



Siracusa, 30 settembre 2022



**“COVID-LONG COVID:
LO STATO DELL’ARTE”**

Aspetti radiologici del Covid



Prof. Vincenzo Cuccurullo

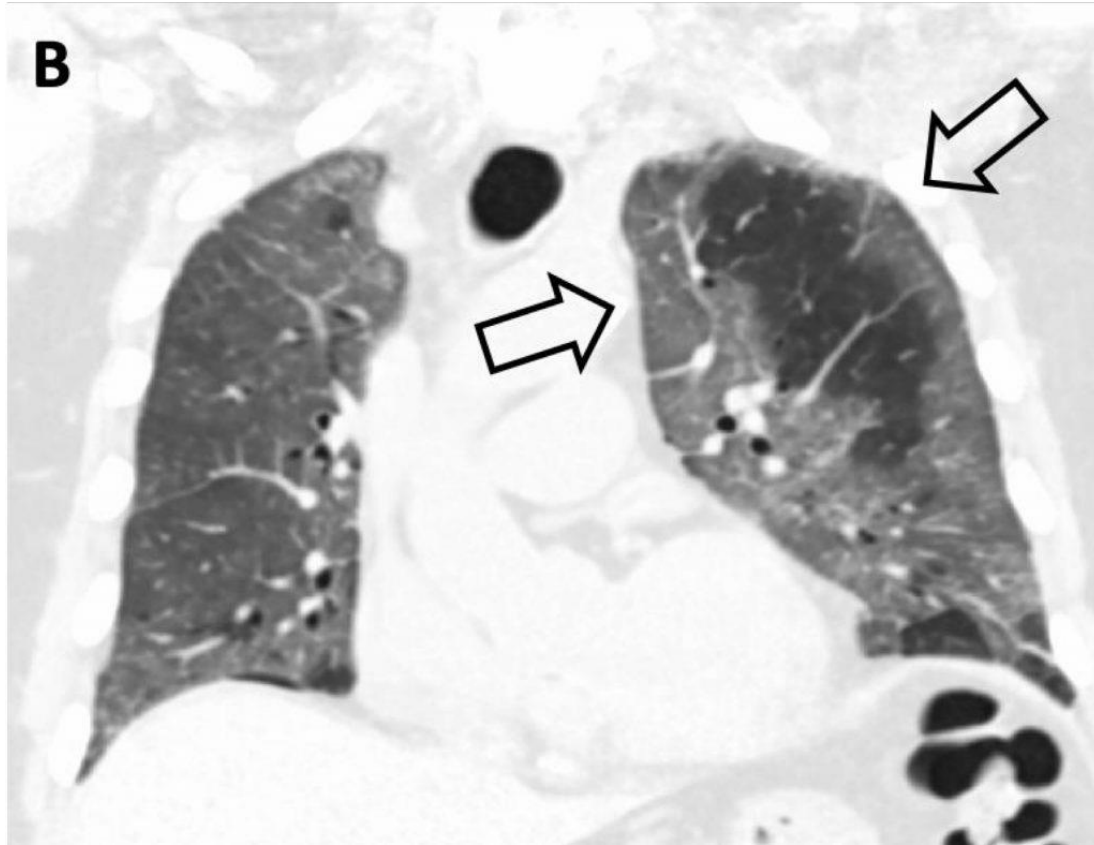
V: Università
degli Studi
della Campania
Largo Vivantielli

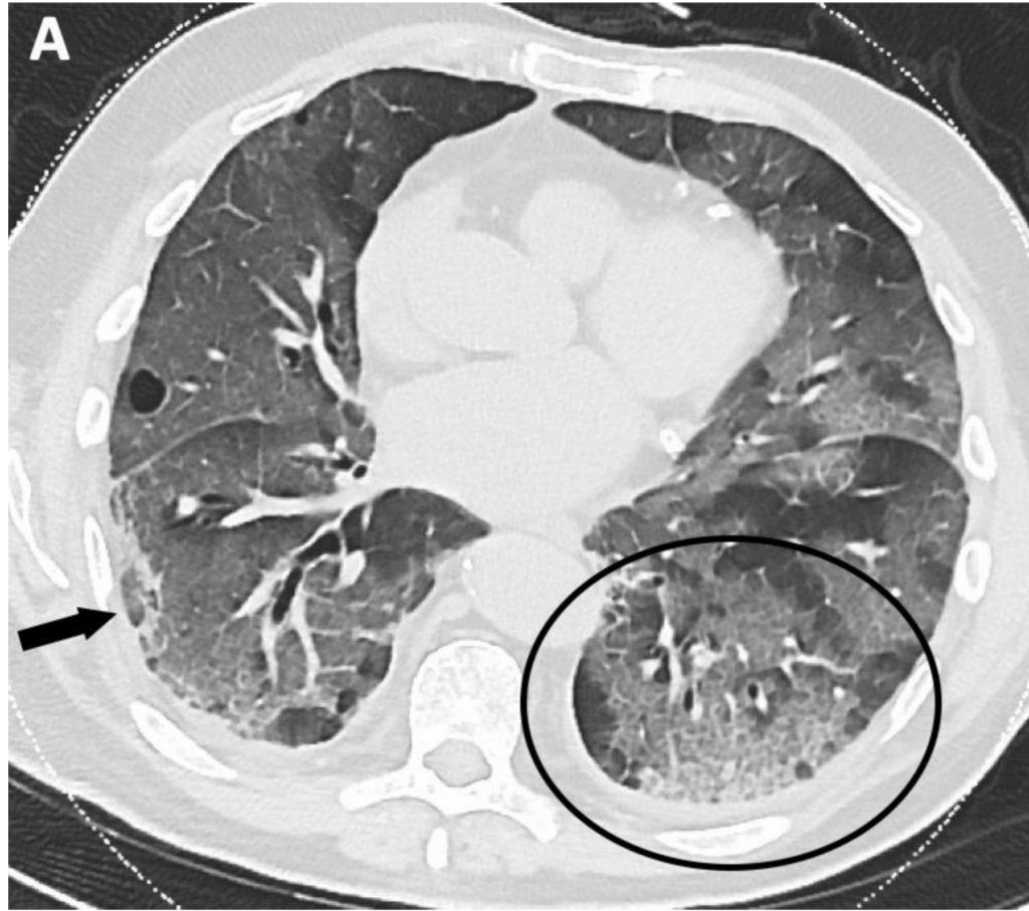
Il 7 gennaio 2020, un nuovo coronavirus, originariamente abbreviato come 2019-nCoV dall'Organizzazione Mondiale della Sanità (World Health Organization, WHO), è stato identificato dal tampone rinofaringeo di un paziente.

Questo patogeno è stato successivamente rinominato come coronavirus della sindrome respiratoria acuta grave 2 (Severe Acute Respiratory Syndrome Coronavirus 2, SARS-CoV-2) e la malattia è stata chiamata COVID-19 (Coronavirus Disease 2019) dalla WHO.

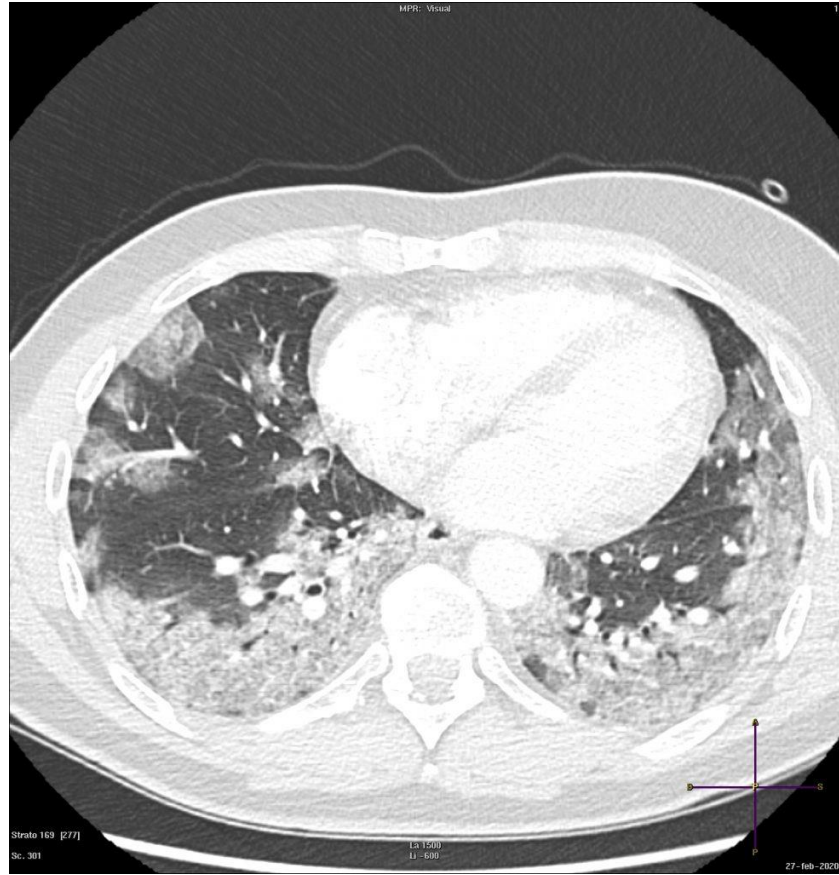


Cos'è questo?

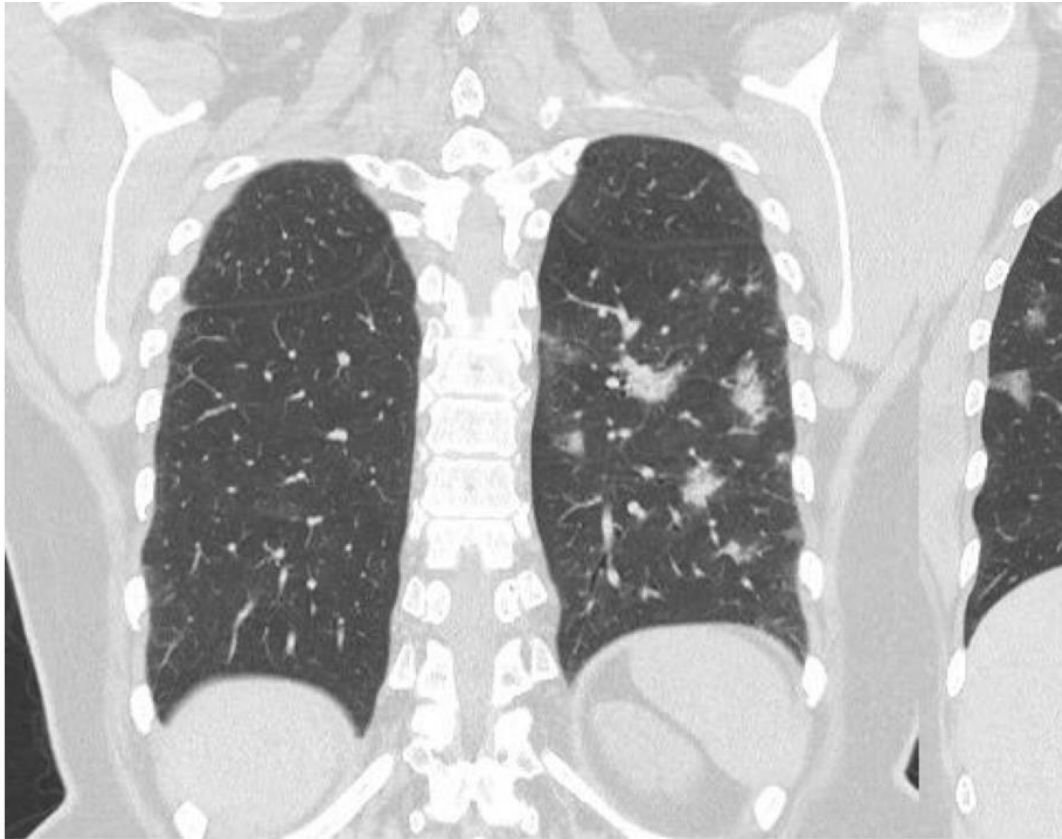






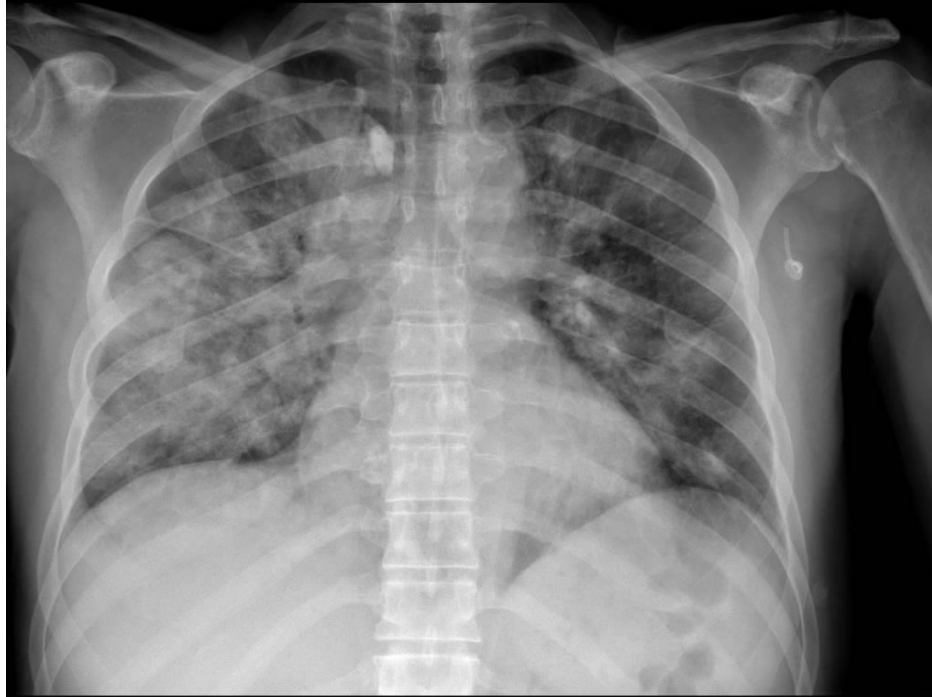






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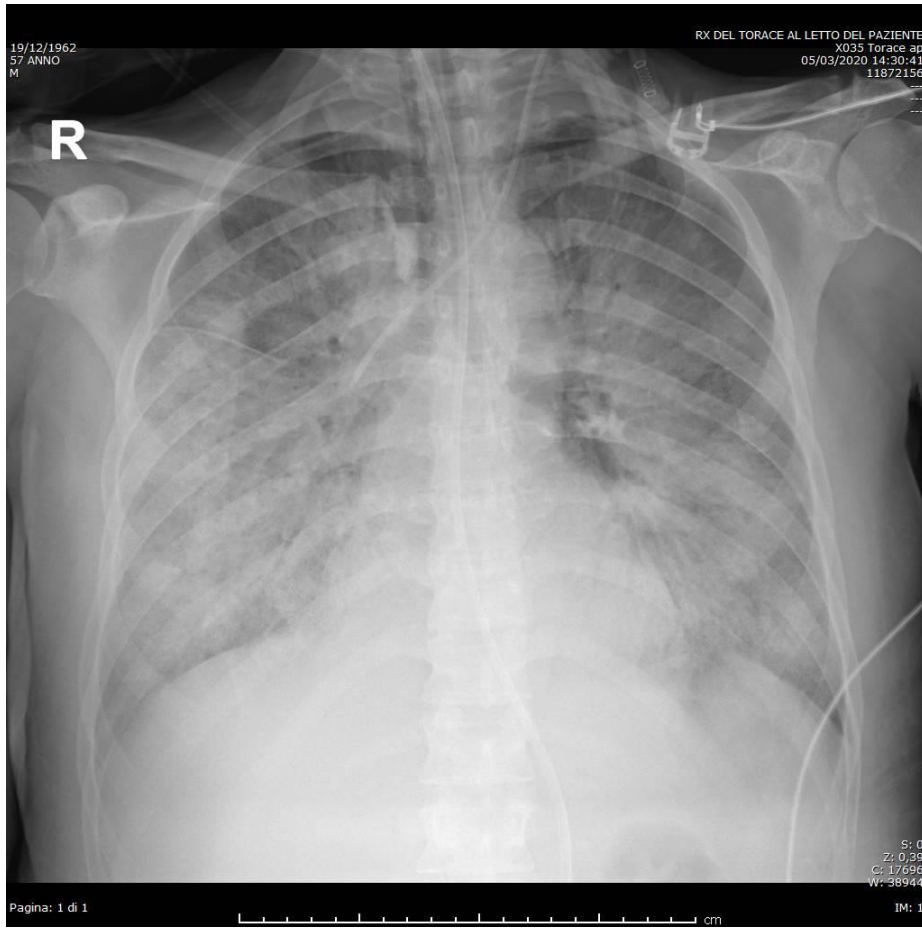
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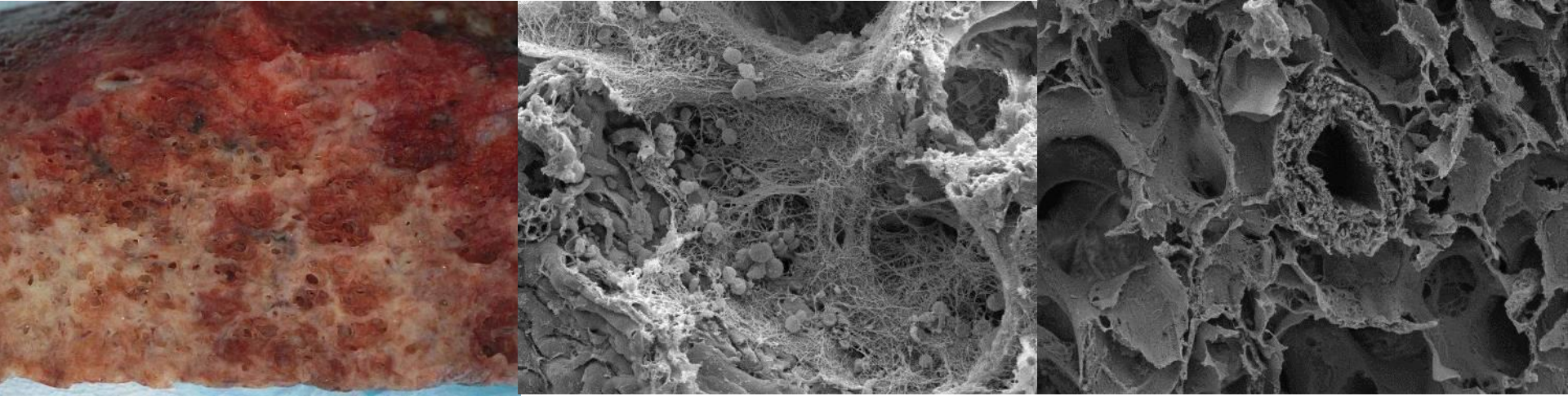
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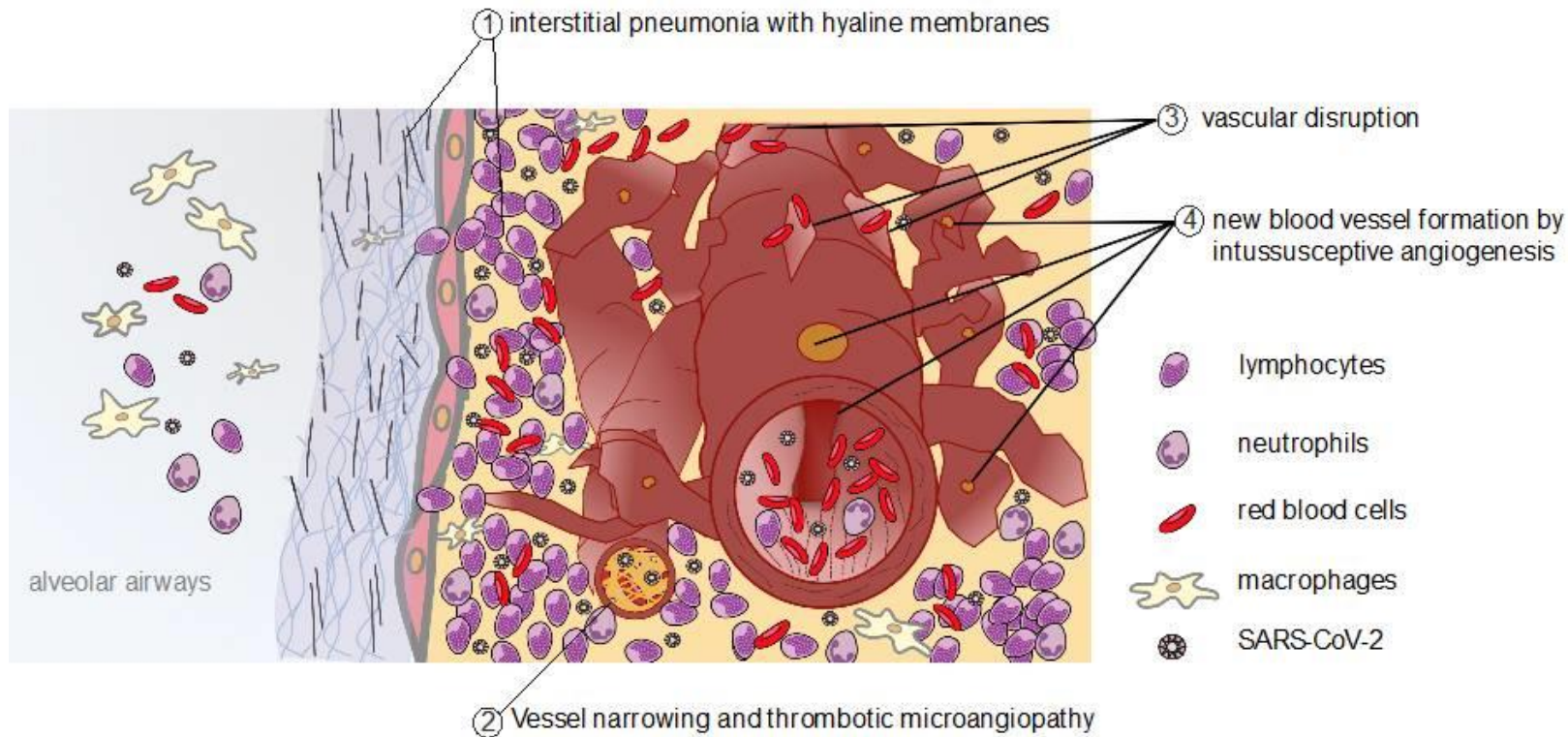
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Diffuso danno alveolare in COVID-19

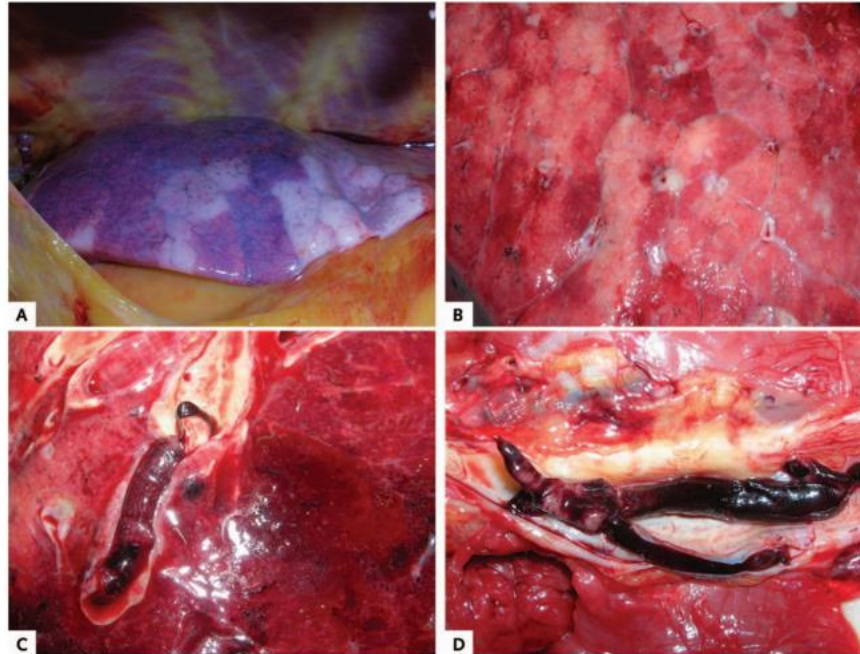


Ackermann M, Verleden SE, Kuehnel M, et al. Pulmonary Vascular Endothelialitis, Thrombosis, and Angiogenesis in Covid-19. *N Engl J Med.* 2020;383(2):120-128.



Ackermann M, Mentzer SJ, Kolb M, Jonigk D, Inflammation and Intussusceptive Angiogenesis in Covid-19: Everything in and out of flow, Eur open Respiratory Journal November 2020

Coagulopatia da COVID-19 (*studi autoptici*)



Wichmann D *et al*, Ann Int Med 2020

Coagulopatia da COVID-19



Confirmation of the high cumulative incidence of thrombotic complications in critically ill ICU patients with COVID-19: An updated analysis

F.A. Klok^{a,*}, M.J.H.A. Kruijff^b, N.J.M. van der Meer^{c,d}, M.S. Arbous^e, D. Gommers^f, K.M. Kant^g, F.H.J. Kaptein^a, J. van Paassen^e, M.A.M. Stals^a, M.V. Huisman^{a,1}, H. Endeman¹



BRIEF REPORT

High incidence of venous thromboembolic events in anticoagulated severe COVID-19 patients

Jean-François Litjens¹ | Maxime Leclerc² | Camille Chochois² | Jean-Michel Monsallier³ | Michel Ramakers² | Malika Auvray² | Karim Merouani³



Intensive Care Med
<https://doi.org/10.1007/s00134-020-06062-x>

ORIGINAL

High risk of thrombosis in patients with severe SARS-CoV-2 infection: a multicenter prospective cohort study



Julie Helms^{1,2}, Charles Tacquard³, François Severac⁴, Ian Leonard-Lorant⁵, Mickaël Ohana⁵, Xavier Delabranche³, Hamid Merdji^{1,6}, Raphaël Clere-Jehl^{1,2}, Malika Schenck⁷, Florence Fagot Gandet⁷, Samira Fafi-Kremer^{2,8}, Vincent Castelain⁷, Francis Schneider⁷, Lélia Grunebaum⁹, Eduardo Anglés-Cano¹⁰, Laurent Sattler⁹, Paul-Michel Mertes³, Ferhat Meziani^{1,6†} and CRICS TRIGGERSEP Group (Clinical Research in Intensive Care and Sepsis Trial Group for Global Evaluation and Research in Sepsis)



Full Length Article

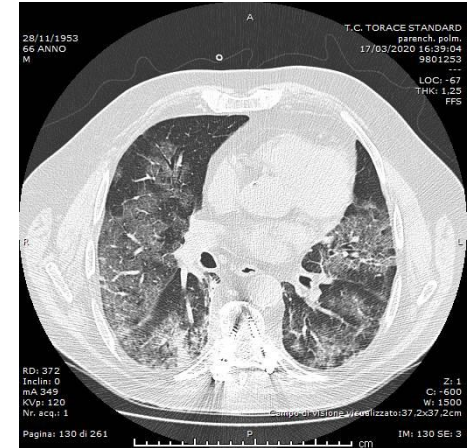
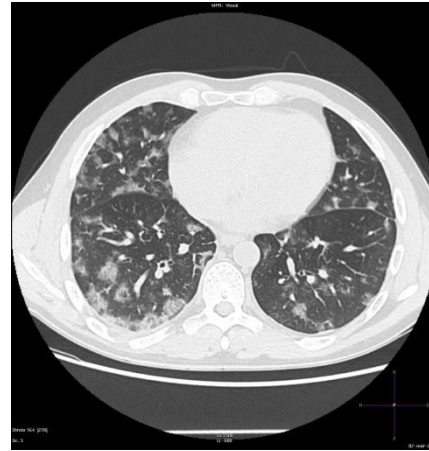
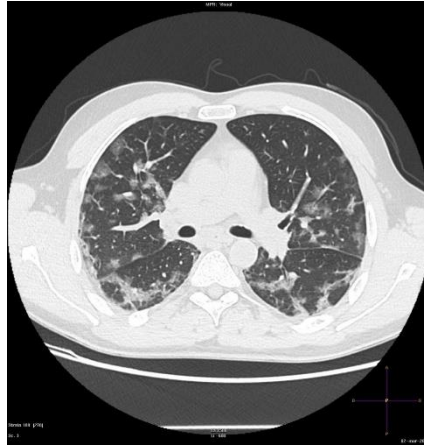
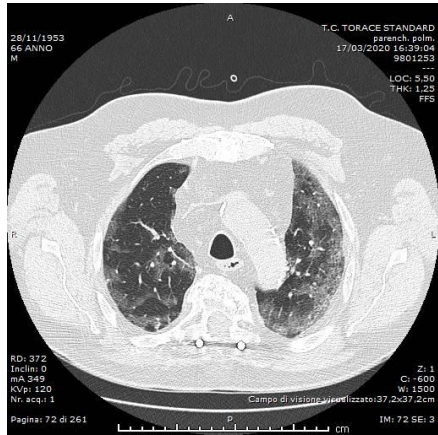
Venous and arterial thromboembolic complications in COVID-19 patients admitted to an academic hospital in Milan, Italy



Corrado Lodigiani^{1,3,*}, Giacomo Iapichino⁵, Luca Carenzo⁵, Maurizio Cecconi^{1,3,c}, Paola Ferrazzi^{1,3}, Tim Sebastian¹, Nils Kucher⁴, Jan-Dirk Studt⁴, Clara Sacco³, Bertuzzi Alexia⁴, Maria Teresa Sandri¹, Stefano Barco^{4,11}, on behalf of the Humanitas COVID-19 Task Force

L'uso dell'imaging della Tomografia Computerizzata (TC) nella diagnosi ed evoluzione del COVID-19 si è posto fin dall'inizio della pandemia come uno strumento diagnostico complementare, a volte superiore alla tecnica di elezione ovvero alla RT-PCR, a causa dell'elevato numero di falsi negativi prodotti da quest'ultima.

Marzo 2020



Un esame TC, eseguito con tecnica ad alta risoluzione, è la metodica che meglio consente una corretta identificazione dello stadio di malattia.

L'Imaging toracico consente di monitorare l'efficacia della terapia e identificare la guarigione clinica.

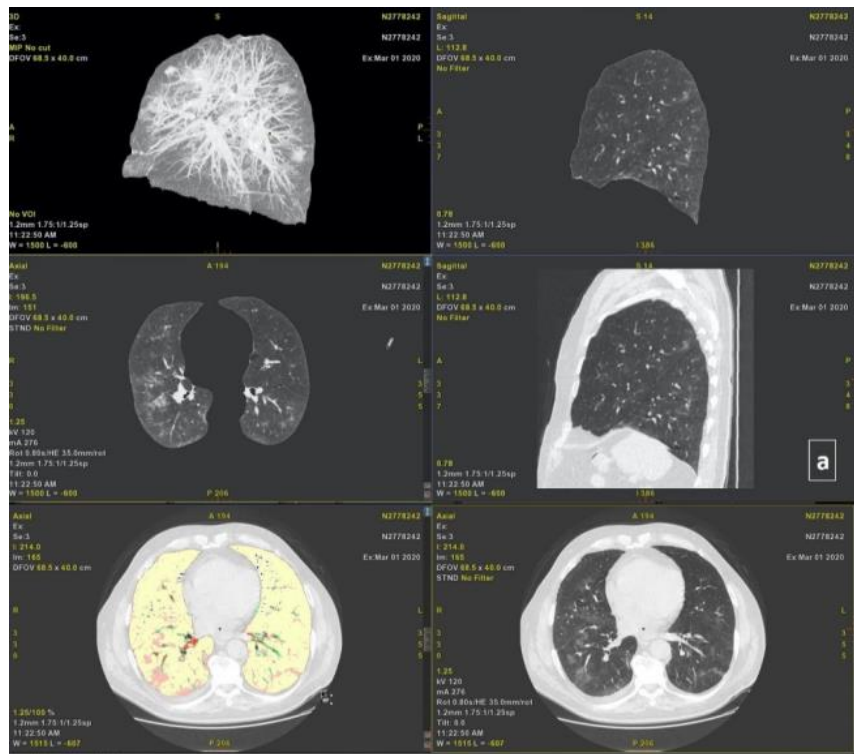
In questa condizione pandemica, tutti i pazienti che necessitano di una valutazione radiologica, dovevano essere studiati, utilizzando gli strumenti di imaging più appropriati relativi al quesito clinico, prestando la massima attenzione allo scopo di preservare la salute pubblica.

Anche se ogni scenario richiede una gestione diversa, tuttavia per tutti gli scenari, abbiamo dovuto mettere in atto procedure volte ad evitare la contaminazione degli operatori sanitari, degli altri pazienti e delle apparecchiature radiologiche.

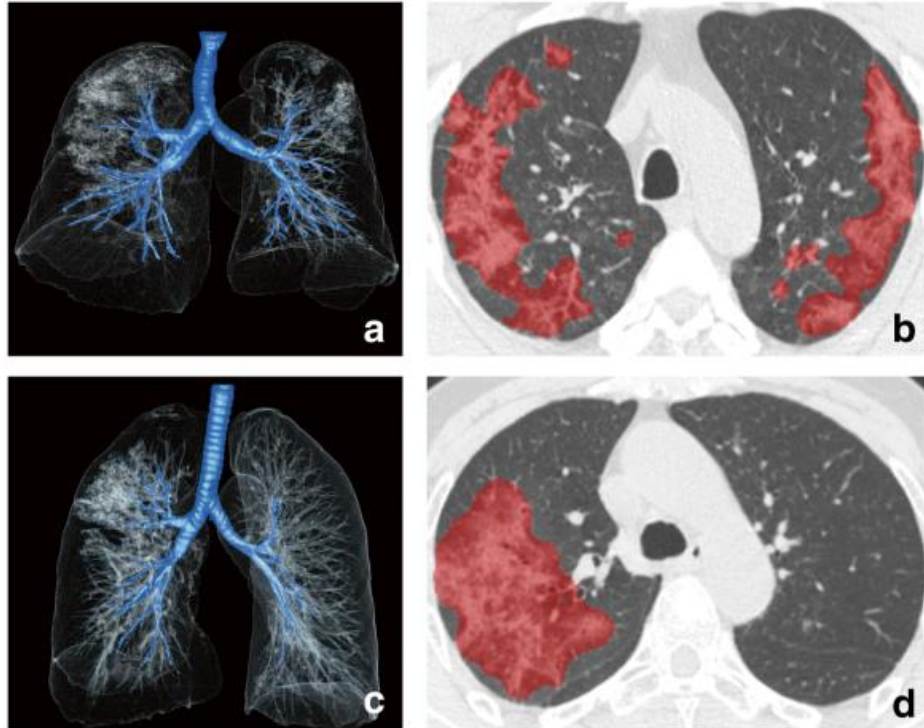
Dopo ogni procedura radiologica, l'apparecchiatura deve essere sanificata con soluzioni contenente 500 mg/L di cloro e la stanza deve esser sottoposta a una ventilazione adeguata.

Categoria	Livello di sospetto per coinvolgimento polmonare di COVID-19	Descrizione
CO-RADS 0	Non interpretabile	Scansione tecnicamente insufficiente per assegnare un punteggio
CO-RADS 1	Molto basso	Normale o non -infettivo
CO-RADS 2	Basso	Tipico di altre infezioni ma non di COVID-19
CO-RADS 3	Equivoco/non sicuro	Caratteristiche compatibili con COVID-19, ma anche con altre malattie
CO-RADS 4	Elevato	Sospetto per COVID-19
CO-RADS 5	Molto elevato	Tipico per COVID-19
CO-RADS 6	Comprovato	RT PCR positiva per SARS-CoV-2

Artificial Intelligence and COVID-19 Using Chest CT Scan and Chest X-ray Images: Machine Learning and Deep Learning Approaches for Diagnosis and Treatment

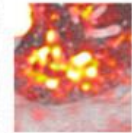
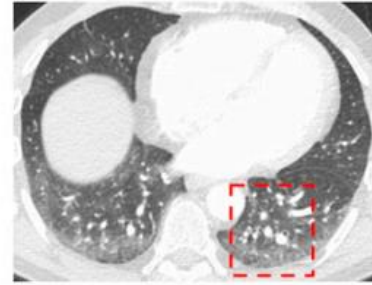
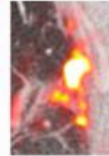
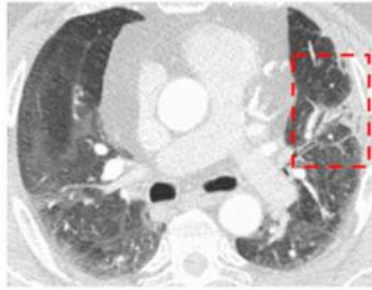
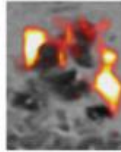
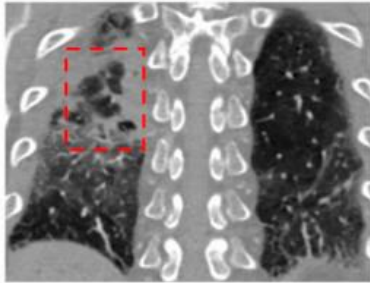
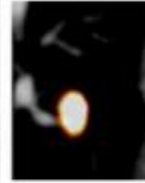
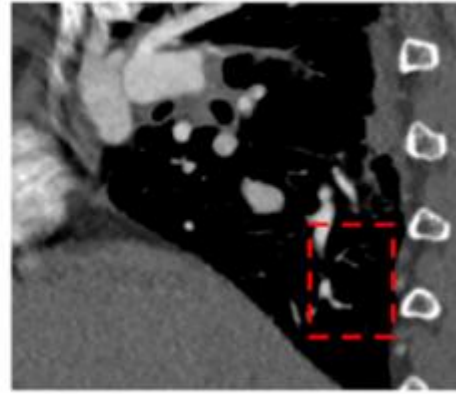
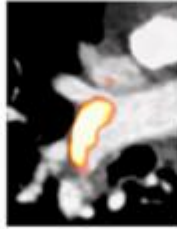
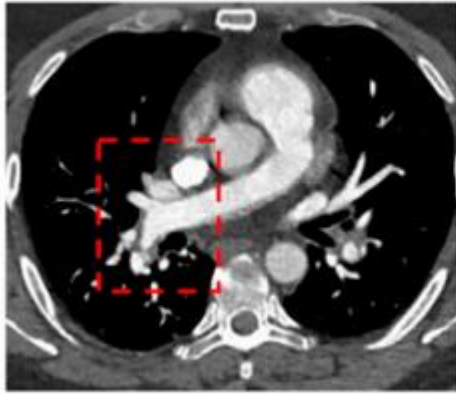


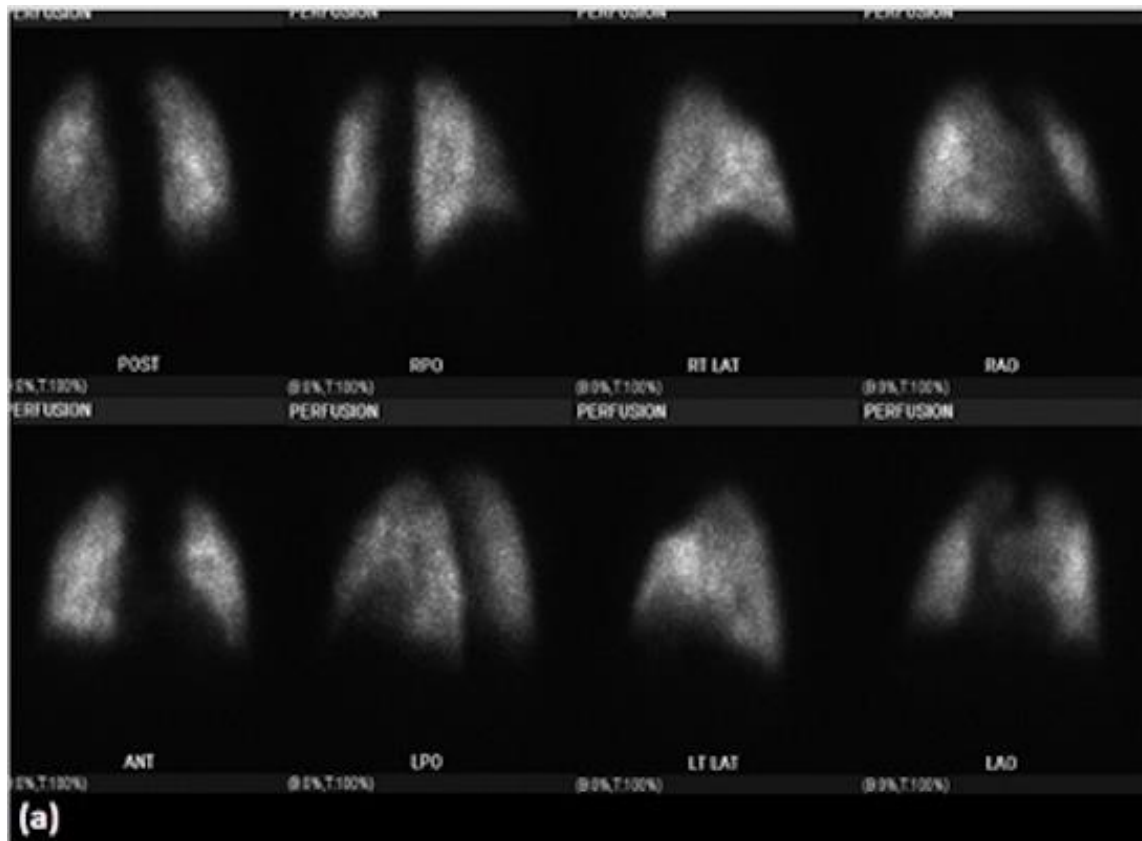
Radiomics nomogram for the prediction of 2019 novel coronavirus pneumonia caused by SARS-CoV-2

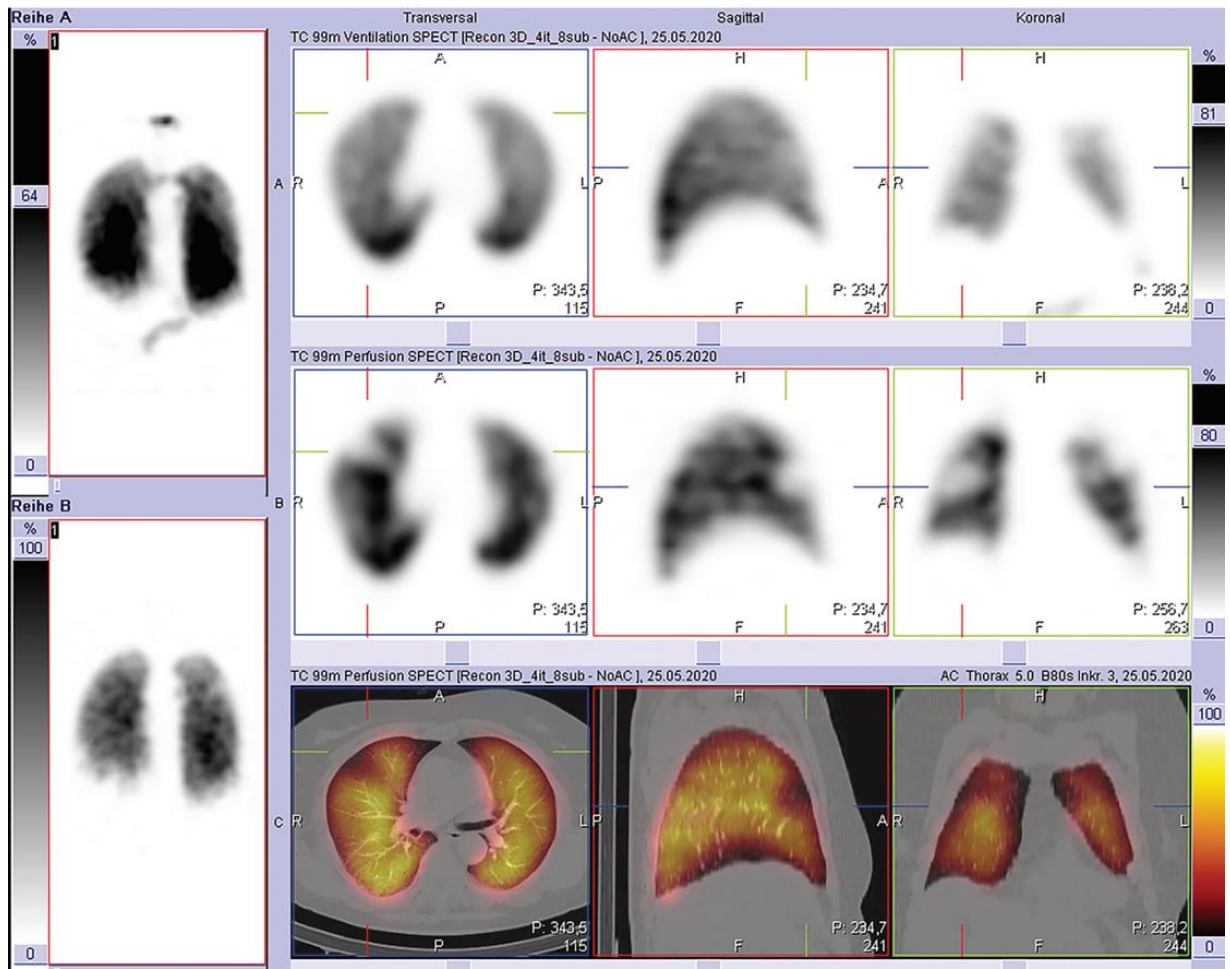


In Vivo Thrombosis Imaging in Patients Recovering from COVID-19 and Pulmonary Embolism

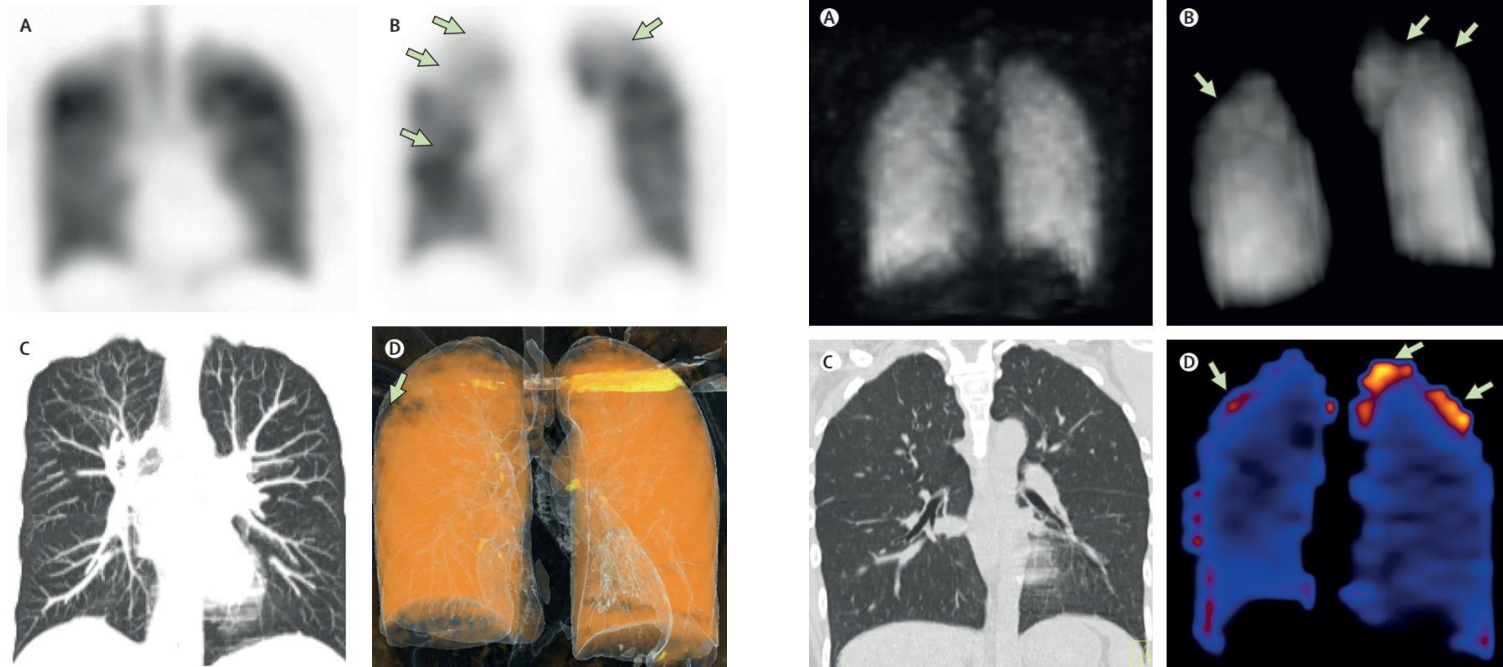
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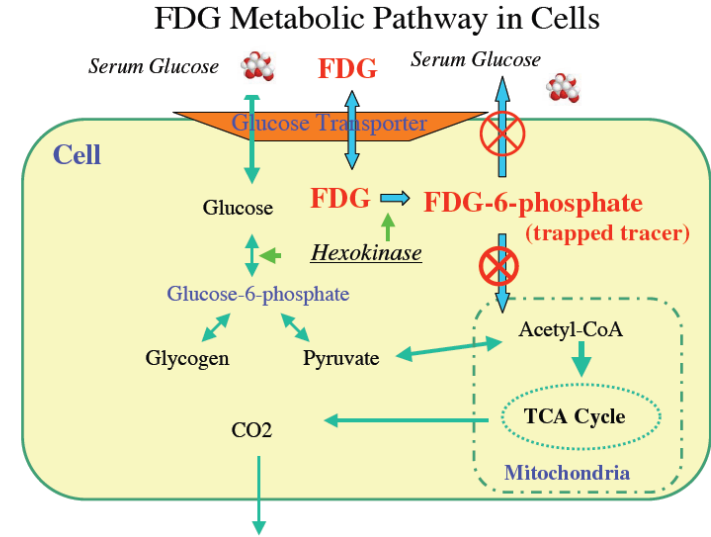
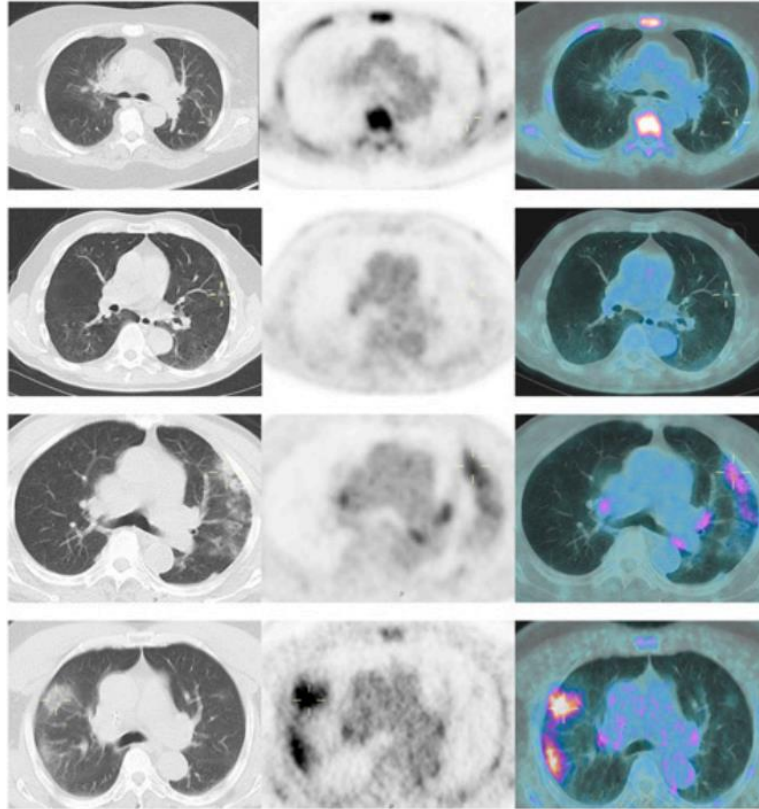


Beyond the clot: perfusion imaging of the pulmonary vasculature after COVID-19



Lancet Respir Med 2021;
9: 107-16

Evolution of ^{18}F -FDG PET/CT Findings in Patients After COVID-19: An Initial Investigation



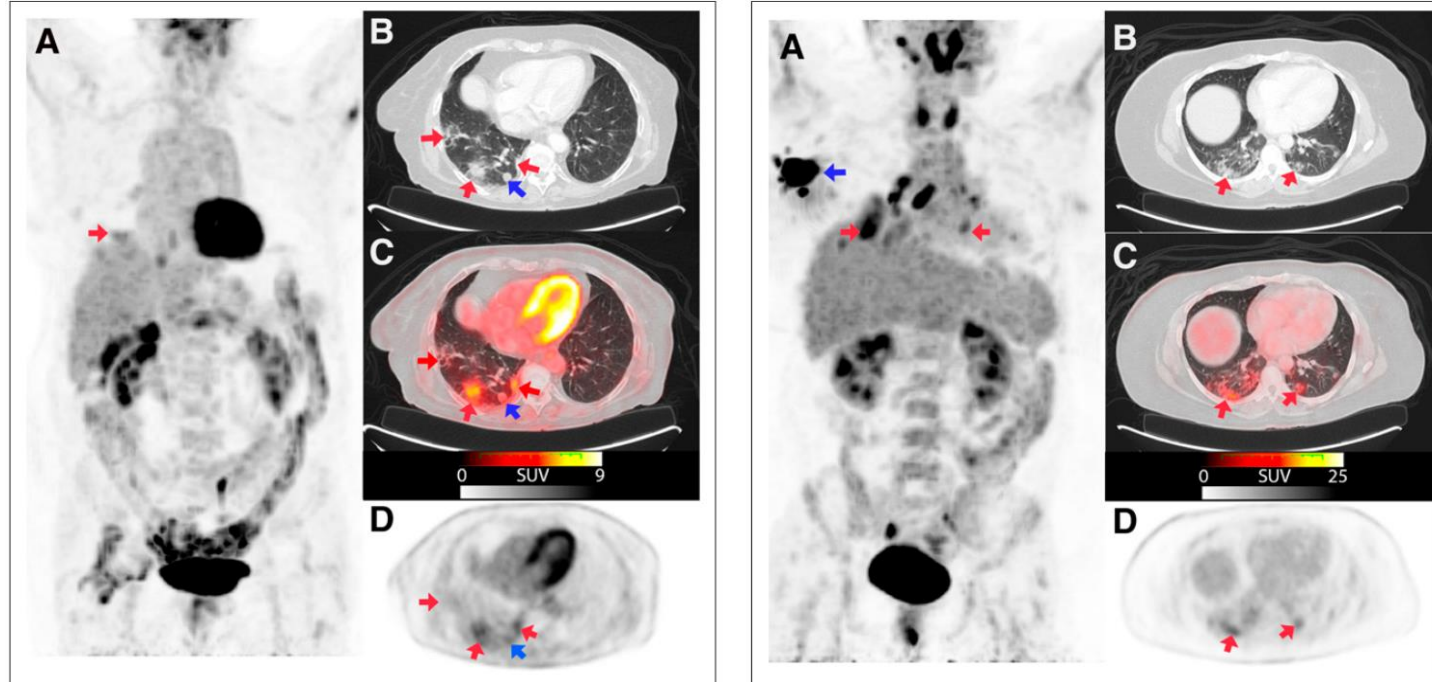
J Nucl Med 2022; 63:270–273

Durante l'epidemia di COVID-19, è stato opportuno determinare la formulazione di linee guida per la gestione dei pazienti fragili, e quindi anche quelli oncologici, considerando la possibilità di procrastinare quei trattamenti che non sono urgenti, mentre laddove sia possibile sarebbe opportuna un'assistenza domiciliare.

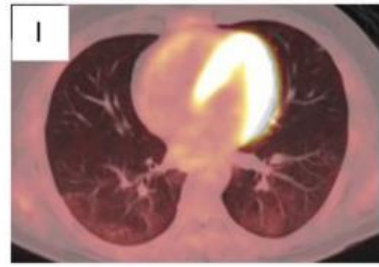
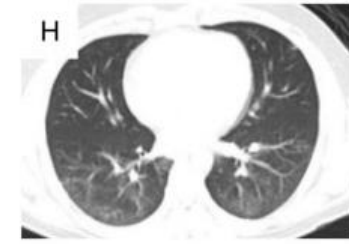
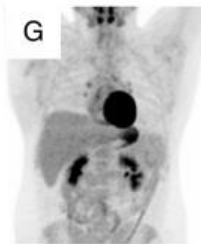
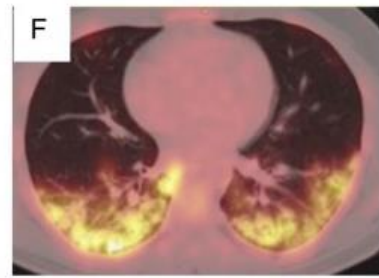
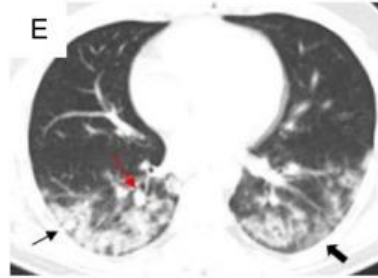
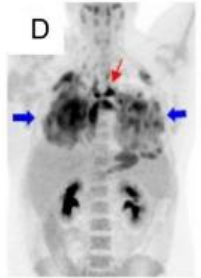
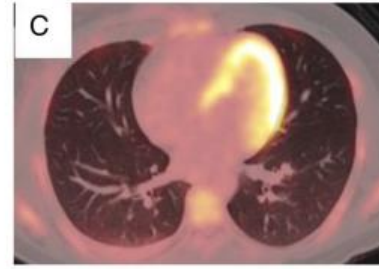
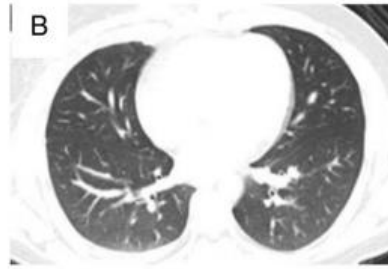
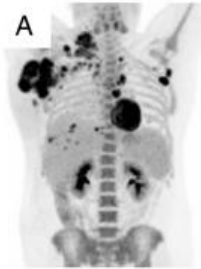
*Nella gestione radiologica del paziente oncologico
possono essere definiti 4 scenari:*

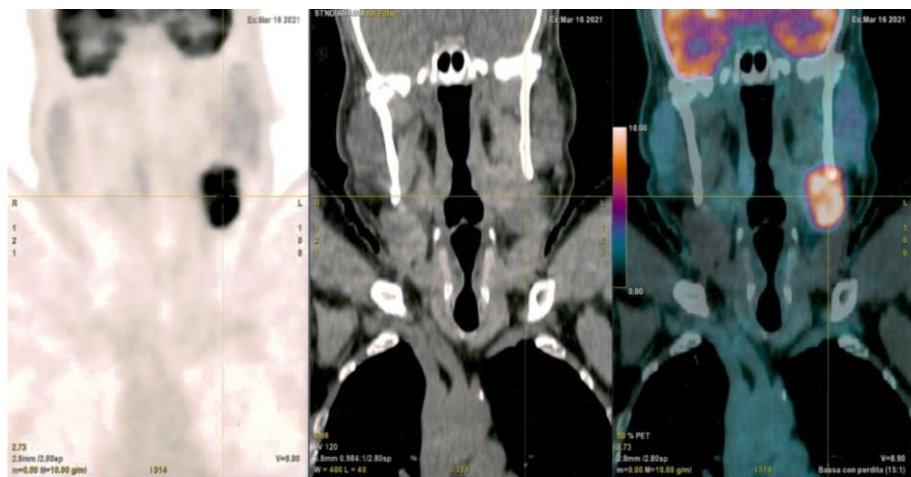
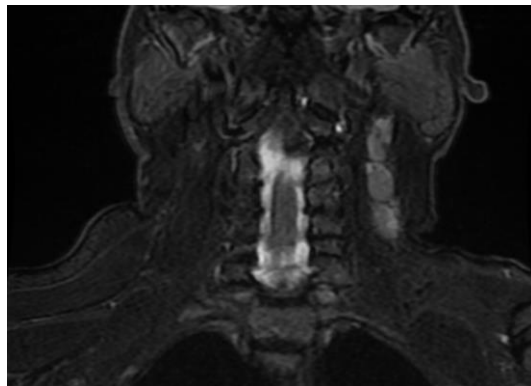
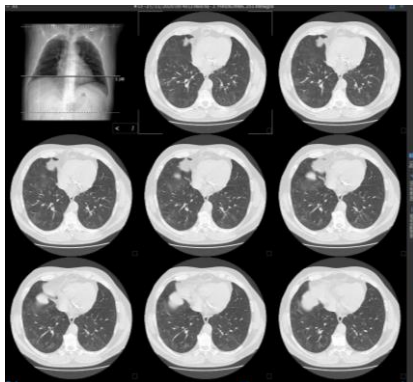
- 1) Paziente oncologico non COVID-19;
- 2) Paziente oncologico COVID-19 “sospetto”;
- 3) Paziente oncologico COVID-19 confermato;
- 4) Pazienti oncologici con diagnosi occasionale di COVID-19.

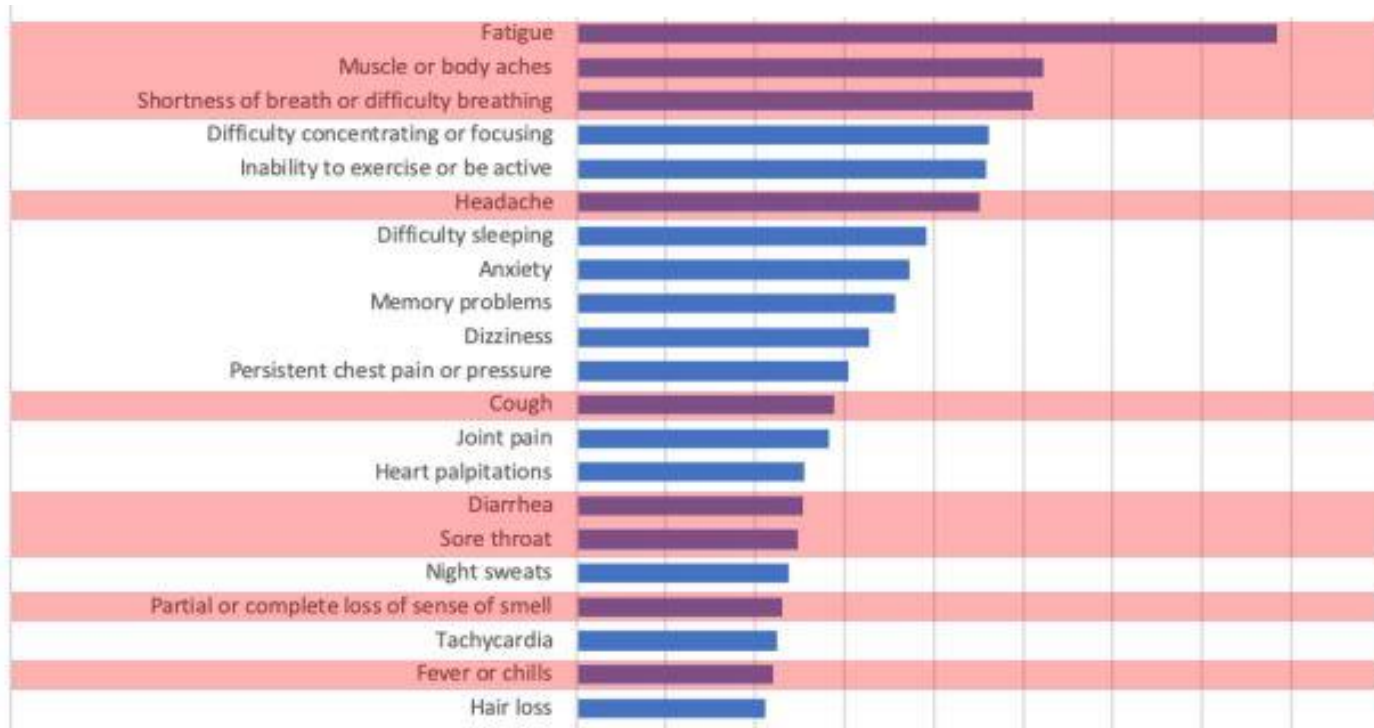
Incidental Findings Suggestive of COVID-19 Pneumonia in Oncologic Patients Undergoing ^{18}F -FDG PET/CT Studies: Association Between Metabolic and Structural Lung Changes



J Nucl Med 2022; 63:274–279
DOI: 10.2967/jnumed.121.261915

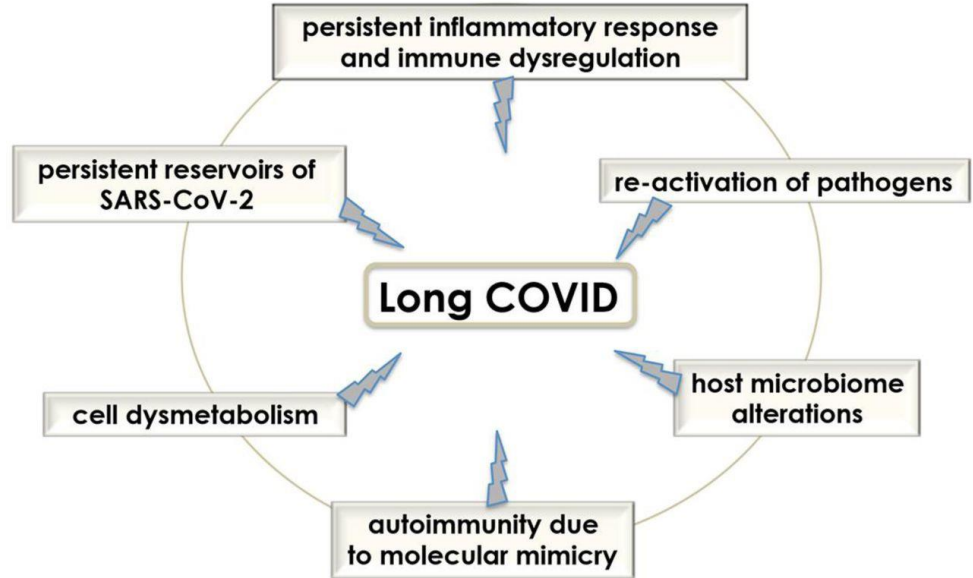
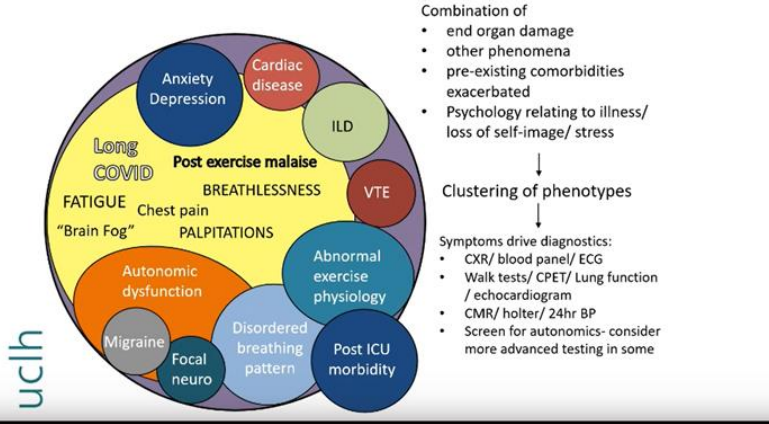


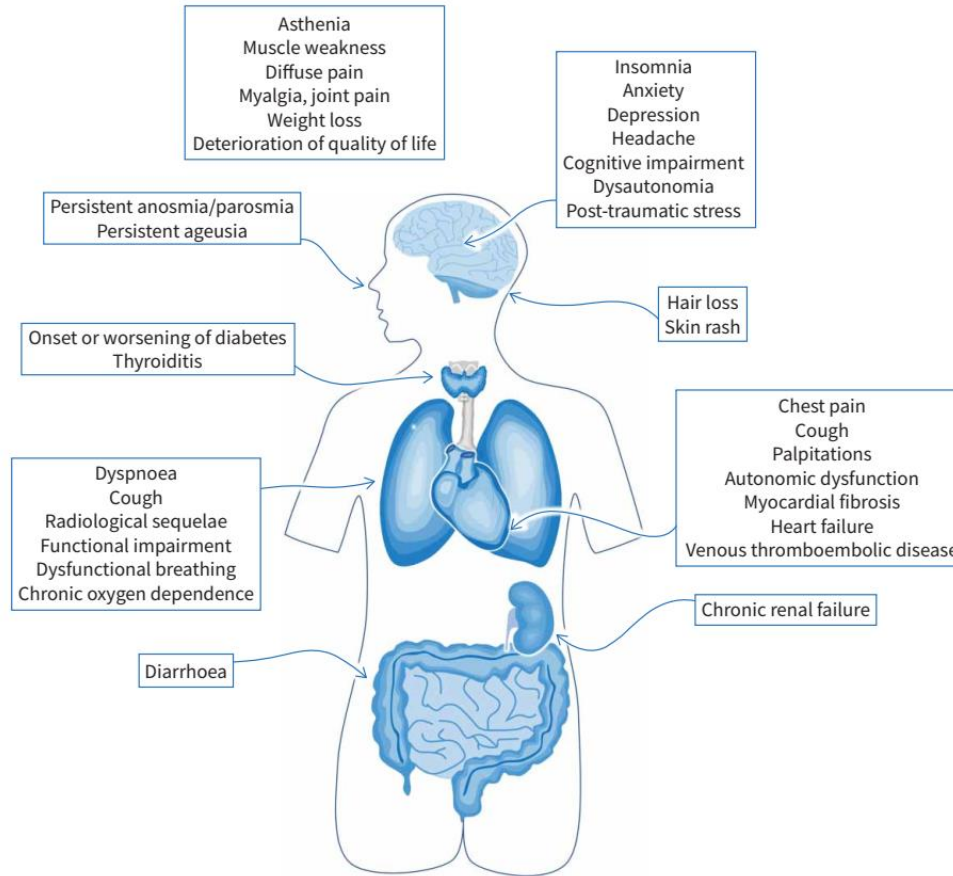


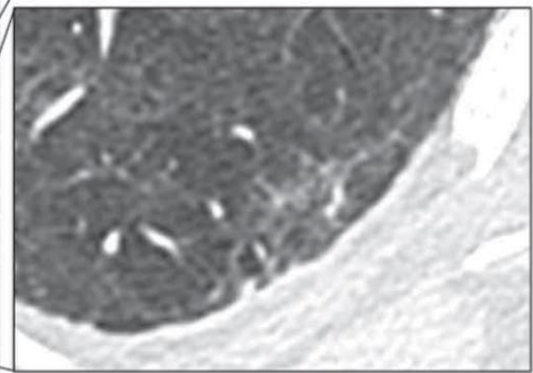
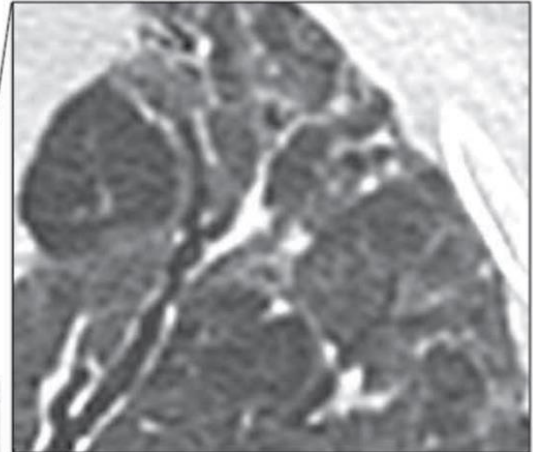
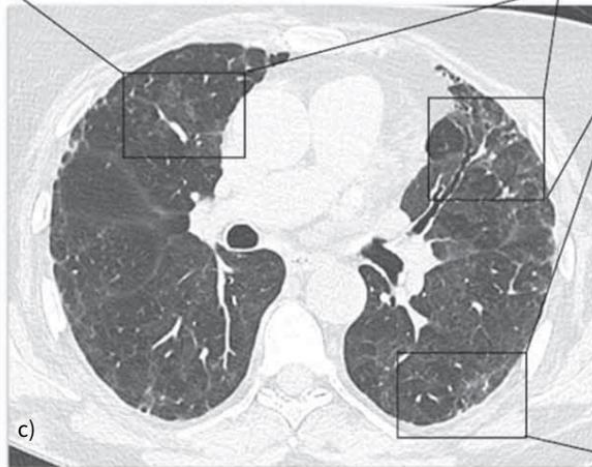
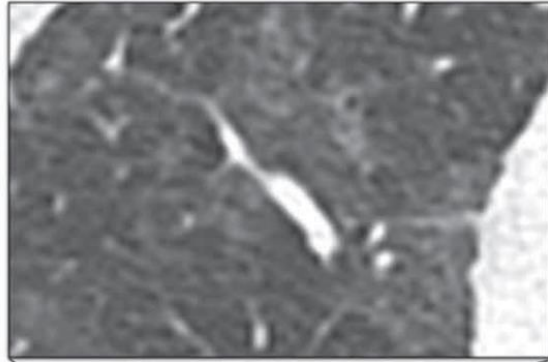
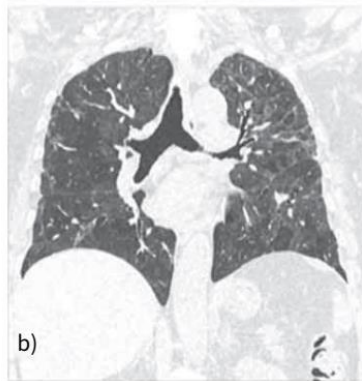
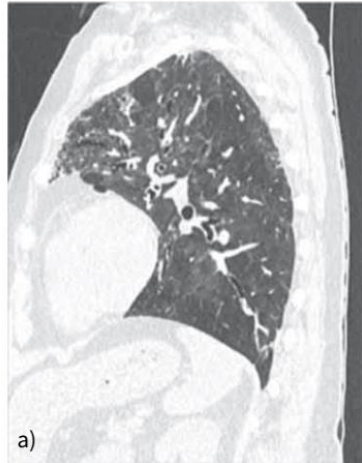




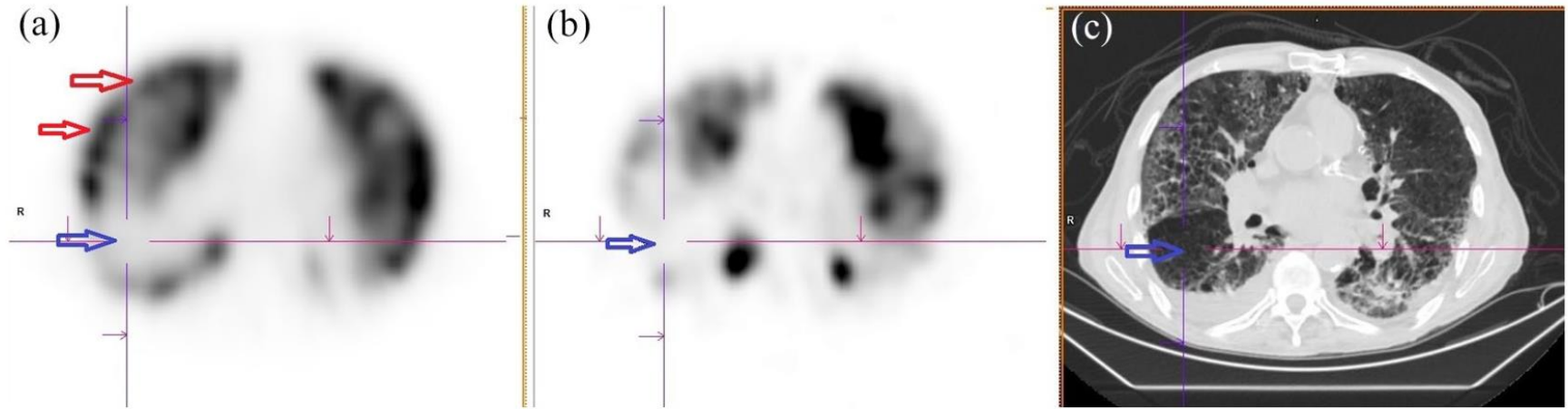
Spectrum of findings in post COVID syndrome:

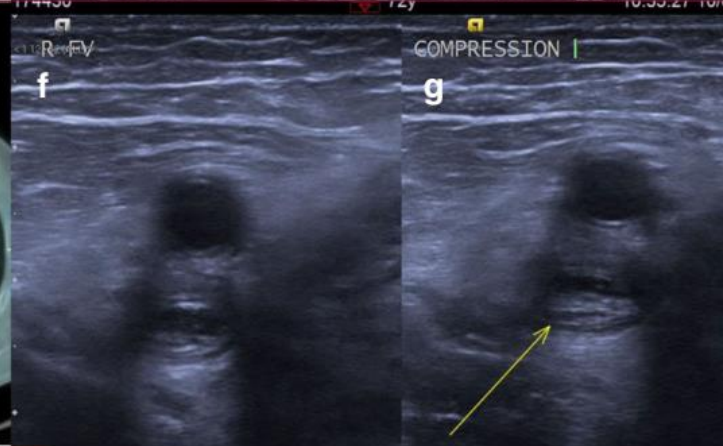
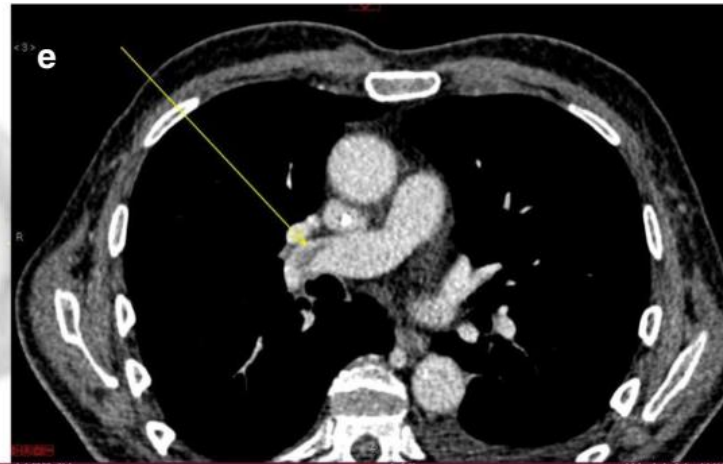
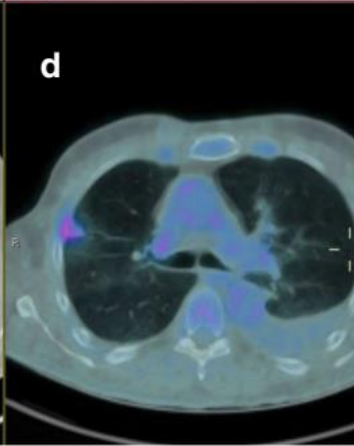
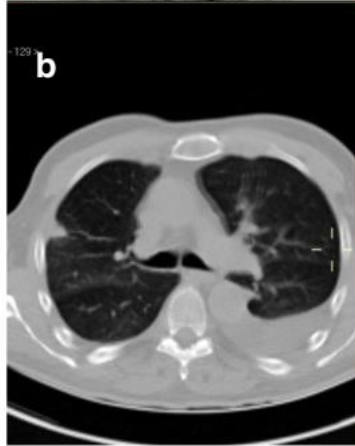
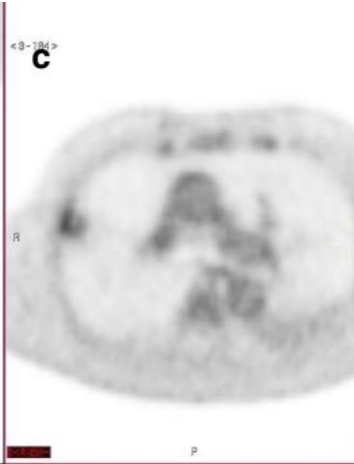




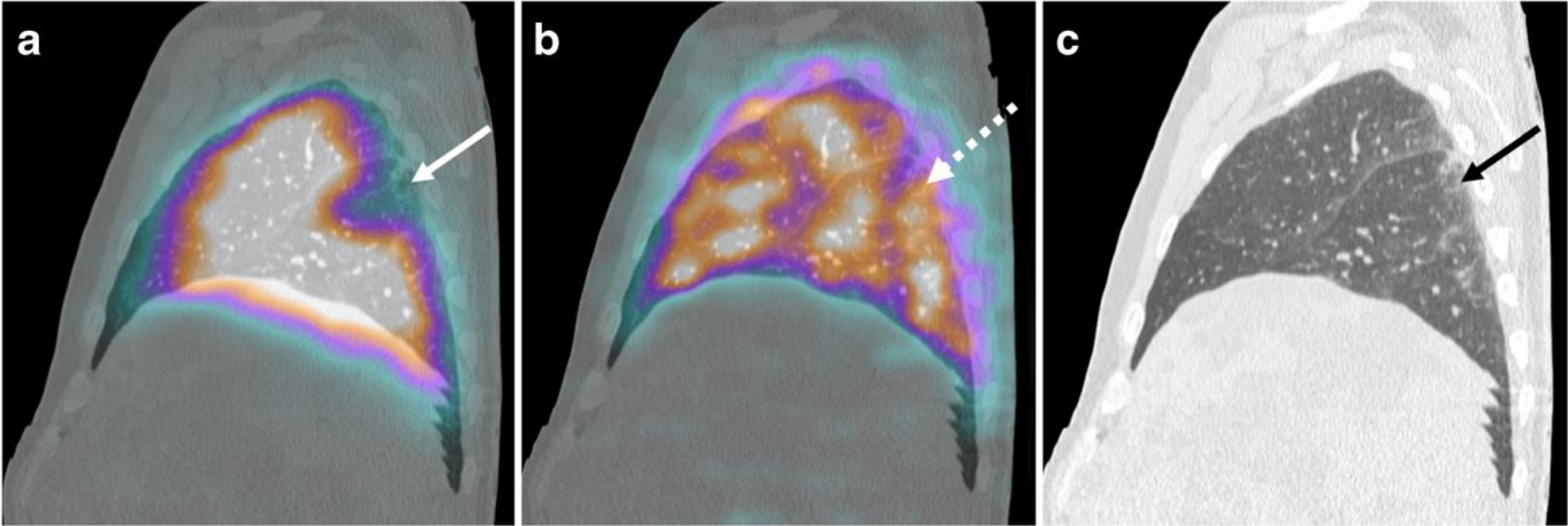


Microvascular injuries, secondary edema, and inconsistencies in lung vascularization between affected and nonaffected pulmonary segments of non-critically ill hospitalized COVID-19 patients presenting with clinical deterioration

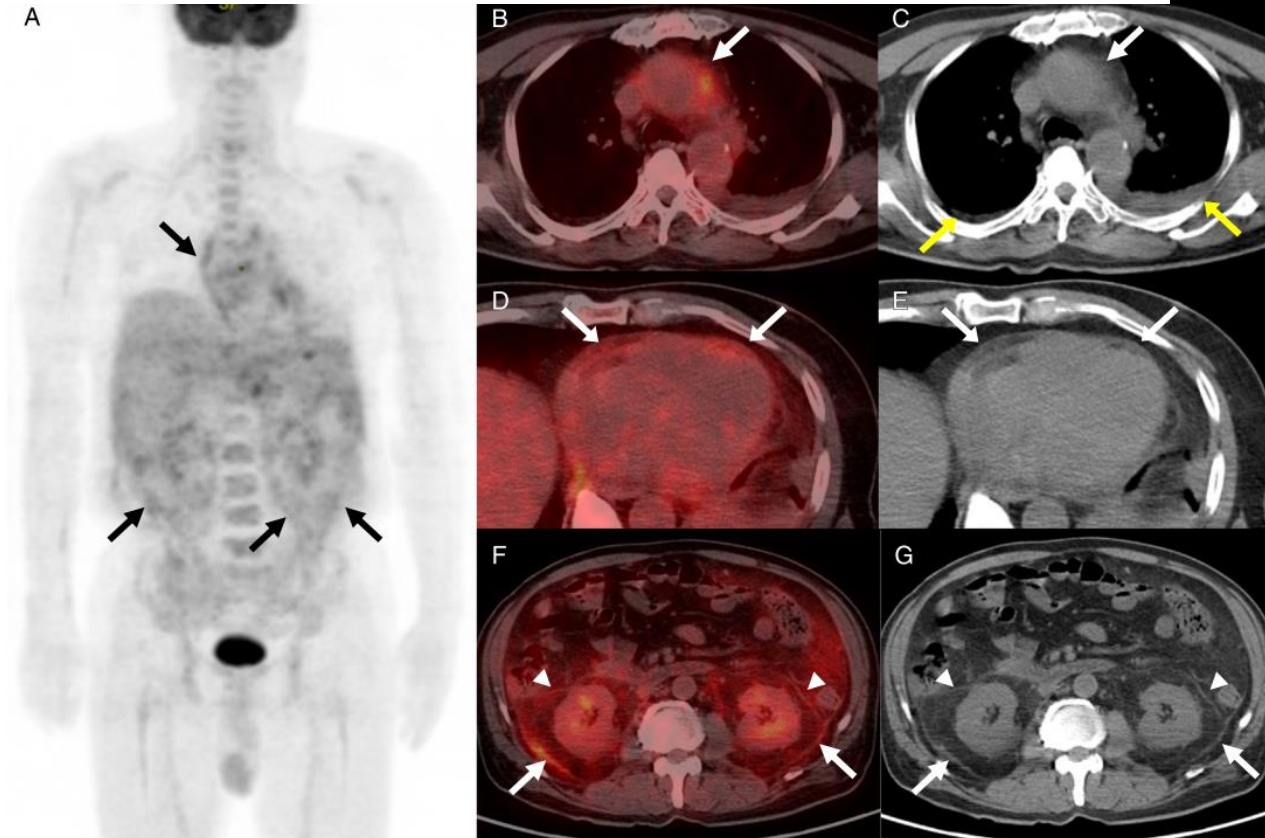




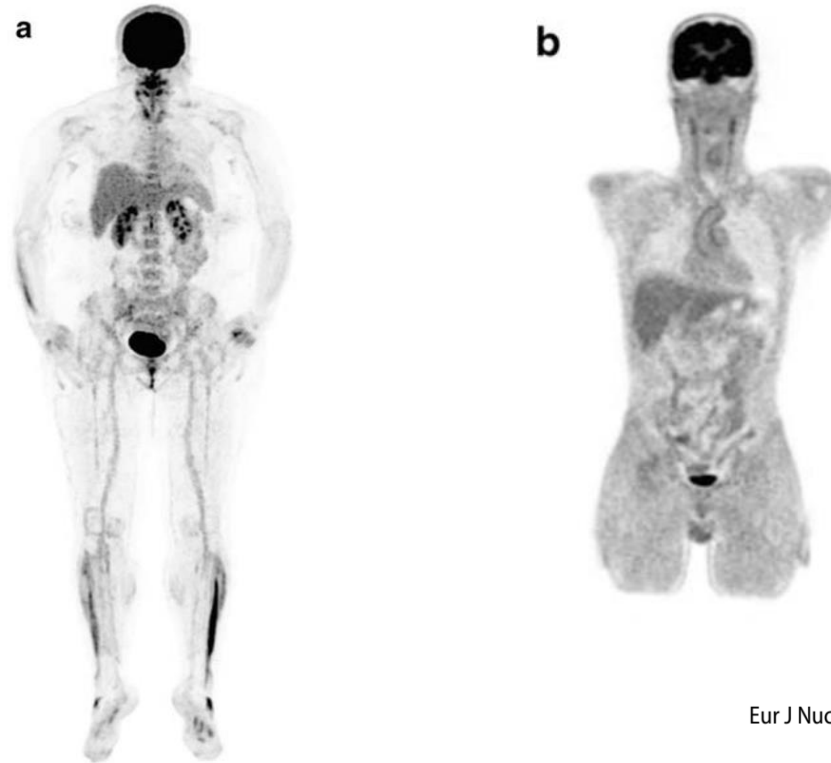
Ventilation/perfusion SPECT/CT findings in different lung lesions associated with COVID-19: a case series



COVID-19 Vaccine–Induced Multisystem Inflammatory Syndrome With Polyserositis Detected by FDG PET/CT

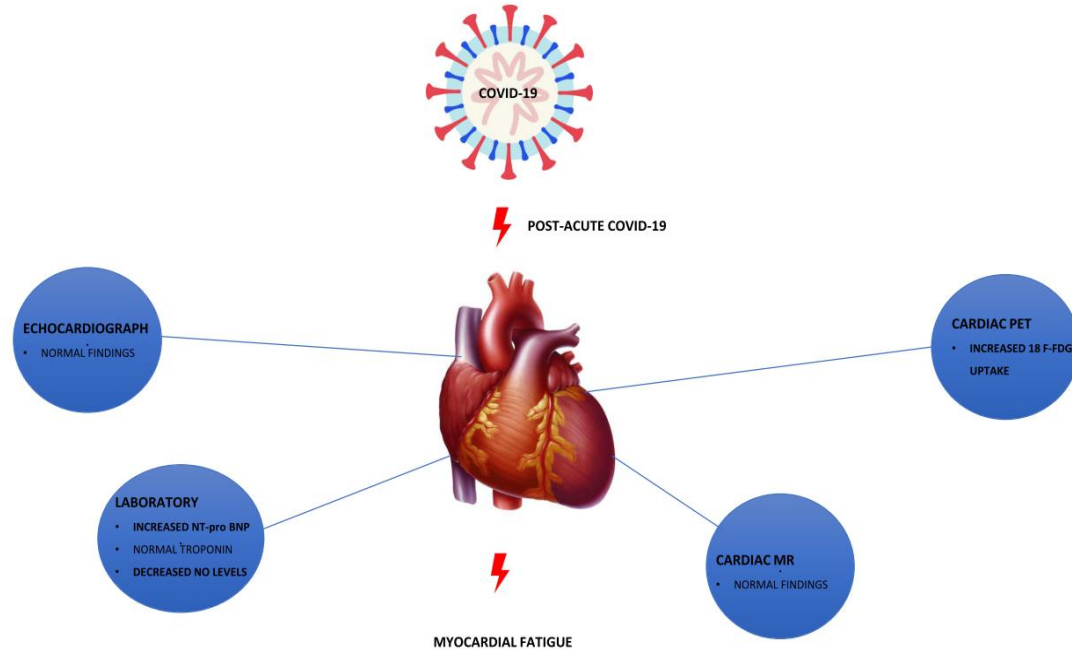


Vasculitis changes in COVID-19 survivors with persistent symptoms: an [^{18}F]FDG-PET/CT study

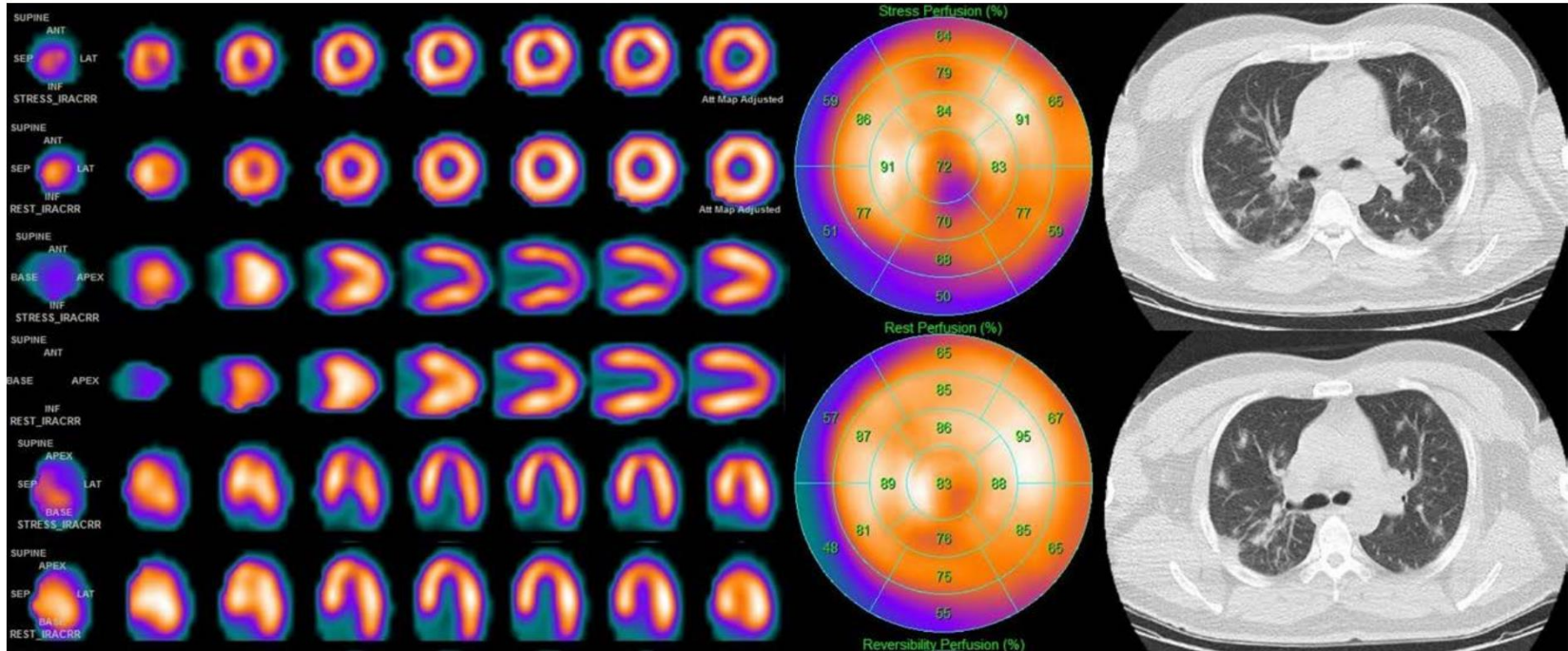


Eur J Nucl Med Mol Imaging (2021) 48:1460–1466

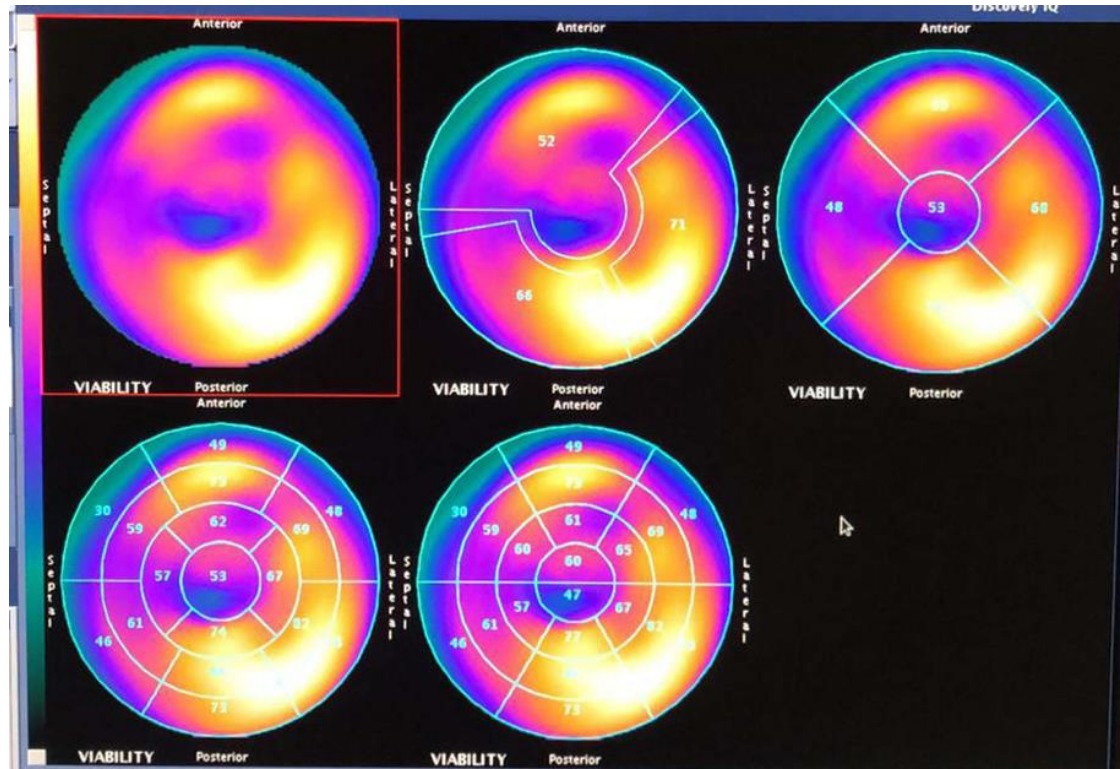
Laboratory and Imaging Evaluation of Cardiac Involvement in Patients with Post-Acute COVID-19



The effect of coronavirus disease 2019 pneumonia on myocardial ischemia detected by single-photon emission computed tomography myocardial perfusion imaging



Laboratory and Imaging Evaluation of Cardiac Involvement in Patients with Post-Acute COVID-19



International Journal of General Medicine 2021;14 4977-4985

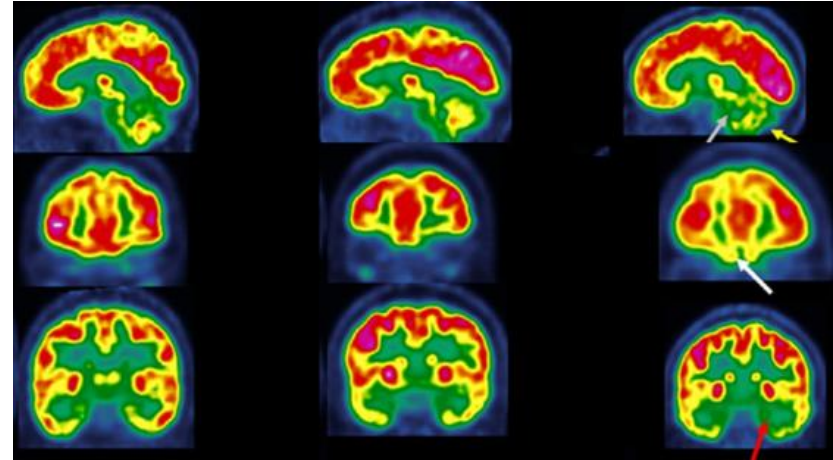
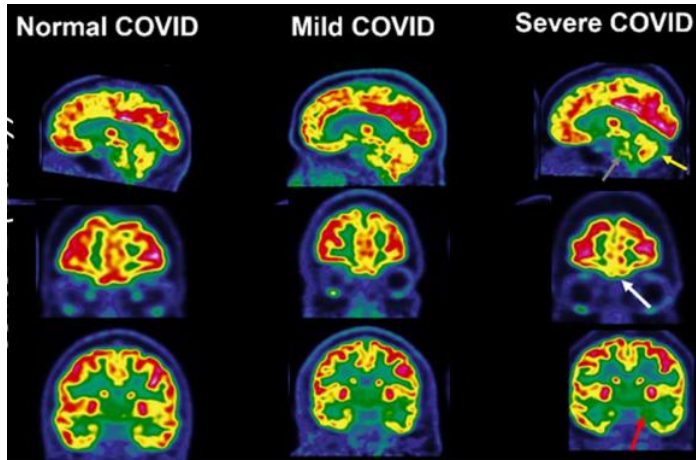
OPEN

Long-term cardiovascular outcomes of COVID-19

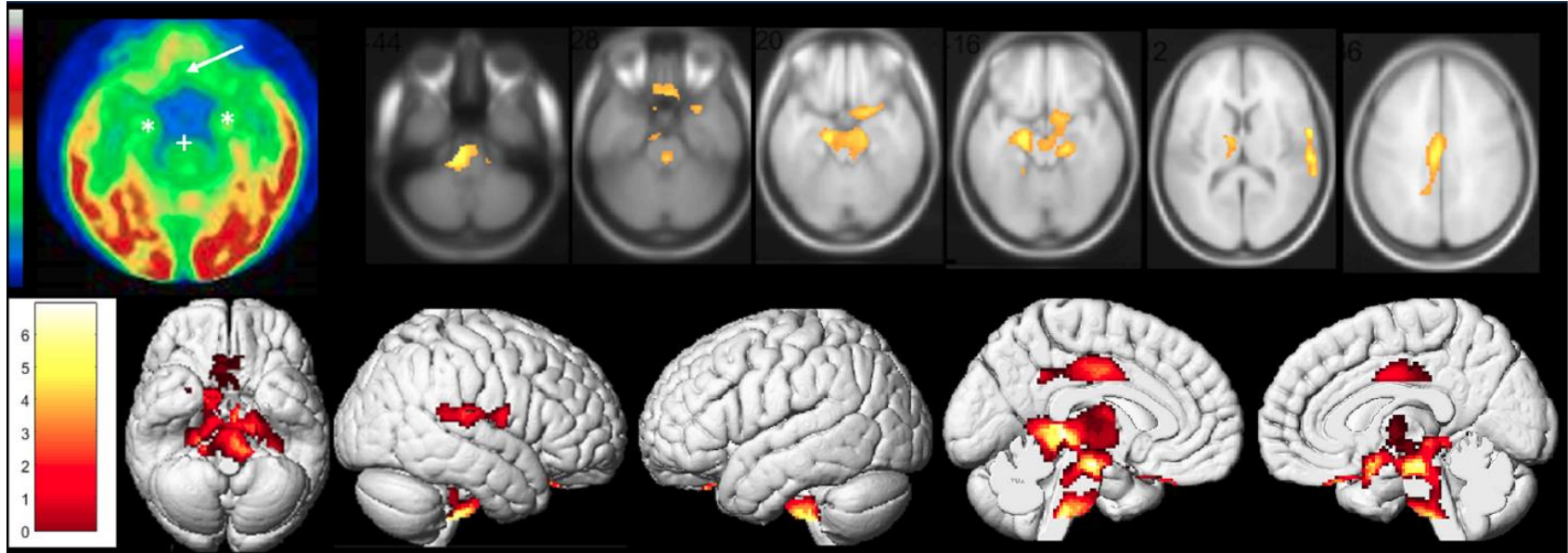
In summary, using a national cohort of people with COVID-19, we show that risk and 12-month burden of incident cardiovascular disease are substantial and span several cardiovascular disease categories (ischemic and non-ischemic heart disease, dysrhythmias and others). The risks and burdens of cardiovascular disease were evident even among those whose acute COVID-19 did not necessitate hospitalization. Care pathways of people who survived the acute episode of COVID-19 should include attention to cardiovascular health and disease

nature
medicine

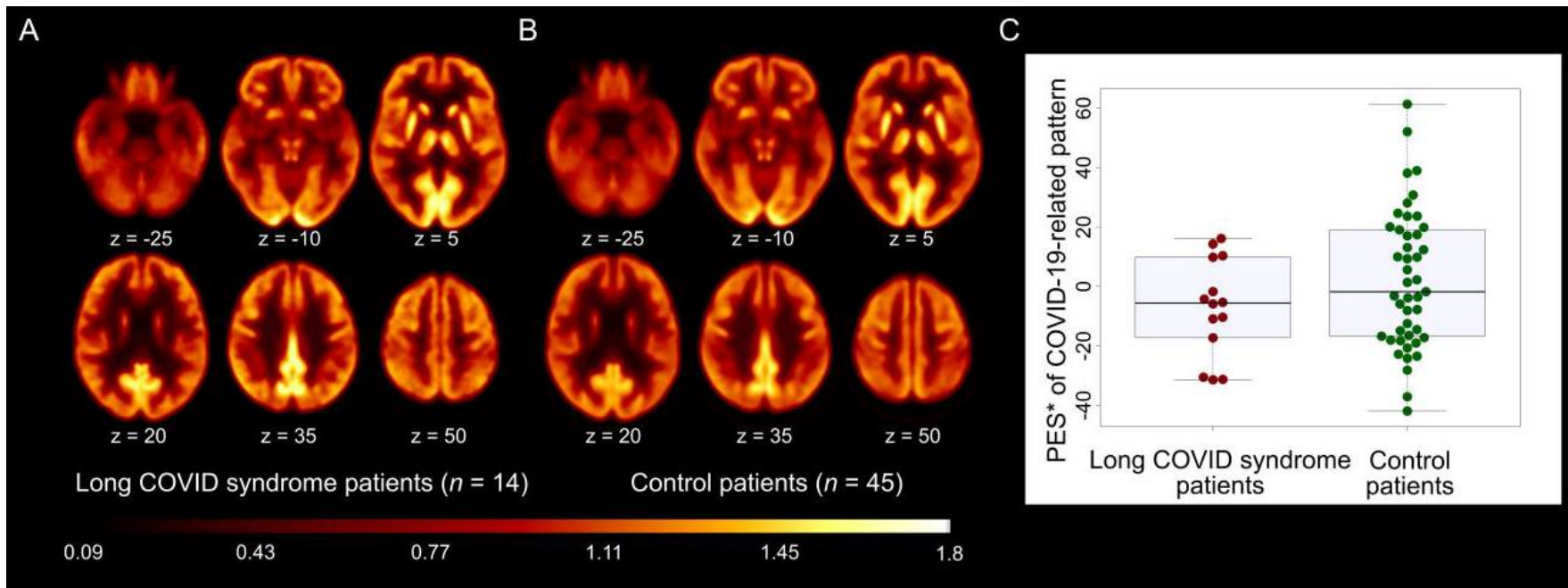
Visual interpretation of brain hypometabolism related to neurological long COVID: a French multicentric experience



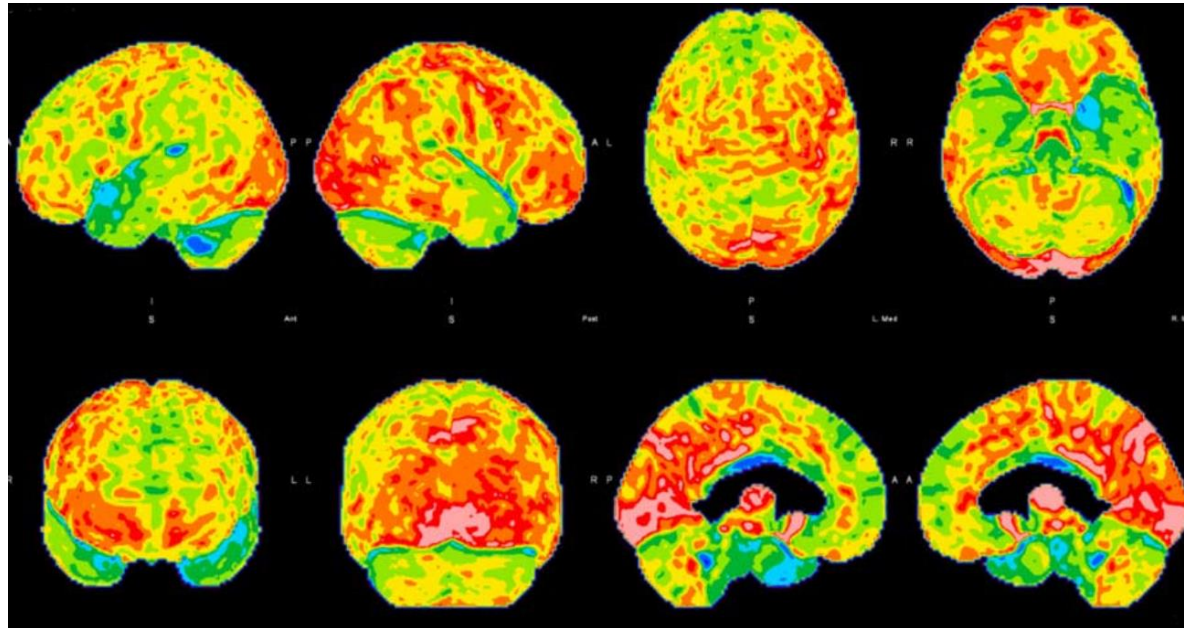
^{18}F -FDG brain PET hypometabolism in post-SARS-CoV-2 infection: substrate for persistent/delayed disorders?



Neuropsychological profiles and cerebral glucose metabolism in neurocognitive Long COVID-syndrome



Long-term Neuropsychiatric Complications and ^{18}F -FDG-PET Hypometabolism in the Brain From Prolonged Infection of COVID-19







Siracusa, 30 settembre 2022



“COVID-LONG COVID: LO STATO DELL’ARTE”

Aspetti radiologici del Covid



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