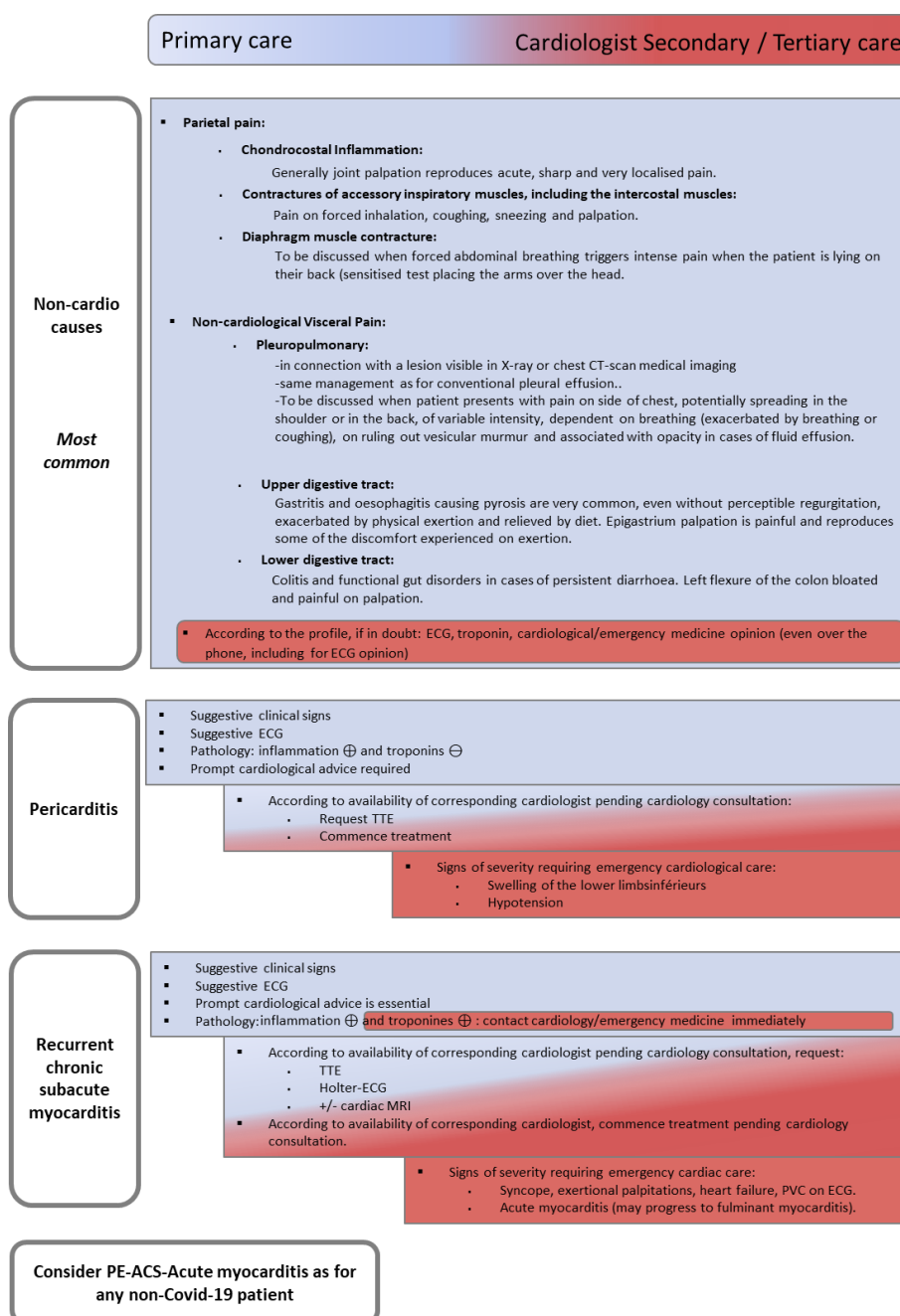


**TOOLKIT
GUIDE**

Chest pain in the context of long-term Covid-19 symptoms

Validated by the HAS Board on 10 February 2021

Principle: screen for common parietal cause, discuss/rule out cardiological cause

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Chest pain: common complaints associated with Covid-19 but with a variety of causes and effects, frequently non-cardiological.

Objective: establish differential diagnosis between pain falling within the remit of primary, secondary or tertiary care. Importance of the interview and physical assessment to guide possible diagnoses and select the review to be carried out.

Do not hesitate to request a cardiological/emergency medicine opinion, even over the phone, including to assist with an ECG reading.

Causes to be discussed in a context of long-term Covid-19 symptoms:

1. Not falling within the remit of specialist cardiological care (most common case):
 - intercostal or diaphragmatic muscle pain, chondrocostal inflammation, hyperventilation syndrome, pleuropulmonary, digestive tract, panic attacks.
2. Requiring prompt or emergency specialist cardiological care:
 - subacute/chronic recurrent myocarditis and/or pericarditis: non-rare causes,
 - acute coronary syndrome (ACS), pulmonary embolism (PE) as for any pain.

The interview and physical assessment help direct the diagnosis. The 1st consultation is lengthy. Listening to the patients is an integral part of the diagnostic and therapeutic management process.

Parietal Pain:

Chondrocostal Inflammation: (Tietze Syndrome)

- Aseptic synovitis of the joints between the breastbone, ribs or their cartilage.
- To be discussed when chondrocostal joint palpation reproduces acute, sharp and very localised pain.
- Treatment: Topical NSAIDs or Aspirin at anti-inflammatory dose.

Contractures of accessory inspiratory muscles: including the intercostal muscles

- Involved in chest inhalation. They are overworked in cases of tachypnoea and hyperventilation.
- To be discussed when pain returns during forced chest inhalation, coughing, sneezing, and when these muscles are palpated.
- Treatment: manual therapies, muscle tension relief and respiratory rehabilitation, Aspirin at anti-inflammatory dose or muscle relaxants.

Diaphragm muscle contracture:

- Main inspiratory muscle affected during bouts of respiratory distress but also due to neighbouring visceral, gastric, pleural or colonic pain.
- To be discussed when forced abdominal breathing triggers intense pain when the patient is lying on their back. Sensitised test placing the arms over the head.
- Treatment: manual therapy, cardiac coherence and respiratory rehabilitation.

Non-cardiological visceral pain:

Pleuropulmonary:

In connection with a lesion visible in medical imaging (X-ray or chest CT-scan). Management is the same as for conventional pleural effusion.

- Pain on side of chest, potentially spreading in the shoulder or in the back, of variable intensity, dependent on breathing = exacerbated by breathing or coughing.
- To be discussed at the clinical assessment on ruling out vesicular murmur and associated with opacity in cases of fluid effusion.
- At least one chest X-ray required.
- Pulmonary assessment required (pleural ultrasound, pleural tap, etc.).
- Treatment: dependent on cause of pleural effusion.

Upper digestive tract:

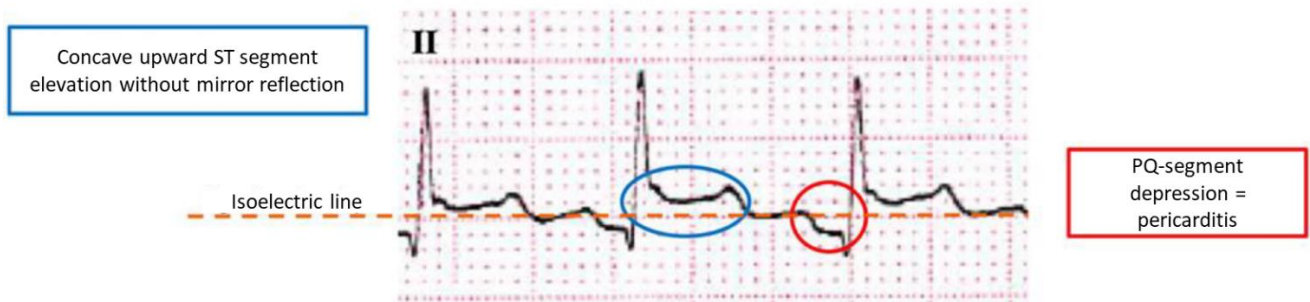
- Gastritis and oesophagitis causing pyrosis are very common. They are exacerbated by physical exertion and relieved by diet.
- To be discussed when epigastrium palpation is painful and partially reproduces the discomfort experienced on exertion. The lack of regurgitation perceived by the patient masks its digestive cause.
- Treatment: PPIs, antacids, mucilages, and changing dietary habits.

Lower digestive tract:

- Colitis and functional gut disorders are common when diarrhoea persists.
- The left flexure of the colon is bloated and painful.
- Treatment: dietary changes and antispasmodics

Pericarditis: prompt cardiological advice required

- **To be discussed when presented with the following symptoms:** precordial or retrosternal pain triggered by inhalation and relieved by sitting leaning forwards of variable duration occurring several times a day, relieved by self-medicated NSAIDs.
- **ECG** if available: PQ-segment depression and concave upward ST-segment elevation (typically), or T-wave abnormality.
- **Pathology:** biological inflammatory syndrome (sometimes absent): CRP elevation, hyperleukocytosis but negative troponins.



- **Prompt cardiological advice required**
- **According to availability of the corresponding cardiologist and in the absence of signs of severity:**
 - Request TTE: pericardial effusion (possible kinetic disorder if associated myocarditis).
 - Commence treatment which will be reviewed by the cardiologist.
 - Rest until pain clears, with activities limited to those needed for everyday living
 - Non-steroidal anti-inflammatory drug (aspirin/ibuprofen).
 - Colchicine if diagnostic certainty is to be reviewed by the cardiologist.
 - Exercise contraindicated for one month, resumption if pain clears, dry pericardium on monitoring TTE.
- **Signs of severity requiring emergency cardiological care:** swelling of the lower limbs, hypotension.

Myocarditis: generally subacute/chronic/recurrent, generally not severe. Prompt cardiological advice required.

- **To be discussed when presented with the following symptoms:** prolonged, recurrent, potentially oppressive, precordial or retrosternal pain, of variable description, and not having the combination: triggered by exertion and ceasing once exertion stops.
- **ECG:** any T-wave or ST-segment repolarisation disorder, including mimicking ACS (to be managed as such in this case), PVC. But may be normal.
- **Prompt cardiological advice is essential if:**
 - ECG abnormality, troponins $\oplus$ or CRP $\oplus$ and in the absence of parietal pain.
 - Persistence of persistent suspect painful syndromes even in the absence of pathological and ECG disorder.
- **Pathology:** inflammatory syndrome with CRP elevation, hyperleukocytosis. Elevated troponin establishes a diagnosis of inflammatory myocardial necrosis for myocarditis (or ischaemic myocardial necrosis for coronary disease and ACS). **In this case: call the cardiologist/centre 15 advice line.**

According to the availability of the cardiologist, in the absence of signs of severity, so as not to delay treatment, request:

- TTE: abnormalities ranging from kinetic disorder to drop in LVEF for severe forms. Pericardial effusion in cases of associated pericarditis. May be “normal”.
- Holter-ECG: screening for ventricular hyperexcitability.
- $\pm$ cardiac MRI: confirms diagnosis of active or secondary myocarditis (+/- pericarditis).
- Commence treatment which will be reviewed by the cardiologist:
 - Rest until pain clears, with activities limited to those needed for everyday living
 - Low-dose beta-blocker for antiarrhythmic purposes (1/4 dose, bisoprolol type for superior tolerance), in the absence of ECG conduction disorders.
 - Low-dose ACE inhibitor or ARB for antifibrotic purposes (1/4 dose)
 - Exercise contraindicated for 3-6 months. Resumption of exercise or rehabilitation training after checking for absence of ventricular excitability with exercise stress test

Signs of severity requiring emergency cardiological care:

- Syncope, exertional palpitations, heart failure, PVC on ECG, onset of conduction disorder.
- Acute myocarditis (pain less than 3 days old): may progress to fulminant myocarditis.

ACS: any inflammation can result in coronary disease destabilisation. To be discussed/screened/assessed as for any patient regardless of Covid-19

PE: any inflammation promotes venous thrombosis. To be discussed/screened/assessed as for any patient regardless of Covid-19

Conclusions

- Chest pain: complaints commonly associated with Covid-19 but with a variety of causes and effects, frequently non-cardiological.
- Importance of interview and clinical assessment.
- According to the profile, in the event of doubt: ECG, troponin, cardiological/emergency medicine advice.

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This document presents the main points of the publication: **Chest pain in the context of long-term Covid-19 symptoms, rapid response method, 10 February 2021**

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