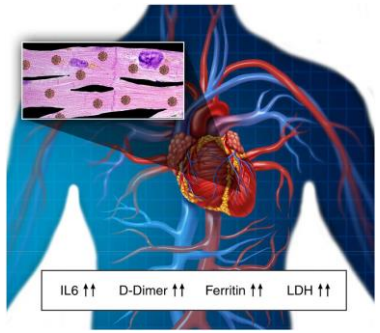




# Kardiyovasküler Komplikasyonlar ve Tromboz Riski

Prof. Dr. Akın Kaya

Ankara Üniversitesi Tıp Fakültesi

Göğüs Hastalıkları

State of the art review

# Respiratory follow-up of patients with COVID-19 pneumonia

Peter M George [1,2], Shaney L Barratt [3,4], Robin Condliffe,[5] Sujal R Desai,[6] Anand Devaraj,[6] Ian Forrest,[7] Michael A Gibbons,[8] Nicholas Hart,[9] R Gisli Jenkins [10], Danny F McAuley,[11] Brijesh V Patel,[12] Erica Thwaite,[13] Lisa G Spencer[13]

Respiration

Guidelines

Respiration 2021;100:826–841
DOI: 10.1159/000517255

Received: April 27, 2021
Accepted. April 29, 2021
Published online: June 4, 2021



NICE National Institute for Health and Care Excellence

RCGP Royal College of General Practitioners

Healthcare Improvement Scotland | SIGN

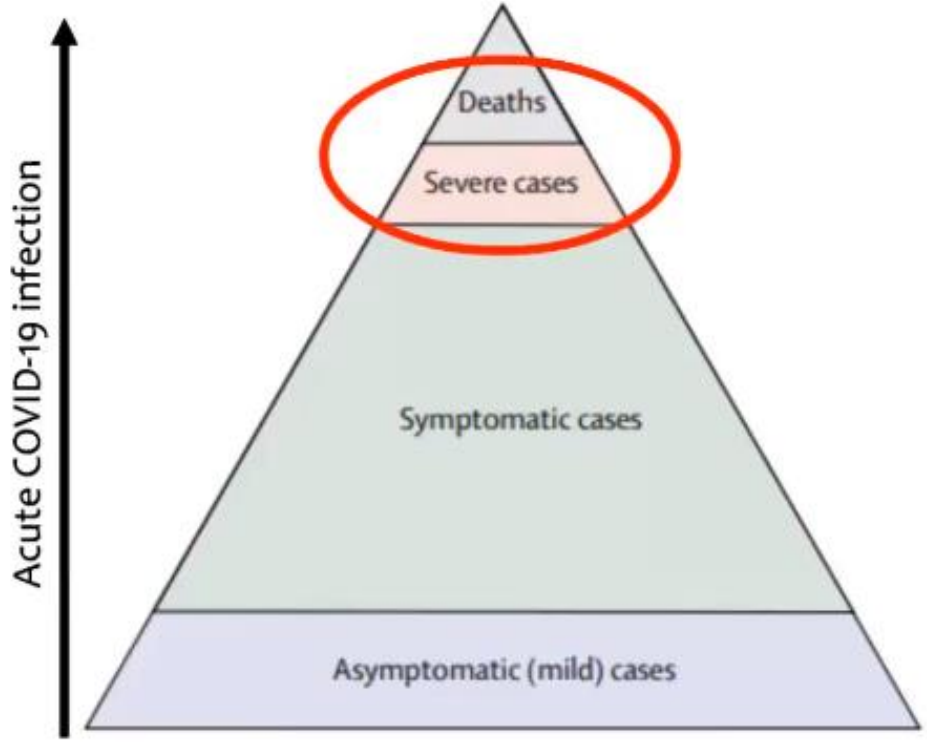
NICE guideline

# COVID-19 rapid guideline: managing the long-term effects of COVID-19

# Swiss Recommendations for the Follow-Up and Treatment of Pulmonary Long COVID

British Thoracic Society

# British Thoracic Society Guidance on Respiratory Follow Up of Patients with a Clinico-Radiological Diagnosis of COVID-19 Pneumonia

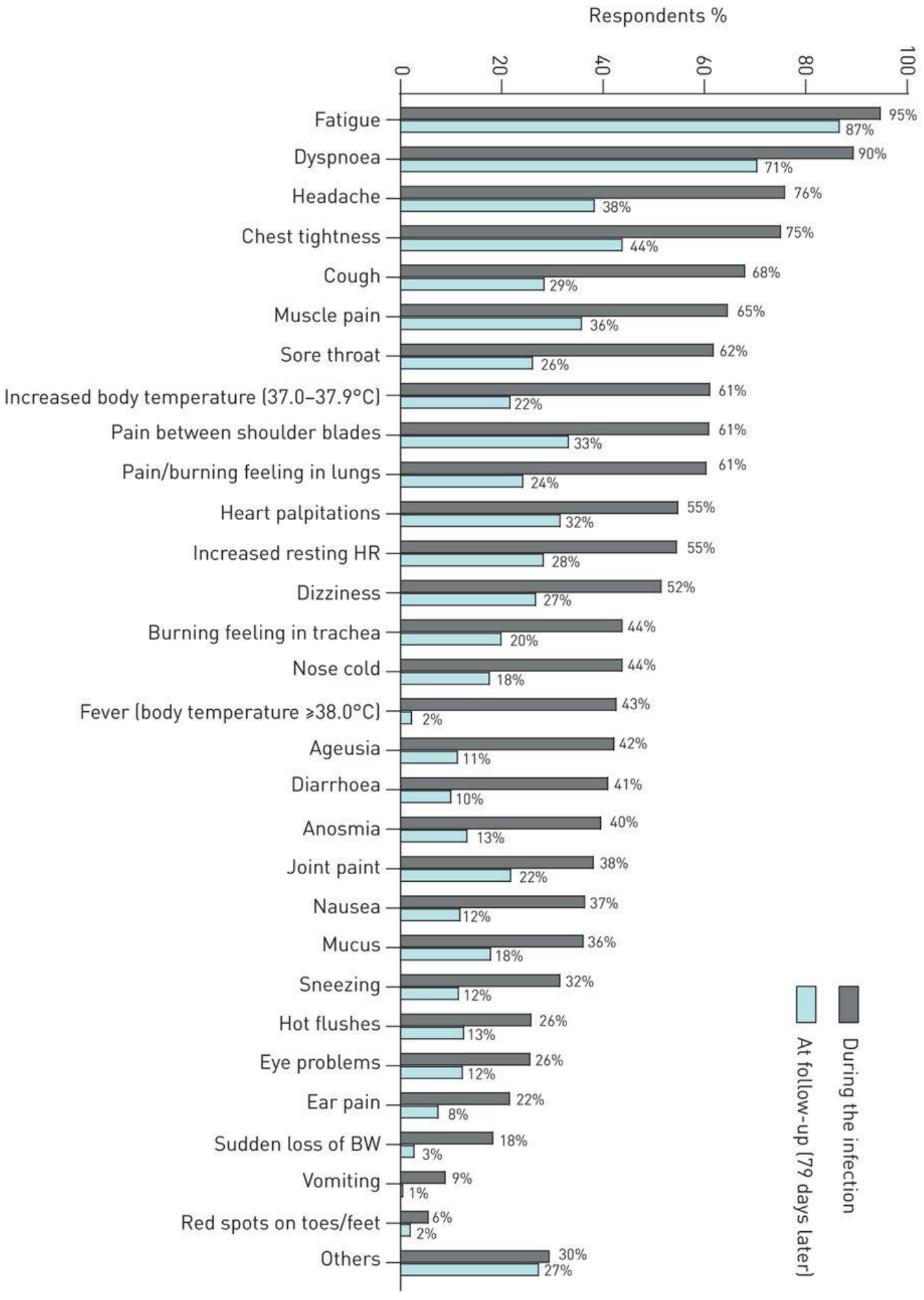

Acute COVID-19 infection:
Signs/symptoms <4 wks

Ongoing symptomatic COVID-19:
Signs/symptoms 4-12 wks

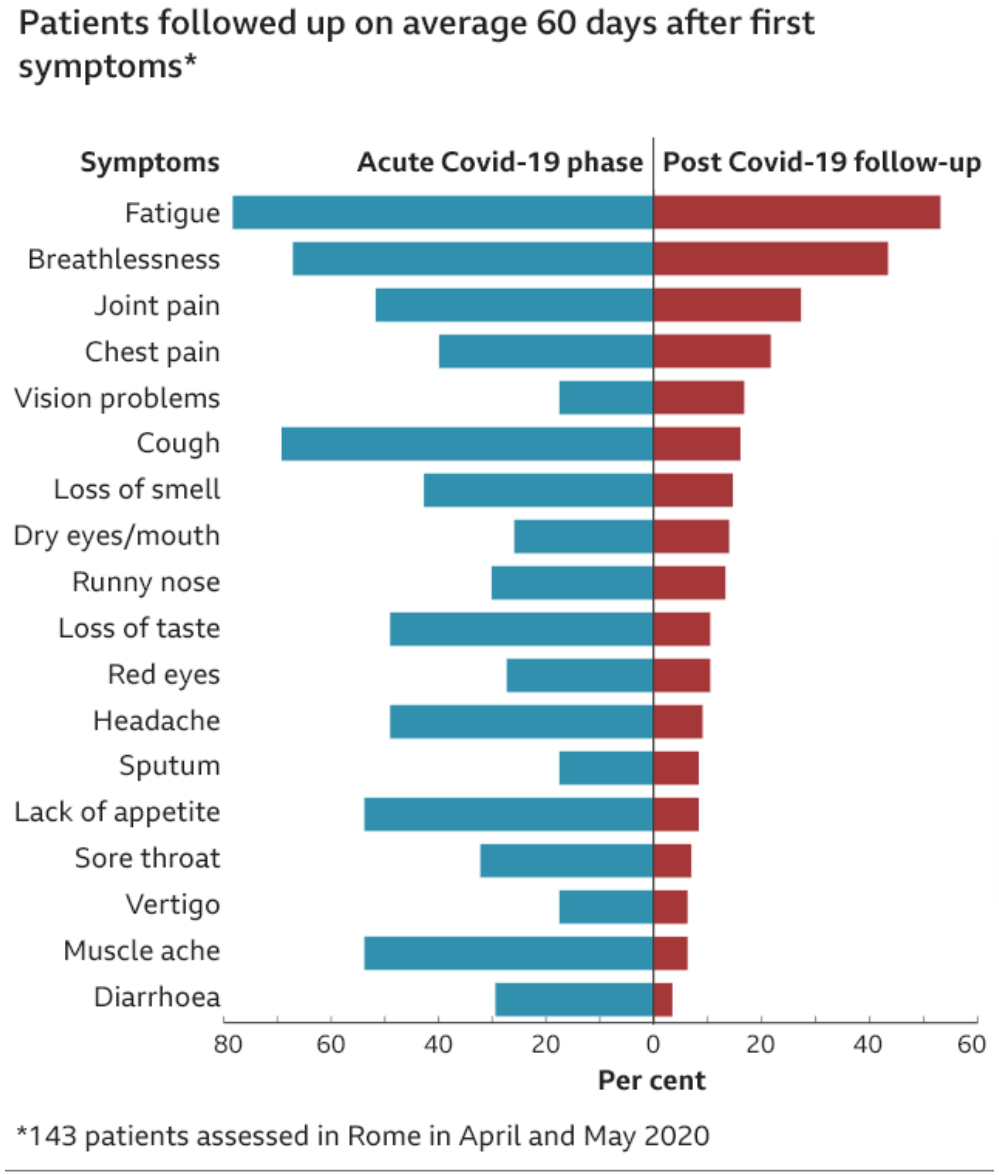
Post-COVID-19 syndrome:
Signs/symptoms >12 wks, not explained by alternative diagnosis

NICE National Institute for Health and Care Excellence

*Verity et al. Lancet Infect Dis 2020*
*https://www.nice.org.uk/guidance/gid-ng10179/documents/final-scope*


Respondents %
0
20
40
60
80
100
Fatigue
95%
87%
Dyspnoea
90%
71%
Headache
76%
38%
Chest tightness
75%
44%
Cough
68%
29%
Muscle pain
65%
36%
Sore throat
62%
26%
Increased body temperature (37.0–37.9°C)
61%
22%
Pain between shoulder blades
61%
33%
Pain/burning feeling in lungs
61%
24%
Heart palpitations
55%
32%
Increased resting HR
55%
28%
Dizziness
52%
27%
Burning feeling in trachea
44%
20%
Nose cold
44%
18%
Fever (body temperature ≥38.0°C)
43%
2%
Ageusia
42%
11%
Diarrhoea
41%
10%
Anosmia
40%
13%
Joint paint
38%
22%
Nausea
37%
12%
Mucus
36%
18%
Sneezing
32%
12%
Hot flushes
26%
13%
Eye problems
26%
12%
Ear pain
22%
8%
Sudden loss of BW
18%
3%
Vomiting
9%
1%
Red spots on toes/feet
6%
2%
Others
30%
27%
During the infection
At follow-up (79 days later)

# PERSISTENT SYMPTOMS post COVID-19




60 (14) days after onset first COVID-19 symptoms

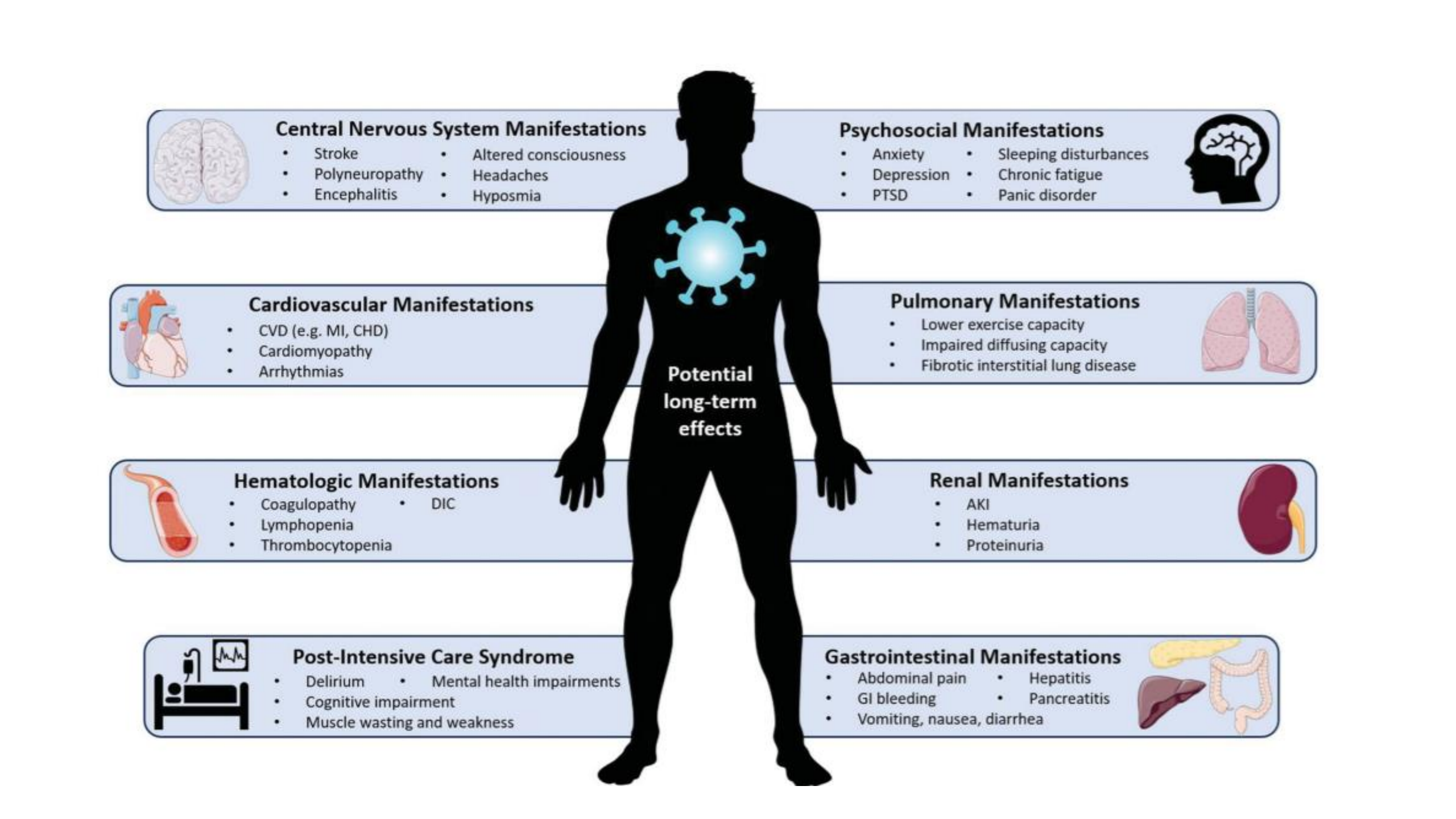
None of the patients had fever or any signs or symptoms of acute illness

12.6% free of COVID-19-related symptoms
32.0% had 1 or 2 symptoms
55.0% had 3 or more symptoms

44% low qualiy of life (EQ-5D)

JAMA August 11, 2020 Volume 324, Number 6

Yvonne M.J. Goërtz et al. ERJ Open Res 2020;6:00542-2020


Central Nervous System Manifestations
Stroke
Polyneuropathy
Encephalitis
Altered consciousness
Headaches
Hyposmia
Psychosocial Manifestations
Anxiety
Depression
PTSD
Sleeping disturbances
Chronic fatigue
Panic disorder
Cardiovascular Manifestations
CVD (e.g. MI, CHD)
Cardiomyopathy
Arrhythmias
Pulmonary Manifestations
Lower exercise capacity
Impaired diffusing capacity
Fibrotic interstitial lung disease
Potential long-term effects
Hematologic Manifestations
Coagulopathy
Lymphopenia
Thrombocytopenia
DIC
Renal Manifestations
AKI
Hematuria
Proteinuria
Post-Intensive Care Syndrome
Delirium
Cognitive impairment
Muscle wasting and weakness
Mental health impairments
Gastrointestinal Manifestations
Abdominal pain
GI bleeding
Vomiting, nausea, diarrhea
Hepatitis
Pancreatitis

thebmj Visual summary

# "Long covid" in primary care

Assessment and initial management of patients with continuing symptoms

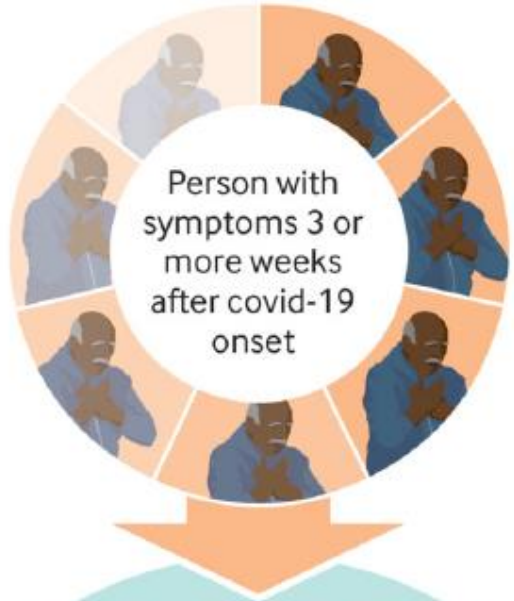
Post-acute covid-19 appears to be a multi-system disease, sometimes occurring after a relatively mild acute illness. Clinical management requires a whole-patient perspective. This graphic summarises the assessment and initial management of patients with delayed recovery from an episode of covid-19 that was managed in the community or in a standard hospital ward.

## An uncertain picture

The long term course of covid-19 is unknown. This graphic presesents an approach based on evidence available at the time of publication. However, caution is advised, as patients may present atypically, and new treatments are likely to emerge

## Managing comorbidities

Many patients have comorbidities including diabetes, hypertension, kidney disease or ischaemic heart disease. These need to be managed in conjuntion with covid-19 treatment. Refer to condition specific guidance, available in the associated article by Greenhalgh and colleagues




## Clinical assessment

**Full history**
From date of first symptom

**Current symptoms**
Nature and severity

**Examination, for example:**

- Temperature
- Heart rate and rhythm
- Blood pressure
- Respiratory examination
- Functional status
- Pulse oximetry
- Clinical testing

If indicated

Assess comorbidities

Social and financial circumstances

## Investigations

Clinical testing is not always needed, but can help to pinpoint causes of contiuing symptoms, and to exclude conditions like pulmonary embolism or myocarditis. Examples are provided below:

**Blood tests**

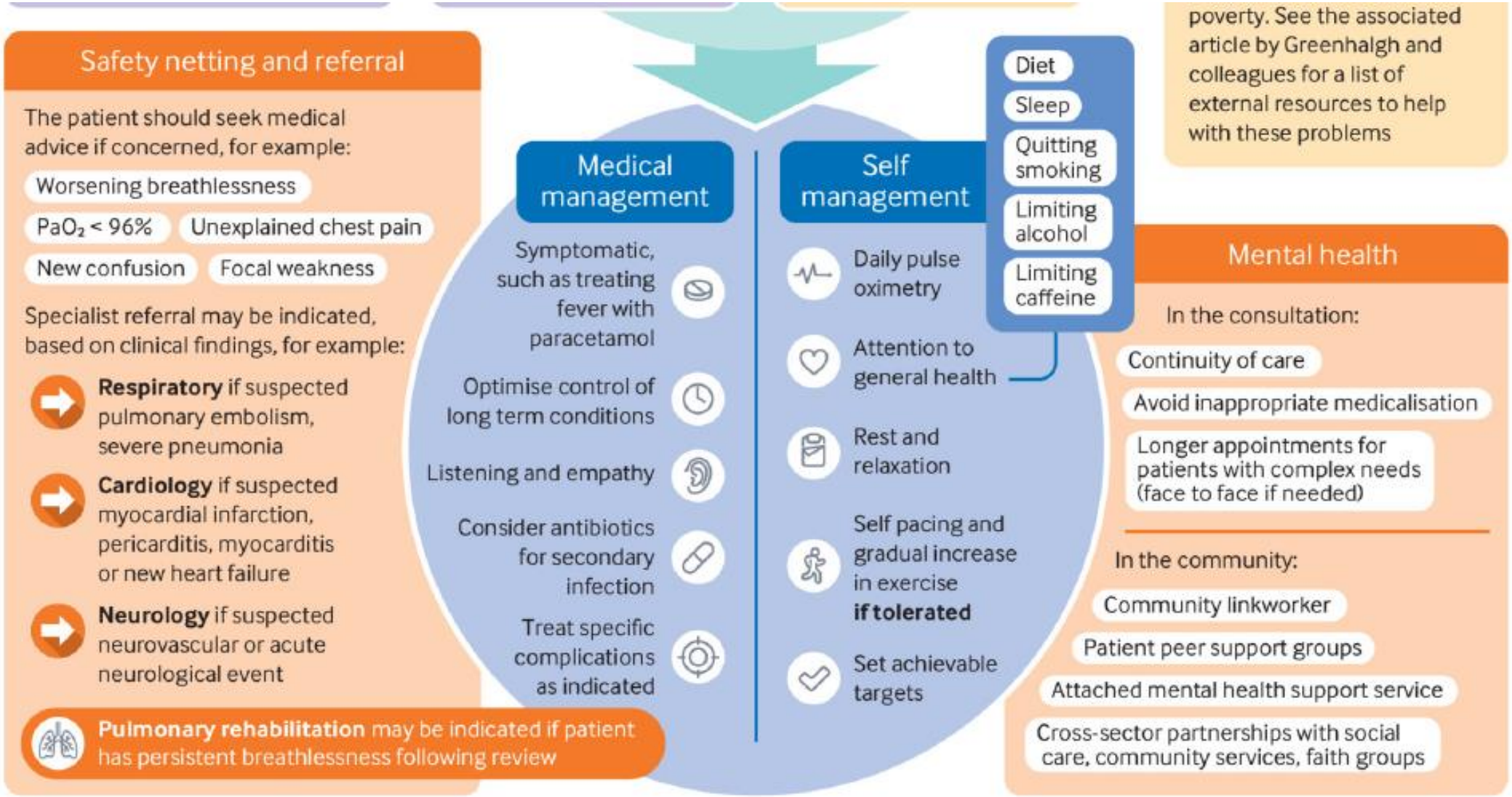
- Full blood count
- Electrolytes
- Liver and renal function
- Troponin
- C reactive protein
- Creatine kinase
- D-dimer
- Brain natriuretic peptides
- Ferritin – to assess inflammatory and prothrombotic states

**Other investigations**

- Chest x ray
- Urine tests
- 12 lead electrocardiogram

## Social, financial, and cultural support

Prolonged covid-19 may limit the ability to engage in work and family activities. Patients may have experienced family bereavements as well as job losses and consequent financial stress and food poverty. See the associated


poverty. See the associated article by Greenhalgh and colleagues for a list of external resources to help with these problems
Safety netting and referral
The patient should seek medical advice if concerned, for example:
Worsening breathlessness
$PaO_2$ < 96%
Unexplained chest pain
New confusion
Focal weakness
Specialist referral may be indicated, based on clinical findings, for example:
Respiratory if suspected pulmonary embolism, severe pneumonia
Cardiology if suspected myocardial infarction, pericarditis, myocarditis or new heart failure
Neurology if suspected neurovascular or acute neurological event
Pulmonary rehabilitation may be indicated if patient has persistent breathlessness following review
Medical management
Symptomatic, such as treating fever with paracetamol
Optimise control of long term conditions
Listening and empathy
Consider antibiotics for secondary infection
Treat specific complications as indicated
Self management
Daily pulse oximetry
Attention to general health
Rest and relaxation
Self pacing and gradual increase in exercise if tolerated
Set achievable targets
Diet
Sleep
Quitting smoking
Limiting alcohol
Limiting caffeine
Mental health
In the consultation:
Continuity of care
Avoid inappropriate medicalisation
Longer appointments for patients with complex needs (face to face if needed)
In the community:
Community linkworker
Patient peer support groups
Attached mental health support service
Cross-sector partnerships with social care, community services, faith groups

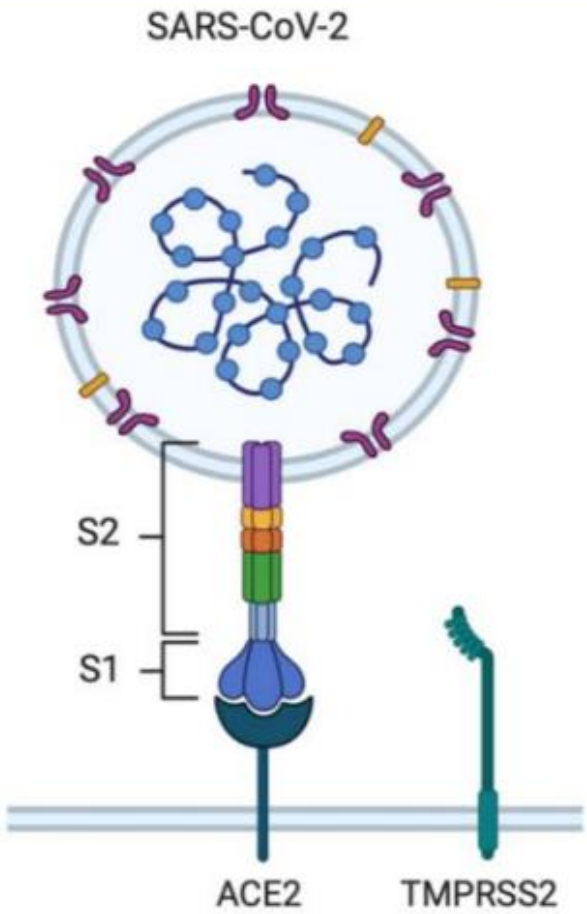
# Insights into cardiac injury from in vitro and ex vivo studies

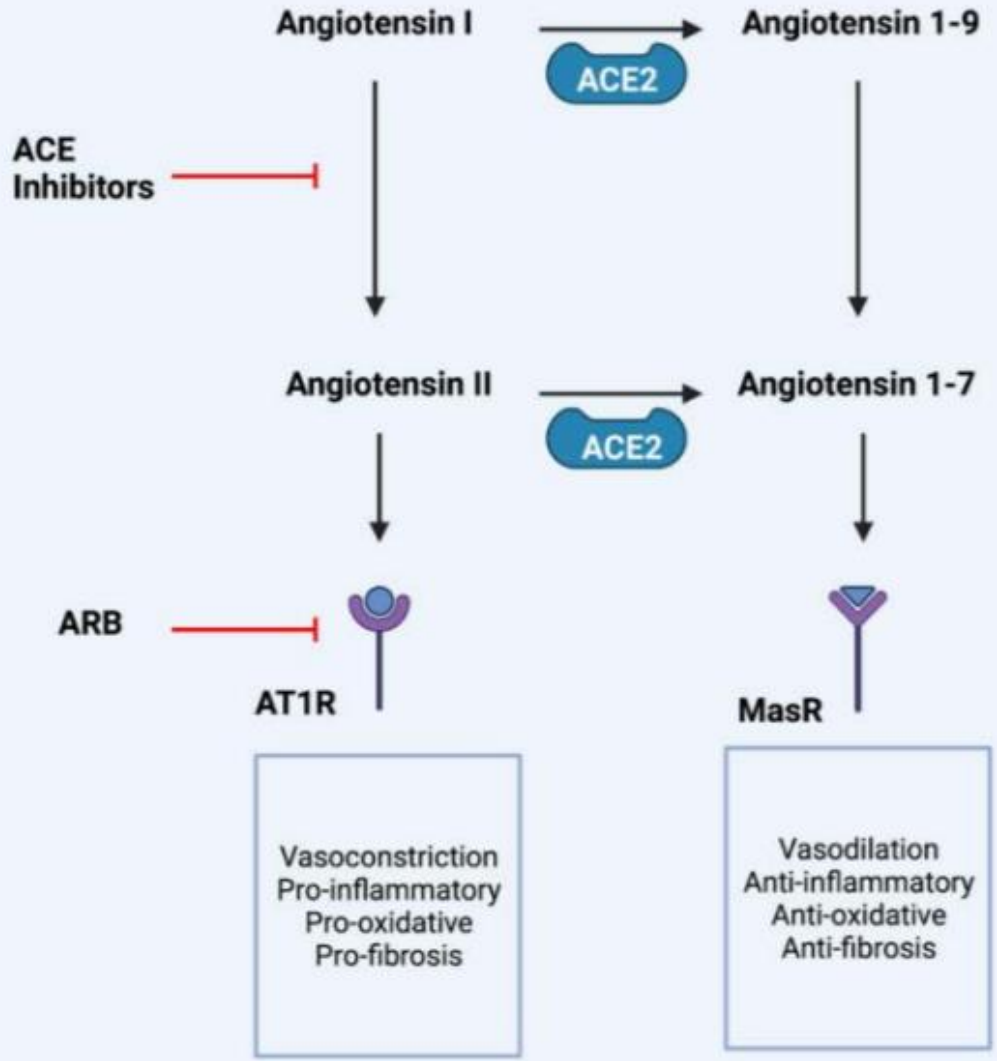
- Viral toxicity
- Immune mediated
- Endotheliitis
- Immunothrombotic mechanisms
- Ischaemic-supply and demand (including RV dysfunction)
- Others: Takotsubo

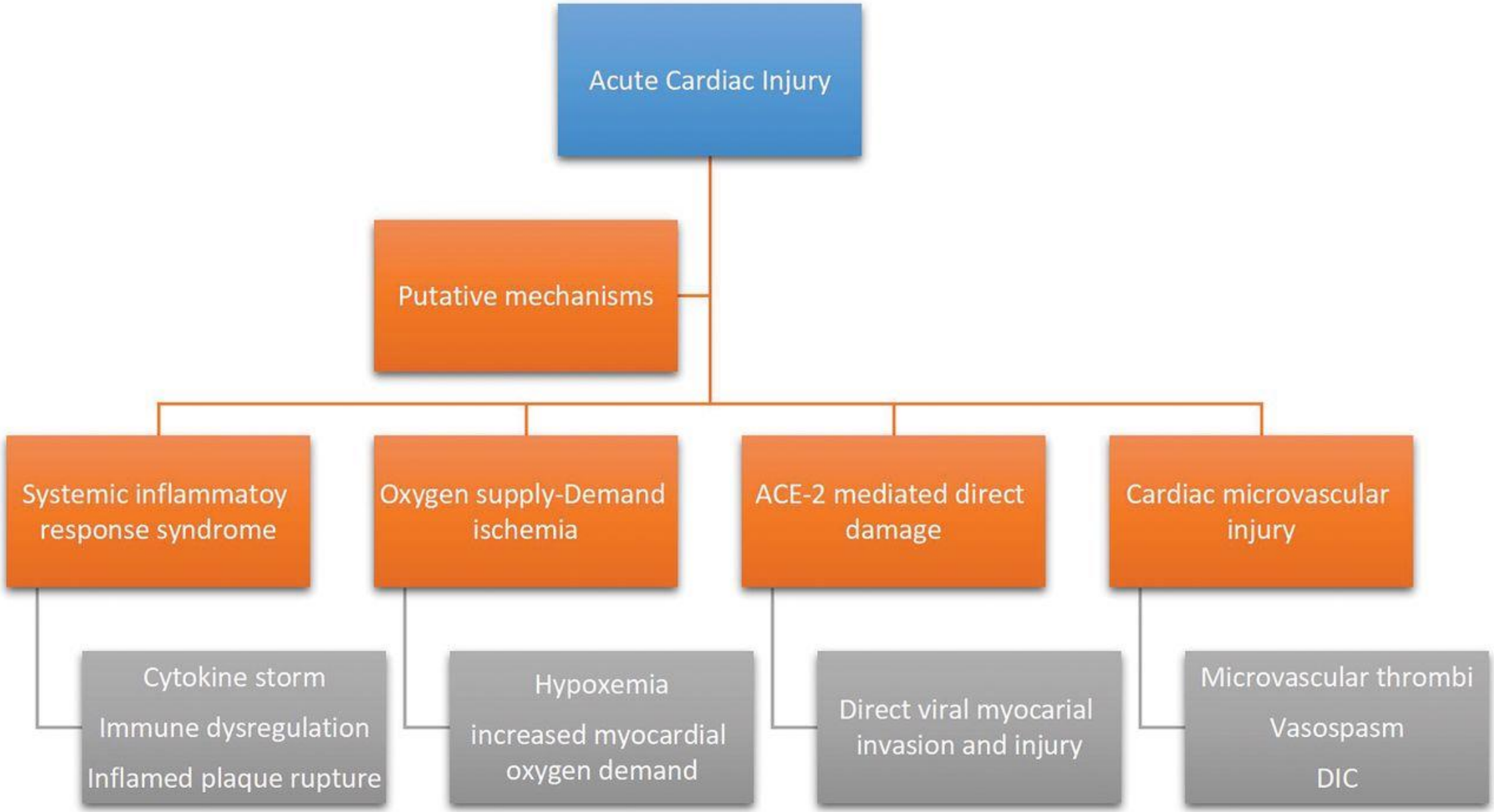
## ACE2

- Two forms: soluble and transmembrane protein.

-Present in: respiratory epithelium, myocardium, endothelial cells.




Acute Cardiac Injury
Putative mechanisms
Systemic inflammatoy response syndrome
Oxygen supply-Demand ischemia
ACE-2 mediated direct damage
Cardiac microvascular injury
Cytokine storm
Immune dysregulation
Inflamed plaque rupture
Hypoxemia
increased myocardial oxygen demand
Direct viral myocarial invasion and injury
Microvascular thrombi
Vasospasm
DIC

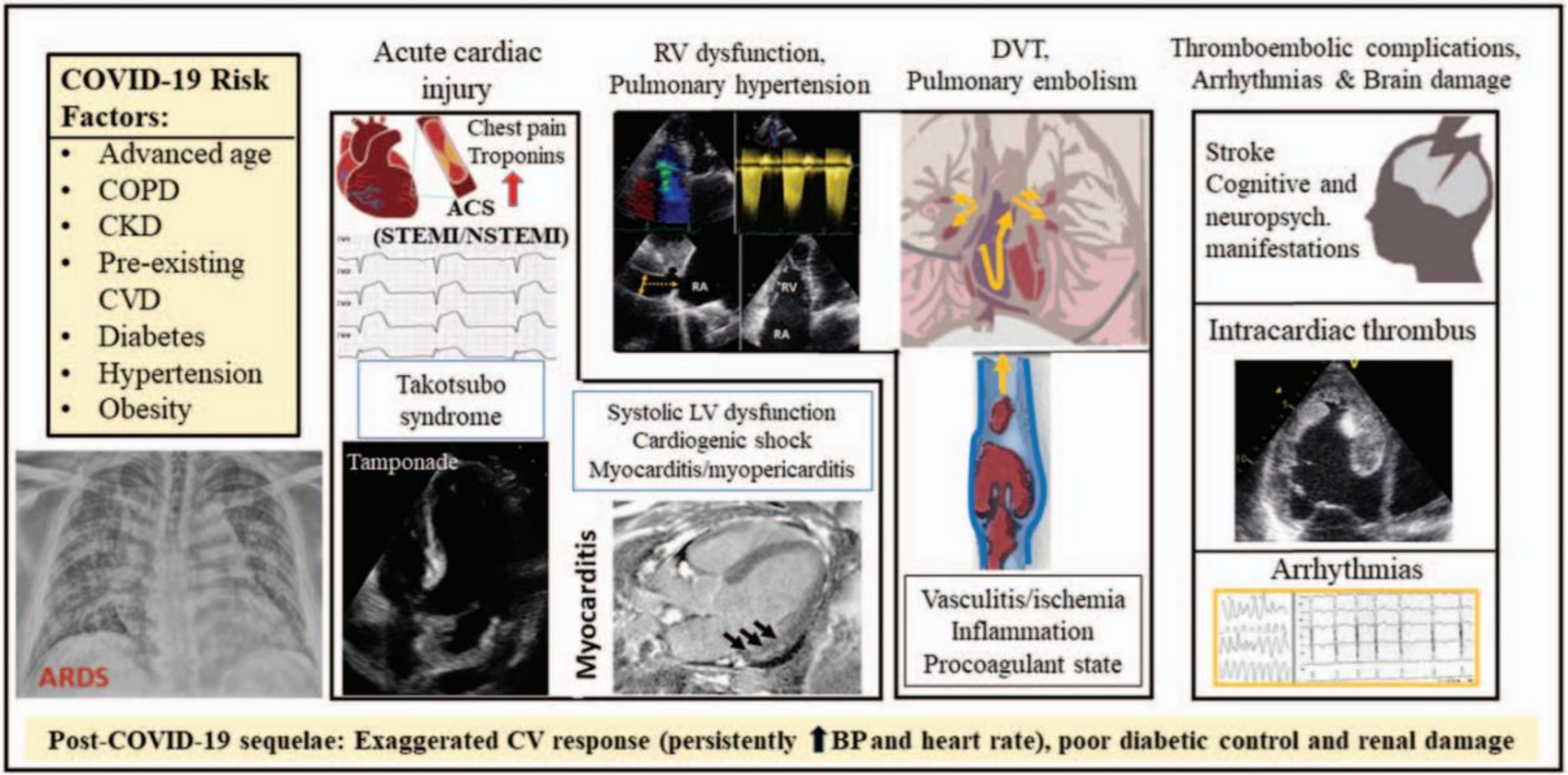
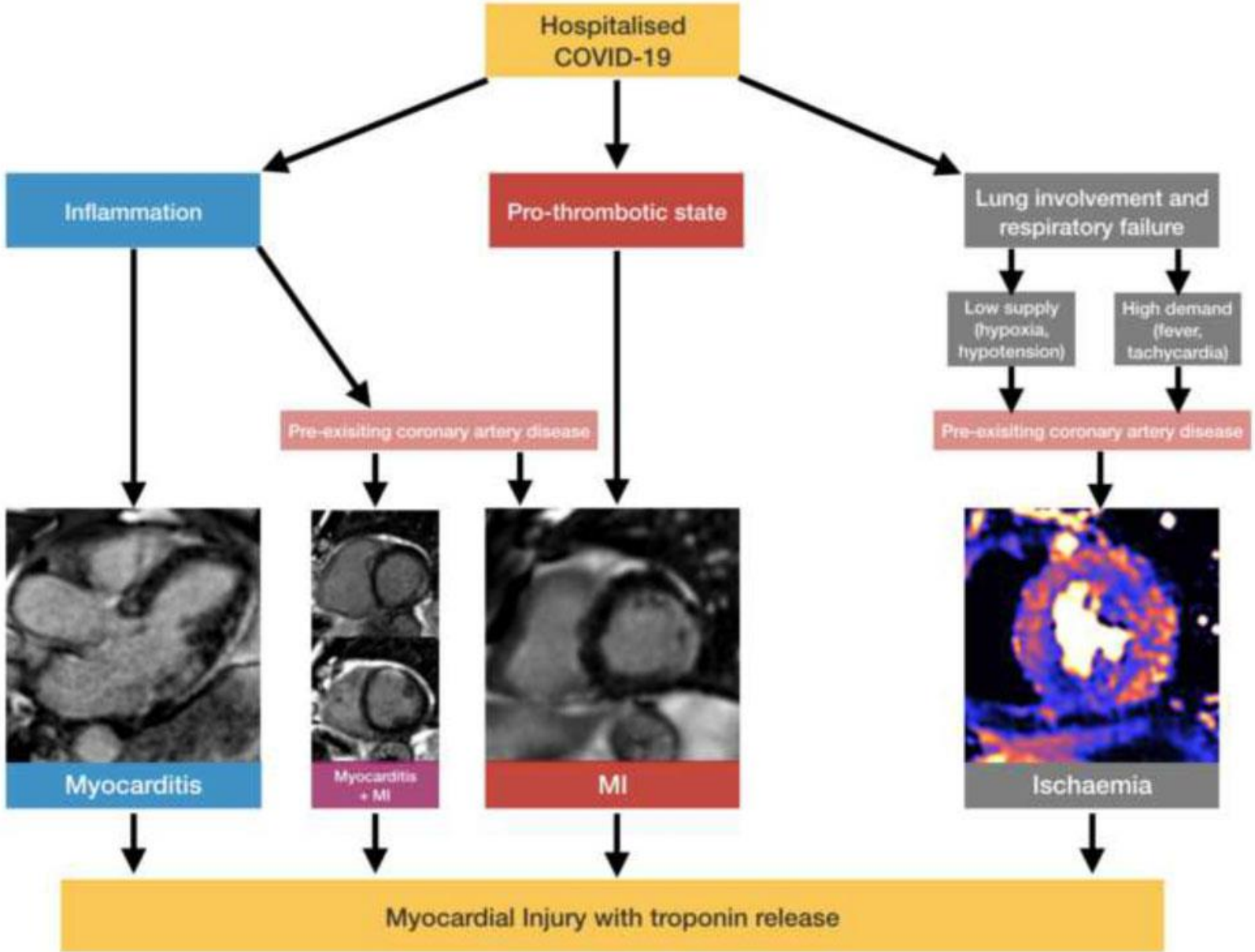
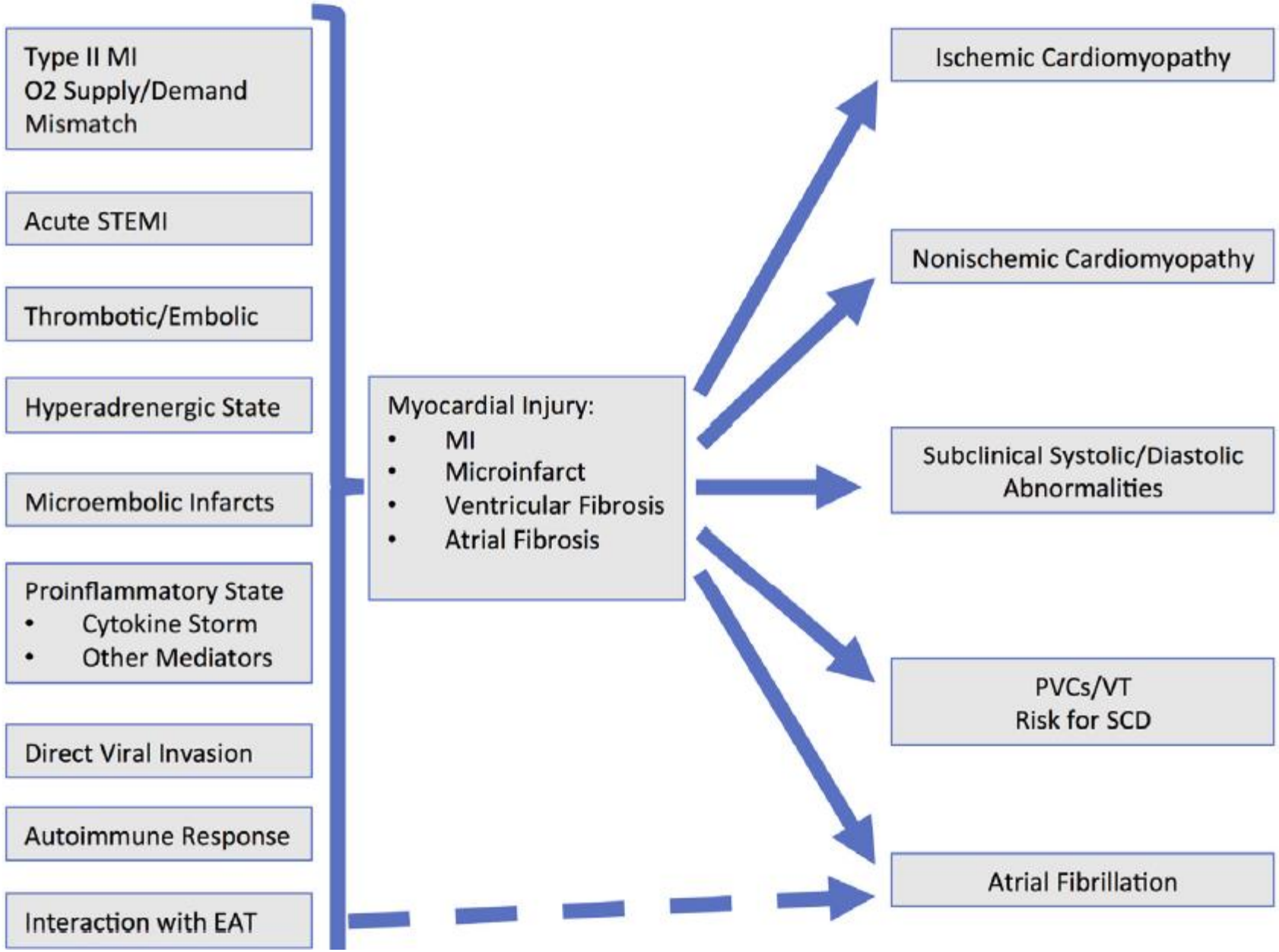
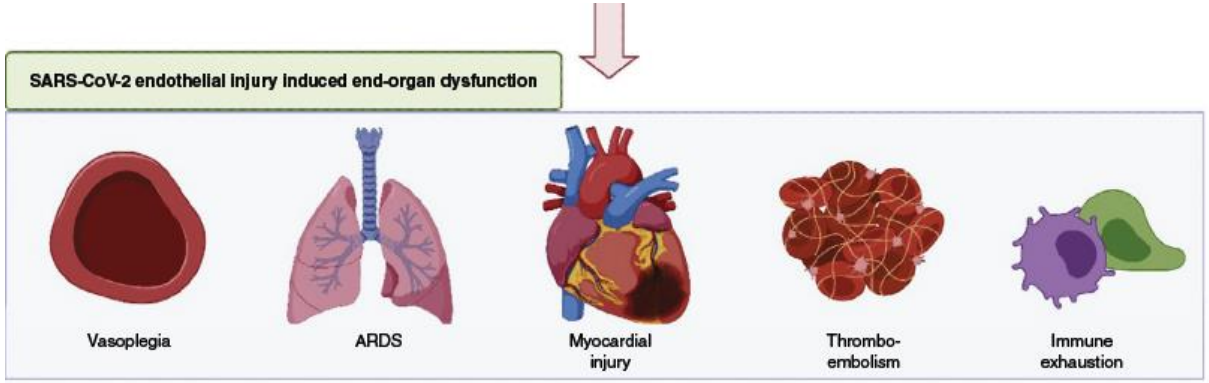



**FIGURE 2** Overview of acute cardiovascular complications in coronavirus disease 2019. ACS, acute coronary syndrome; CVD, cardiovascular disease; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; DVT, deep venous thrombosis.


Hospitalised COVID-19
Inflammation
Pro-thrombotic state
Lung involvement and respiratory failure
Low supply (hypoxia, hypotension)
High demand (fever, tachycardia)
Pre-exisiting coronary artery disease
Pre-exisiting coronary artery disease
Myocarditis
Myocarditis + MI
MI
Ischaemia
Myocardial Injury with troponin release


Type II MI
O2 Supply/Demand
Mismatch
Acute STEMI
Thrombotic/Embolic
Hyperadrenergic State
Microembolic Infarcts
Proinflammatory State
• Cytokine Storm
• Other Mediators
Direct Viral Invasion
Autoimmune Response
Interaction with EAT
Myocardial Injury:
• MI
• Microinfarct
• Ventricular Fibrosis
• Atrial Fibrosis
Ischemic Cardiomyopathy
Nonischemic Cardiomyopathy
Subclinical Systolic/Diastolic
Abnormalities
PVCs/VT
Risk for SCD
Atrial Fibrillation



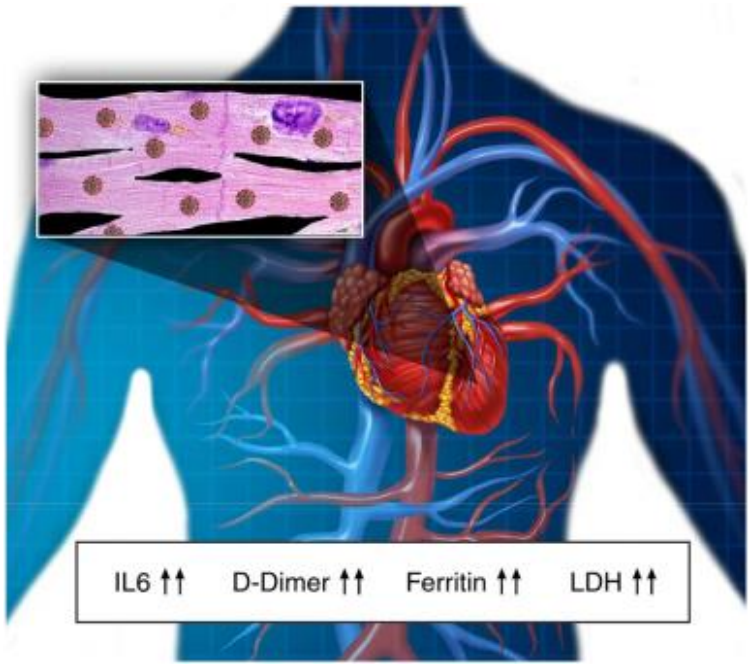
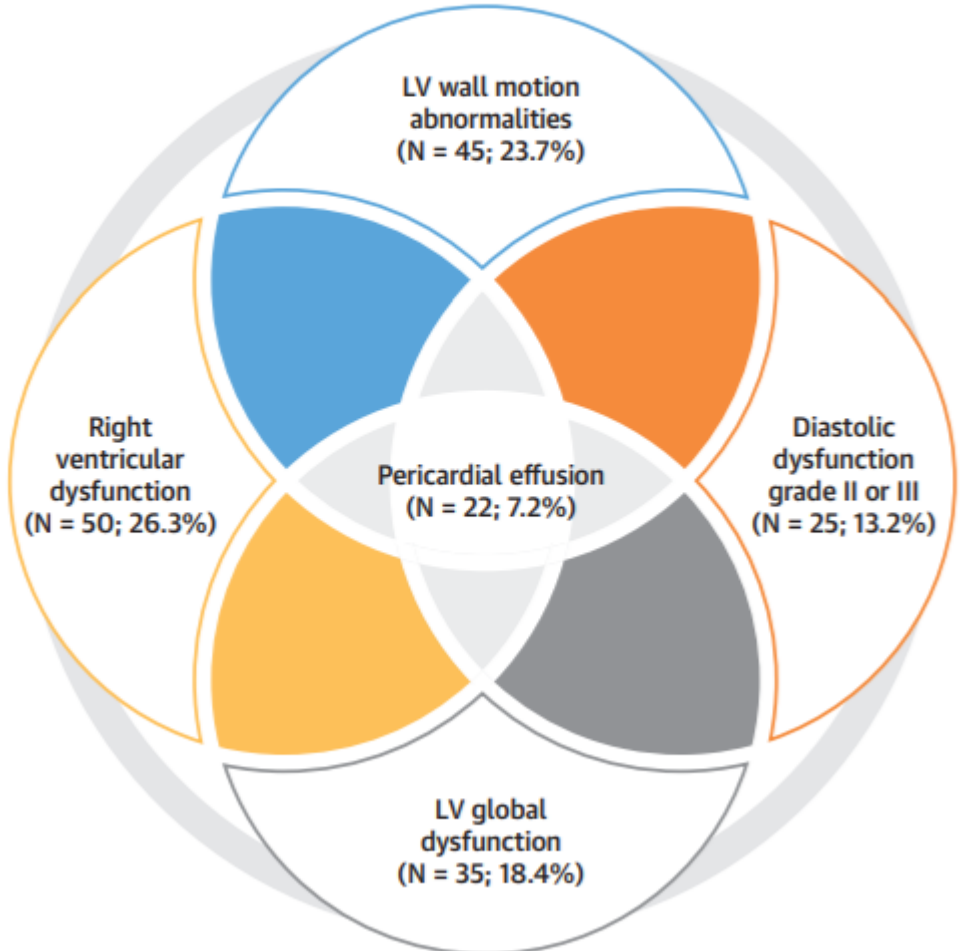




**TABLE 94.2 Important Pathology Findings in Autopsies of Subjects with COVID-19**

| |
|---|
| **Cardiac Pathology** |
| Cardiomegaly |
| Cardiac dilation |
| Lymphocytic epicarditis/pericarditis |
| Lymphocytic myocarditis |
| Individual/focal myocyte necrosis |
| Acute ischemia |
| Intracardiac thrombi |
| Intramyocardial microthrombi in capillaries, arterioles, and small arteries |
| Pericardial effusion |
| **Pulmonary Pathology** |
| Severe endothelial injury |
| Acute pneumonitis |
| Interstitial pneumonitis |
| Interstitial lymphocytic pneumonitis |
| Incipient interstitial pneumonitis |
| Diffuse alveolar damage with perivascular T-cell infiltration |
| Bronchopneumonia with aspiration |
| Microthrombi in capillaries and small blood vessels |
| Microangiopathy and intussusceptive angiogenesis |
| Large pulmonary thromboemboli |

# Characterization of Myocardial Injury in Patients With COVID-19

## Spectrum of Major Echocardiographic Abnormalities in Patients With Myocardial Injury and COVID-19



american physiological society
AMERICAN JOURNAL OF PHYSIOLOGY
CELL PHYSIOLOGY
First published Noven

REVIEW

# Long-term complications of COVID-19

- Göğüs Ağrısı
- Çarpıntı
- POTS: Postüral taşikardi sendromu
- Miyokardit
- Ekokardiogram bulguları

# Kardiyak Sonuçlar

## CARDIOVASCULAR LONG COVID

### COVID 19: ACUTE

- Cardiogenic shock
- Acute heart failure
- Acute Ischemic syndromes
- Acute thromboembolic events
- Myocardial damage
- Myopericarditis
- Stroke
- Arrhythmias

Context of observation: Hospitalization in ICU or non-ICU wards or outpatient setting. Factors contributing to the risk of infection: age, sex, chronic comorbidities/diseases.

### COVID 19: EVOLUTION

- Death
- Survival with residual organ damage
- Survival with repair of the acute damage
- Recovery
  - Clinical
  - Functional
  - Structural
- Persistent cardiovascular symptoms

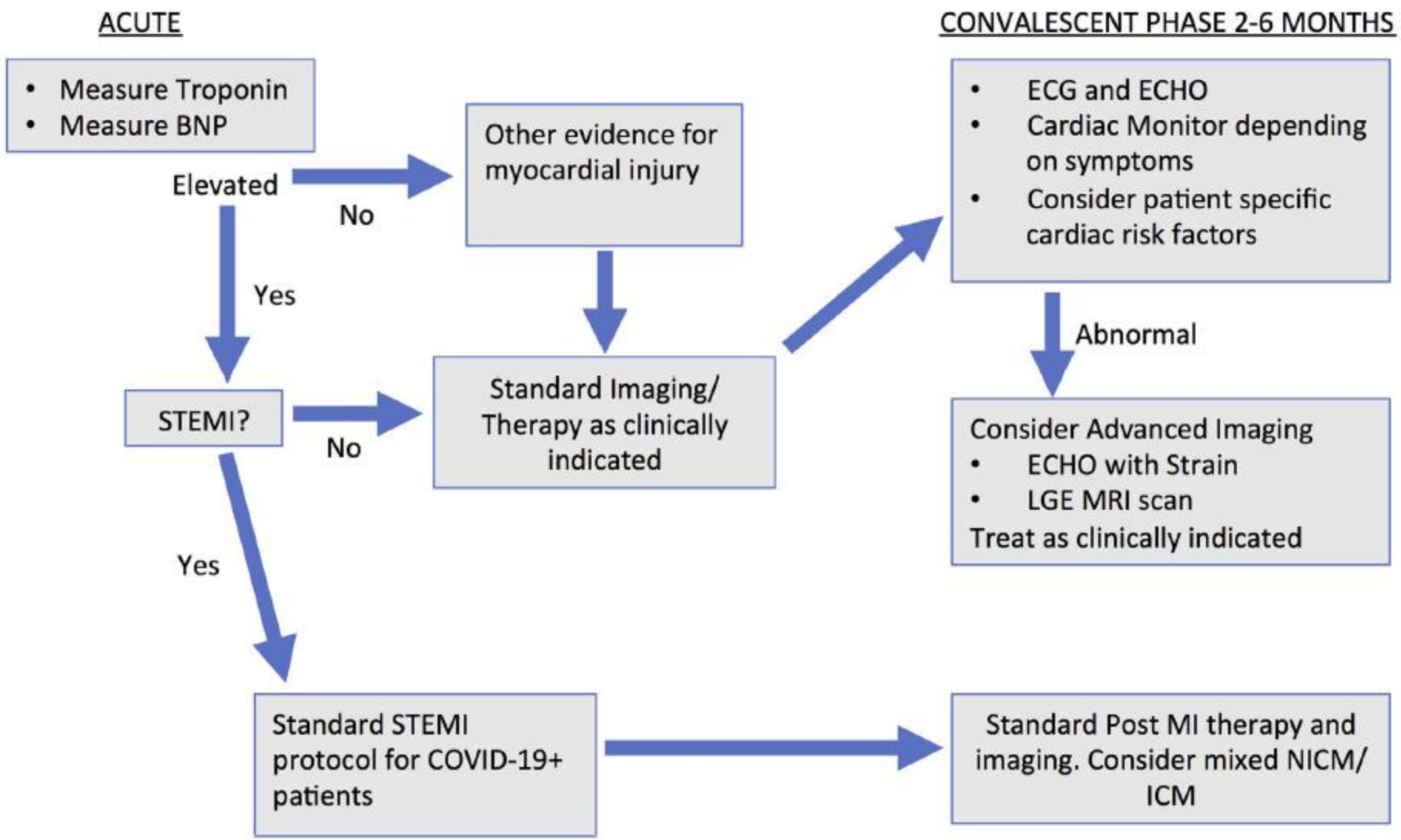
Context of observation of survivors: rehabilitation clinics or services for patients who were admitted to ICU or other Hospital Wards; family physicians. Self-managed symptoms.

### LONG COVID

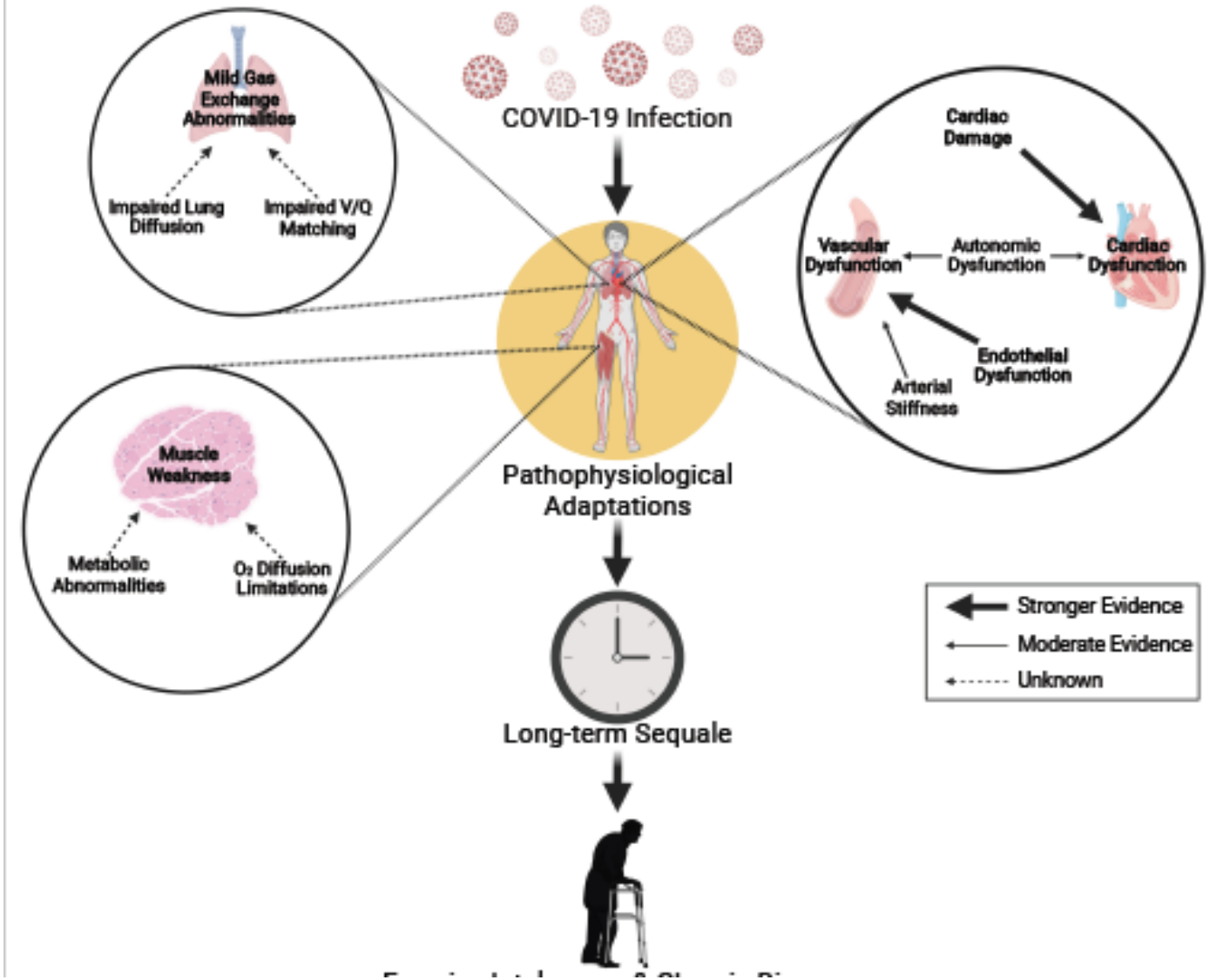
Criteria

- Persistence > 12 weeks following the acute phase
- Symptoms, constitutional, cardiovascular
- Biomarkers
  - Coagulation: fibrinogen, D-Dimer, platelets
  - Myocyte damage: hsTnI
  - Systemic inflammation, CRP, Leukocyte count
  - Immunity/cytokines (IL-6)
  - Myocyte load/stress BNP, NtProBNP
- De novo ECG changes and Imaging findings: 2DTTE, CMR, others (PET?)
- De novo events in low-risk subjects

Context of observation of survivors: Long COVID clinics with multidisciplinary evaluation including cardiologists. Either post-ICU and non ICU wards or non hospitalized patients may complain Long Covid symptoms / manifestations


ACUTE
CONVALESCENT PHASE 2-6 MONTHS
• Measure Troponin
• Measure BNP
Elevated
No
Other evidence for myocardial injury
Yes
STEMI?
No
Standard Imaging/ Therapy as clinically indicated
• ECG and ECHO
• Cardiac Monitor depending on symptoms
• Consider patient specific cardiac risk factors
Abnormal
Consider Advanced Imaging
• ECHO with Strain
• LGE MRI scan
Treat as clinically indicated
Yes
Standard STEMI protocol for COVID-19+ patients
Standard Post MI therapy and imaging. Consider mixed NICM/ ICM

# From Heart to Muscle: Pathophysiological mechanisms underlying long-term physical sequelae from SARS-CoV-2 infection



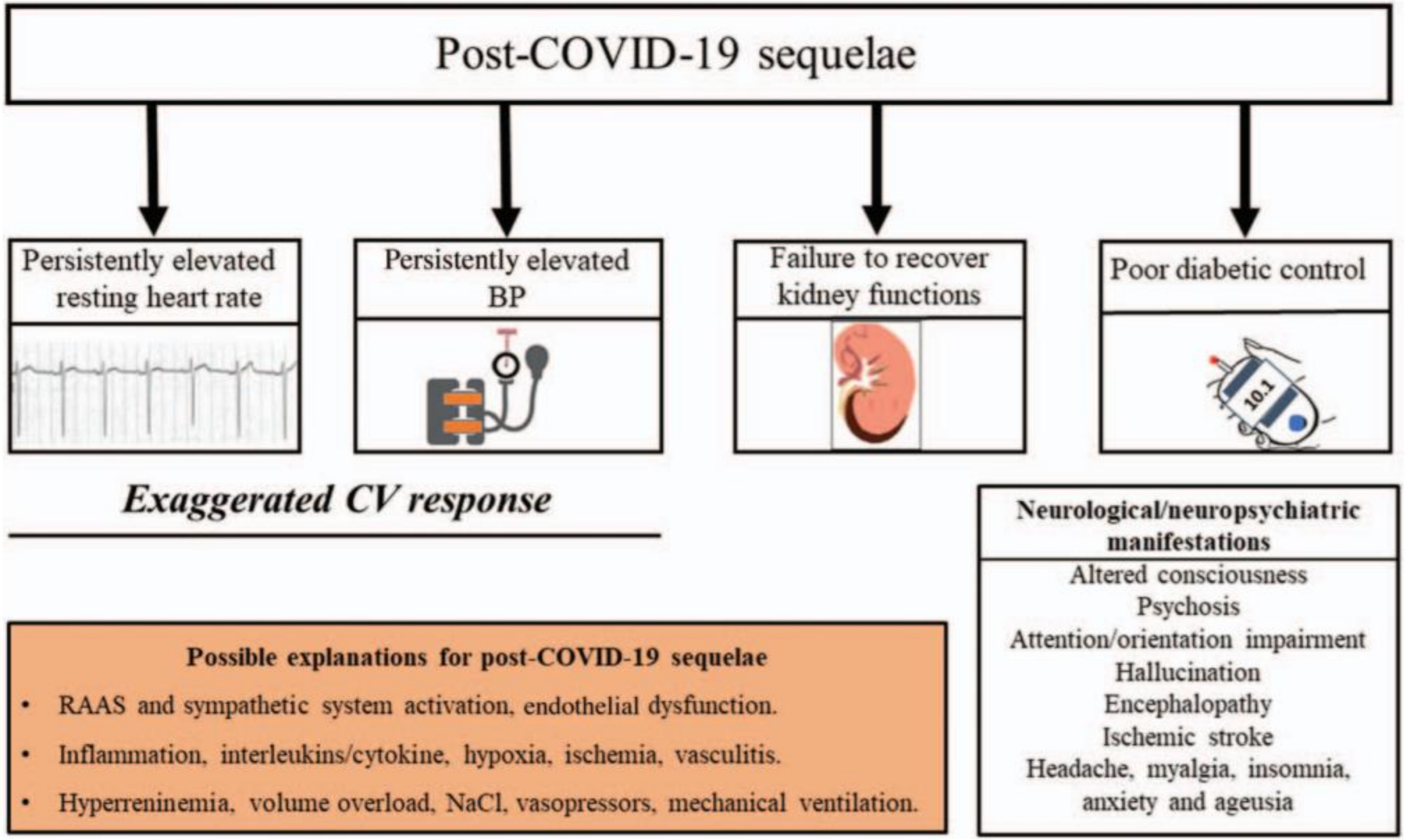
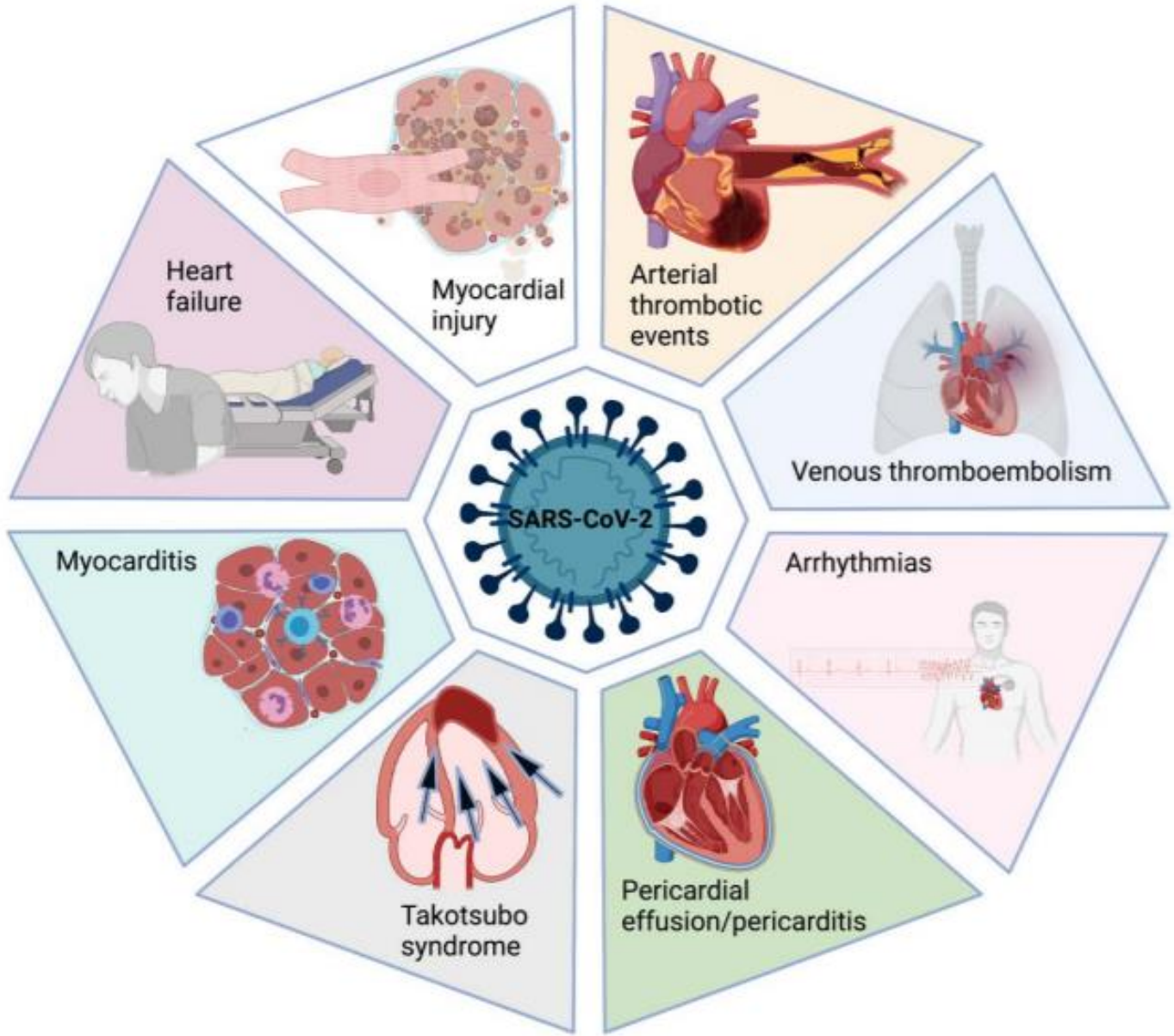
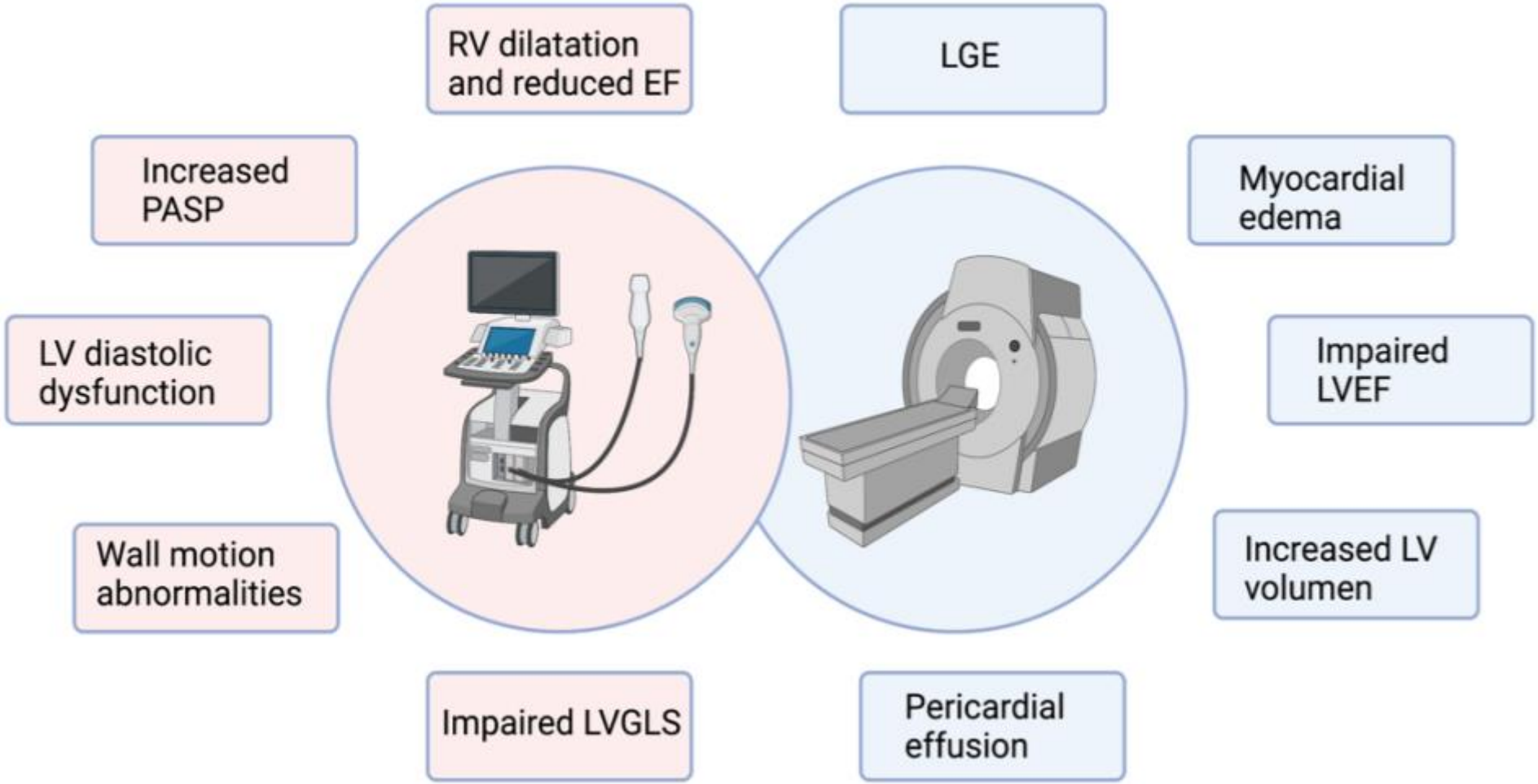
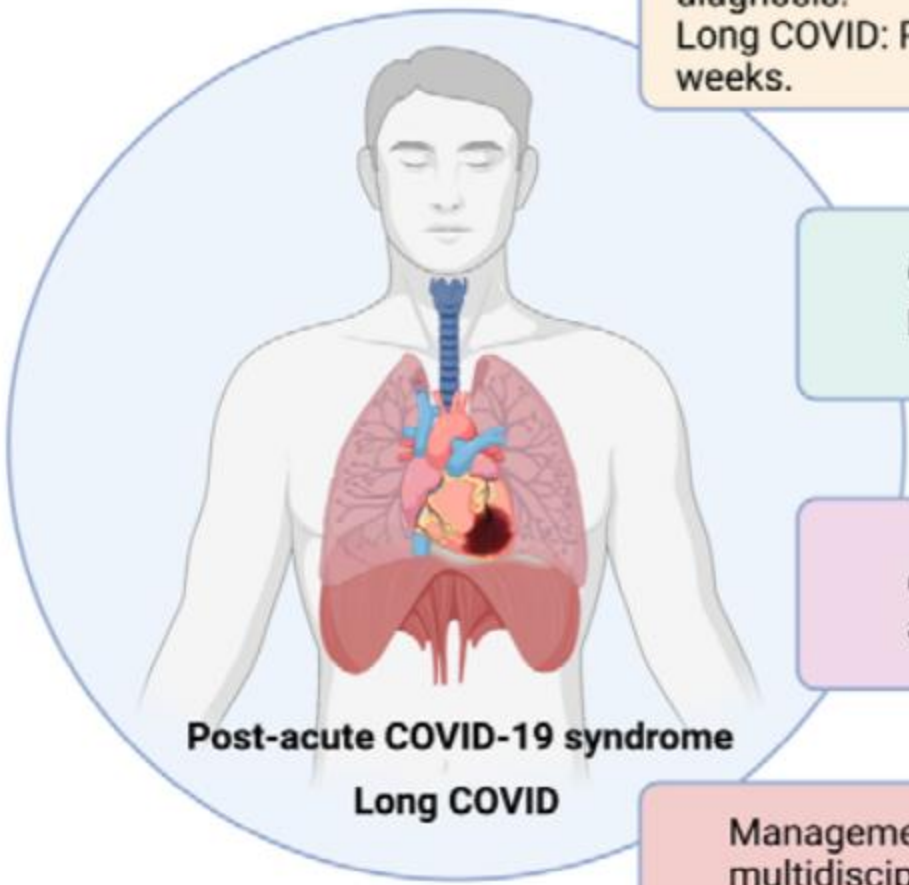



**FIGURE 6** Post- coronavirus disease 2019 sequelae: persistently elevated blood pressure and resting heart rate, kidney injury, poor glycemic control and neurological manifestations, and their possible explanations suggested in the literature. BP, blood pressure; RAAS, renin–angiotensin–aldosterone system.


Heart failure
Myocardial injury
Arterial thrombotic events
Venous thromboembolism
SARS-CoV-2
Myocarditis
Arrhythmias
Takotsubo syndrome
Pericardial effusion/pericarditis


RV dilatation and reduced EF
LGE
Increased PASP
Myocardial edema
LV diastolic dysfunction
Impaired LVEF
Wall motion abnormalities
Increased LV volumen
Impaired LVGLS
Pericardial effusion




PACS: Persistent symptoms 3-4 weeks after diagnosis.
Long COVID: Persistence of symptoms after 12 weeks.

Cardiovascular symptoms: chest pain, palpitations, dyspnea, POTS.

Cardiac imaging: signs of myocarditis and pericardial disease CMR and Echo.

Management: rehabilitation and multidisciplinary approach, lifestyle care.
BB and ivabradine (tachycardia).

# COVID-19
# Antikoagülan tedavi

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY VOL. 75, NO. 23, 2020

PUBLISHED BY ELSEVIER

THE PRESENT AND FUTURE

*JACC* STATE-OF-THE-ART REVIEW

# COVID-19 and Thrombotic or Thromboembolic Disease: Implications for Prevention, Antithrombotic Therapy, and Follow-Up

*JACC* State-of-the-Art Review

Journal of Thrombosis and Thrombolysis (2020) 50:72–81
https://doi.org/10.1007/s11239-020-02138-z

Check for updates

# Thromboembolism and anticoagulant therapy during the COVID-19 pandemic: interim clinical guidance from the anticoagulation forum

Geoffrey D. Barnes[1] · Allison Burnett[2] · Arthur Allen[3] · Marilyn Blumenstein[4] · Nathan P. Clark[5] · Adam Cuker[6] · William E. Dager[7] · Steven B. Deitelzweig[8] · Stacy Ellsworth[9] · David Garcia[10] · Scott Kaatz[9] · Tracy Minichiello[11]

Published online: 21 May 2020


Received: 23 April 2020 | Accepted: 21 May 2020
DOI: 10.1111/jth.14929

jth

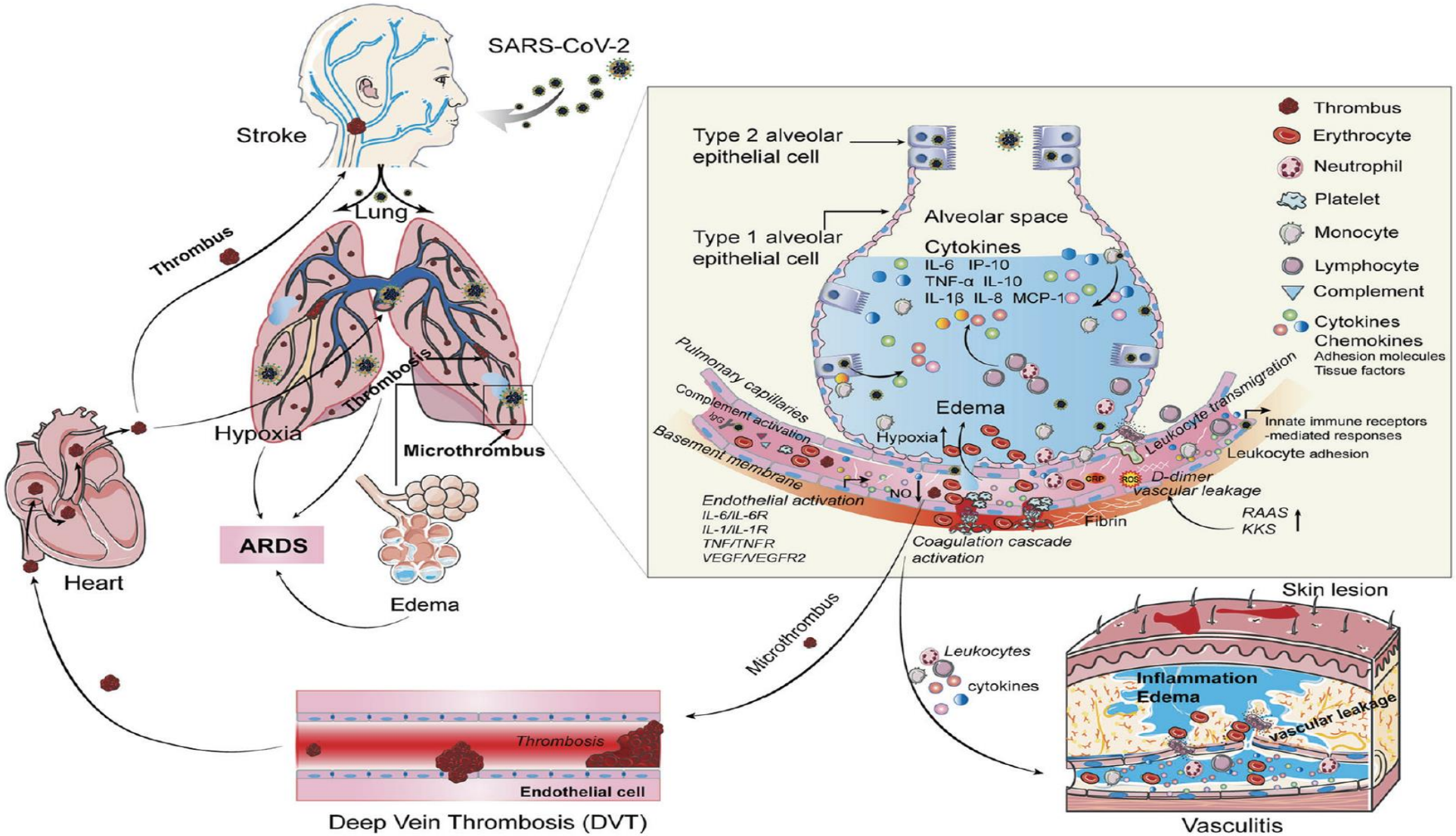
RECOMMENDATIONS AND GUIDELINES

# Scientific and Standardization Committee communication: Clinical guidance on the diagnosis, prevention, and treatment of venous thromboembolism in hospitalized patients with COVID-19

Alex C. Spyropoulos[1] | Jerrold H. Levy[2] | Walter Ageno[3] | Jean Marie Connors[4] | Beverley J. Hunt[5] | Toshiaki Iba[6] | Marcel Levi[7] | Charles Marc Samama[8] | Jecko Thachil[9] | Dimitrios Giannis[10] | James D. Douketis[11] | on behalf of the Subcommittee on Perioperative, Critical Care Thrombosis, Haemostasis of the Scientific, Standardization Committee of the International Society on Thrombosis and Haemostasis

American Society *of* Hematology
Helping hematologists conquer blood diseases worldwide

# ASH Guidelines on Use of Anticoagulation in Patients with COVID-19




Jin, Y., Ji, W., Yang, H. *et al.* Endothelial activation and dysfunction in COVID-19: from basic mechanisms to potential therapeutic approaches. *Sig Transduct Target Ther* 5, 293 (2020). https://doi.org/10.1038/s41392-020-00454-7

- COVID-19 inflamasyon ve protrombotik durumlarla ilişkili;

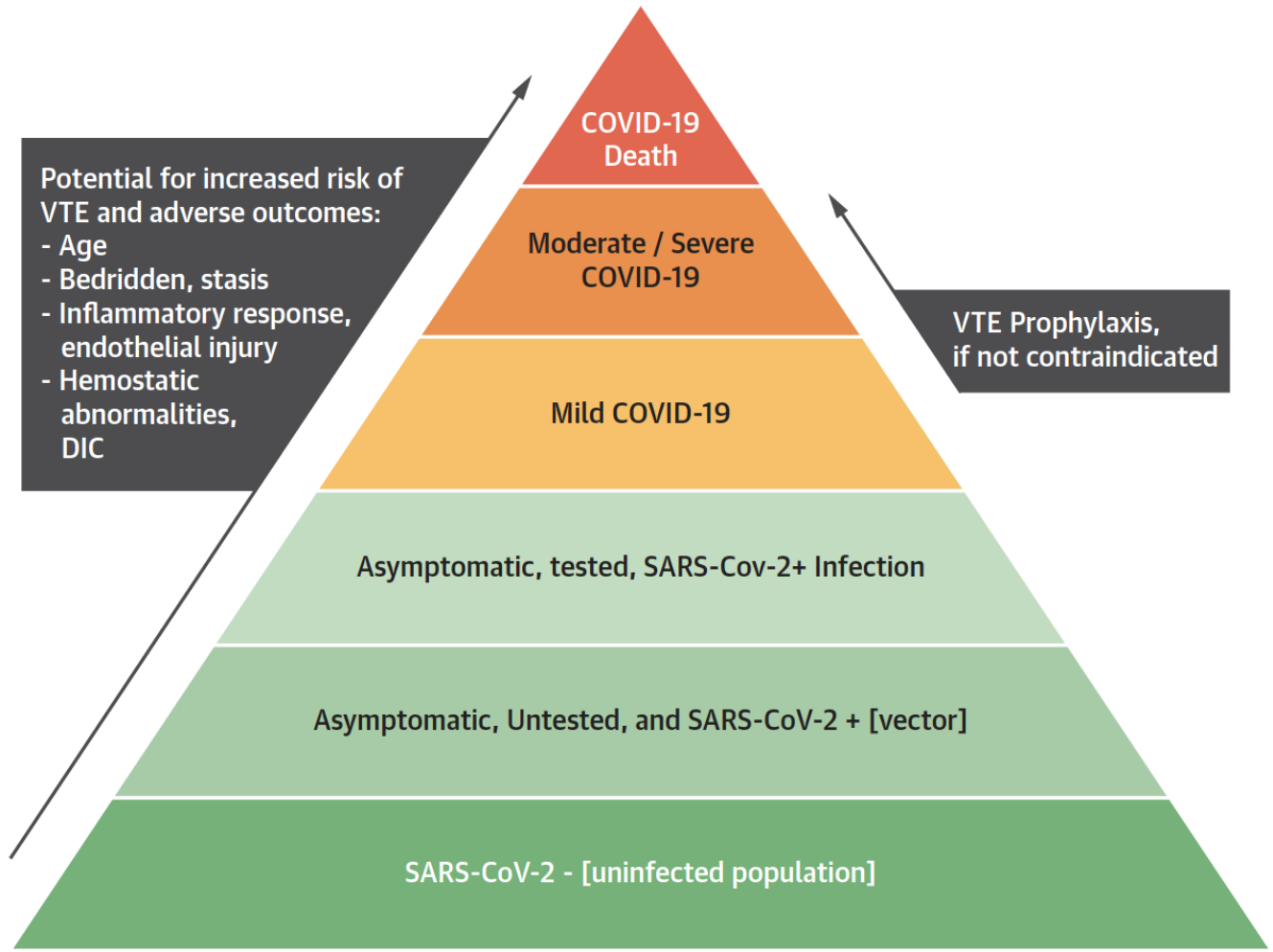
  fibrin, fibrin yıkım ürünleri, fibrinojen ve d-dimer artışı

- Hiperkoagülabilite prognozu belirleyen önemli bir neden ancak;

  Standart antikoagülan doz ???

  Kanama riski!!!

**FIGURE 1** Variability in Resources and Testing Strategies, and in Contracting COVID-19 After Exposure to SARS-CoV-2




Such variability explains the dissimilar population rates of the infection, and the distinct case fatality rates, across various regions and countries. Inflammatory response, increased age, and bedridden status—which are more frequently observed in severe coronavirus disease-2019 (COVID-19)—may contribute to thrombosis and adverse outcomes. DIC = disseminated intravascular coagulation; SARS-CoV-2 = severe acute respiratory syndrome-coronavirus-2; VTE = venous thromboembolism.

COVID-19 and Thrombotic or Thromboembolic Disease: Implications for Prevention, Antithrombotic Therapy, and Follow-Up: JACC State-of-the-Art Review. J Am Coll Cardiol 2020 Jun 16;75(23):2950-2973.

# Ayaktan takip edilen COVID-19 olgularında VTE profilaksisi

- Başka bir risk faktörü nedeni ile VTE profilaksisi alması gerekmiyor ise, ayaktan takip edilen olgularda antikoagülan tedavi başlanması önerilmemektedir

# Hastaneye yatırılan COVID-19 olgularında

- Kontraendikasyon yok ise profilaktik dozda antikoagülan tedavi verilmeli

- VTE tanısı almış ya da radyolojik görüntüleme yöntemlerinin olmadığı durumlarda; yakın süreçte tromboembolik olay öyküsü olan hastalar ya da yüksek şüpheli tromboemboli kliniği olan hastalarda terapotik dozda antikoagülan tedavi uygulanmalıdır

# Antikoagülan dozu?

- Tüm rehberlerde hospitalize edilen COVID-19 olgularına profilaktik dozda antikoagülan tedavi (VTE risk skorlarından bağımsız)

- Bazı rehberlerde ağır seyirli olgularda intermediate doz antikoagülan tedavi ???

- Antikoagülan tedavi kontraendikasyonu varlığında mekanik tromboprofilaksi (intermittan pnomatik kompresyon)

  (*medikal tromboprofilaksiye geçiş için düzenli değerlendirilerek*)

# Antikoagülan dozu?

- Yoğun bakım dışındaki hastalarda, diğer medikal ve cerrahi nedenlerle hastanede yatan hastalarla benzer şekilde

- Yoğun bakım yatışı gereken ağır hastalığı olan olgularda ise daha yüksek doz antikoagülan tedavi uygulanmasına yönelik öneriler ????
  - Enoxaparin 40 mg sc 2x1
  - enoxaparin 0.5 mg/kg sc 2x1
  - UFH 7500 u sc 3x1
  - Düşük yoğunlukta heparin infüzyonu ??

- YBÜ de iyileşme gösterip, servise transfer edilen olgularda antikoagülan dozları tekrar profilaksi dozlarına düşürülebilir

Barnes GD, Burnett A, Allen A, Thromboembolism and anticoagulant therapy during the COVID-19 pandemic: interim clinical guidance from the anticoagulation forum. J Thromb Thrombolysis. 2020 Jul;50(1):72-81.

# Trombolitik tedavinin kullanımı

- Trombolitik tedavi kullanımı için; yüksek riskli (masif) emboli, akut iskemik stroke, ST eleve AMI gibi tromboliz endikasyonu olan durumlar dışında COVID-19 hastalarında trombolitik tedavi önerilmemektedir.

Barnes GD, Burnett A, Allen A, Thromboembolism and anticoagulant therapy during the COVID-19 pandemic: interim clinical guidance from the anticoagulation forum. J Thromb Thrombolysis. 2020 Jul;50(1):72-81.

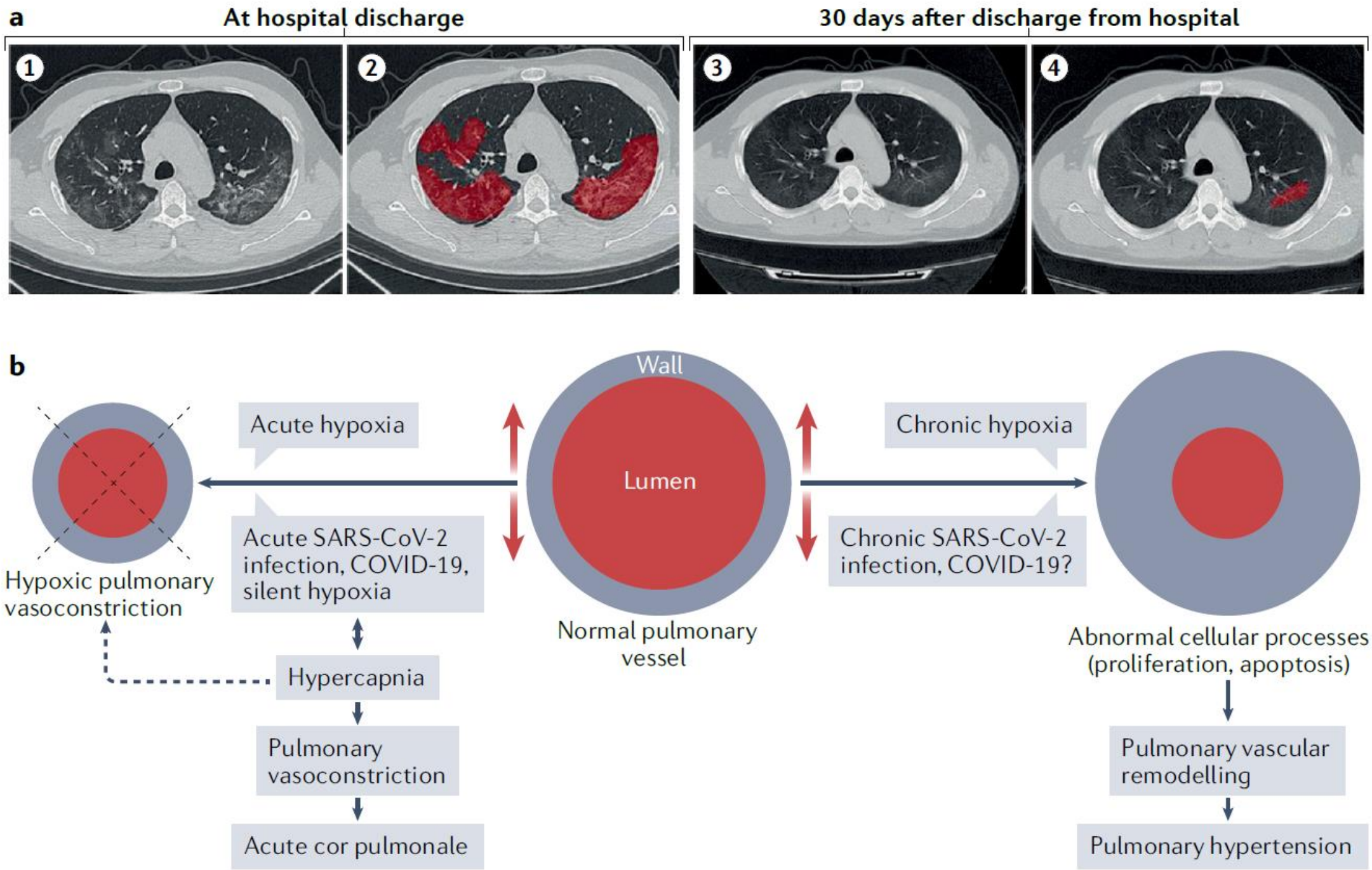
# Taburculuk sonrası?

- COVID-19 hastalarında taburculuk sonrasında rutin VTE profilaksisi önerilmemektedir.

- Hastanın taburculuk sonrası VTE gelişimi için devam eden risk faktörleri varsa (uzamış hastane yatışı, tam iyileşme süreci tamamlanamayan, yeterli mobilitenin henüz sağlanamadığı), taburculuk sonrası VTE profilaksisi kararı olgu bazında, multidisipliner tartışma ile verilebilir.
  - Betrixaban (35-42 gün) / rivaroxaban (31-39 gün) / enoxaparin (6-14 gün)

# Pulmoner HT-KTEPH

- Akut: medial hipertrofi ve düz kas hücresi proliferasyonu PH.
- İntravasküler emboli
- KTEPH..? Benzer genetik riskler..
- Ardışık 200 hastada (yoğun bakım dışı) pulmoner hipertansiyon prevalansı(sistolik pulmoner arter basıncı 35 mmHg) ve sağ ventrikül disfonksiyonusırasıyla %12.0 ve %14.
- Başka bir çalışma 67 hastada 26'sı Şiddetli COVID-19 ve  (%39) akut pulmoner hipertansiyon
- Mevcut kanıtlara göre akut dönemde PH gelişmesi ileride kronik PH yatkınlığı yapabilir.


a
At hospital discharge
30 days after discharge from hospital
1
2
3
4
b
Wall
Lumen
Normal pulmonary vessel
Acute hypoxia
Chronic hypoxia
Hypoxic pulmonary vasoconstriction
Acute SARS-CoV-2 infection, COVID-19, silent hypoxia
Chronic SARS-CoV-2 infection, COVID-19?
Hypercapnia
Pulmonary vasoconstriction
Acute cor pulmonale
Abnormal cellular processes (proliferation, apoptosis)
Pulmonary vascular remodelling
Pulmonary hypertension

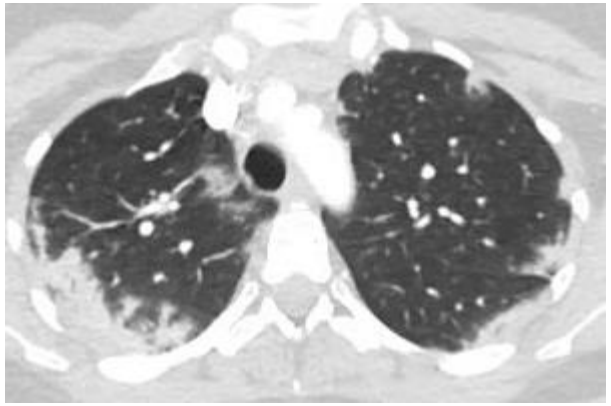
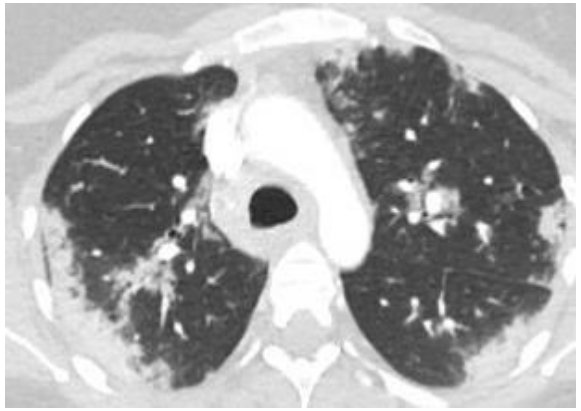
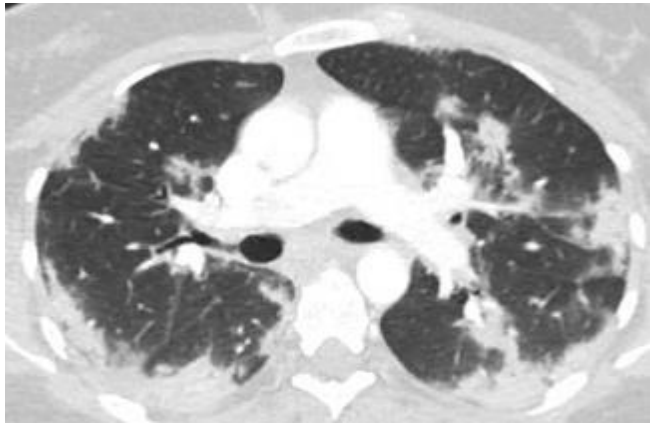
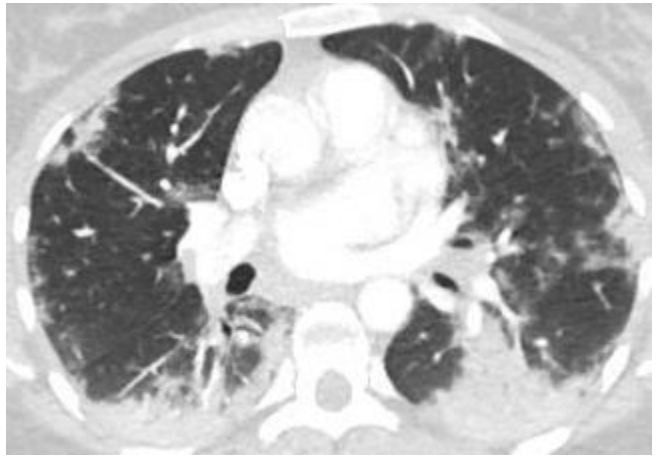
# OLGU 1

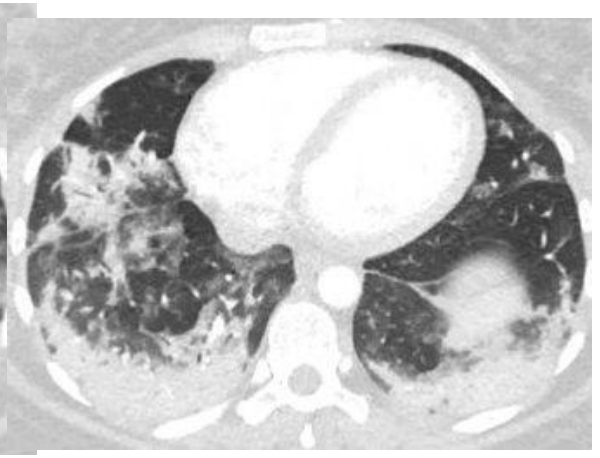
- 33 yaşında kadın
- 35 hf. Gebe
- Temaslı
- Saturasyon %80.
- D-dimer :üst limit
- Lenfosit 900.
- PCR pozitif
- Acil sezeryan
- Plq tedavisi (pandemi başlangıcında bir hasta)

BT Anjio: PE yok. Covid-19 enfeksiyonu ile uyumlu.

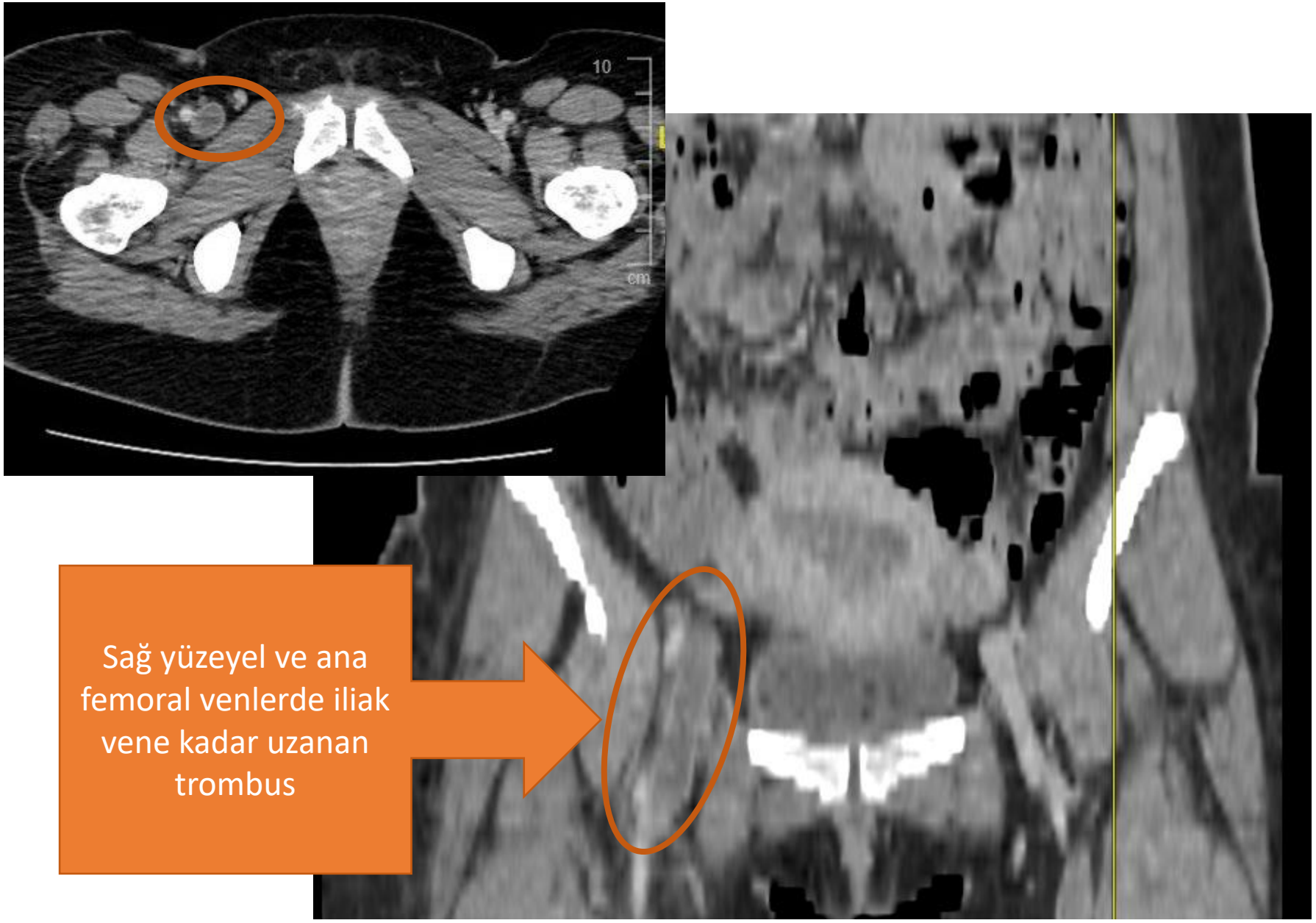
- 3 gün sonra oksjien ihtiyacında artış genel durum bozukluğu tekrar YB.

# YB’a TEKRAR ALINMA

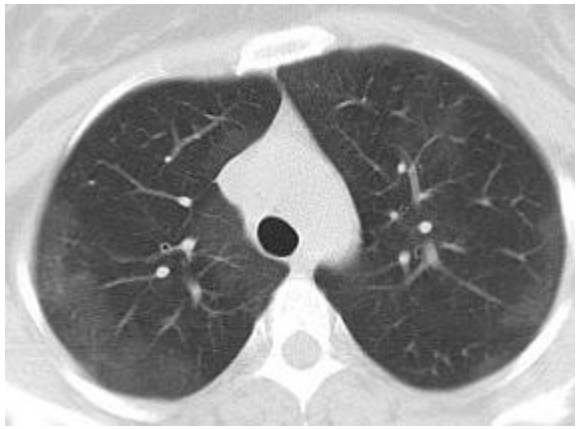


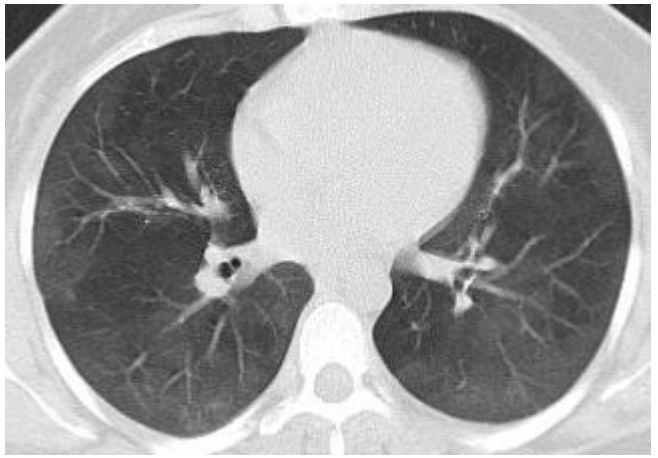
- Yüksek flow oksijen/NIVM saturasyon düşük.
- Entübe oluyor.
- Favipiravir
- Sitokin fırtınası tocilizumab
- Ekstubasyon sonrasında covid servis.
- Sağ bacakta ağrı.


10
cm
Sağ yüzeyel ve ana femoral venlerde iliak vene kadar uzanan trombus

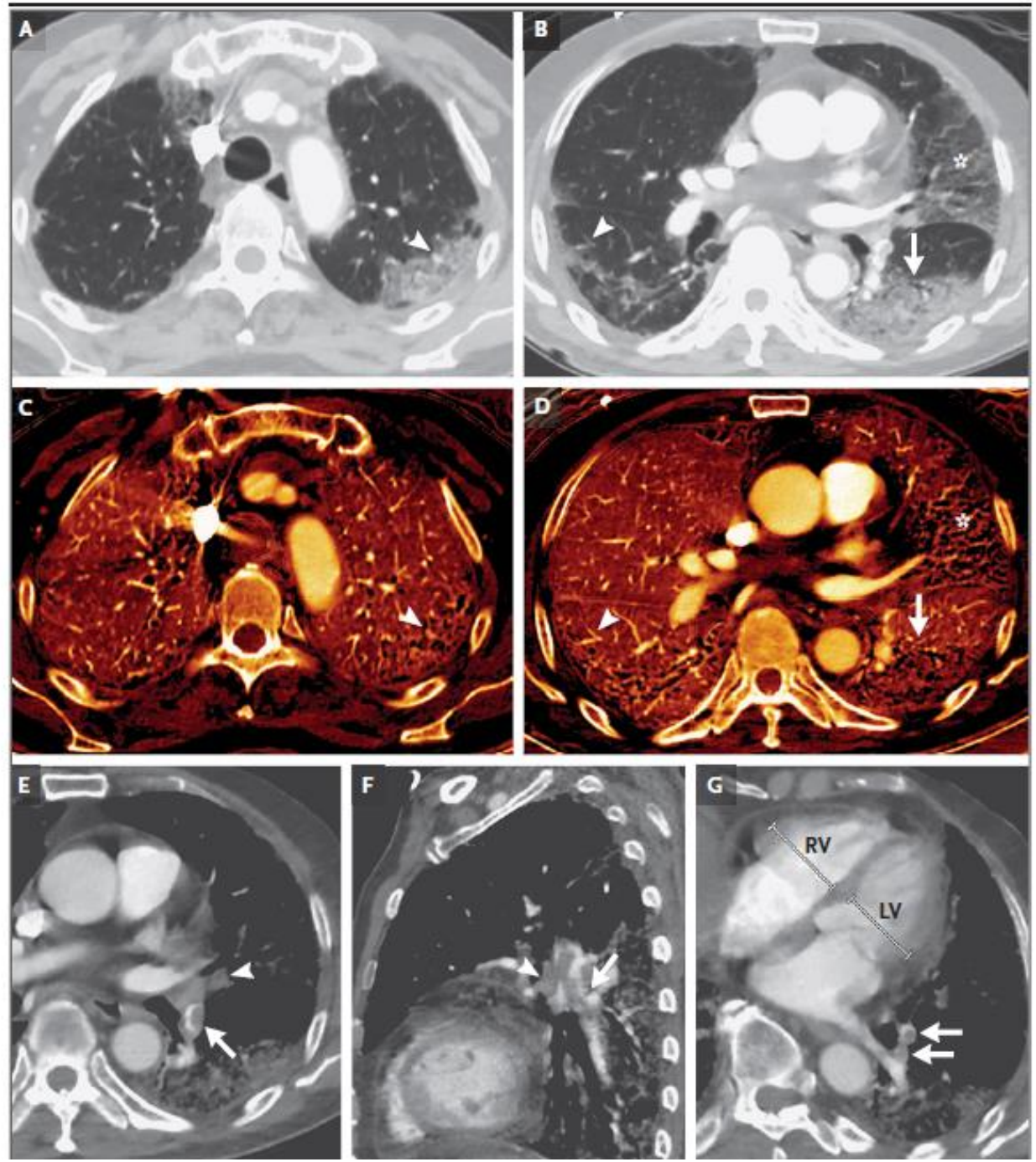
- Covid serviste takiplerde ek sorun yok.
- Ancak hasta oksijensiz desature oluyor.
- Göğüs hastalıkları post-covid servise devir.
- Oda havasında PaO2: 73.
- Taburcu

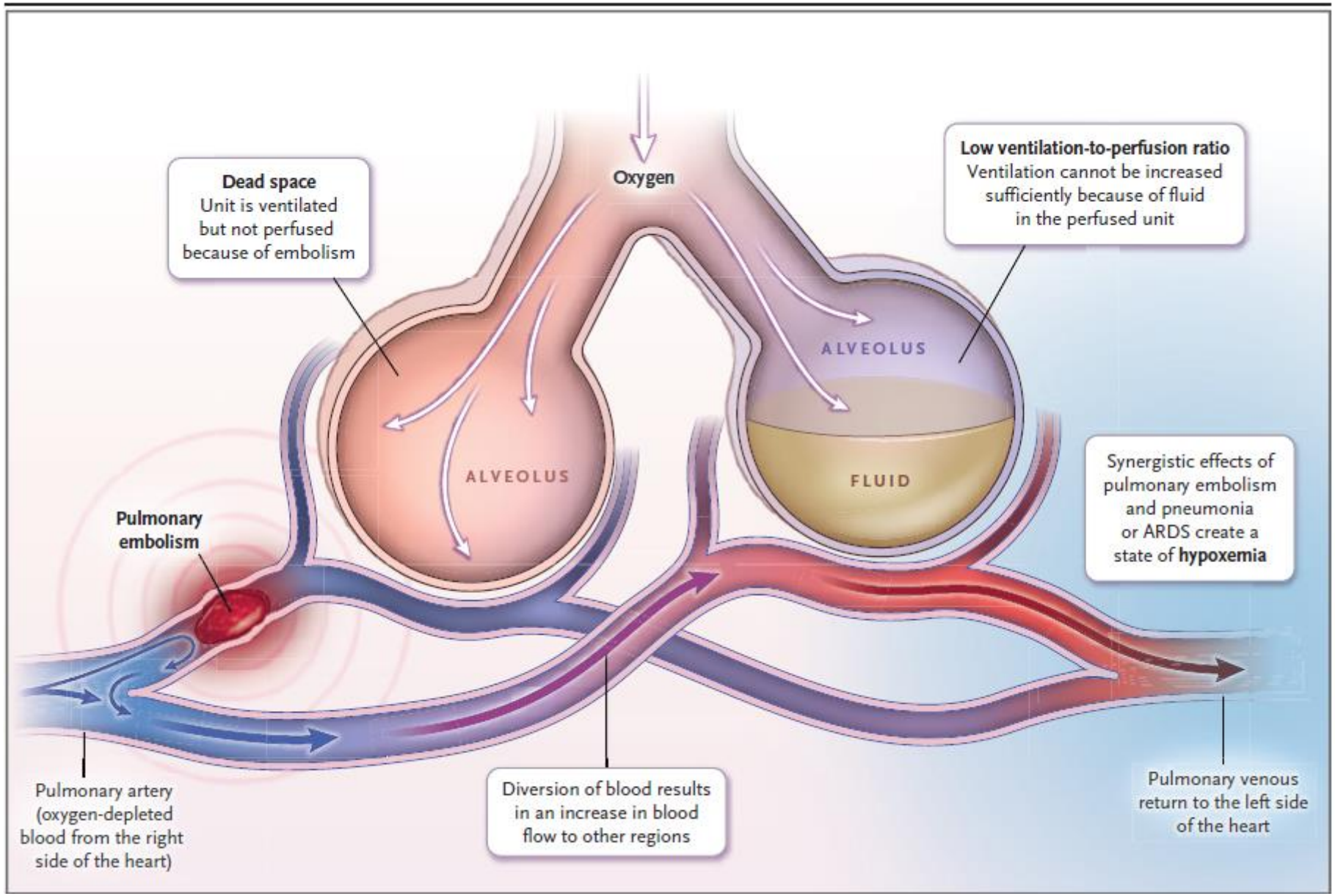
# 4 AY SONRA





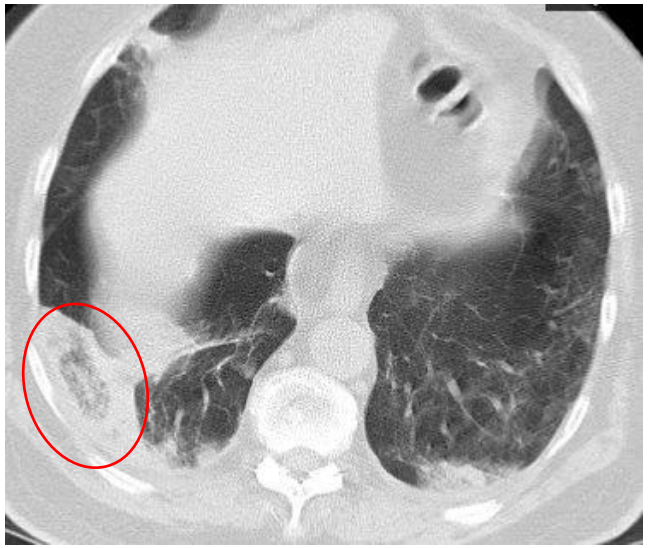
BT de halen bulgular var ancak hastanın saturasyonu efor ve istirahatte normal

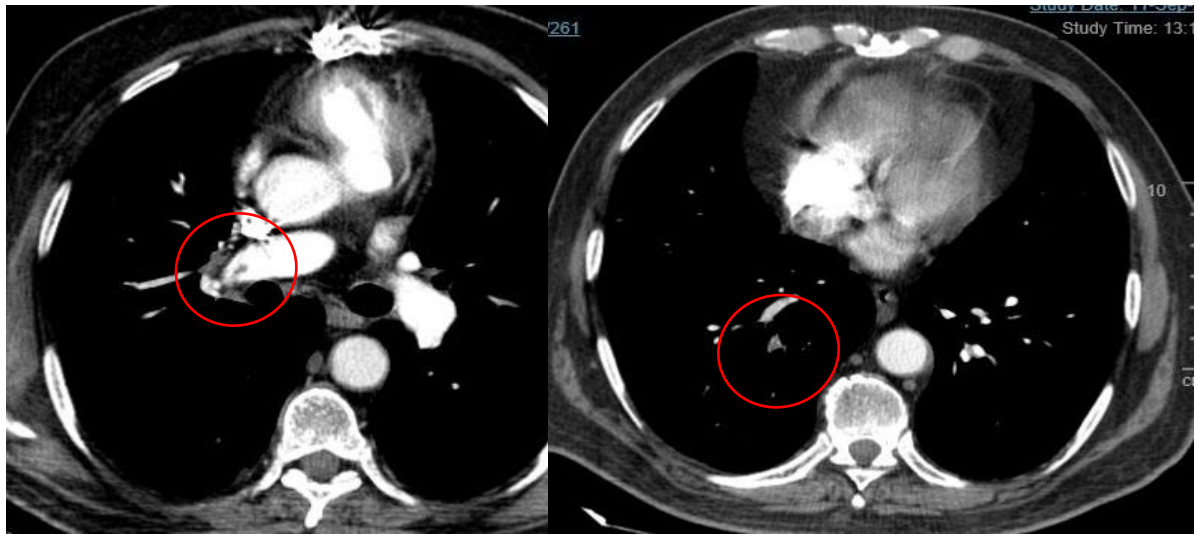

A
B
C
D
E
F
G
RV
LV


Dead space
Unit is ventilated but not perfused because of embolism
Oxygen
Low ventilation-to-perfusion ratio
Ventilation cannot be increased sufficiently because of fluid in the perfused unit
ALVEOLUS
ALVEOLUS
FLUID
Synergistic effects of pulmonary embolism and pneumonia or ARDS create a state of hypoxemia
Pulmonary embolism
Pulmonary artery (oxygen-depleted blood from the right side of the heart)
Diversion of blood results in an increase in blood flow to other regions
Pulmonary venous return to the left side of the heart

# OLGU 3

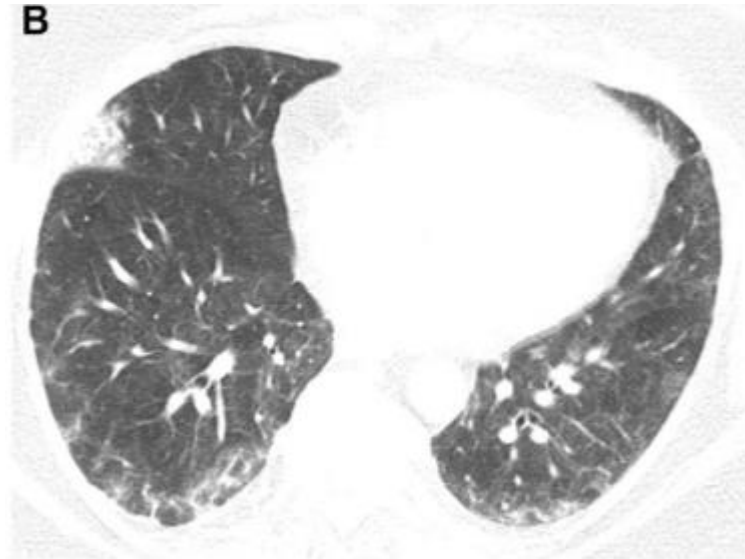
- 68 yaş erkek
- Semptomatik. Pcr pozitif. Hafif hipoksemi.
- D-dimer 700.
- Acilde BT  yaklaşık %30 tutulum ve sağda enfarkt? ile uyumlu görüntü.
- Bunun üzerine BT anjio çekildi. Sağ akciğerde pulmoner emboli ile uyumlu dolum defektleri.

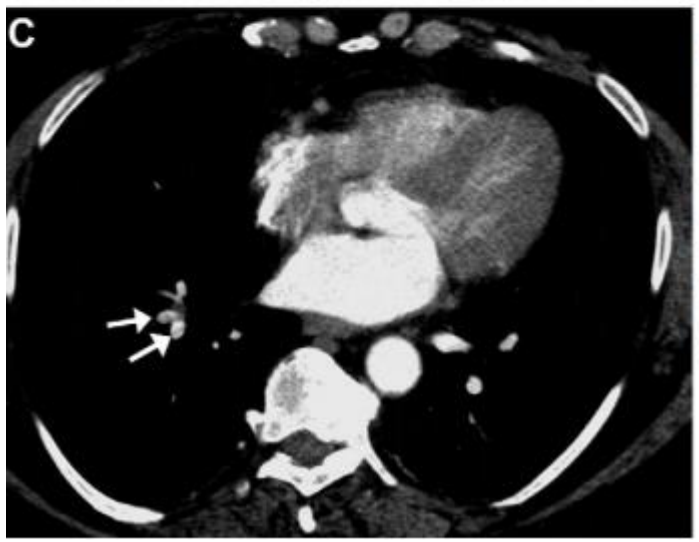





Covid tedavisine ek olarak tedavi dozunda DMAH


A


B


C