COVID & sequelles respiratoires

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Cas 1: patient 66 ans

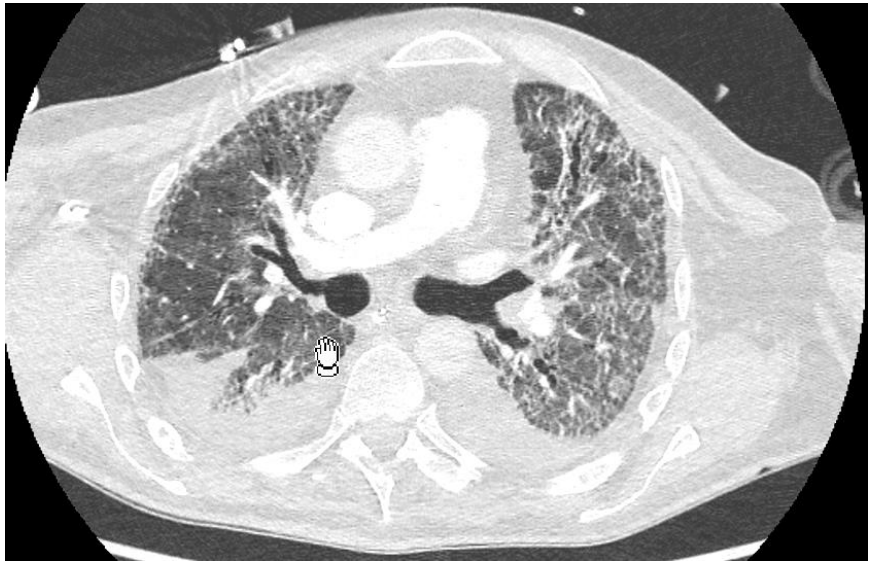
1. **Pneumonie SARS-CoV-2 avec SDRA sévère 28.03.2020**
   - Intubation 03.04. - 06.05.20 (trachéostomie)
   - Ventilation en décubitus ventral 04. - 12.04.20
   - ECMO v-v 12.04. -15.05.20

2. **Fibrose pulmonaire secondaire**

3. **Pneumonie nosocomiale (pathogène inconnu) 02.04.2020**

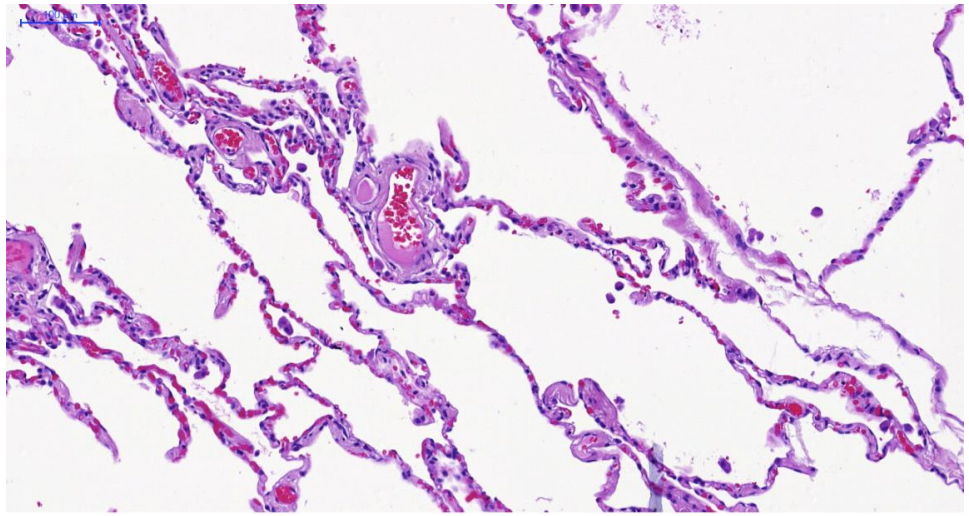
4. **Embolie pulmonaire bilatérale 05.04.2020**

Cas 1: patient de 66 ans

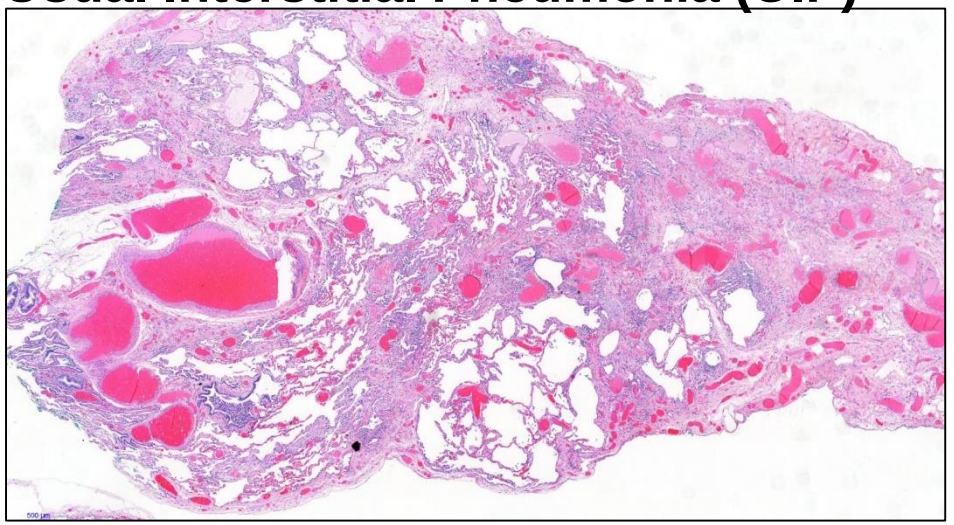


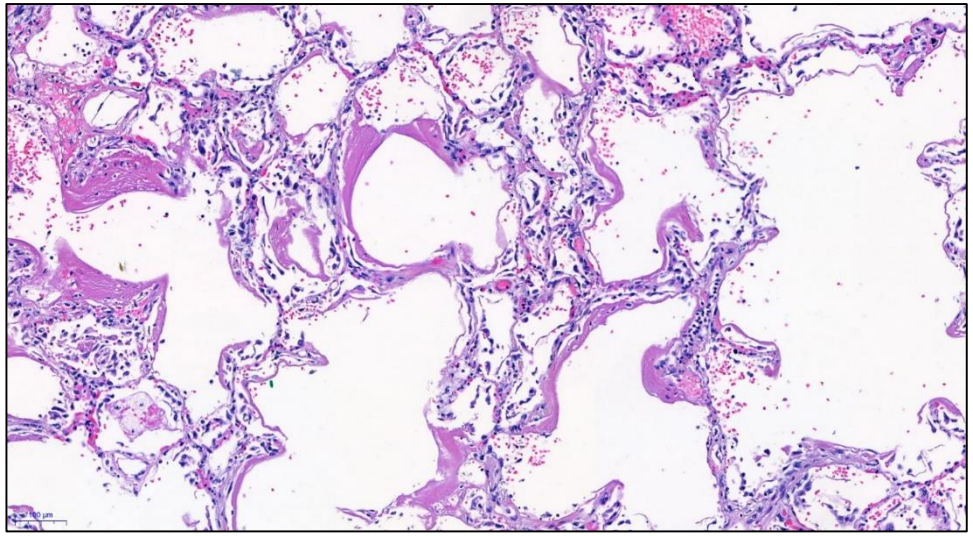
Pneumopathies interstitielles après COVID

Normal

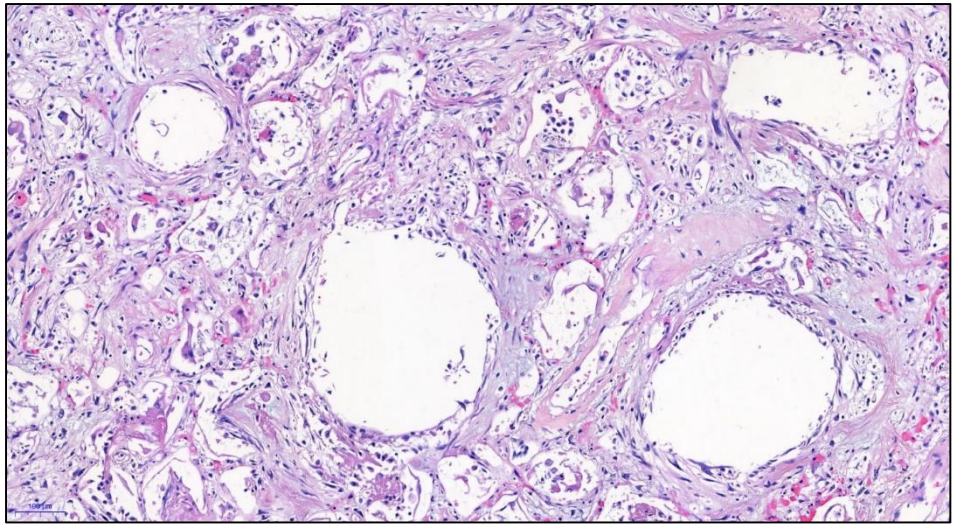


Usual Interstitial Pneumonia (UIP)





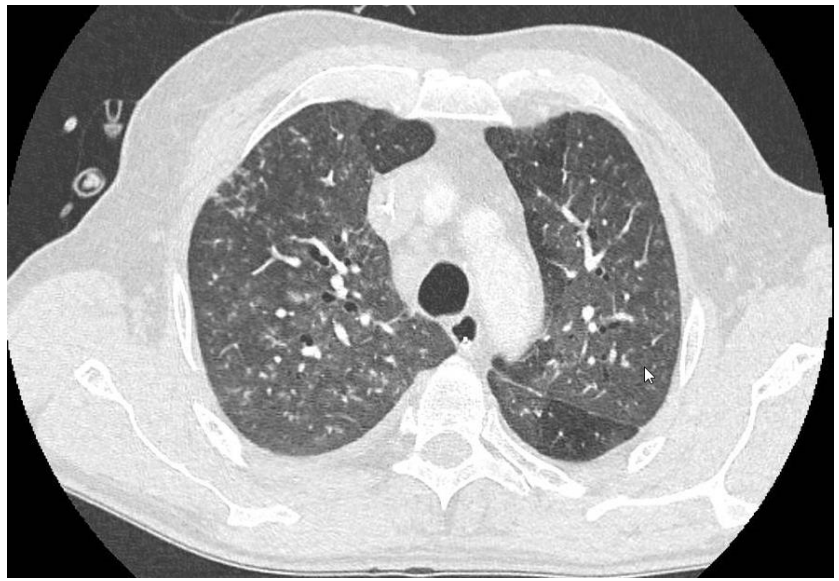
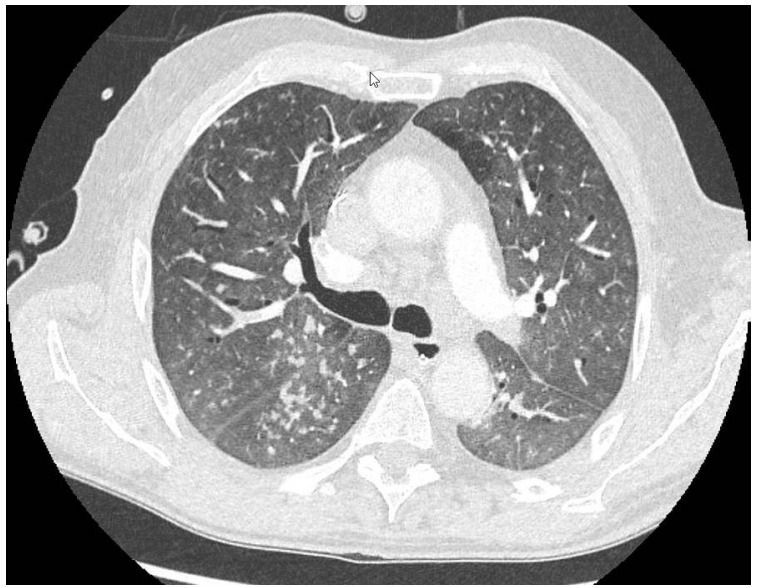
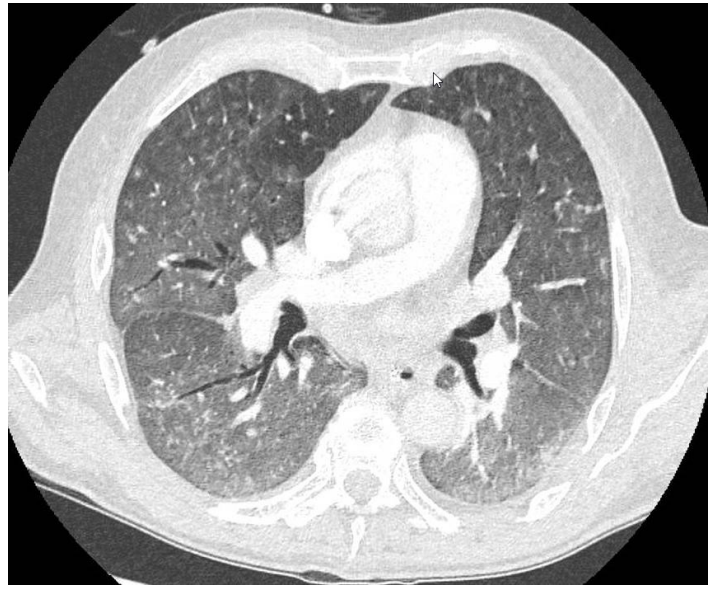
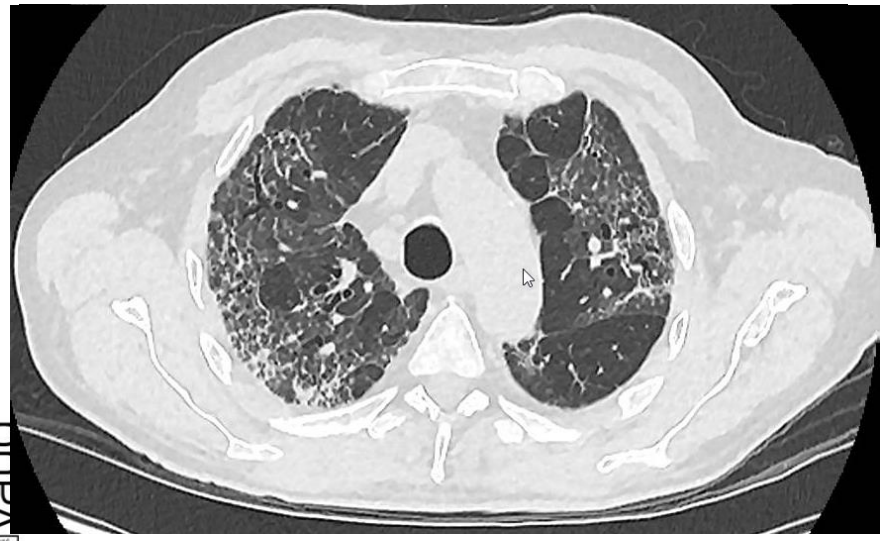
Acute diffuse alveolar damage (DAD)



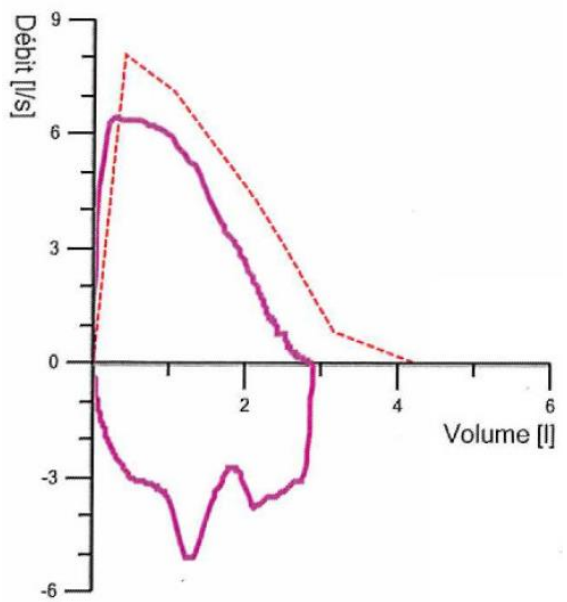
Proliferative DAD

Courtesy D. Berezowska, CHUV

Cas 2: patient 60 ans (03 → 04 → 07/2020)

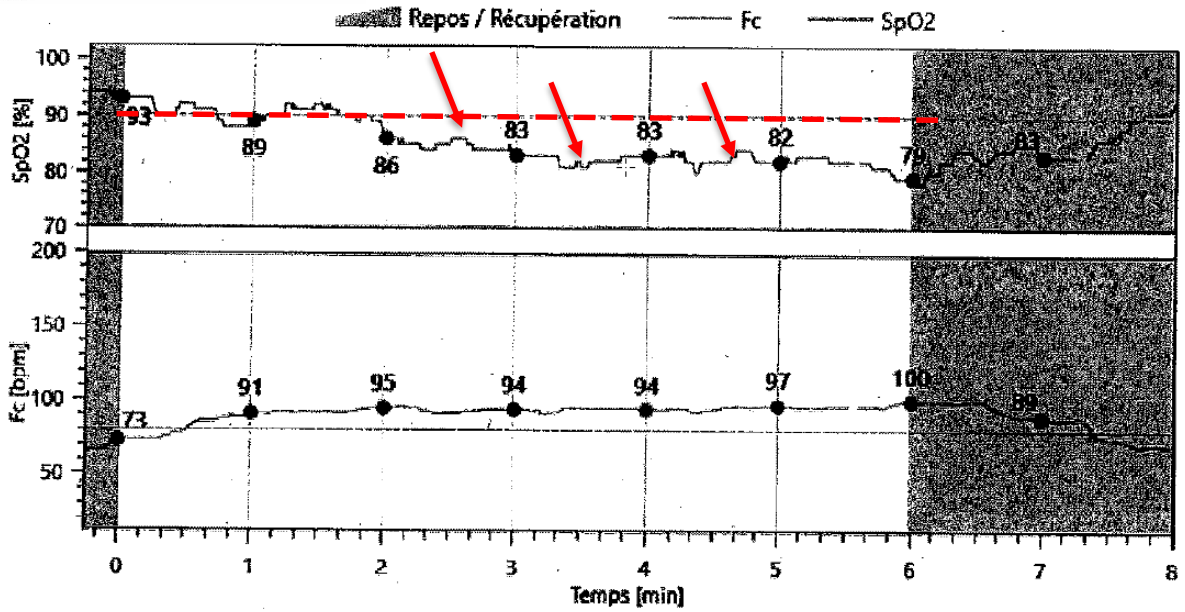





Cas 2: patient 60 ans (03 → 04/2020)



	Unité		Théor.	LLN	Pre	%Pred.
CVL	l	(1)	4.13 (1)	3.21	2.93	71%
CVLin	l	(1)	4.13 (1)	3.21	2.93	71%
CI	l	(3)	3.27 (3)		1.61	49%
CPT	l	(1)	6.66 (1)	5.51	3.62	54%
CRF PL	l	(1)	3.48 (1)	2.49	2.02	58%
VR	l	(1)	2.37 (1)	1.70	0.69	29%
VR/CPT	%	(1)	37 (1)	28	19	51%
VEMS	l	(35)	3.30 (35)	2.48	2.62	79%
CVF	l	(35)	4.25 (35)	3.23	2.88	68%
VEMS/CVF	%	(35)	78 (35)	66	91	117%
FEV1/SVC	%	(1)	76 (1)	64	89	117%
DEM25-75	l/s	(35)	2.77 (35)	1.34	4.00	144%

	Unité		Théor.	LLN	Pre	%Pred.
DLCO	mmol/kPa/min	(1)	9.06 (1)	6.75	3.93	43%
DLCO (Hb)	mmol/kPa/min	(1)	9.06 (1)	6.75	4.10	45%
Kco	mmol/kPa/min/l	(1)	1.36 (1)	0.92	1.08	80%
Kco (Hb)	mmol/kPa/min/l	(1)	1.36 (1)	0.92	1.13	83%
VA	l	(1)	6.51 (1)		3.63	56%
CVI	l	(1)	4.13 (1)	3.21	2.90	70%



EUROPEAN RESPIRATORY *journal*

FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Early View

Original article

Pulmonary function and radiological features four months after COVID-19: first results from the national prospective observational Swiss COVID-19 lung study

Sabina A. Guler, Lukas Ebner, Catherine Beigelman, Pierre-Olivier Bridevaux, Martin Brutsche, Christian Clarenbach, Christian Garzoni, Thomas K. Geiser, Alexandra Lenoir, Marco Mancinetti, Bruno Naccini, Sebastian R. Ott, Lise Piquilloud, Maura Prella, Yok-Ai Que, Paula M. Soccal, Christophe von Garnier, Manuela Funke-Chambour

Please cite this article as: Guler SA, Ebner L, Beigelman C, *et al*. Pulmonary function and radiological features four months after COVID-19: first results from the national prospective observational Swiss COVID-19 lung study. *Eur Respir J* 2021; in press (https://doi.org/10.1183/13993003.03690-2020).

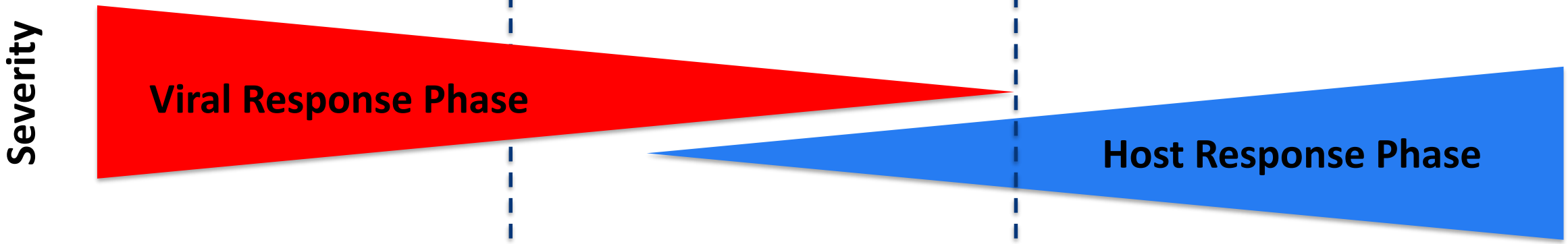
Etude prospective observationnelle
113 survivants COVID-19 après 4 mois
- léger / modéré (47)
- sévère / critique (66)

- capacité de diffusion↓
- tolérance à l'effort↓
- hypoxémie
- restriction (post ventilation invasive)
- altérations radiologiques (CT)
(atteinte des petites voies aériennes)

Eur Respir J 2021; in press (https://doi.org/10.1183/13993003.03690-2020)

Eur Respir J 2021; in press (https://doi.org/10.1183/13993003.03690-2020)

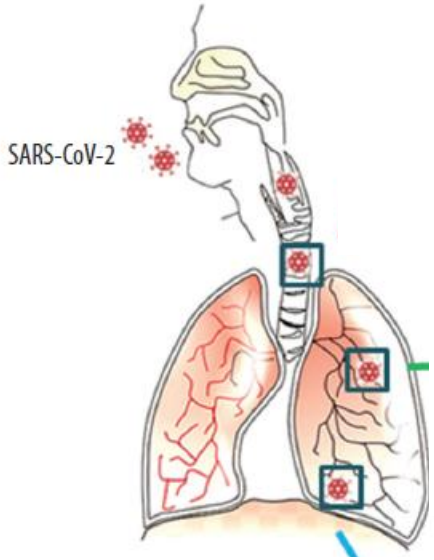
COVID-19 Phases et Traitements



	Stage 1 Early infection	Stage 2 Pulmonary	Stage 3 Hyperinflammatory
Clinical Symptoms	Fatigue Fever Dry cough	Dyspnoea Hypoxia	ARDS Septic shock Cardiac failure
Clinical Signs	Lymphopenia	Radiological infiltrates Raised liver enzymes	Inflammatory markers Cardiac markers
Therapy		Remdesevir	Oxygen, Anticoagulation Dexamethasone Tocilizumab ? Anakinra?

Modified from Saddiqi HK et al. J Heart Lung Transpl, Vol 39, No 5, May 2020

Séquelles pulmonaires post-COVID: Origine?



Wang F. et al. Med Sci Monit, 2020; 26: e928996

Fibrose pulmonaire post-COVID?

- **SARS-CoV (2003): 62% pulmonary fibrosis (CT)**

  Antonio GE, et al. Radiology 2003; 228: 810–15.

- **MERS (2011): 33% radiographic evidence pulmonary fibrosis**

  Das KM, et al. Indian J Radiol Imaging 2017; 27: 342–49.

- **COVID-19 post-ARDS 8/8 patients lung fibrotic changes (cryobiopsies)**

  Grillo F, et al. Lancet Infect Dis July 28, 2020 https://doi.org/10.1016/S1473-3099(20)30582-X

- **COVID-19 post-ARDS patients in 38/38 DAD**

  Carsana L, et al. Lancet Infect Dis 2020 June 8, 2020 https://doi.org/10.1016/S1473-3099(20)30434-5

Post-COVID-19 pulmonary fibrosis?

Fatal pulmonary fibrosis: a post-COVID-19 autopsy case

Hanna Ferløv Schwensen ,[1] Line Kristine Borreschmidt,[1,2] Merete Storgaard,[3] Søren Redsted,[4] Steffen Christensen,[5] Line Bille Madsen[1]

Schwensen HF, et al. J Clin Pathol Epub ahead of print: doi:10.1136/ jclinpath-2020-206879

Pulmonary fibrosis secondary to COVID-19: a call to arms?

Spagnolo P, et al. Lancet Respir Med 2020; May 15. https://doi.org/10.1016/S22132600(20)30225-3.

Pulmonary fibrosis and COVID-19: the potential role for antifibrotic therapy

George PM, et al. Lancet Respir Med 2020; May 15. https://doi.org/10.1016/S22132600(20)30225-3.

Mon patient a de la dyspnée post-COVID …

1. Saturation transcutanée, laboratoire (Hb, BNP, D-Dimères), ECG, Spirométrie, CXR

2. Patients après insuffisance respiratoire sur pneumonie SARS-CoV-2 (étude COVIDLung)
   → 3 mois: CT, fonction pulmonaire, test de marche
   → si anormales: contrôles 6 et 12 mois

3. Tout patient post infection SARS-CoV-2 avec dyspnée et/ou toux persistante
   → hyper-reactivité bronchique, asthme, BPCO, fibrose pulmonaire, embolie pulmonaire (, RGO, RSC)

4. Dyspnée et hypoxémie avec fonction pulmonaire et imagerie normales: exclure hypertension pulmonaire chronique thromboembolique (CT angiographie, scintigraphie, échocardiographie)

5. Traitements:
   → ? Anti-inflammatoire: corticostéroïdes inhalatoires (toux), immunosuppression (ILD)
   → ? Bronchodilatation: LABA/LAMA (BPCO)
   → ? Anti-fibrotiques: Nintedanib/Pirfenidone (pneumopathie fibrosante)
   → ? Réadaptation cardio-pulmonaire