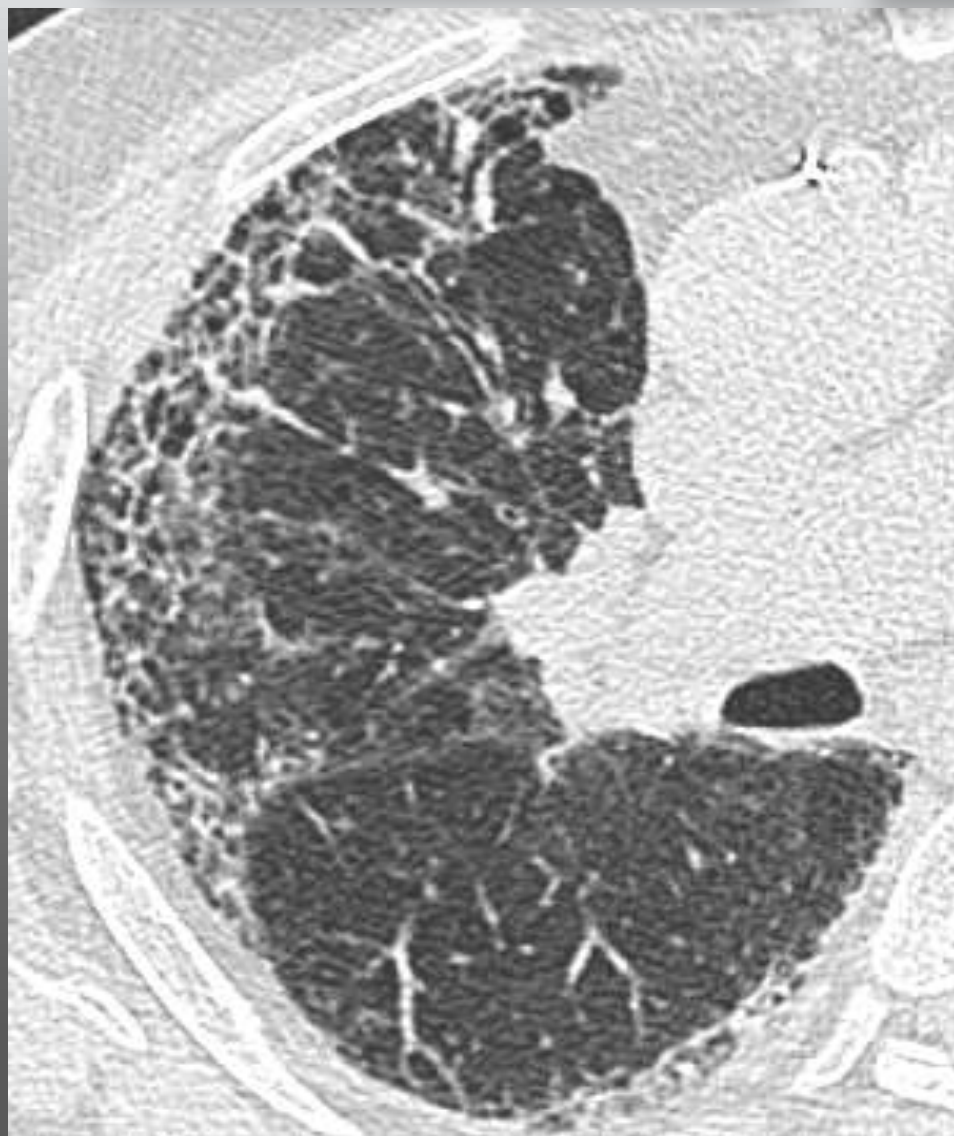
Résolution contraste
Moins de bruit
Moins de détails



Filtre lung 1,4mm

PIC

Filtre soft 1,25 mm



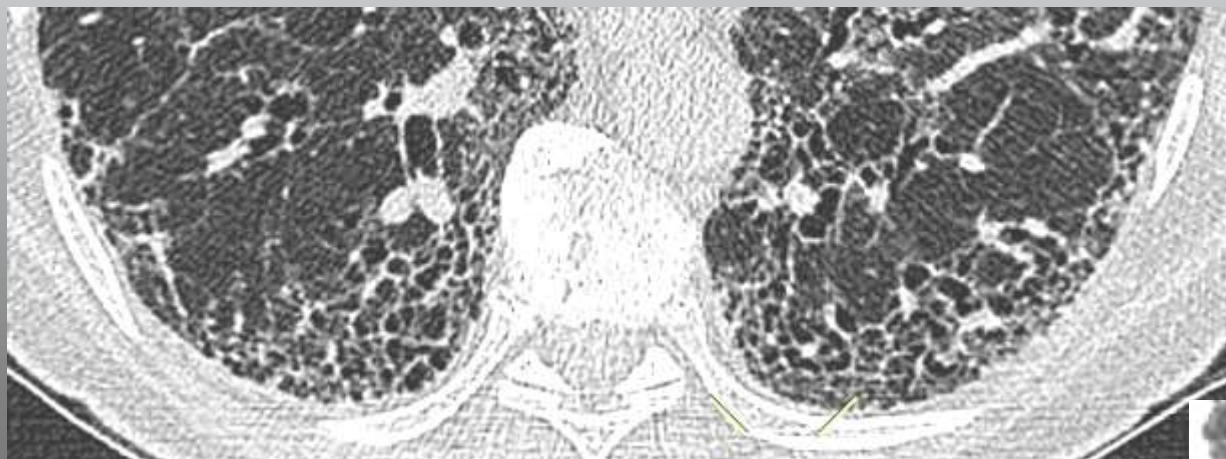
Réticulations
Rayon de miel ?

Perte de résolution spatiale

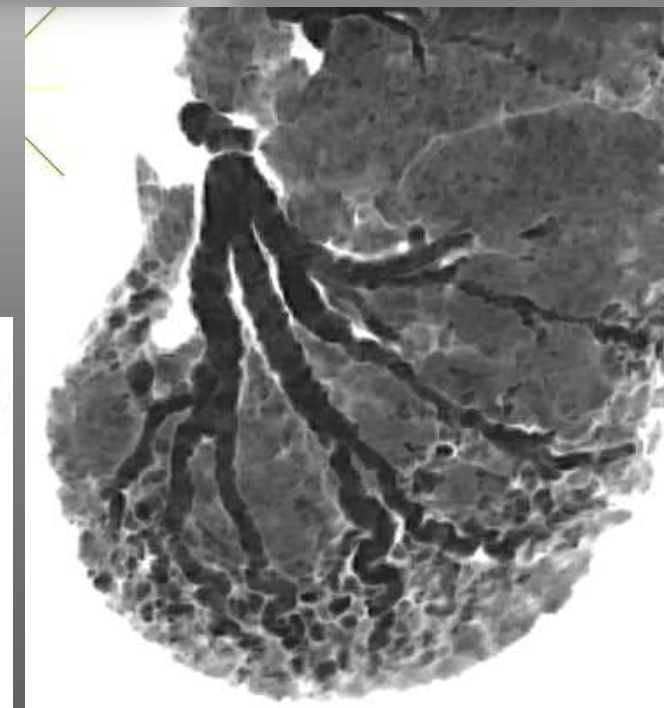
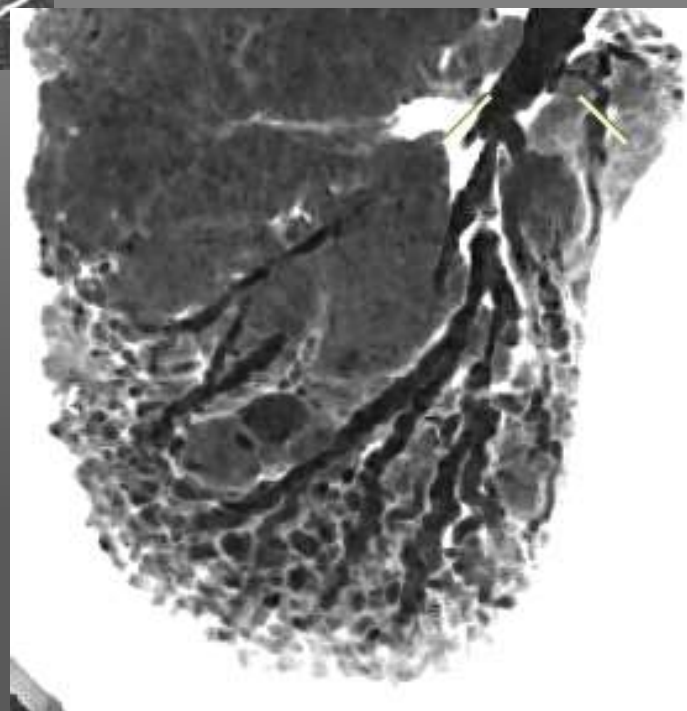
PIC traitée par Pirfenidone

Utilisez les filtres
de reconstruction
adaptés

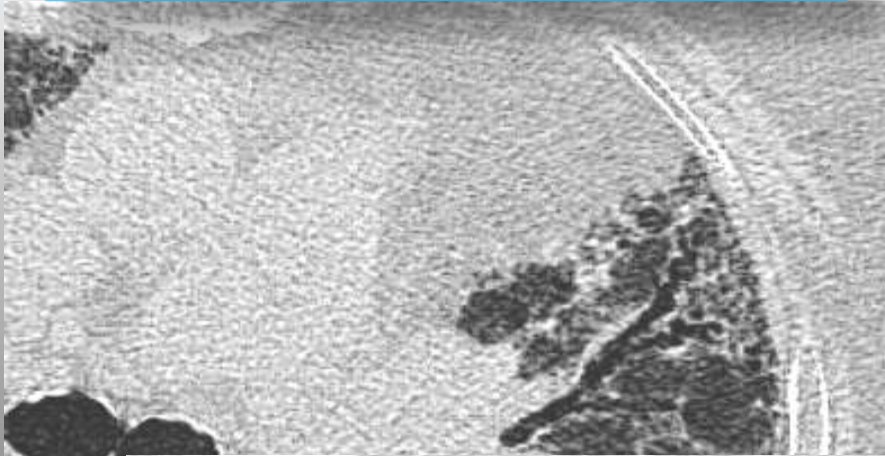
mIP 10 mm
Soft



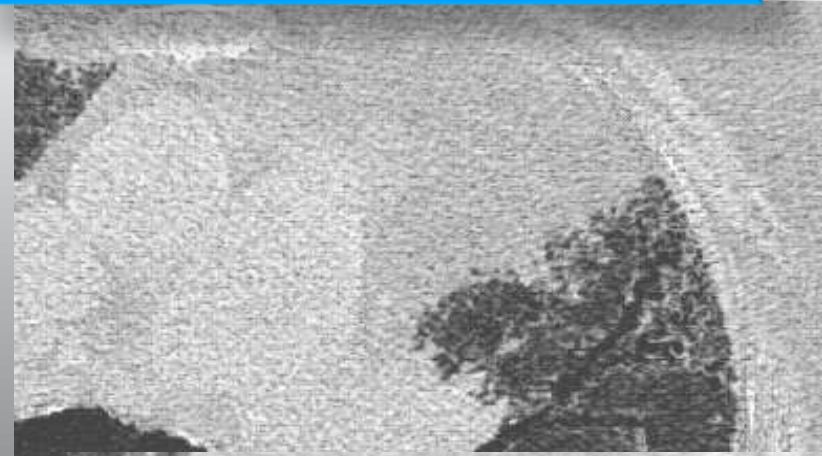
CTDI: ≤ 3
DLP: 102 mGy \times cm



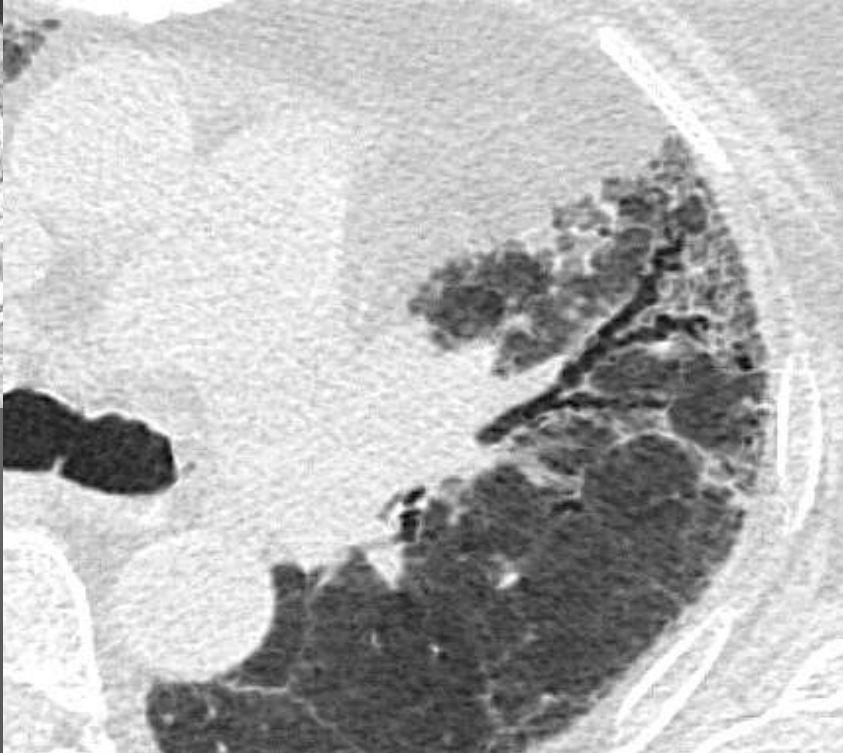
mIP 3,3mm Filtre lung



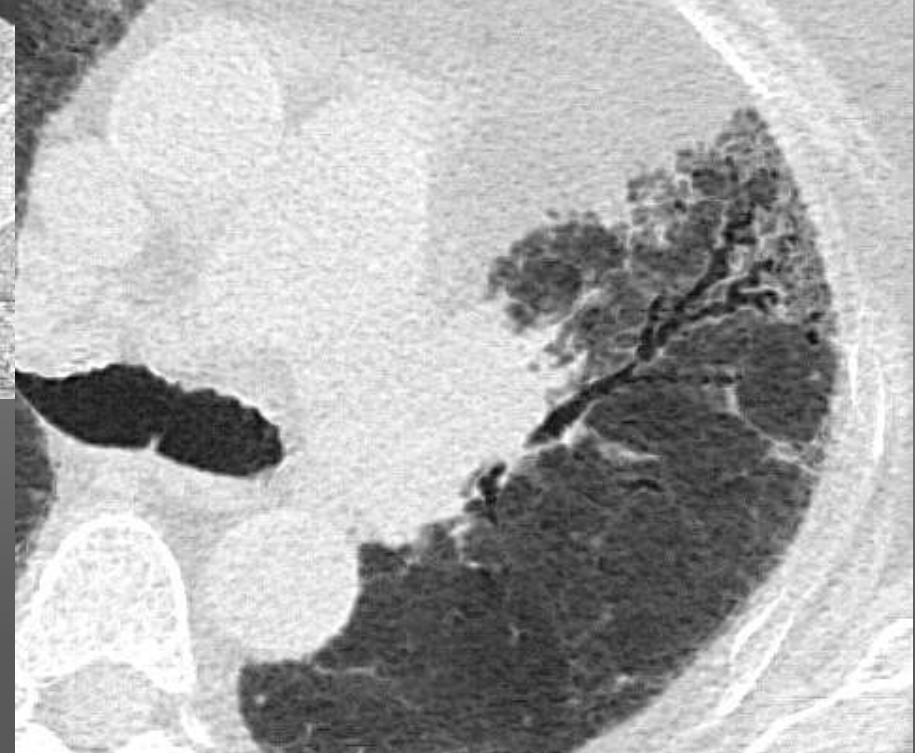
mIP 6,5mm Filtre lung



mIP 3,3mm Filtre soft

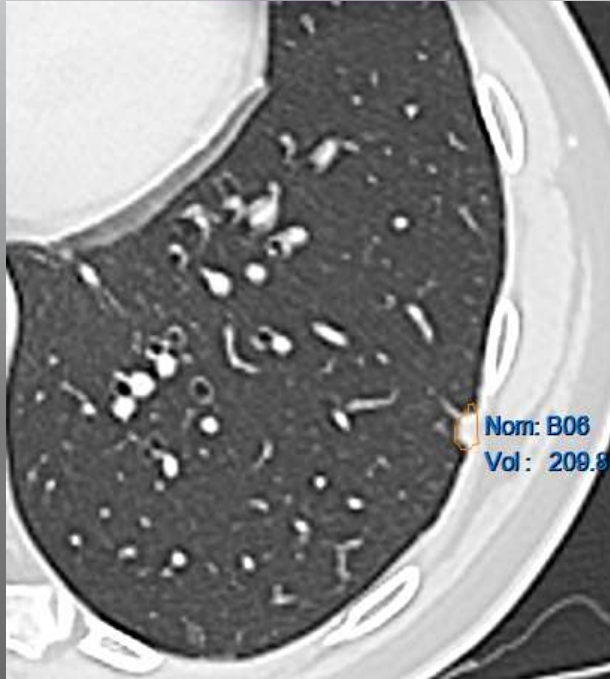


mIP 6,5mm Filtre soft



CONTRÔLE NODULES-INFECTION

10/05/21



10/09/21



CTDI: 0,7-0,9
0,7mSv

Series	Type	Scan Range (mm)	CTDIvol (mGy)	DLP (mGy*cm)	Phantom cm
Scout					
1	Scout	S60-I670	0.04	2.83	Body 32
1	Scout	S60-I670	0.04	2.83	Body 32
GSI THORAX ABDOMEN					
2	Helical	10.989-I684.989	8.62	642.96	Body 32
				Total Exam DLP:	648.62

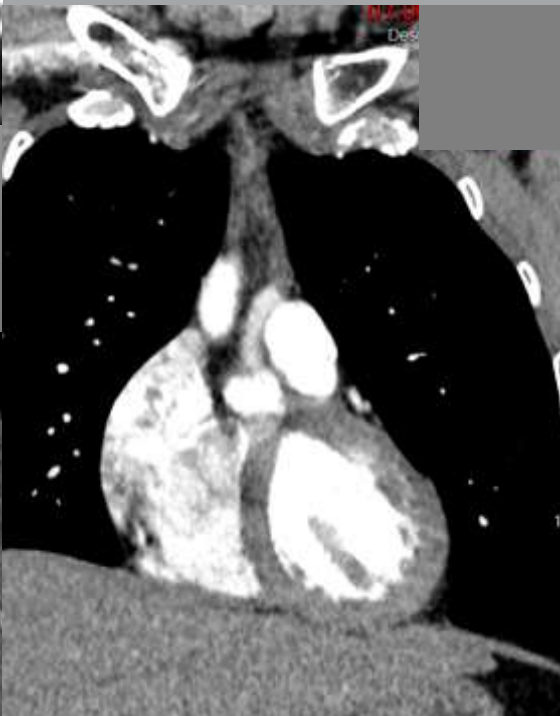
Series	Type	Scan Range (mm)	CTDIvol (mGy)	DLP (mGy*cm)	Phantom cm
Scout					
1	Scout	S60-I280	0.05	1.65	Body 32
1	Scout	S60-I300	0.05	1.73	Body 32
THORAX					
2	Helical	S20.713-I299.286	0.93	35.91	Body 32
				Total Exam DLP:	39.29
1/1					

100 px

100 px



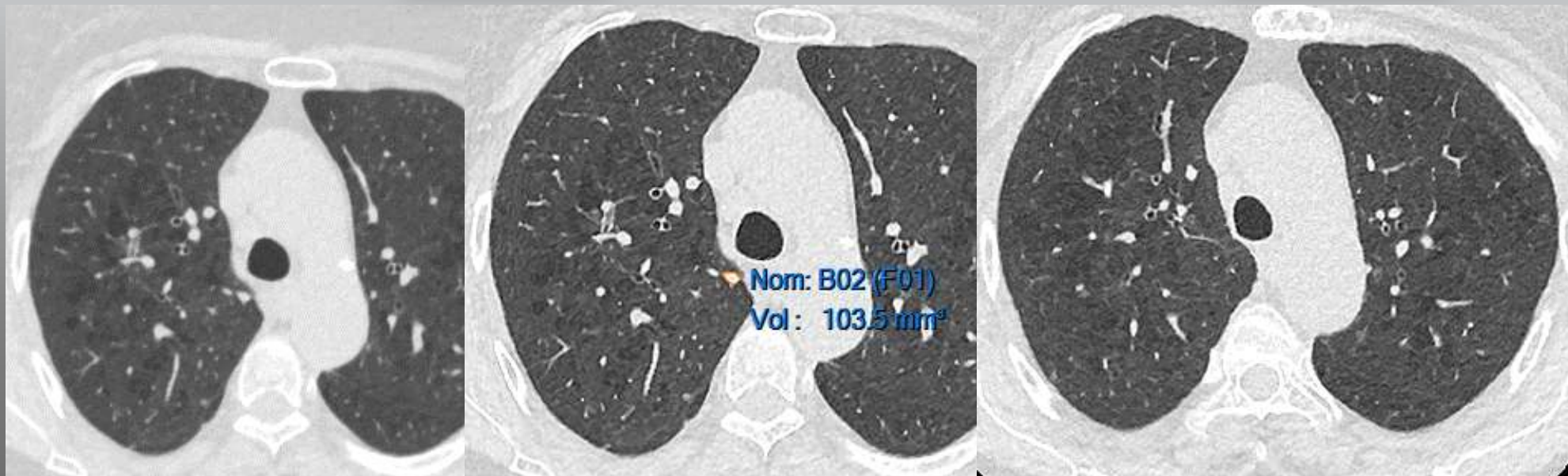
**Tout ne sera pas
analysable!**



Baisse progressive

06/02/20

15/09/21



DIAGNOSTIC CHUV LAUSANNE
9-1>

Dose Report

Desc. série : Dose Rpt
157%
1 x 51.2
Vision

Series	Type	Scan Range (mm)	CTDIvol (mGy)	DLP (mGy*cm)	Phantom (cm)
Scout					
1	Scout	560-1320	0.03	1.08	Body 32
1	Scout	560-1320	0.03	1.08	Body 32
THORAX					
2	Helical	S14.947-1309.053	1.36	52.45	Body 32
				Total Exam DLP:	54.61

Dose Report

Desc. série : Dose Rpt
157%
1 x 51.2
Vision

Series	Type	Scan Range (mm)	CTDIvol (mGy)	DLP (mGy*cm)	Phantom (cm)
Scout					
1	Scout	S60-1280	0.05	1.76	Body 32
1	Scout	S60-1280	0.05	1.76	Body 32
THORAX					
2	Helical	S12.5-1277.5	1.02	35.68	Body 32
				Total Exam DLP:	39.2
1/1					

100

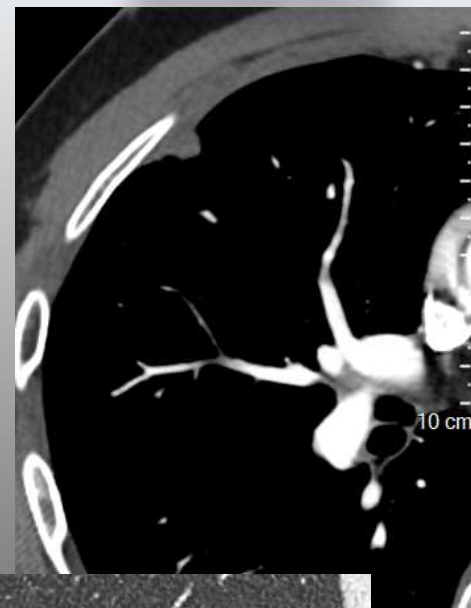
07/08/21



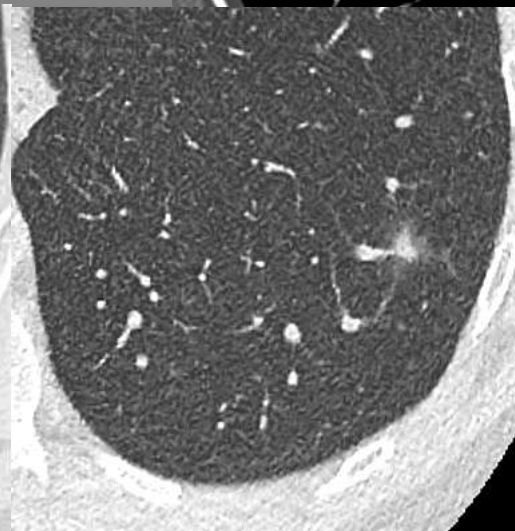
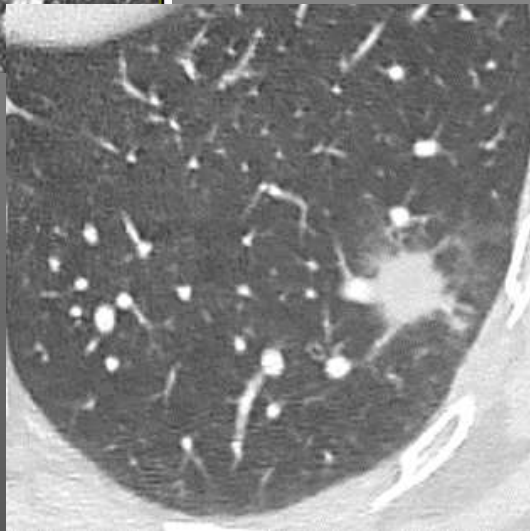
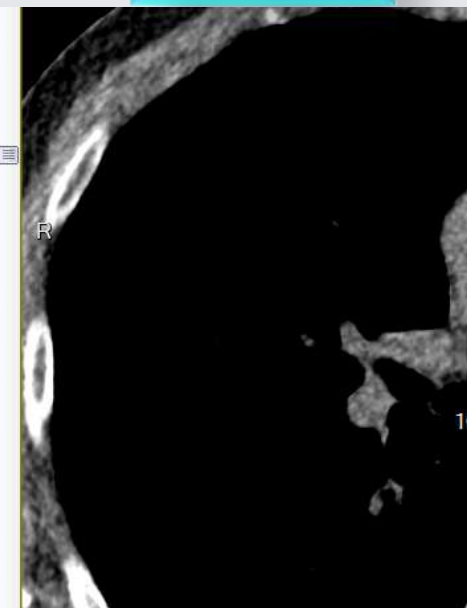
07/09/21



07/08/21



07/09/21



Helical	S7.84-I292.16	8.38	325.32	Body 32
SmartPrep	I112.498-I112.498	1.79	0.90	Body 32
SmartPrep	I112.498-I112.498	18.19	9.09	Body 32
Total Exam DLP:			337.81	

THORAX				
2	Helical	S60.114-I297.886	0.28	12.21
				Body 32
Total Exam DLP:			14.61	

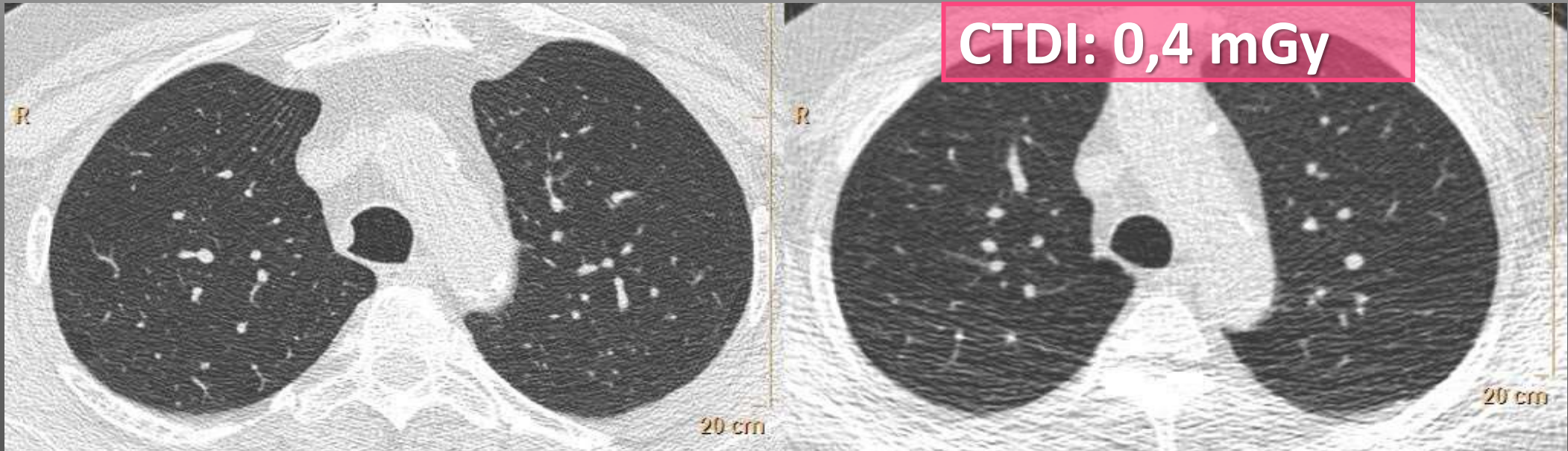
Les plus faibles doses

Acquisition additionnelles
Mucoviscidose

Secrétions endobronchiques

120 kV, 100 mAs 148.0 mm
Z 1.57 SW 1.50 mm

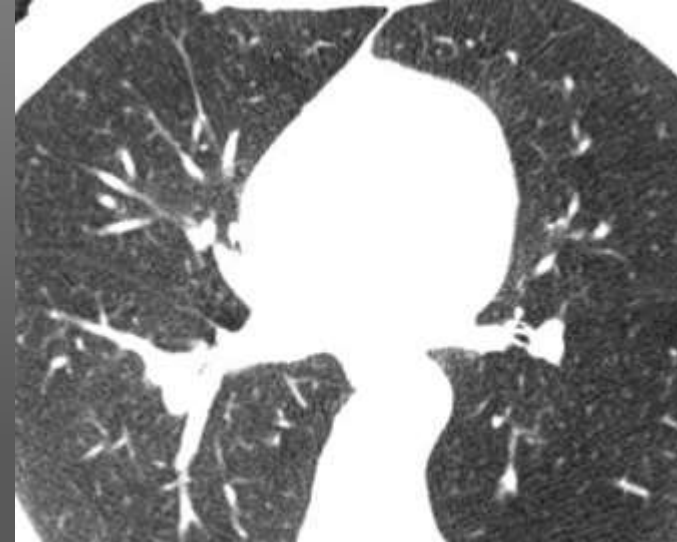
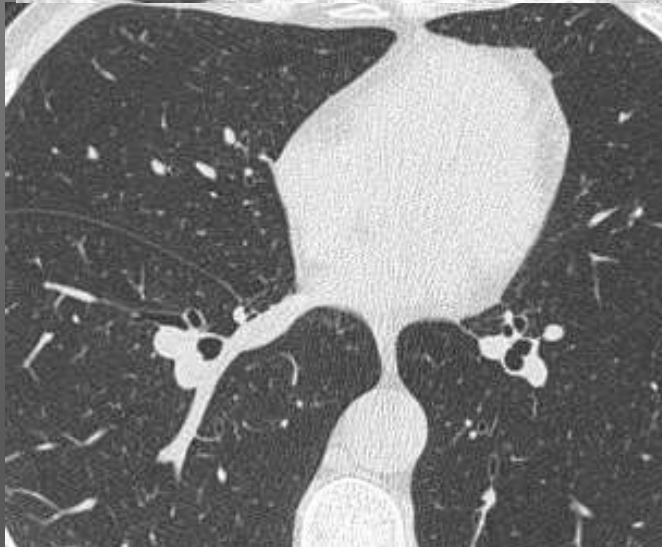
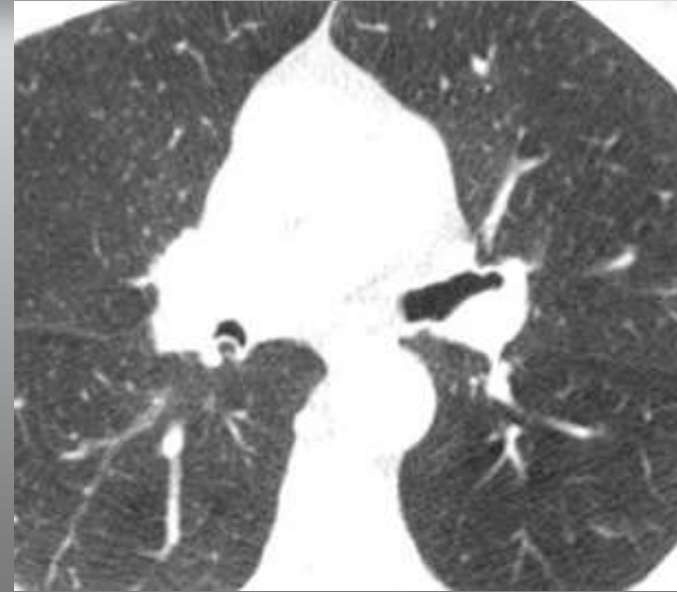
100 kV, 10 mAs
Z 1.30



120 kV, 100 mAs ...

100 kV, 10 mAs ...

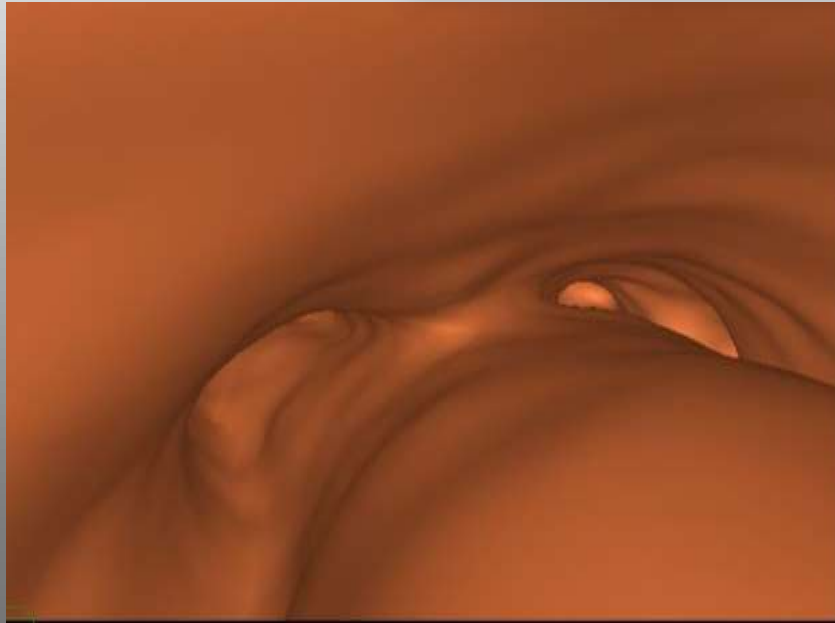
Trachéobronchomalacie



75 mAs

15 mAs

Trachéobronchomalacie



11 mAs

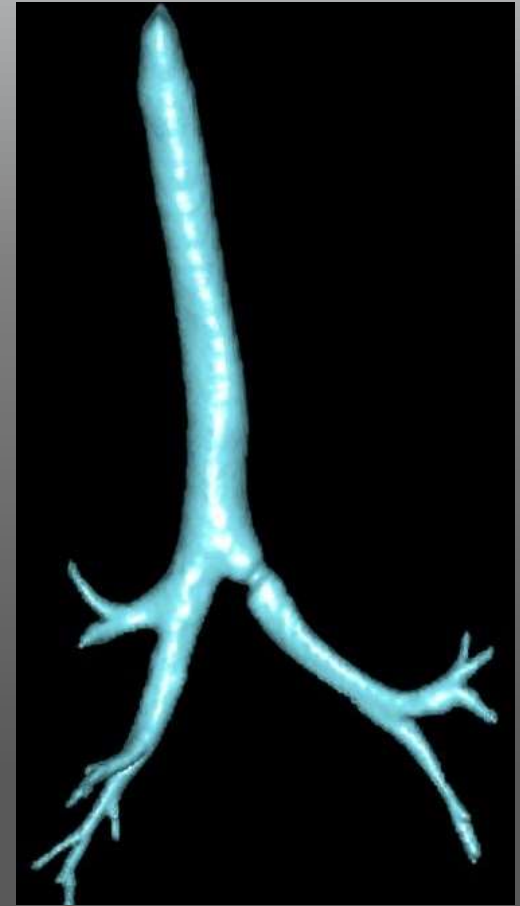
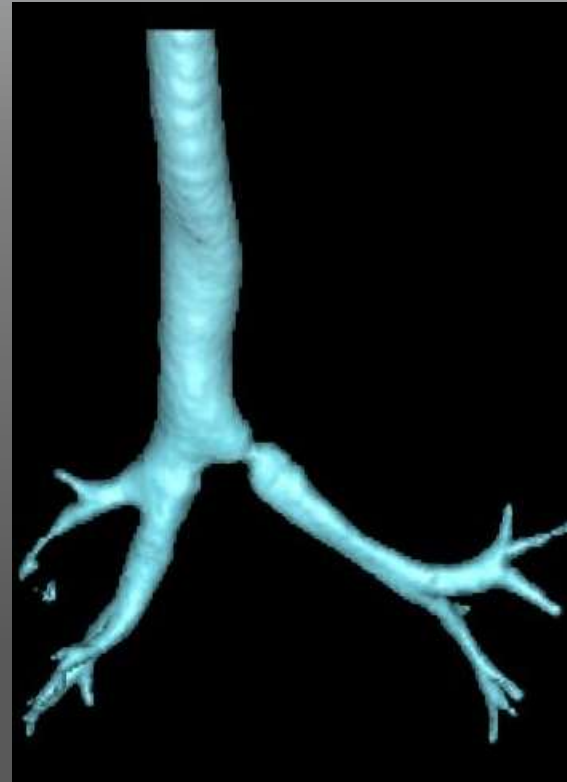
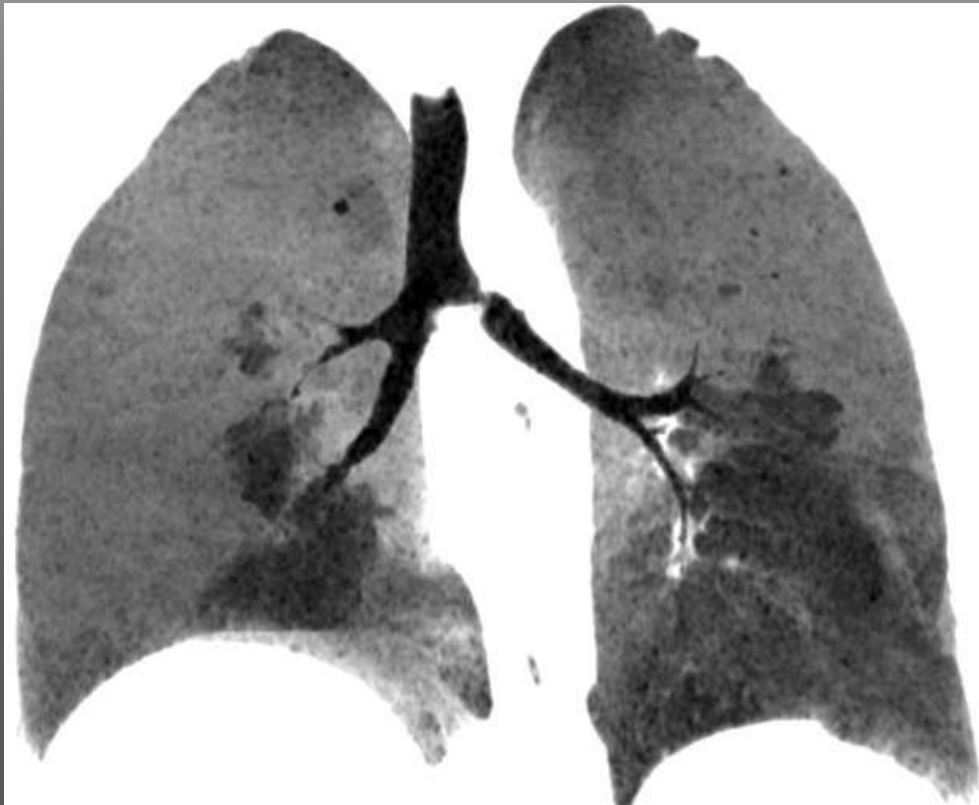
Endoscopie virtuelle et extraction
3D possibles





Piégeage expiratoire

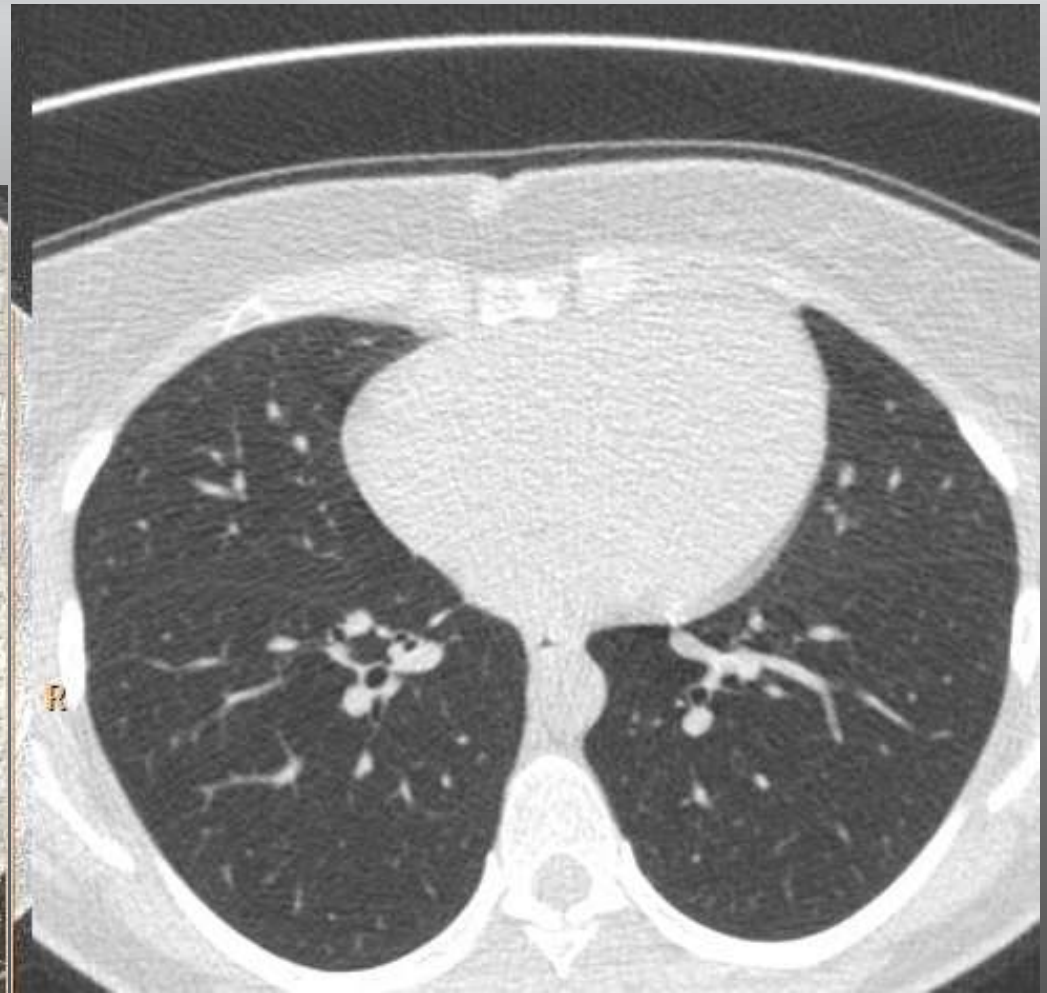
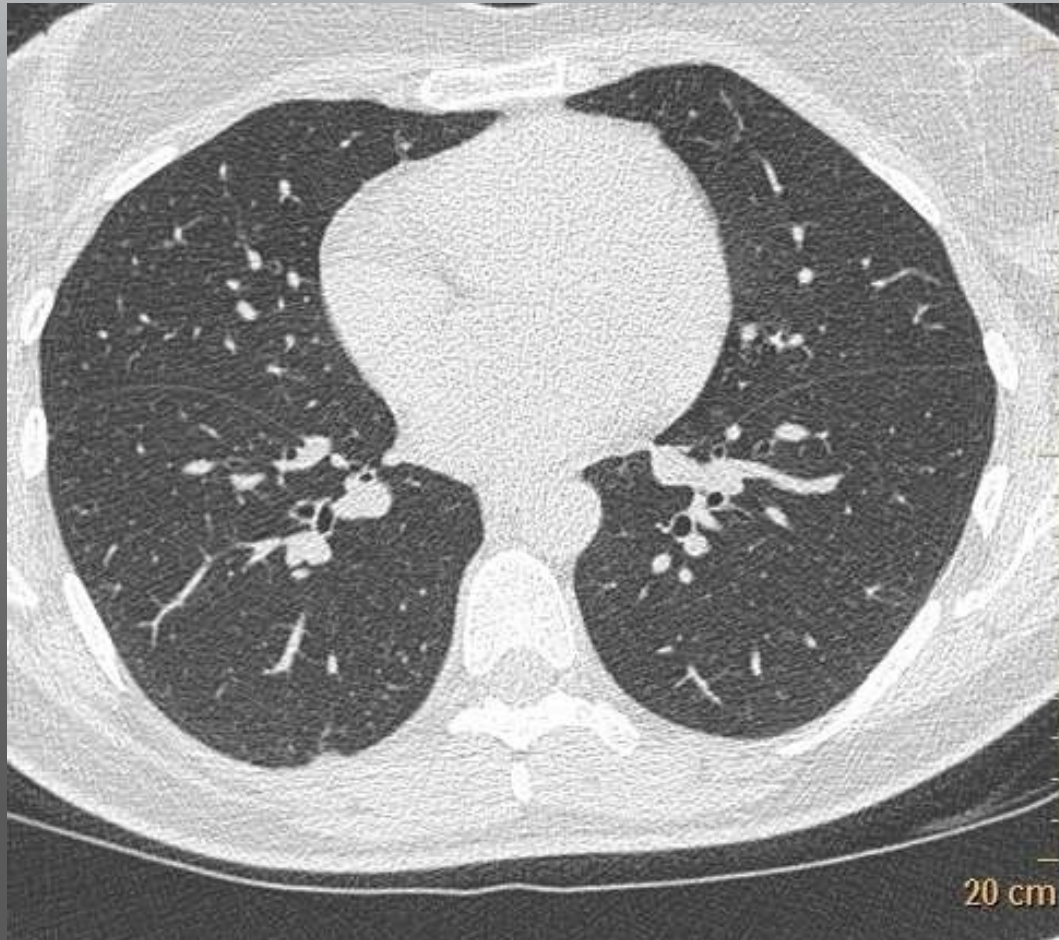
Inspiration Dose N



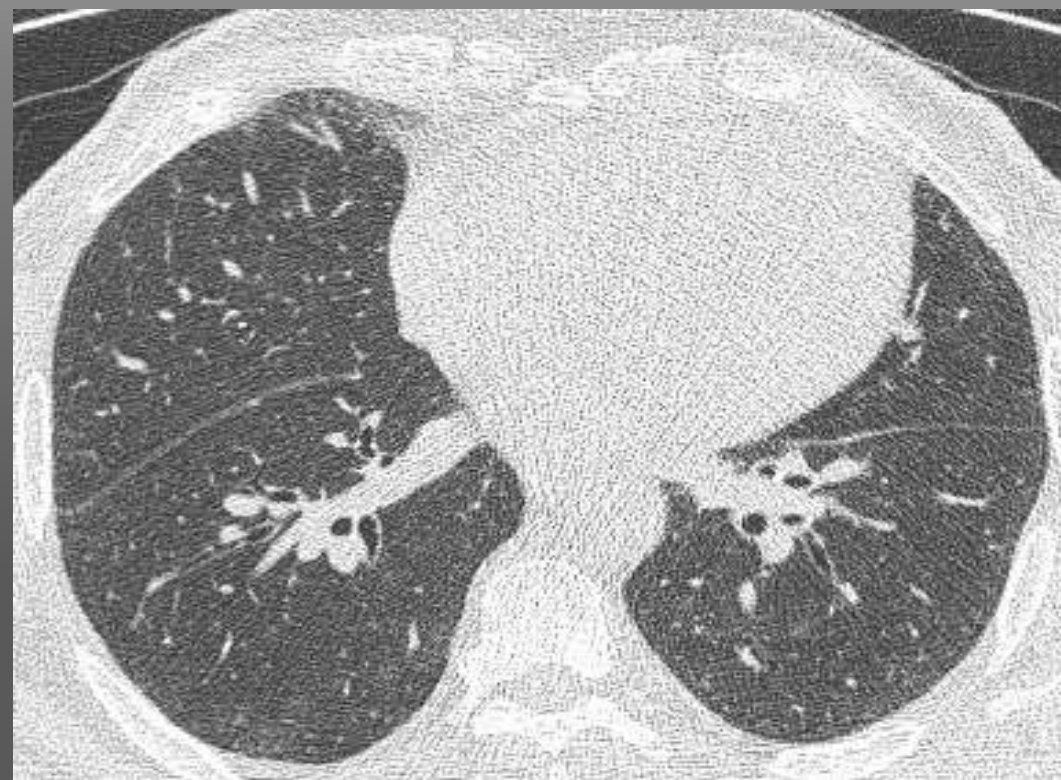
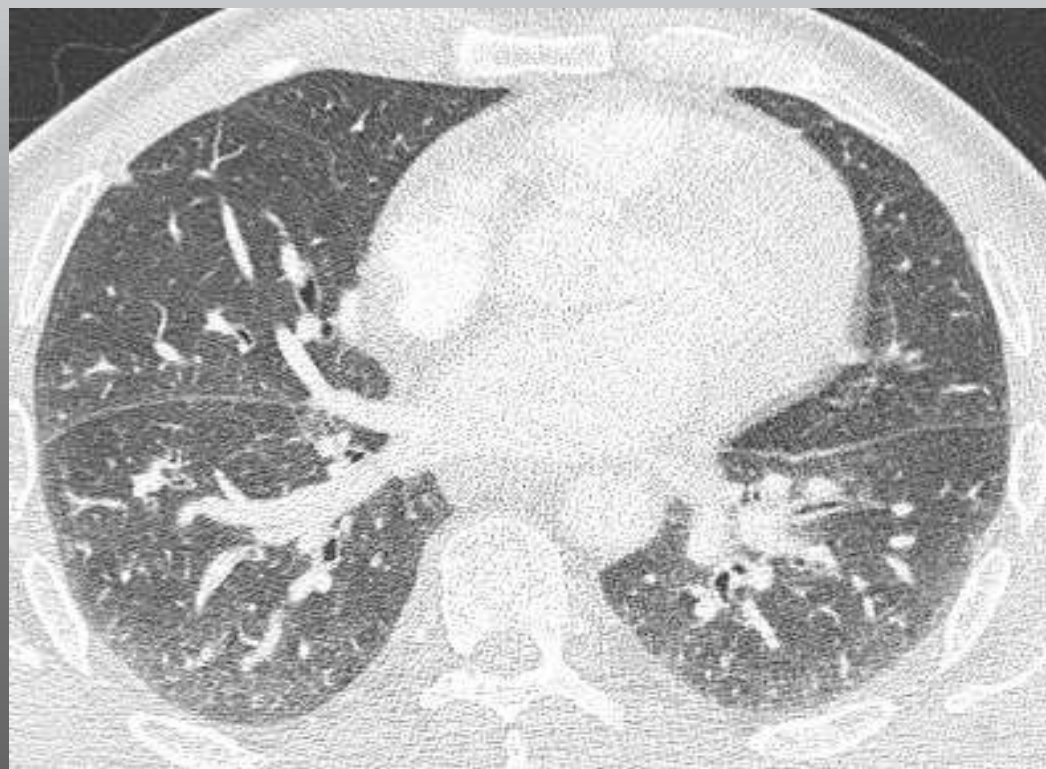
Pseudo-plaques pleurales

120 kV, 11 mAs

120 kV, 60 mAs

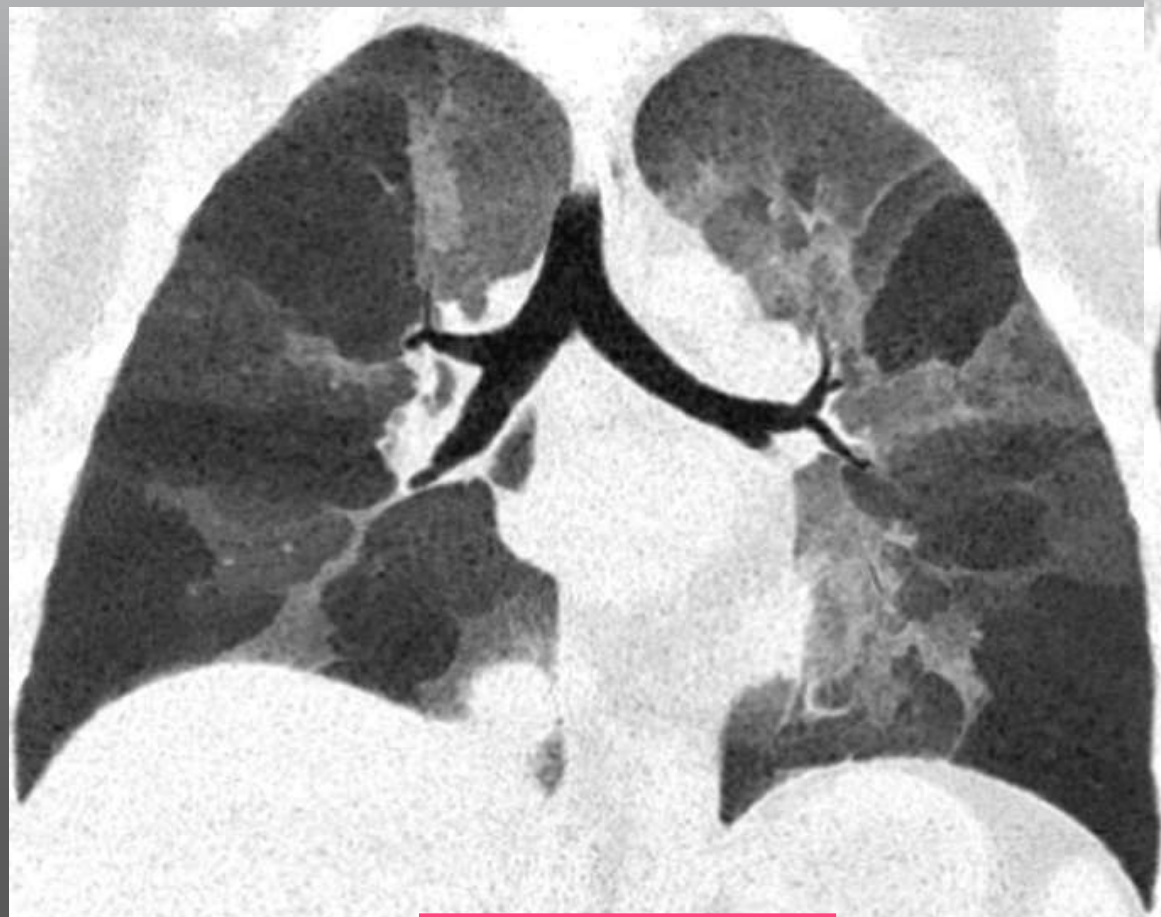


Verre dépoli dépendant anorganique

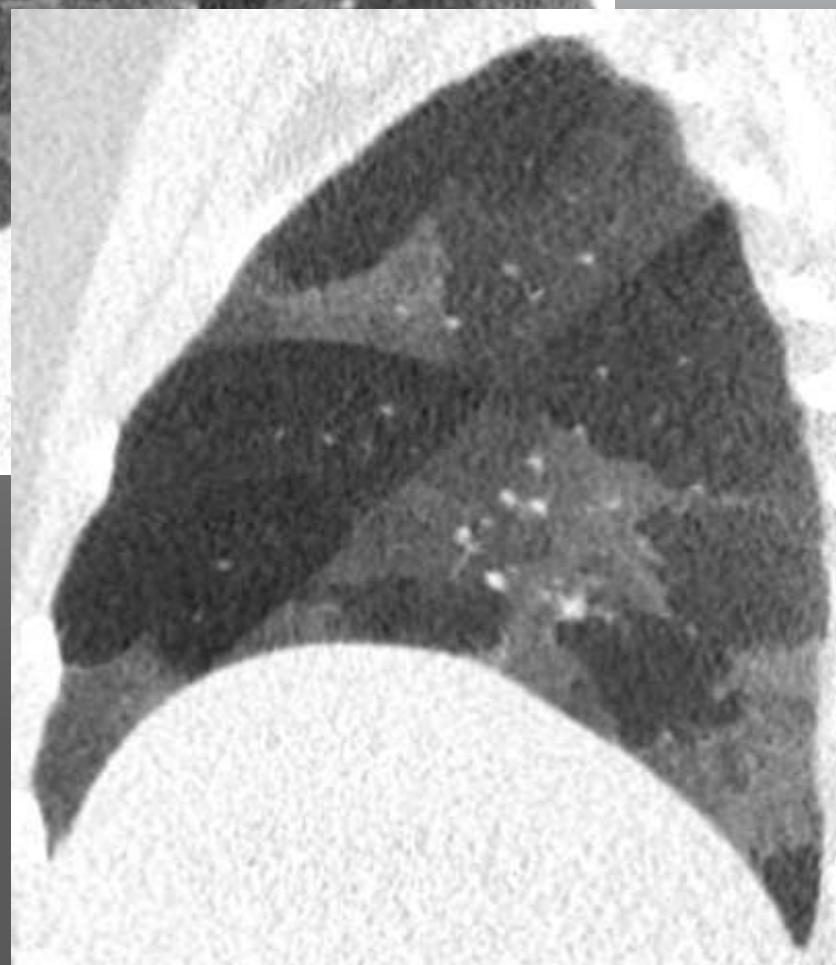
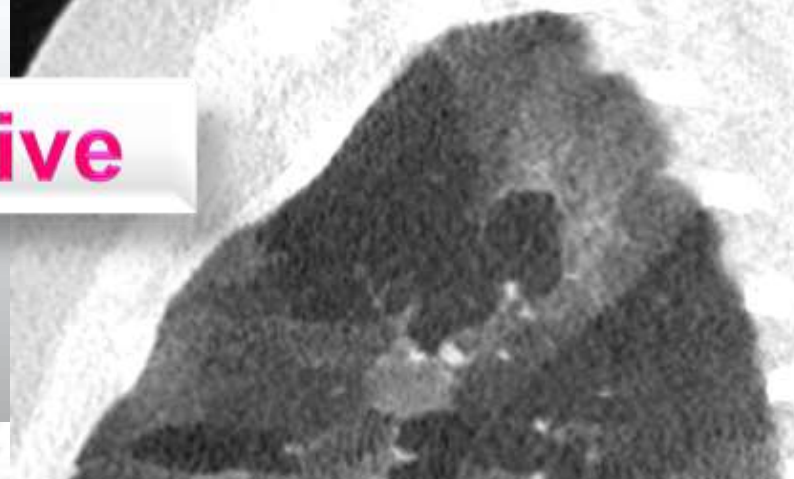


Bronchiolite constrictive

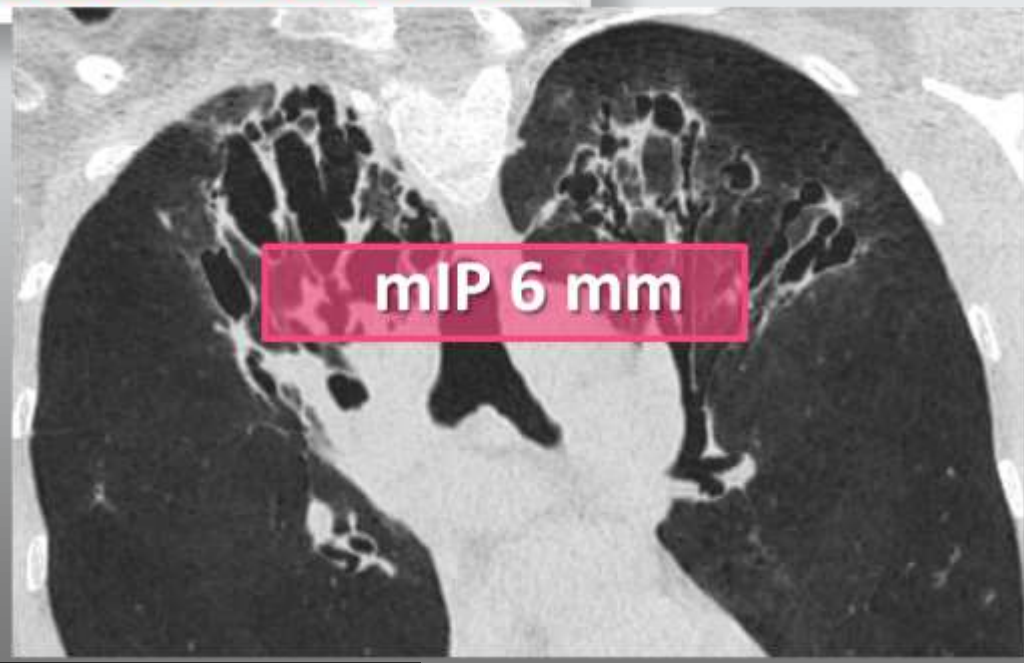
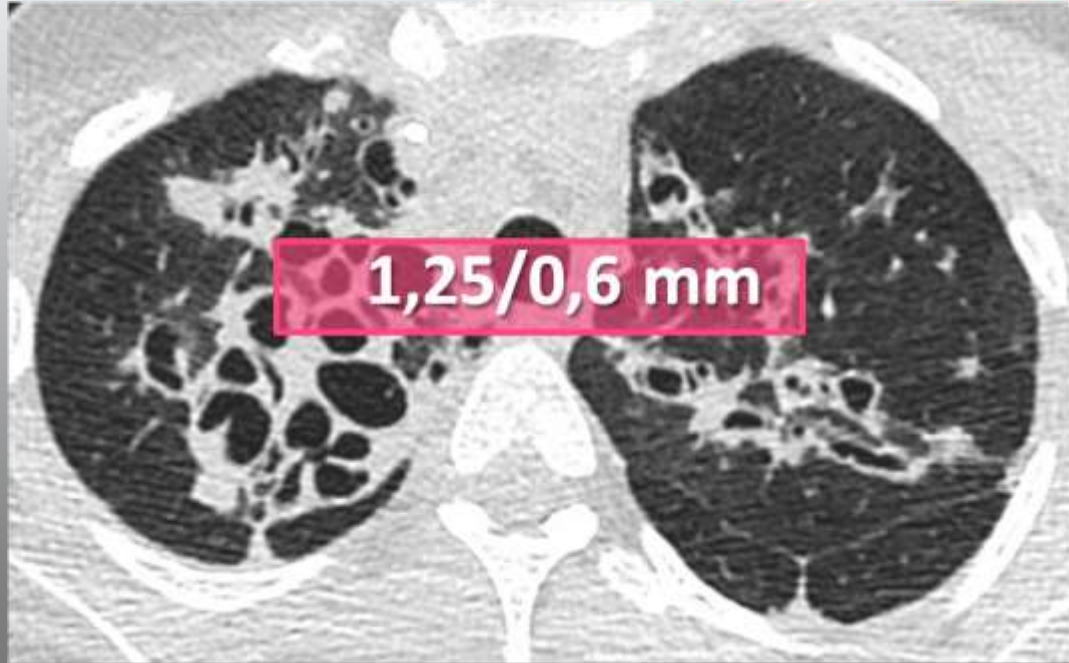
Expiration



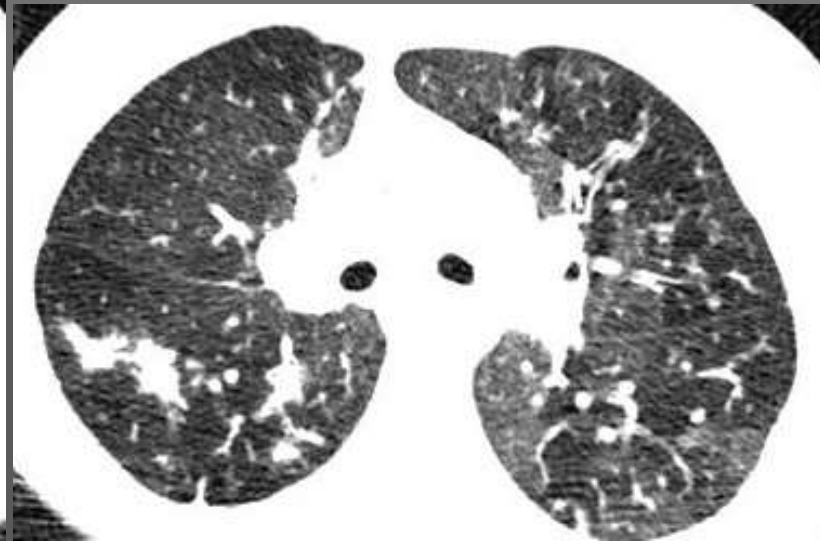
15 mAs



Mucoviscidose 18 ans



LightSpeed 8 barettes



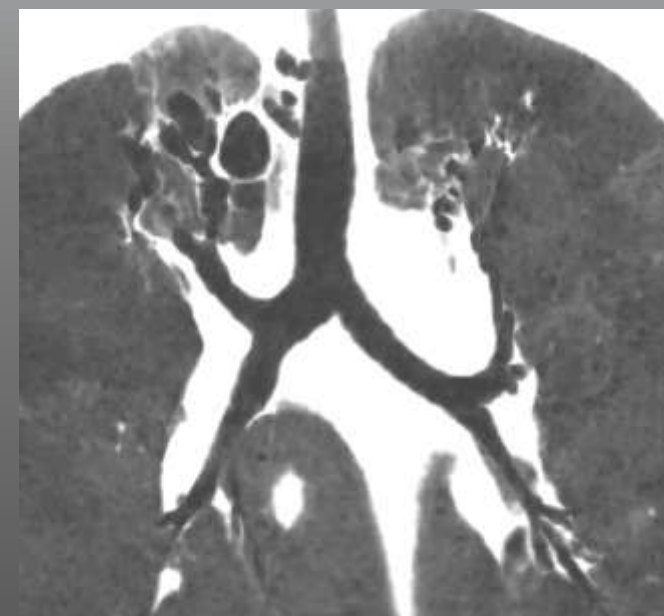
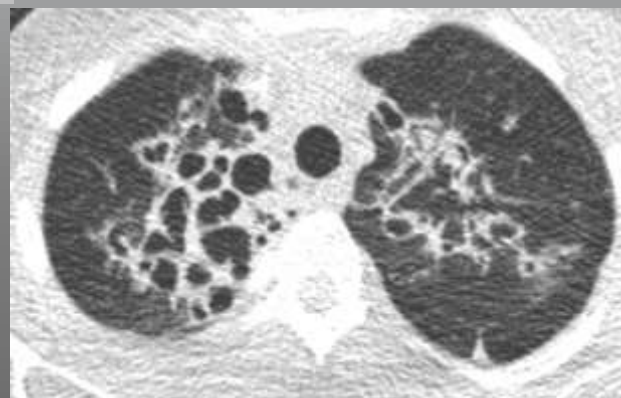
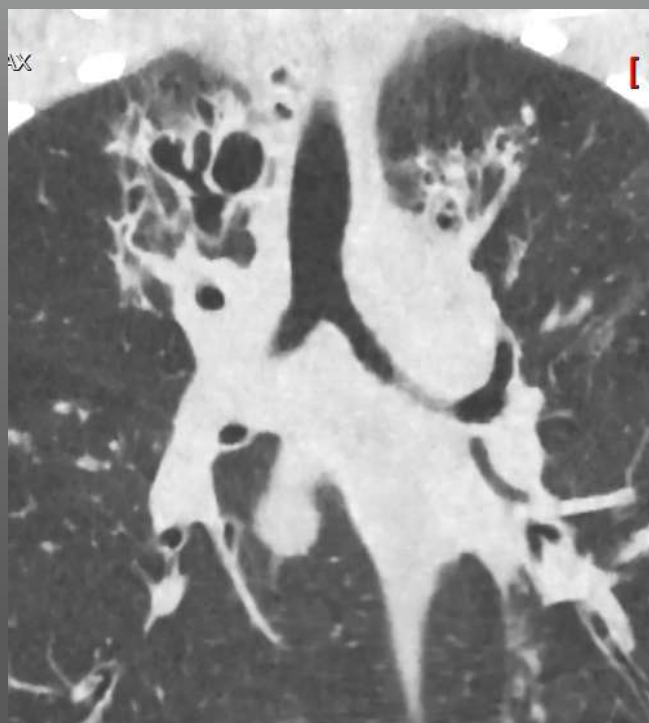
5.750	0.66	24.13
1.750	0.33	11.27
Total Exam DLP:		35.40

REGLE POUR MUCOVISCIDOSE HORS HEMOPTYSIE

0,05 mSv

RX thorax face:
0,02 -0,299 mSv

Qualité d'image
Compromis selon le détail



ies	Type	Scan Range (mm)	CTDIvol (mGy)	DLP (mGy-cm)	Phantom cm
L	Scout	-	-	-	-
2	Scout	-	-	-	-
3	Helical	553.750-1252.850	0.11	4.14	Body 32
Total Exam DLP:				4.14	

Détection, sévérité, extension DDB, nb de générations ...

Ernst et al Radiology 2014: 273: 597
Nick et al Clin Chest Med 2016 : 37-47

CONCLUSION

Merci pour votre attention!