Case 20

You are the Foundation Year 2 doctor working in the emergency department at General Hospital.

Your bleep number is 2468. Your consultant is Dr Tokell.

Patient details

Patient name: Tae Swift
Date of birth: 13/12/1989
Patient number: X345678912
Address: 89 Northumberland Road, Newcastle-Upon-Tyne, NE1 4HA

History

Mrs Swift presented to the emergency department with a 2-day history of worsening shortness of breath. She said it came on suddenly and is getting worse, it is now present even at rest. She has no cough, no haemoptysis, and reports no other symptoms.

Mrs Swift has no prior medical history, and her only medication is the COCP which she has taken for the past 9 years. She is not pregnant and her last menstrual period was 2 weeks ago.

Examination

Oxygen saturations: 95% (15L non-rebreathe)

Respiratory rate: 28bpm

Heart rate: 112bpm

Blood pressure: 128/72mmHg

Temperature: 36.8 C

On auscultation of her chest there are no crackles or added sounds.

Heart sounds normal.

Abdomen soft and non-tender.

She is able to mobilise herself from bed to a chair.

Investigations

ECG – sinus rhythm, NAD

FBC - NAD

U&E – NAD, creatinine 47

LFT - NAD

CRP <5

D-dimer >100

Task

Please request the most appropriate imaging modality to determine the cause of Mrs Swift's symptoms. Include any relevant PMH, medication and investigation results in the request.

REQUEST FOR RADIOLOGICAL OPINION

Surname: Swift

First Names: Tae

Address: 89 Northumberland Road

Newcastle-Upon-Tyne

NE1 4HA

DOB: 13/12/1989

Patient No: X345678912

Ward/Clinic/Practice: Emergency Department

Consultant/GP:
Dr Tokell

WALK ☐ CHAIR ☒
TROLLEY ☐ BED ☐
OXYGEN ☒ DRIP ☐
PORTABLE EXAM ☐

Patient's telephone number:
n/a

Previous X-rays
n/a

Is the patient pregnant? Yes ☐ No ☒
LMP Date: *2 weeks ago*

Relevant clinical information:
2-day worsening shortness of breath, short of breath at rest. No cough, no haemoptysis
PMH: nil, on the COCP
O2 95% on 15L oxygen, respiratory rate 28, heart rate 112, BP 128/72, apyrexial
D-dimer >100
?pulmonary embolism

Is the patient diabetic? Yes ☐ No ☒

CT/Angio/IVU exams please state
Creatinine level: 47

Are specific infection control precautions required? Yes ☐ No ☒

If yes, state reason:

Office use only

Suggested investigation: CT pulmonary angiogram

Requesting MO: Niamh Garratt (F2) N Garratt

Contact/Bleep: 2468

Answer

This person is most likely presenting with a pulmonary embolism. The diagnostic investigation of choice is a CT pulmonary angiogram (CTPA). The Well's score can be used to determine the likelihood of a PE, and the need for a CTPA vs a D-dimer.

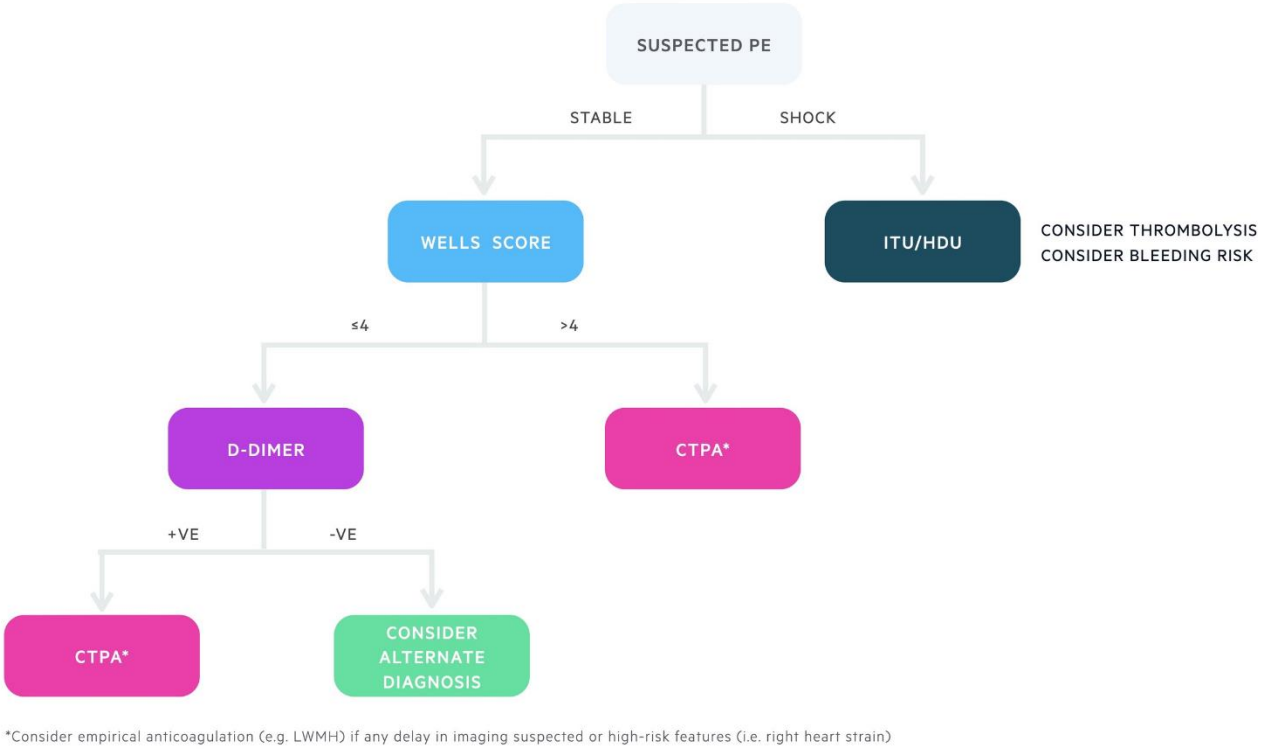
Two-level PE Wells score
(Photo taken from Geeky Medics https://geekymedics.com/pulmonary-embolism-pe-acute-management-abcde-approach/)

Clinical feature	Points
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3
Heart rate more than 100 beats per minute	1.5
Immobilisation for more than 3 days or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment, treated in the last 6 months, or palliative)	1

Alternative conditions to consider include

- Respiratory – pneumothorax, pneumonia, and acute exacerbation of chronic lung disease
- Cardiac – acute coronary syndrome, acute congestive heart failure, dissecting or rupturing aortic aneurysm, and pericarditis
- Musculoskeletal chest pain
- Gastro-oesophageal reflux disease
- Causes for collapse e.g. vasovagal syncope, orthostatic hypotension, cardiac arrhythmias, seizures, and cerebrovascular disorders

The two-level Wells score is used to determine the likelihood of a PE and the need for ionising radiation for diagnosis. If the score is 4 or greater (e.g. 1.5 points for previous DVT, 1.5 points for heart rate >100, and an alternative diagnosis is less likely than PE), then the patient can go for a CTPA, without the need for a D-dimer blood test prior. However, if the score if less than 4, then a D-dimer is done first to determine the need for a CTPA. This is summarised nicely in this flow chart from the Pulsenotes website (https://app.pulsenotes.com/medicine/respiratory/notes/pulmonary-embolism)



In the case of our patient above, they presented with acute onset shortness of breath, tachycardia, and a risk factor for PE (use of the COCP). A D-dimer has already been performed as her Wells score is 1.5, so the next step from here to diagnose or rule out a PE is a CT pulmonary angiogram.

It is important to remember the other boxes on the form! Don't forget to check if a person requires oxygen or drips, check if they are diabetic, and if they've given a creatinine level, write it down – even if it's not a CT/angio/IVU as stated on the form. In this case, a chair is the preferred option for mode of transport as the patient is known to be able to mobilise from bed to chair.

The NICE CKS on pulmonary embolism management is also a good resource to read through for more information on suspected pulmonary embolism.

https://cks.nice.org.uk/topics/pulmonary-embolism/management/suspected-pulmonary-embolism/