heart following COVID -19

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Management of Long-term Cardiovascular Complications Following Covid Infection

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Potential conflicts of interest

- Pfizer: Research grant.
- Moderna: Speaker.
- Pharmascience and Servier Canada: Ad Board
- Member of the Scientific Advisor Board of Long Covid for Health Canada.

Objectives

- **A**wareness of burden of Post Acute Covid Condition (PACS),
- **R**ecognition of cardiovascular (CV) symptoms of PACS,
- **M**anagement of CV symptoms of PACS,
- **W**hen to refer to cardiologists.

Pre-test 1

- Is Long Covid real?
- A: True
- B: False
- C: Uncertain

Pre-test 2

Which arrhythmia has been reported in patients with PACS:

- Postural Orthostatic Tachycardia (POTS)
- Sinus tachycardia
- Sinus bradycardia
- Heart block
- Ventricular tachycardia
- Atrial fibrillation
- Atrial flutter
- All of the above

Pre-test 3

Treatment for suspected myopericarditis should be deferred until Echocardiogram or MRI obtained

a. Yes

b. No

c. Uncertain

Definitions

- ``*Long Covid or Long Haulers*``
- **Post Acute Covid Syndrome (PACS) or (PCC)**
- 3 months after COVID-19 and last for **at least 2 months.**
- Common symptoms: **fatigue, shortness of breath, and cognitive dysfunction**.
- Symptoms may be **new onset or persist from the initial illness**. Symptoms may also **fluctuate or relapse.**

WHO oct 2021

Burden of PACS

- 30%-50% following COVID-19 infection (original variant) in 2020.
- More frequent in women, patients hospitalized for COVID.
- Since the vaccinations, PACS are becoming less frequent, approximately 16%.
- Estimate: 1.4 million of Canadians with PASC in 2022.

Azzolini E *JAMA.* 2022
&
https://www150.statcan.gc.ca

Burden of PACS

Severity and persistence of symptoms are worse

- Female individuals.
- Less than two doses of vaccinations.

Pathophysiology of PACS

Unknown

Many theories

- Chronic inflammation
- Activation of auto-immune diseases
- Micro-clots
- Myalgia Encephalomyalite

Care for the patients post Acute Covid Infection

- Care ≠ Management.
- Caring for patients with COVID-19: overwhelming!!.
- Dismal quality of life and huge burdens of disabilities.
- Care requires empathy, compassion, and being there for these patients. (These patients often face skepticism from health care providers, insurers and others).

Care for the patients post Acute Covid Infection

- Post COVID is a new science and very little scientific data.
- Most of the evidences derive from observational studies.
- Trial and errors +++.
- Management may be empirical, extrapolation and off-label.
- Patients are generally the best teachers. So please listen, listen!! And care!.

Most Frequent Symptoms

- July 2021-Nov 2022, we have evaluated 255 patients with cardiovascular symptoms “Long Covid” at McGill
- **Most common symptoms**
- Decreased exercise tolerance,
- Palpitation,
- Chest pain,
- Dizziness,
- Rarely syncope and pre-syncope

Other non Cardiovascular Symptoms

- Often blamed as psychosomatic or peri-menopausal.
- Dypsnea and fatigue are very common.
- If brain fog+, suspect PACS.
- Some laboratory abnormalities: high sedimentation rate, relative leukopenia, elevated d-dimer, CRP, fibrinogen.

Atypical symptoms

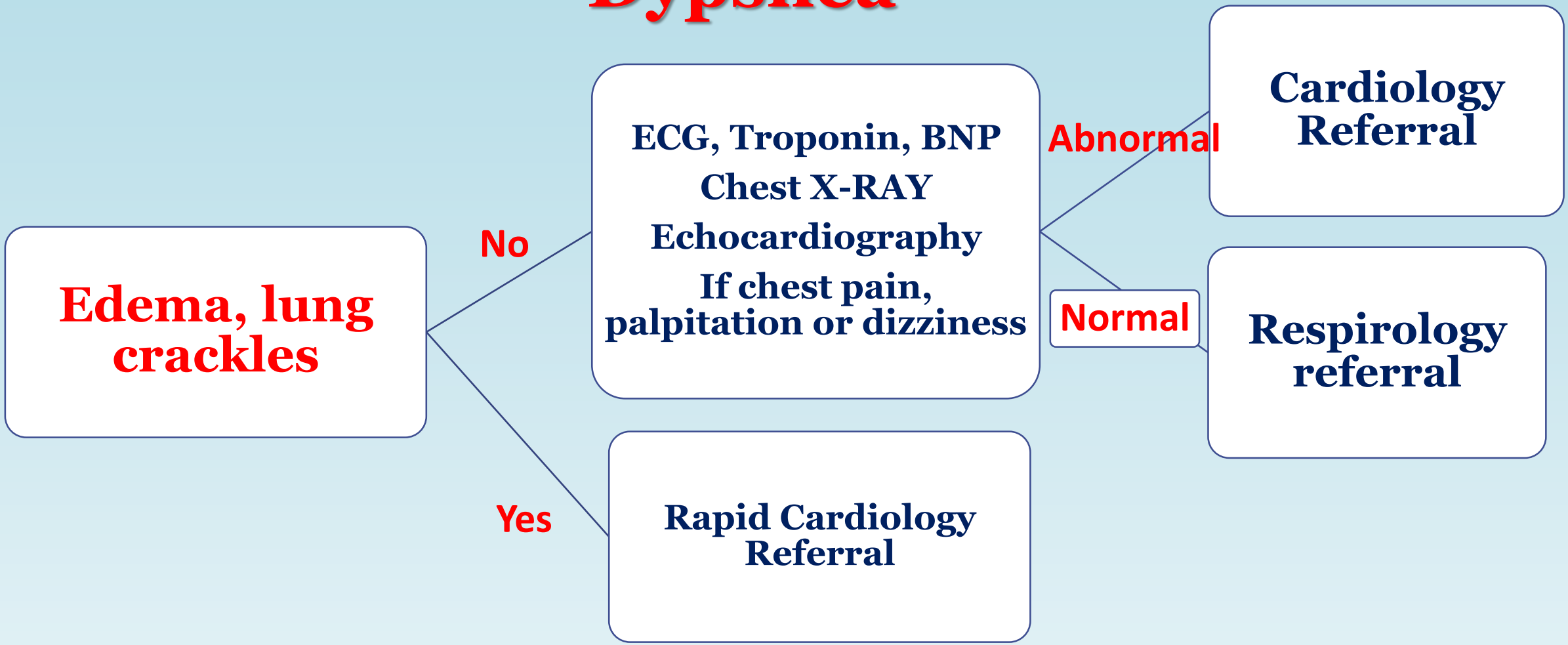
- Example: orthostatic nausea, exertional dizziness…
- Be always aware of the possibility of PACS.
- Ask about last infection, and last infected contact
- Ask about Vaccination status.

Most Frequent CV diseases

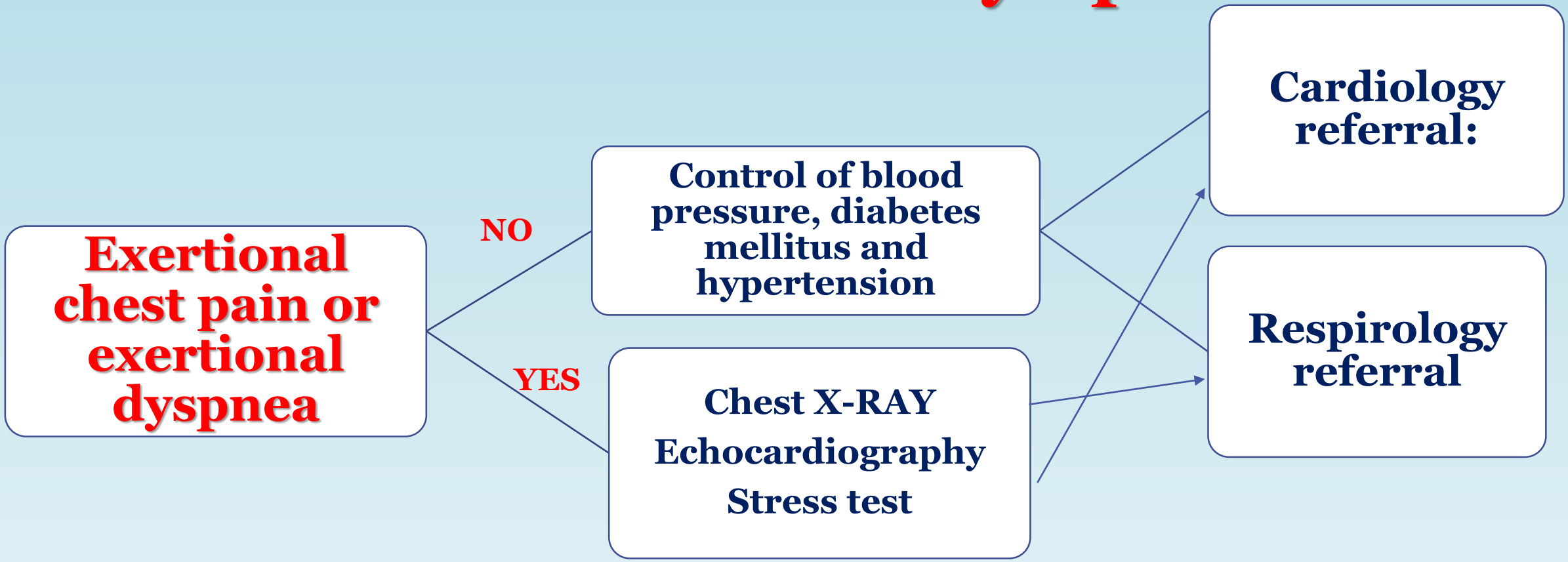
At least 30% of patients with PACS will have some CV diseases.

- **Postural orthostatic tachycardia (POTS).**
- **Inappropriate sinus tachycardia,**
- **Myopericarditis,**
- Rare: heart block, atrial fibrillation/flutter and ventricular tachycardia.
- Rare: heart failure and acute myocardial infarction,
- Rare: venous clots.

Non-Exertional Dypsnea



Exertional symptoms



Chest pain

Pleuritic chest pain

Anti-inflammatories high dose

Gastric cytoprotection

Colchicine 0.6 bid if >=70 kg

0.6 daily if <70 kg

If regular colchicine not tolerated, may consider off-label use of sustained release Colchicine (MyINFLA).

Symptoms persist

Cardiology referral:

Trial of steroids, anakinra

Echo,

Cardiac MRI

Consider ruling out pulmonary embolism

(d-dimer may be falsely elevated).

CRP may often be falsely negative. Sedimentation rate and leucopenia often noted post COVID

Dizziness or palpitations

Orthostatic blood pressure and heart rate

(at least 10 minutes standing)

POTS

Trial of Ivabradine* (5bid), Calcium-Blocker or Beta-blocker

POTS persists

Cardiology referral

Echocardiography,

Holter

Liberal daily hydration

Salt-rich diet if normotensive

Compression stocking

Avoid prolonged standing position

Supine exercise

Hypotension persists

Midodrine (10 tid)

or

Florinef (0.05-0.1 bid)

*: Ivabradine approved only for heart failure in Canada, but commonly used in Europe for POTS, inappropriate sinus tachycardia

Syncope or pre-syncope

- Rapid cardiology referral
- Or
- Emergency room

POTS & Orthostatic Hypotension

POTS (Orthostatic tachycardia)

- Increase of heart rate by ≥ 30 (within 10 min) without postural hypotension.
- Improved sensitivity (water <=1 L x 24 hours before), limit sodium intake, no compression stocking and no antihypertensive the day of the visit.

Orthostatic hypotension

- Decrease of systolic by >20 mmHg and diastolic by >10 mmHg.
- Tilt test effectiveness?

Lifestyle advices for both POTS and Orthostatic hypotension

- Slow changes in position.
- Liberal fluid (>3L/day), salt (5-10 gm daily), (use of salt-sticks).
- Electrolyte fluid.
- Compression stockings (waist-high, 20-30 mmHg) (specially made). If not available at least medium pressure knee high compression stockings

Inappropriate sinus tach

- For patients without private insurer, calcium blocker or beta blocker. Beta-blocker may not be well tolerated/worsening brain fog.
- Calcium blocker may not be effective (more AV blocker than SA)

- Private insurance
- Ivabradine (Lancora©) specific SA node blocker.
- Ivabradine 2.5-5 mg bid with meals.

(evening dose may be reduced or none if heart rate at supper <=60/min)

Myopericarditis

- Chest pains may not be always pleuritic,
- May be CRP negative,
- Often high sedimentation rate, and relative leukopenia
- Recurs often.

Myopericarditis

- **Treatment can be started without waiting for echo or MRI.**
- High dose anti-inflammatory x 2 weeks.
- Colchicine 0.6 daily (if >=70 kg, colchicine 0.6 bid).
- For patients with intolerance to low-dose colchicine, may try off-label use of extended-release colchicine (MyInfla).
- (Myinfla is approved for coronary disease only in Canada).
- At least one year of therapy
- If recurs or worsened, cardiology referral (anti-TNF1 with anakinra)

Reinfections

- Are frequent
- May re-activate symptoms
- If Paxlovid given: Ivabradine and Colchicine have to be stopped during Paxlovid.

Summary of key messages

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Suspected inflammation of the myocardium or pericardium

- Cardiac MRI if any of the following: ECHo abnormal, increased troponin and/or natriuretic peptides, severe symptoms.
- **Therapies:**
- NSAIDS and Colchicine if pericarditis suspected. Diagnosis does not require CMR.
- If Colchicine not tolerated, off-label use of Myinfla (sustained release Colchicine).
- Three-six months abstention from moderate-high intensity physical exertion.

Arrhythmia

- Most frequent inappropriate sinus tach, sinus bradycardia,
- More rare: atrial fibrillation, atrial flutter, ventricular tachycardia, heart block.
- Tests:ECG,smart watch, Holter, loop recorder.
- **Therapies:**
- Off-label use of Ivabradine for iappropriate sinus tach
- (SA I_f inhibitor, BB, CCB).

Postural Orthostatic Tachycardia Syndrome

- Orthostatic increase of heart rate >30/min without hypotension.

Management

Hydration, compression stockings

- Supine, semi-erect exercise, swimming with gradual progression to erect exercise (pillow below the knees before standing up from supine).
- Slow change in position.
- I_f channel inhibitor, CCB, BB

Orthostatic hypotension

- Decrease of systolic BP >20 mmHg or diastolic BP>10 mmHg with standing.

Therapies

- Slow changes in position.
- Liberal fluid (>3L/day), salt (5-10 gm daily).
- Compression stockings (waist-high)
- Refractory cases: mitodrine or fludrocortisone.

General measures

- Multidisciplinary teams
- Encourage full Covid-19 vaccination and sanitary measures (especially with travels).
- If active peri-myocarditis, consultation with cardiologist prior to vaccination.

Delays for vaccinations are not always necessary

Post exertional Malaise

- Excessive fatigue secondary after exertion or emotional stress.

Therapies

- Rehabilitation with the ‘‘stop, rest and pace’’ strategy.
- Short periods of exercise (5-10 minutes daily).
- Avoid over-exertion; rest between exertion.
- Divide complex task into several small tasks, to be done sequentially.

Centre universitaire de santé McGill
Institut de recherche

McGill University Health Centre
Research Institute

Instructions for Patients with Long COVID

- ❑ Gluten free diet (no pasta, no starch)
- ❑ Histamine free diet (no coffee or tea) (no alcohol), (no tomato, avocado, spinach)
- ❑ Antihistamine
- ❑ Probiotics
- ❑ No canned food
- ❑ No fast food
- ❑ AT least 3 liters of water daily
- ❑ At least 3 gram of salt
- ❑ Magnesium at least 500 mg per day and/or foods rich in magnesium
  salmon, tuna, nuts, seeds of sunflower, flax, pumpkin

- ❑ Compression stocking 20-30 mmHg, waist length

- ❑ Exercise without gravity (yoga, swimming, stationary bicycle)

- ❑ Breathing exercise: 6 slow and big breaths per minute (at least 5 times per day).

Version: Sept 7, 2022

Pre-test 1

- Is Long Covid real?
- A: True
- B: False
- C: Uncertain

Pre-test 1 - Answer

- Is **Long Covid real?**
- A: Absolutely true, unfortunately!

Pre-test 2 - Answer

Which arrhythmia has been reported in patients with PACS

- POTS
- Sinus tachycardia
- Sinus bradycardia
- Heart block
- Ventricular tachycardia
- Atrial fibrillation
- Atrial flutter
- All of the above

Pre-test 2

Which arrhythmia has been reported in patients with PACS

- POTS
- Sinus tachycardia
- Sinus bradycardia
- Heart block
- Ventricular tachycardia
- Atrial fibrillation
- Atrial flutter
- **The answer is: All of the above**

Pre-test 3

Treatment for suspected myopericarditis should be deferred until Echocardiogram or MRI obtained

a. Yes

b. No

c. Uncertain

Pre-test 3 - Answer

Treatment for suspected myopericarditis **should be started and should not wait** for imaging studies.

An echocardiogram to obtain urgently if hypotension or severe dyspnea.

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