

**General Practitioner, Dr C
Medical Centre**

**A Report by the
Deputy Health and Disability Commissioner**

(Case 20HDC02286)

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Executive summary

1. This report concerns the care provided to a woman in her sixties after a diagnosis of a lower leg deep vein thrombosis (DVT). Over nearly two years, she presented to a medical centre on several occasions with ongoing symptoms suggestive of a pulmonary embolus (PE). Sadly, she died as a result of a PE arising from a DVT in her leg.

Findings

2. The Deputy Commissioner found a general practitioner (GP) in breach of Right 4(1) of the Code for the inadequate management of the woman's symptoms, which resulted in her not receiving the right investigations in a timely manner. In addition, the Deputy Commissioner found the GP in breach of Right 6(1) for failing to inform the woman about having requested a CT chest scan in error and that the request had been declined.
3. The Deputy Commissioner made critical comments about the care provided by two other providers and the medical centre and made other comments on the care provided by Te Whatu Ora.

Recommendations

4. The Deputy Commissioner considered that in light of the changes already made by the GP, and as she intends to retire from practice in the near future, she should undertake further education/training on the diagnosis of PE should she return to general practice.
5. The Deputy Commissioner recommended that a second GP provide evidence that he has revised his knowledge regarding the clinical circumstances in which the PERC rule may be used to exclude PE as a diagnosis.
6. The Deputy Commissioner recommended that the medical centre review its policy and processes regarding nursing management of tasks and recalls, including documentation of task completion or attempts at patient contact, and use this case as a basis for developing education/training on diagnosis of PE for staff.

Complaint and investigation

7. The Health and Disability Commissioner (HDC) received a referral from the Coroner regarding health services provided to Ms A between Month1 and Month22.
8. The following issues were identified for investigation:
 - *Whether the medical centre provided Ms A with an appropriate standard of care between Month1 and Month22 (inclusive).*

- *Whether Dr C provided Ms A with an appropriate standard of care between Month1¹ and Month22 (inclusive).*

9. This report is the opinion of Deputy Commissioner Dr Vanessa Caldwell and is made in accordance with the power delegated to her by the Commissioner.

10. The parties directly involved in the investigation were:

Ms A	Consumer
Ms B	Consumer's sister/complainant
Dr C	Provider/general practitioner
Medical centre	Provider/general practice

11. Further information was received from:

Coroner's Office	
Te Whatu Ora ² (formerly DHB)	Provider/hospital
24-hour clinic	Acute care health service
Dr D	Provider/senior medical officer

12. General practitioner Dr E is also mentioned in this report.

13. In-house clinical advice was obtained from Dr David Maplesden (Appendix A).

Information gathered during investigation

Introduction

14. Ms A, aged in her sixties in 2018, had been a patient at the medical centre since 2003. She had no significant relevant past medical history and generally kept good health.

15. In Month1, Ms A was diagnosed with lower leg deep vein thrombosis (DVT).³ Between Month1 and Month22, she presented to the medical centre on several occasions with ongoing symptoms suggestive of a pulmonary embolism (PE).⁴ Primarily her care was managed by her GP, Dr C. Sadly, Ms A died suddenly in Month22.

16. Ms A's sister, Ms B, raised concerns with the Coroner that Ms A did not receive appropriate care from Dr C, and was not referred for further investigations.

¹ Relevant months are referred to as Months 1-22 to protect privacy.

² On 1 July 2022, the Pae Ora (Healthy Futures) Act 2022 came into force, which disestablished all district health boards. Their functions and liabilities were merged into Te Whatu Ora | Health New Zealand. All references in this report to the District Health Board now refer to Te Whatu Ora.

³ A blood clot in a deep vein.

⁴ A blockage in one of the blood vessels in the lungs, most often occurring when a blood clot in the leg travels to the lungs and becomes lodged in a blood vessel.

17. I express my sincere condolences to Ms B for the passing of her sister.

Background

DVT diagnosis — 15 Month1

18. On 15 Month1 Ms A presented to a 24-hour clinic. A nurse took observations⁵ and documented that Ms A reported pain in the back of her left knee and calf that had commenced three weeks' previously and travelled up her leg, and that the leg was red, warm, and painful. The nurse documented no shortness of breath or cough, and 'no pain with walking, pain when sitting'. Ms A reported that three to four months previously she had returned from a trip overseas.
19. Dr D, a senior medical officer, recorded a history of one month of worsening swelling in her left leg, which had become increasingly warm, tender, and swollen over the preceding few days. Ms A also reported increased shortness of breath on exertion (SOBOE) over the past month,⁶ and observed that she became slightly short of breath walking to the treatment bay. Ms A did not report chest pain, palpitations, cough, fever, nausea or vomiting.
20. Dr D documented that Ms A was alert and oriented, there was no increased work of breathing at rest, her cardiovascular examination was normal, her abdomen was normal, and her chest was clear.⁷ Dr D did not calculate Ms A's respiratory rate and did not document her WELLS score.⁸
21. Dr D's impression was that Ms A likely had a DVT of the left leg and possible PE. He requested an ultrasound scan (USS) of the lower left leg, blood tests,⁹ and an electrocardiogram (ECG),¹⁰ which showed no signs indicative of PE.
22. Dr D took further observations, recording that Ms A was hypertensive¹¹ (which was consistent with previous GP observations) and her pulse had settled.¹²
23. Ms A's blood results showed elevated D-dimer results,¹³ and the USS confirmed a DVT present in her left leg below the knee, and an inflamed vein¹⁴ behind the knee.

⁵ Afebrile, pulse 105 beats per minute, oxygen saturation 95–96% on room air, weight 90kg.

⁶ Dyspnoea (difficulty breathing) on exertion, becoming short of breath with stairs.

⁷ Pulmonary bilateral breath sounds, no crackles, wheezes, rhonchi (a low-pitched rattling sound).

⁸ A clinical decision tool used in the diagnosis of DVT to assist with decision-making around whether to proceed with further diagnostic testing.

⁹ D-dimer, full blood count, coagulation, diabetes, troponin, liver, renal, and thyroid function.

¹⁰ Recording of the electrical activity of the heart to detect abnormalities.

¹¹ Blood pressure 160/100mmHg.

¹² Pulse 88 beats per minute.

¹³ 2651µg/L (normal <500). D-dimer is a blood test that tests the amount of D-dimer (a protein the body produces to break down a blood clot). An elevated D-dimer result suggests that the person may have a blood clot.

¹⁴ Superficial thrombophlebitis — an inflamed vein near the surface of the skin, caused by a blood clot.

24. Dr D prescribed an anticoagulant medication (Clexane)¹⁵ for four days. He instructed Ms A to follow up with her GP and practice nurse, as she needed to commence a different anticoagulant (dabigatran)¹⁶ after completion of the four days of Clexane, and to have her blood pressure rechecked (as she was hypertensive).¹⁷
25. Dr D told HDC that he felt that Ms A did not require hospitalisation because she was not in distress, had normal oxygenation,¹⁸ her chest examination was unremarkable, and her pulse had settled. Dr D said that further evaluation would not have changed Ms A's clinical management. Dr D did not refer Ms A for a computed tomography angiography (CTA).¹⁹ He stated that a CTA may have demonstrated a PE, but if so, he would have prescribed the same medication for the same duration. Dr D also said that future application of the Geneva scale²⁰ would not have changed, as three points are given for either a previous DVT or PE.

GP consultation — 18 Month1

26. On 18 Month1, Ms A presented to GP Dr C. Ms A was on her final dose of Clexane and was due to switch to dabigatran the next day. Dr C documented Ms A's DVT diagnosis from 15 Month1 and SOBOE over the past month. On examination, Dr C documented Ms A's blood pressure (not hypertensive²¹), oxygen saturation (within the normal range²²), normal and clear chest, normal heart sounds, and no ankle swelling. Ms A's heart rate was faster than usual.²³ Dr C documented an impression of possible congestive heart failure (CHF).
27. Dr C told HDC that Ms A said that the SOBOE started around the same time as she first noticed her calf pain, which was linked to walking her dog, and stopped as soon as she ceased activity. Dr C also said that there was no evidence of shortness of breath on presentation. However, Dr C did not document these observations. Dr C requested an urgent chest X-ray, as she was unsure of the cause of Ms A's intermittent SOBOE. The referral noted '??PE'. The chest X-ray reported 'no significant abnormality'.²⁴ Dr C also arranged a brain natriuretic peptide (BNP) blood test²⁵ to assess the likelihood of CHF causing the SOBOE. This test result was normal.
28. The clinical notes record that Ms A telephoned the medical centre for the results on 23 Month1 and was advised that they were normal. Ms A reported that she was still short of breath and asked for advice. Dr C telephoned Ms A the same day to discuss the results, and documented that Ms A thought there had been some improvement. Dr C also documented that Ms A's condition should be monitored closely and queried a possible CT scan of her

¹⁵ An anticoagulant medication used to treat and prevent blood clots.

¹⁶ An anticoagulant used to treat and prevent blood clots.

¹⁷ 160/100mmHg.

¹⁸ Oxygen saturation 95%.

¹⁹ A scan used to produce images of blood vessels.

²⁰ A clinical prediction rule used in determining the pre-test probability of PE based on a patient's risk factors and clinical findings.

²¹ 128/74mmHg.

²² 97%.

²³ 103 beats per minute (mild tachycardia).

²⁴ Heart size normal, lungs clear apart from minor scarring, and no mediastinal or pleural abnormality.

²⁵ A test used to help determine the presence of heart failure.

lungs. Dr C told HDC that she made a note to consider a CT chest scan, but this is inconsistent with her clinical notes. Dr C did not refer Ms A for a CT pulmonary angiogram (CTPA).²⁶

29. Dr C told HDC that Ms A's SOBOE preceded her diagnosis of lower leg DVT. She said that she noted the comment made by Dr D²⁷ on the possibility of PE, but also noted that he did not refer Ms A for a CTPA, and she considered that Ms A's history and description of her symptoms could point towards a cardiac or lung cause. Dr C said that on reflection, she may have come to the conclusion that it was not a PE on the presumption that Dr D had considered a PE to be unlikely, as he had not referred Ms A for a CTPA. Dr C further stated that Ms A's BMI²⁸ may also have been relevant to her SOBOE.

GP consultations Month3 to Month10

30. Ms A saw Dr C on three occasions between Month3 and Month10. The clinical notes record that at these consultations Ms A reported persisting allergies, and an occasional cough when walking her dog. Dr C told HDC that Ms A otherwise felt well. Dr C documented that in Month4 she discussed with Ms A the future risk of DVT and possible preventative measures.
31. After six months, in April 2019, Ms A stopped taking dabigatran. Dr C told HDC that six months is the recommended duration for anticoagulation medication following an unprovoked lower limb DVT.

GP consultation 26 Month14

32. On 26 Month14, Ms A presented to Dr C with acute pain, weakness, and heaviness in her left leg while walking (following a road trip three weeks previously). Dr C documented the history of DVT in Month1, and that Ms A had no shortness of breath, her chest was clear, and she had normal heart sounds. Dr C documented a WELLS score of three.²⁹ Ms A's blood pressure on this occasion was raised.³⁰
33. Dr C told HDC that she asked about any chest symptoms Ms A was experiencing or had experienced recently, and Ms A said there were none, but this was not documented. Dr C said that she does not believe she considered a PE to have been a risk due to the lack of any chest or breathing symptoms.
34. Dr C referred Ms A for blood tests and a scan of her left lower leg. The D-dimer blood test was elevated,³¹ and the USS showed no evidence of a DVT. Dr C's clinical notes record that Ms A would see the practice nurse if her symptoms did not settle, and a later record of a telephone call from Ms A (not with Dr C) states that Ms A would contact the medical centre with any concerns.

²⁶ A scan to look for blood clots in the lung.

²⁷ From the 15 Month1 presentation to the 24-hour clinic.

²⁸ 37.9 (obese).

²⁹ A WELLS score of three or higher indicates that the patient is at high risk of DVT.

³⁰ 132/84mmHg.

³¹ 1140µg/L (normal <500).

35. On 28 Month14 Ms A telephoned the medical centre. The clinical notes record that Ms A wanted to know ‘if [Dr C] would like to do further investigation as pain has recurred [three times] in [the] same leg since having [the] blood clot’. The advice communicated to Ms A from Dr C was: ‘All investigations have been done, just needs to re-present if pain happens again.’

GP consultation — 21 Month17

36. On 21 Month17 Ms A presented to Dr C again. Ms A had had two episodes of nose bleeds in the past month and an ear infection.³² Dr C told HDC that Ms A did not mention any other concerns, and the clinical notes do not record discussion of her previous symptoms, including SOBOE.

GP consultation 15 Month20

37. On 15 Month20, Ms A had a telephone consultation with Dr E, another doctor at the medical centre. Dr E told HDC that the telephone consultation was scheduled because of COVID-19 pandemic restrictions.
38. Dr E documented that Ms A had experienced two or three episodes of SOBOE, and had no chest pain, coughing, fever, or breathing discomfort when lying flat.³³ He recorded Ms A’s previous ‘suspected DVT with elevated D-dimer’, in addition to the recent negative USS, and that Ms A usually experienced leg swelling, but had improper functioning of the vein valves in her leg.³⁴ Dr E told HDC that Ms A had reported chronic leg swelling since Month1, and did not report this as a new concern, although this is not documented. Dr E told HDC that he noted that previously Ms A had been on dabigatran for six months, but he thought that Dr C would be best placed to assess whether to re-commence anticoagulant treatment.
39. Dr E said that he did not suspect PE due to Ms A’s low PERC score,³⁵ although the PERC score was not documented. Nonetheless, he arranged a chest X-ray and blood tests, including D-dimer and BNP, and documented that spirometry³⁶ would be considered following receipt of the results. The chest X-ray referral noted: ‘? Cardiomegaly³⁷ ? Lung fibrosis³⁸.’
40. The chest X-ray was reported as normal.³⁹ However, the D-dimer result was elevated, and considerably higher than the previous result in Month1.⁴⁰ Dr E told HDC that because of Ms A’s previously elevated D-dimer results without current signs of DVT or PE, he considered other non-thromboembolic possibilities. Dr E’s clinical notes from 21 Month20 (when the results were received) record consideration of recent surgery, trauma, infection, heart

³² Otitis externa (inflammation of the external ear canal).

³³ Orthopnea.

³⁴ Venous insufficiency.

³⁵ A criteria used to rule out PE.

³⁶ A test to measure the amount of air that is breathed in and out of the lungs.

³⁷ An enlarged heart.

³⁸ Lung disease that occurs when lung tissue becomes damaged and scarred.

³⁹ No abnormality in the heart, lungs or pleural cavities. Heart size normal with cardiothoracic ratio of 45%.

⁴⁰ 4499µg/L (normal <500).

attack, and some cancers or conditions in which fibrin⁴¹ is not cleared normally, such as liver disease. However, Dr E also documented that Ms A's liver function was normal.

41. Further blood tests⁴² were requested by Dr E on 21 Month20. The medical centre told HDC that Dr E sent a task to the nursing inbox to ask the nurses to contact Ms A. However, this was not completed until 9 Month21, when a nurse telephoned Ms A and emailed the blood request form from 21 Month20 to the laboratory. The medical centre was unable to ascertain why there was a delay in the nursing task being completed. The bloods requested by Dr E were reported as normal, and the results were shared with Ms A on 12 Month21.

GP consultation — 26 Month20

42. On 26 Month20 the medical centre telephoned Ms A to inform her that the chest X-ray was normal. Ms A reported that she was still experiencing shortness of breath, and a telephone consultation⁴³ with Dr C was arranged.
43. Dr C documented that Ms A was experiencing SOB/OE with any exercise and was afraid to go walking as it made her feel sweaty and weak (Dr C did not document in the clinical notes how long these symptoms had persisted but noted in a referral sent later that day that they had persisted for three weeks, as discussed below). Dr C documented that Ms A had no cough, chest pain, or shortness of breath during sleep, but she felt unable to get sufficient air into her lungs. Dr C told HDC that during the consultation Ms A was not suffering from shortness of breath, although this was not documented. The clinical notes record consideration of the previous DVT diagnosis in 2018, but the recent elevated D-dimer result is not recorded.
44. Dr C documented the plan to refer Ms A for an urgent CTPA, and advice that Ms A should go to the Emergency Department (ED) if her condition worsened. Dr C told HDC that she considered that this was necessary safety-netting advice, which was well understood by Ms A.
45. Dr C told HDC that her understanding was that Ms A's initial SOB/OE symptoms had arisen prior to her DVT diagnosis, and at the time of this presentation had also persisted for three weeks when exercising. Dr C told HDC that on the basis of this information, she considered that Ms A's chest symptoms may have been standalone or pre-existing and may have correlated to a chronic as opposed to acute lung disorder. Dr C also said that she considered cardiac ischaemia⁴⁴ as a possible cause but did not think further investigations were warranted at that time, as Ms A's symptoms were not typical (no chest pain), and her previous ECG⁴⁵ had not shown anything of concern. Dr C also told HDC that due to Ms A's described symptoms and the recent elevated D-dimer result, she was concerned about the possibility of a potential PE.

⁴¹ A protein formed from fibrinogen during the clotting of blood, which impedes blood flow.

⁴² Iron studies, coagulation studies, PTT, PT, fibrinogen.

⁴³ Due to COVID-19 pandemic restrictions.

⁴⁴ Reduced blood flow to the heart, preventing it from receiving enough oxygen.

⁴⁵ Performed in Month1.

46. Later that evening, Dr C sent a referral for a chest CT to the community radiology service. The referral requested the CT within two weeks, and documented:

'3/52 h[istory] of dyspnea of effort getting worse normal CXR
DVT Oct 201[8], elevated D di[m]er >2y — no cause found, but nor raised further, no h[istory] travel or COVID risk ?? PE updated CR requested Thank you'

47. Dr C told HDC that the request clearly stated that she was seeking to investigate a potential PE. However, she made an error in requesting a CT chest rather than a CTPA.

Declined referral

48. Two hours later, the referral for a CT chest was refused, with the following message:

'... CT thorax [chest] requests must be accompanied by a recommendation from a hospital respiratory physician ... refer patients with pulmonary nodules to Respiratory Department nodule clinic for follow-up Search "CT Chest" on HealthPathways.'

49. Dr C was advised to add additional detail, note that the request was a repeat, and resubmit if she considered that the request should be reconsidered. The message also advised:

'Please communicate this outcome to your patient. The Medical Council of New Zealand Statement on safe practice in an environment of resource limitation advises "Doctors who are placed in a position where they are unable to provide a preferred treatment are advised to inform the patient what the preferred treatment involves, what the next best option is and what the next best option involves. This discussion should be documented".'

50. Dr C did not correct or resubmit the referral.

51. Dr C told HDC that she cannot explain why she did not pursue this with either a referral for the correct investigation or discussion with a hospital colleague. She stated that the procedure at the medical centre for diagnosis and management (including the process around declined referrals) follows the recommendations on HealthPathways, which recommends that doctors consider why requests have been declined and follow up as indicated by the patient's need for management.

52. Dr C said that her recollection is that she interpreted the declined referral as an indication that the investigation was not required according to the information she had provided. She said that the declined referral was interpreted as 'an incorrect and inappropriate referral on [her] behalf'. Dr C told HDC that her interpretation was incorrect, and, with hindsight, she realises that she should have pushed for a CTPA or for Ms A to be seen in ED.

Further investigations

53. Dr C requested further blood tests for renal function, which were reported as normal on 29 Month20. Dr C said that she did not arrange a further D-dimer test as she already knew that this was elevated.

Care provided in Month22

54. The clinical notes document that the medical centre contacted Ms A on 30 Month21 to arrange an appointment with Dr C. Dr C told HDC that this was at her request. Ms A presented on 3 Month22 and reported having had three nosebleeds in Month18 (one of which had lasted for up to two hours) and some SOBOE for a few days after each episode; two episodes of sudden-onset SOBOE; some ankle swelling that had resolved; and an occasional cough (without any wheeze). Ms A reported that she had no chest pain or shortness of breath during sleep. Dr C told HDC that Ms A denied any shortness of breath at the time, and said she was feeling well again, although this was not documented.
55. Dr C said that she was aware that nose bleeds are not typically associated with PE, and normally reduced ankle swelling would suggest a resolution of an episode of heart failure. Dr C documented that on examination, Ms A's heart sounds were normal, and her chest was clear, and Ms A's peak flow⁴⁶ was measured.
56. There is no record of any discussion with Ms A on 3 Month22 regarding the CT chest referral that was declined on 26 Month20. In response to the provisional opinion, Ms B told HDC that she recalled that Ms A telephoned her and told her that the scan referral that she had been waiting for had been declined. Ms B recalled that Ms A was concerned that it had been declined and that it had taken a long time for her to find out about this, as it was her understanding that the scan was urgent. Ms B could not recall when the telephone call took place.
57. Dr C documented an impression of possible interstitial lung disease⁴⁷ and arranged for spirometry to investigate airway function, and further blood tests⁴⁸ to investigate CHF. Dr C told HDC that she thought that airway function might be the cause of Ms A's breathlessness, and that Ms A's high BMI could be a contributing factor.
58. Dr C did not request a D-dimer blood test and told HDC that regular D-dimer blood tests were not taken consistently as the USS of Ms A's leg on 26 Month14 had not demonstrated a DVT. Ms A's other blood test results were normal.⁴⁹
59. Ms A underwent spirometry testing with a nurse on 15 Month22. The clinical notes record that while initially she was wheezy, she reported feeling much better after having used a bronchodilator inhaler.⁵⁰ Dr C told HDC that Ms A's response to the inhaler suggested the possibility of asthma, but this was not reached as a definitive diagnosis on 15 Month22. Dr C said that she was not working that day, and, as the results did not show a major abnormality, they were left for her to review on 17 Month22. Dr C's plan was to follow up with Ms A after reviewing the results.

⁴⁶ Measurement of air flow out of the lungs (result 330L/min).

⁴⁷ A group of disorders that cause progressive scarring of lung tissue.

⁴⁸ Complete blood count, ferritin, and BNP.

⁴⁹ Complete blood count and BNP normal, ferritin elevated but iron studies otherwise normal.

⁵⁰ Medication that makes breathing easier.

60. Dr C told HDC that she did not consider a potential PE from Ms A's history and is unsure whether the declined referral of 26 Month20 had any influence on this decision. Dr C said that she wishes she had considered the possibility of PE at that consultation. She stated:

'All I can say is I was reassured by [Ms A] describing that she "felt well" again, I was (I appreciate wrongly) assured by the communication from radiology, and I considered the asthma diagnosis, and associated management would improve things for [Ms A]. I think it is clear that I was still investigating diagnostic possibilities including heart failure and asthma, which could have been possible causes of intermittent shortness of breath. Her presentation was not the typical presentation I had seen for pulmonary embolus in my practice in the past.'

Subsequent events

61. Sadly, Ms A died suddenly at her home on 18 Month22.

Coroner

62. Dr C told the Coroner that the diagnosis was unclear, and the breathing issues were intermittent, and at times exercise related.

63. The Coroner concluded that Ms A died as a result of acute and chronic PE arising from leg DVT. The autopsy demonstrated blood clots in the lungs, most of which were acute,⁵¹ but some of which were chronic.⁵²

64. The medical advisor to the Chief Coroner advised the Coroner that she had the following 'significant concerns' about the care Ms A received:

- Neither Dr C (nor her colleagues at the medical centre) responded to the declined request for an urgent investigation into PE. An appropriate response would have been a telephone call to a hospital respiratory physician (or other hospital doctor such as an on-call medical registrar).
- Dr C's request for a CT chest was returned without advice that this was the wrong investigation to order (and that the correct investigation was a CTPA), and without any recognition of the urgent need for the investigation.

65. The medical advisor noted that if Dr C had taken appropriate action on the returned referral, 'it is very likely Ms A would have been seen promptly at the hospital and a CTPA performed'.

66. The medical advisor also had questions about the reasonableness of the clinicians not pursuing the possible diagnosis of PE in Month1, whether Ms A should have been advised to take anticoagulation treatment for longer than six months, and whether it was reasonable for Dr E to have failed to consider PE as a cause for Ms A's breathlessness on 15 Month20. However, the medical advisor did not investigate these questions, noting that these

⁵¹ Recent — within days.

⁵² Older — within weeks to months.

concerns were 'overshadowed' by the significant concern that Ms A did not have an urgent CTPA in Month20.

Further information

Dr D

67. Dr D extended his sincere condolences to Ms A's family. He told HDC that reviewing Ms A's case has given him renewed appreciation for the benefit of using and charting clinical risk calculators in medical records.

Dr C

68. Dr C told HDC that she remains very saddened, shocked, and sorry about Ms A's passing. She reiterated her sincere condolences to Ms A's family.
69. Dr C agreed with my in-house clinical advisor, Dr Maplesden (whose advice is discussed further below), that PE can be difficult to diagnose, as it can present in various ways. She explained that in her experience, situations like Ms A's, where a patient presents without typical symptoms and over a prolonged period of time, are rare. However, Dr C appreciated that with the benefit of hindsight, PE was a logical diagnosis, having regard to Ms A's history, presentation, and the investigation results. Dr C stated:

'With the benefit of hindsight, it now seems obvious that [Ms A's] respiratory symptoms were caused by recurrent pulmonary emboli. Her initial symptoms in 2018 settled (as would be expected) with dabigatran, and when she re-presented with calf pain I was reassured by the normal ultrasound showing no DVT despite an elevated D-dimer. However, when I reviewed her in [Month20] by phone, I was clearly concerned about the possibility of pulmonary embolus and recorded the need for an urgent CTPA. I am unable to explain to my satisfaction why I did not pursue this after receiving the note rejecting my request for a CT chest. I am reluctant to suggest that the Covid19 restrictions influenced my actions, but there is no doubt that we were operating under very difficult circumstances at the time.'

70. While she did not want to 'divert from or make any excuses for the tragedy that is [Ms A's] death', Dr C explained the resourcing issues the medical centre was facing at the time, and continues to face, noting that staffing shortages meant that she was under significant pressure managing to maintain the practice. Dr C also noted the additional demands arising from the COVID-19 pandemic.
71. Dr C told HDC that she is sorry that she did not provide Ms A with the standard of care she would expect of herself, and that she has worked to process what occurred and learn from it and has adjusted her practice to mitigate the risk of a similar event happening again.
72. Dr C intends to retire in 2023.

Dr E

73. Dr E told HDC that he has considered Dr Maplesden's recommendations carefully. In particular, Dr E acknowledged Dr Maplesden's advice about arranging a face-to-face

appointment with a patient after receiving abnormal results. Dr E acknowledged that a more proactive approach is always required when PE is a diagnostic possibility.

Medical centre

74. The medical centre told HDC that no internal review or investigation took place in relation to this complaint, and that ‘the absence of review or investigation is symptomatic of the challenges facing small practices in that there are no independent clinicians available to conduct or lead such reviews’.
75. The medical centre said that currently it is struggling to provide GP coverage for its patient population.⁵³ GPs are available for 1.5 FTE when the practice population warrants availability closer to 2.5 FTE.

Te Whatu Ora

76. Te Whatu Ora offered its sympathy to Ms A’s friends and family for their loss.

Community radiology service

77. Te Whatu Ora told HDC that the service was developed to provide prompt access to GPs for specified tests under specified situations to make the best use of its constrained radiology and specialist resources.
78. Providers in the local community have three main ways to access funded radiology:
- Referral to specialist services (for the specialist service to request any necessary radiology) or admission to hospital;
 - Acute Demand Management Services (for support to manage acutely unwell patients including radiology required acutely (< 48 hours); or
 - Community radiology service for less acute or non-urgent tests.
79. Each community radiology service referral is triaged by a GP triager according to agreed local access criteria, along with clinical discretion where individual interpretation is required. Te Whatu Ora told HDC that the agreed radiology criteria and urgency, along with the processes required to access tests, are published on HealthPathways for referrers, as are the clinical pathways for how to manage clinical conditions.
80. Te Whatu Ora explained that a ‘significant minority’ of requests are returned to the referring GP because the request does not fulfil the agreed criteria or clinical pathway for a condition, or the information on the form is insufficient to make a determination. The referring GP receives an ‘Accept’ or ‘Returned’ message advising of the outcome. Usually this is accompanied by a brief note or reason, not for the purpose of providing clinical management advice, but to help the referring GP to find the required clinical information on HealthPathways in order to continue to manage their patient, establish what alternative clinical pathway is advised, and/or resubmit a request with different information if required.
81. Te Whatu Ora explained that there were three reasons for declining Dr C’s CT chest request:

⁵³ 3,300 enrolled patients.

- Acute investigations are not provided by the community radiology service. Until Ms A's case, Te Whatu Ora was not aware of any previous acute request for a CT chest through the community radiology service.
 - CT chest was the wrong test for Ms A. A CTPA was indicated based on the information available at the time, which raised the suspicion of a PE.
 - In the region, GP-requested imaging is not recommended for the investigation of a potential PE. HealthPathways advises acute specialist care instead. In addition, the locally agreed access criteria for CT chest specifies that a GP CT request is available only if the request includes hospital respiratory physician advice, a radiologist report advising CT chest, or an indeterminate pulmonary nodule found on chest X-ray.
82. Te Whatu Ora told HDC that it did not take further steps to establish whether a CT chest was the correct type of scan ordered, because neither CT chest without specialist recommendation, nor CTPA are available by GP request. Te Whatu Ora considered that it was made clear to Dr C that the request had been declined, and the return advice appropriately directed her to the CT chest page on HealthPathways. Te Whatu Ora commented:
- ‘The purpose of the [community radiology service’s] triage process is to manage resources and not to provide specialist clinical advice on the management of clinical conditions. The intention of the individualised decline message in this case was to help [Dr C] to facilitate [Ms A’s] access to the right services.’
83. Te Whatu Ora also explained that beyond informing Dr C of the outcome of her request, it did not take further steps to follow up on the declined request. It considers that it is the responsibility of the ordering clinician to follow up with the patient.

Responses to provisional opinion

Ms B

84. Ms B was provided with an opportunity to comment on the ‘information gathered’ section of the provisional opinion, and her comments have been included in this report where relevant.

Medical centre

85. The medical centre was provided the opportunity to respond to the relevant section of the provisional opinion, but no response was received.

Dr C

86. Dr C was given the opportunity to respond to the relevant section of the provisional opinion. Dr C told HDC that she has reflected on the situation and accepts that she let Ms A and her family down. Dr C accepted the proposed findings and stated that she reviewed the case fully and implemented the changes in her practice to protect against a similar event happening again.
87. Dr C said that she will retire in 2023.

Dr E

88. Dr E was given the opportunity to respond to the relevant section of the provisional opinion. Dr E provided HDC with details of the steps he has taken to update his clinical knowledge regarding the diagnosis and management of suspected PE since these events and stated that he now feels more confident in these areas.

Te Whatu Ora

89. Te Whatu Ora was provided the opportunity to review the provisional opinion and confirmed that it did not wish to make further comment.

Dr D

90. Dr D was provided the opportunity to respond to the relevant section of the provisional opinion, but no response was received.
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Opinion: Introduction

91. To assist my assessment of this matter, I sought in-house clinical advice from GP Dr David Maplesden. As a reference for recommended management of patients with suspected DVT or PE, Dr Maplesden relied on the relevant Community HealthPathways guidance. This guidance, and Dr Maplesden's advice, is discussed throughout my opinion.
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Opinion: Dr C — breach

Management of symptoms — breach

Consultation — 18 Month1

92. Three days after being diagnosed with lower left leg DVT Ms A presented to Dr C on 18 Month1. Dr C documented that Ms A had had SOBOE over the past month. Dr C told HDC that Ms A's SOBOE began around the same time as Ms A first noticed calf pain, but stopped as soon as she ceased activity, and that there was no evidence of shortness of breath on presentation. However, Dr C did not document this.
93. Dr C stated that Ms A's SOBOE preceded Ms A's DVT diagnosis, and she was unsure of the cause of the intermittent SOBOE. Dr C said that she was aware that Dr D had considered possible PE but had not referred Ms A for a CTPA, so she felt that she should look for other possible causes. Dr C told HDC that on reflection, she may have come to this conclusion on the presumption that Dr D considered PE to be unlikely.
94. Dr C considered that Ms A's history and symptoms could point towards a cardiac or lung cause and documented an impression of CHF. Dr C arranged a BNP blood test to assess the likelihood of CHF, and an urgent chest X-ray, documenting on the referral '?? PE'. The results of these investigations were normal.

95. Ms A telephoned the medical centre for her results on 23 Month1, and reported ongoing shortness of breath and requested advice. However, when Dr C spoke to Ms A, she documented that Ms A thought that there had been some improvement in her symptoms. Dr C documented that Ms A's condition should be monitored closely and made a note to consider a CT lung scan. Dr C did not refer Ms A for a CTPA.
96. My clinical advisor, Dr Maplesden, considered that Dr C's assessment of Ms A on 18 Month1 was adequate. Dr Maplesden advised:
- 'If [Dr C] was confident that the onset of [Ms A's] respiratory symptoms well preceded the onset of any DVT symptoms (in contrast to the history recorded by [Dr D] on 16 [Month1], but noting apparent denial of respiratory symptoms at triage the same day) I think it was reasonable to consider diagnoses other than PE as a cause of the symptoms, and appropriate investigations were arranged in this regard. A further mitigating factor is that [Ms A] was receiving appropriate treatment for VTE⁵⁴ disease at this point.'
97. However, Dr Maplesden advised that if Dr C established that the onset of Ms A's respiratory symptoms coincided with, or followed, the onset of her leg symptoms, he would be mildly to moderately critical that a diagnosis of PE was not considered further.
98. In my view, it is clear that Ms A's SOBOE preceded her DVT diagnosis of 15 Month1, as advised by Dr C. However, it does not appear that Ms A's SOBOE preceded her DVT symptoms (primarily swelling and pain in her leg).
99. Dr D's discharge summary from 16 Month1 (which Dr C told HDC she considered) records that Ms A had reported increased SOBOE over the past month, alongside a one-month history of worsening swelling in her leg. Dr C also told HDC that Ms A's SOBOE commenced around the same time as her calf pain (that is, one month previously).
100. I therefore consider it more likely than not that Dr C was aware that Ms A's respiratory symptoms and DVT symptoms commenced around the same time.
101. While it is clear from the chest X-ray referral that Dr C was considering PE, I consider that she should have pursued a diagnosis of PE further during the initial consultation.

Consultation 26 Month14

102. Ms A re-presented to Dr C on 26 Month14 with acute pain, weakness, and heaviness in her left leg while walking, which had followed a recent road trip. Dr C documented the history of DVT in Month1, and recorded that Ms A had no shortness of breath and her chest was clear. Dr C documented a WELLS score of three.
103. Dr C told HDC that she asked Ms A about any chest symptoms she was experiencing or had experienced recently, and Ms A said there were none. However, this was not documented. Dr C said she did not consider PE to be a risk due to the lack of any chest or breathing

⁵⁴ Venous thromboembolism (a blood clot that blocks the flow of blood in a vein). VTE includes DVT and PE.

symptoms. Dr C referred Ms A for blood tests, including D-dimer, and a USS of her lower left leg. The D-dimer result was elevated,⁵⁵ while the USS showed no evidence of a DVT. Dr C documented that Ms A would see the practice nurse if her symptoms did not settle.

104. Dr Maplesden advised that Dr C's assessment of Ms A was adequate, although she could have documented her assessment of Ms A's leg more thoroughly, including documenting whether there was localised tenderness or pitting oedema.⁵⁶

105. Dr Maplesden further advised that due to the limitations of the USS for DVT, HealthPathways recommends a follow-up USS within five to eight days if there is a WELLS Score of two or higher, a positive D-dimer,⁵⁷ and the patient's symptoms persist without an apparent alternative diagnosis. I note that the medical centre's DVT Policy (Appendix B) is based on the HealthPathways guidance, and similarly recommends that follow-up USS is considered five to eight days after a negative USS if symptoms persist.

106. Dr Maplesden stated:

'It appears the cause of the elevated D-dimer and calf pain was unexplained although there are multiple possible causes other than VTE for both findings. [Ms A] had been given advice to return if her leg symptoms persisted and I would expect repeat ultrasound to have been ordered per Pathways guidance if she had re-presented in the next week or so with persistent symptoms. However, it does not appear there was such a re-presentation.'

107. The clinical notes document that two days after the USS, on 28 Month14, Ms A telephoned the medical centre and queried whether Dr C wished to do further investigations as the 'pain ha[d] recurred [three times] in same leg since having [a] blood clot'. The advice communicated from Dr C was: 'All investigations have been done, just needs to pre-present if pain happens again.'

108. Dr Maplesden advised that while it is not entirely clear from the clinical notes, his interpretation of the record of this conversation is that since the confirmed DVT in Month1, Ms A had three self-limiting episodes of left leg pain, the most recent of those being her presentation to Dr C on 26 Month14. Dr Maplesden did not interpret the telephone call of 28 Month14 as indicating that Ms A's leg pain had recurred since Dr C's assessment of 26 Month14. I agree that this is a reasonable interpretation of the clinical notes and accept Dr Maplesden's advice that there was not a re-presentation that would have required a repeat ultrasound. On this basis, I do not have any significant concerns regarding Dr C's management of Ms A's symptoms at this consultation.

⁵⁵ 1,140µg/L.

⁵⁶ Build-up of excess fluid, causing swelling. When pressure is applied to the swollen area, a 'pit' or indentation will remain.

⁵⁷ 500µg/L or greater.

Consultation 26 Month20

109. Due to reports from Ms A of continued shortness of breath, a telephone consultation (due to COVID-19 pandemic restrictions) with Dr C was arranged on 26 Month20. Dr C documented that Ms A was experiencing SOBOE with any exercise, felt sweaty and weak when walking, and felt unable to get sufficient air into her lungs. Dr C did not document in the clinical notes how long these symptoms had persisted but noted in a referral sent later that day that they had persisted for three weeks (as I discuss later in this opinion). Dr C told HDC that Ms A was not suffering from shortness of breath during the consultation, but again this was not documented.
110. Dr C told HDC that on the basis of her understanding of the timing and persistence of Ms A's chest symptoms, she considered that these may have been standalone or pre-existing and may have related to a chronic (as opposed to acute) lung disorder. Dr C said that she also considered cardiac ischaemia as a possible cause, although Ms A's symptoms were not typical, and her previous ECG had not raised anything of concern.
111. Dr C said that she also considered a potential PE, on the basis of Ms A's symptoms and recent elevated D-dimer result⁵⁸ (ordered by Dr E on 15 Month20). The clinical notes support that this was Dr C's leading impression, as she recorded that Ms A required an urgent CTPA. Ms A was advised to present to ED if her condition worsened, which Dr C said was well understood by Ms A.
112. Dr Maplesden advised that while a cause such as cardiac ischaemia could not be discounted, Ms A's history and symptoms were 'certainly consistent' with PE. In this clinical scenario, Dr Maplesden advised that a majority of his colleagues would consider accepted management to involve expediting a face-to-face assessment, despite COVID-19 precautions. As per HealthPathways guidance, this would most appropriately be done by way of direct referral to ED via ambulance after discussion with the general medicine registrar. Dr Maplesden considered that Dr C's alternative management of attempting to arrange a CTPA in the community was inappropriate and represented a moderate departure from accepted practice.
113. I accept Dr Maplesden's advice that Dr C did not manage Ms A's persistent and worsening symptoms adequately on 26 Month20. I acknowledge Dr Maplesden's advice that it was inappropriate to arrange a CTPA in the community and have significant concerns about Dr C's subsequent management when this was brought to her attention, as I discuss below.

Declined referral

114. Dr C's intention was to refer Ms A for an urgent CTPA (as documented). However, Dr C mistakenly requested a CT chest from the community radiology service. The referral stated: '... DVT Oct 2019, elevated D di[m]er >2y — no cause found, but nor raised further, no hx travel or COVID risk ?? PE updated CR requested Thank you'

⁵⁸ 4,499µg/L.

115. Two hours later the referral was declined (see paragraph 48) and Dr C was advised that if she considered that the request should be re-considered, to add additional detail, note that it was a repeat request, and re-submit the referral. Dr C took no further action in relation to the declined referral.
116. Dr C told HDC that her request clearly stated that she was seeking to investigate a potential PE. On the basis of the clinical records and what is written in the referral, I accept that Dr C's intention was to investigate PE by way of a CTPA as opposed to a CT chest.
117. Dr Maplesden advised that Dr C's referral for a CT chest was not only clinically inappropriate in terms of the procedure requested, but also the mode of referral. As noted previously, Dr Maplesden considered that the appropriate action upon suspicion of PE was direct referral to ED for urgent assessment and imaging.
118. Dr Maplesden also had concerns regarding Dr C's actions on receipt of the declined referral, noting that Dr C should have been aware of the HealthPathways resources facilitating appropriate referral, which were communicated in the community radiology service's decline letter. Dr Maplesden commented:
- 'I believe it was a reasonable expectation that on receipt of the decline letter [Dr C] would review her management decisions and the relevant Health Pathway and refer [Ms A] urgently to ED as per the Pathway recommendations.'
119. Dr C told HDC that she is unable to explain why she did not re-submit a referral for the correct investigation or discuss Ms A's case with a hospital colleague. Dr C's recollection is that she interpreted the declined referral as an indication that the investigation was not required according to the information she had provided to the community radiology service, and that her referral was 'incorrect and inappropriate'. However, in hindsight she accepted that her interpretation was incorrect, and she needed to have pushed for a CTPA or for Ms A to be seen in ED.
120. Dr Maplesden disagreed that the decline letter suggested that CTPA for investigation of possible PE was not necessary. He advised that it is common and expected primary care knowledge that suspected PE requires urgent specialist review and investigation, and Dr C had ready access to the relevant clinical pathway if she had any doubt regarding appropriate management. Dr Maplesden considers that this should have been arranged by Dr C ideally when she first considered PE, and certainly when the decline letter was received. Dr Maplesden is 'at least moderately critical' of Dr C's failure to do so.
121. I accept Dr Maplesden's advice. Dr C did not take any further steps to arrange necessary investigations for Ms A after becoming aware of her error in management.

Care provided in Month22

122. Dr C stated that after the CT chest request was declined, she undertook further investigations into the possibility of a chronic lung disorder, including further blood tests for renal function (which were reported as normal on 29 Month20). The clinical notes record

that the medical centre contacted Ms A on 30 Month21 to arrange an appointment with Dr C, which Dr C said was at her request.

123. At the consultation on 3 Month22, Dr C documented that Ms A had experienced three nosebleeds in Month18 with some SOBOE for a few days after each episode; two episodes of sudden-onset SOBOE; some ankle swelling that had resolved; and an occasional cough (but no wheeze); and that Ms A had denied any chest pain or shortness of breath during sleep. Dr C told HDC that Ms A also denied any shortness of breath on presentation and reported feeling well again, but Dr C did not document this.
124. Dr C explained to HDC that she was aware that nose bleeds are not typically associated with PE, and reduced ankle swelling normally suggests resolution of an episode of heart failure. Dr C considered that the diagnosis was unclear, but documented an impression of possible interstitial lung disease, and arranged for spirometry to investigate airway function, and further blood tests to investigate CHF (which did not include a D-dimer test). Dr C told HDC that she thought that airway function might be the cause of Ms A's breathlessness, and her high BMI could be a contributing factor.
125. There is no record of any discussion with Ms A on 3 Month22 regarding the CT chest referral that was declined on 26 Month20, and Dr C took no further action on the referral at this consultation.
126. On 15 Month22 Ms A underwent spirometry testing with a nurse that suggested the possibility of asthma, although a definitive diagnosis was not reached. Dr C said that she was not working that day and intended to follow up with Ms A after reviewing the results on 17 Month22. Ms A's blood test results were normal.
127. Dr C told HDC that she did not consider a potential PE from Ms A's history, as Ms A's description that she 'felt well' again and the declined referral reassured her. Dr C said that she was still investigating diagnostic possibilities, including heart failure and asthma, which could have been possible causes of intermittent shortness of breath, and she thought that an asthma diagnosis and associated management would improve things for Ms A. Dr C said that Ms A's presentation was not the typical presentation she had seen for PE previously.
128. Dr Maplesden considers that with the benefit of hindsight, it is apparent that Ms A's symptoms were likely related to episodes of PE with shortness of breath lasting a couple of hours, followed by several days of SOBOE. Dr Maplesden stated:

'I believe PE was a logical unifying diagnosis for the history presented by [Ms A], particularly when investigation results (positive and negative) were taken into account (no evidence of heart failure, unremarkable spirometry results, no obvious lung pathology on plain X-ray, persistently elevated D-dimer). I find it difficult to understand why [Dr C] apparently abandoned the diagnosis of possible PE when this diagnosis had not been excluded.'

129. Dr Maplesden was moderately critical that Dr C did not take appropriate steps to exclude PE as a diagnosis in Month22, and that Ms A was left without a clear diagnosis/differential diagnosis or management plan following the spirometry investigations.
130. I accept this advice and consider that Dr C's management of Ms A's symptoms in Month22 was inadequate.
131. I am concerned that there was a delay of over a month between Dr C reviewing Ms A's normal renal function blood results and arranging a follow-up consultation. It is unclear why this consultation was not arranged immediately in order to discuss the declined referral of 26 Month20 and any further investigations that could be undertaken. It is also unclear what eventually prompted Dr C to request a consultation with Ms A on 30 Month21, as the clinical notes do not record any further investigations or contact with Ms A between 29 Month20 and 30 Month21, other than the blood tests reported on 9 Month21 following Dr E's request of 21 Month20.
132. While I acknowledge Dr Maplesden's comments that PE can be a difficult diagnosis because of the varying presentations, I also note his advice that for this reason 'a high index of suspicion is required to ensure the diagnosis is not missed'. When the history of Ms A's presentations is considered, alongside the fact that PE was not excluded in Month20, I consider that Dr C ought to have been highly suspicious of the possibility that Ms A's symptoms were due to a PE. I consider that this was another missed opportunity to ensure that Ms A was referred for the appropriate investigations.
133. I note that with the benefit of hindsight Dr C has also accepted that PE was a logical diagnosis, considering Ms A's history, presentation, and the investigation results.

Conclusion

134. I acknowledge Dr Maplesden's comments around the difficulties associated with diagnosis of PE, and that diagnosis of PE features prominently in the medical literature as a source of diagnostic error (often associated with severe outcomes).
135. I also acknowledge Dr Maplesden's advice that confirmation bias (a common cognitive error) may have had an impact on Dr C's decision to abandon the PE diagnosis after the community radiology service declined her referral in Month20. Dr Maplesden considers that the clinical notes show clinical documentation and assessment of a good standard, and that the diagnostic issues highlighted in his advice appear to be 'isolated and atypical rather than representing a pattern of substandard practice'.
136. I accept Dr Maplesden's advice in this regard and note the difficult circumstances within which Dr C was practising at the time. I recognise the challenging working conditions at the medical centre due to staffing shortages, cited by both Dr C and the medical centre, and also acknowledge that one of Dr C's key consultations with Ms A occurred by telephone due to COVID-19 pandemic restrictions. Dr Maplesden advised that high workload and communication barriers can increase the risk of cognitive errors.

137. Nonetheless, I consider that Dr C did not provide services to Ms A with reasonable care and skill, as Dr C did not:
- Pursue a diagnosis of PE during the initial consultation on 18 Month1;
 - Expedite a face-to-face assessment following the consultation on 26 Month20, by way of referral to ED via ambulance for urgent assessment and imaging;
 - Review her management decisions upon receipt of the declined referral of 26 Month20, and re-refer Ms A for appropriate investigations; and
 - Take appropriate steps to exclude PE as a diagnosis in Month22.
138. In my view, collectively these deficiencies show inadequate management of Ms A's symptoms, resulting in her not receiving the right investigations in a timely manner. The outcome for Ms A and her whānau was devastating. In my opinion, Dr C did not provide services to Ms A with reasonable care and skill, and, accordingly, I find that Dr C breached Right 4(1)⁵⁹ of the Code of Health and Disability Services Consumers' Rights (the Code).

Provision of information regarding declined referral — breach

139. On 26 Month20 the community radiology service declined Dr C's referral for a CT chest and stated that Dr C should communicate the outcome to Ms A. Ms A was not notified of the declined referral.
140. The Medical Council of New Zealand's 'Statement on safe practice in an environment of resource limitation' (2018) states:⁶⁰
- 'It is important to support your patient to make an informed decision about their treatment or management. If you are placed in a position where you are unable to provide a preferred treatment, you should inform the patient (and/or their caregivers/family/whānau where possible) of the reasons for the denial of service, what the best available option is and what that involves. This discussion should be documented.'
141. As discussed earlier in this report, Dr C cannot explain why she did not pursue the declined referral with a referral for the correct investigation or discussion with a hospital colleague but recalls that she interpreted the declined referral as an indication that the referral was 'incorrect and inappropriate' and an indication that the investigation was not required.
142. Regardless of Dr C's interpretation of the declined referral, it was necessary to communicate this to Ms A. Given that referral for CTPA was discussed during the telephone consultation on 26 Month20, I am critical that Dr C did not inform Ms A that she had made an error in requesting a CT chest scan and that this was declined, and the reason it was declined and the best available option. In my view, this is information that a reasonable consumer in Ms

⁵⁹ Right 4(1) states: 'Every consumer has the right to have services provided with reasonable care and skill.'

⁶⁰ <https://www.mcnz.org.nz/assets/standards/ca25302789/Safe-practice-in-an-environment-of-resource-limitation.pdf>.

A's circumstances would expect to receive and is also information that the Medical Council of New Zealand advises should be provided in the circumstances.

143. Had Dr C discussed the declined referral with Ms A, it is my view that this would have provided an opportunity for Dr C to reflect on and understand why it was declined, which in turn may have led her to pursue the PE diagnosis by way of the correct investigations.
144. Dr C's failure to provide this information to Ms A meant that Ms A was left in the dark for over a month regarding the outcome of the investigations Dr C had proposed on 26 Month20. Ms A was unable to participate in her own health care and query why the investigations could not be performed. Accordingly, I find that Dr C breached Right 6(1) of the Code.⁶¹

Anticoagulant medication — no breach

145. Ms A took Clexane (anticoagulant medication) for four days from 15 Month1, and then took another coagulant medication, dabigatran, until April 2019 (six months in total).
146. Dr Maplesden advised that current New Zealand guidance for a distal DVT⁶² (as Ms A had) that has been unprovoked, or with persisting risk factors, is a three-month course of a direct oral anticoagulant such as dabigatran or rivaroxaban. He stated that for patients with a proximal DVT or PE that is unprovoked or associated with a transient (non-surgical) risk factor, the guidance is a three- to six-month course.
147. Dr Maplesden advised that Dr C's management of Ms A between Month3 and Month10 was consistent with accepted practice, assuming that Ms A's respiratory symptoms had resolved. I note that the clinical records from Ms A's consultations on 13 Month3, 29 Month4, and 25 Month10 do not record respiratory symptoms of concern aside from an allergic cough from dog exposure.
148. I accept this advice, and I do not have concerns regarding the course of anticoagulant medication.

Opinion: Dr E — adverse comment

149. On 15 Month20 Ms A had a telephone consultation with Dr E. Dr E documented that Ms A had experienced two or three episodes of SOBOE, but had no chest pain, coughing, fever, or orthopnea. The clinical notes show that Dr E was aware of Ms A's DVT diagnosis in Month1 (and course of anticoagulant medication), her elevated D-dimer results, and the negative leg USS from Month14. Dr E also documented that Ms A usually experienced leg

⁶¹ Right 6(1) states: 'Every consumer has the right to the information that a reasonable consumer, in that consumer's circumstances, would expect to receive ...'

⁶² DVT that is located below the knee and confined to the calf veins.

swelling but had venous insufficiency.⁶³ Dr E told HDC that Ms A had reported chronic leg swelling since Month1, and did not report this as a new concern, although this was not documented.

150. Dr E told HDC that he did not suspect PE due to Ms A's low PERC score, although the PERC score is not documented in the clinical notes. Dr E arranged a chest X-ray and blood tests, including D-dimer and BNP, and planned to consider spirometry following receipt of the results. The chest X-ray referral indicates that Dr E's impression at the time was cardiomegaly or lung fibrosis.
151. Ms A's chest X-ray was reported as normal, but the D-dimer result was elevated, and had risen significantly since the previous test in Month14. Dr E told HDC that due to Ms A's previously elevated D-dimer results, without current signs of DVT or PE, he considered other non-thromboembolic possibilities, including infections, malignancies, or conditions in which fibrin is not cleared normally, such as liver disease. This is supported by Dr E's clinical notes recorded on 21 Month20 on receipt of the results, which document that Ms A's liver function tests were normal, and further blood tests were requested.
152. The medical centre told HDC that Dr E sent a task to the nursing inbox to ask the nurses to contact Ms A to arrange these blood tests. However, unfortunately there was a delay of over two weeks for this task to be actioned, and the bloods were not taken until 9 Month21. The blood results were normal, and this was shared with Ms A on 12 Month21. Dr E had no further involvement in Ms A's care.
153. My clinical advisor, Dr Maplesden, advised that it was reasonable for Dr E to assume on the basis of the available notes that DVT had been excluded as a cause, and Ms A's chronic leg swelling was not related to her current respiratory symptoms. However, Dr Maplesden considered it unclear why Dr E ordered a D-dimer test if VTE was not suspected as a cause of either Ms A's respiratory symptoms or leg swelling. Dr Maplesden also commented that Dr E's use of the PERC rule implied that he was considering PE as a diagnosis.
154. Dr Maplesden advised that Dr E was unable to use the PERC rule during a telephone consultation unless he was able to determine Ms A's oxygen concentration and pulse rate, which are not recorded in the clinical notes. In addition, Dr Maplesden noted that even without these measurements, the PERC rule could not be used by Dr E in the circumstances because Ms A already had three positive criteria,⁶⁴ and any positive criterion means the rule cannot be used to exclude PE as a diagnosis. Dr Maplesden considered that Dr E's reference to a 'low PERC score' suggests a lack of understanding of the PERC rule.
155. In addition, Dr Maplesden considered that once the elevated D-dimer result was received, the possibility of PE was raised, as PE could not be excluded on the basis of the PERC score, and the normal chest X-ray and BNP narrowed the potential cause of Ms A's respiratory symptoms. Dr Maplesden commented:

⁶³ Improper functioning of the vein valves in the leg, causing swelling and skin changes.

⁶⁴ Age ≥50 years, unilateral leg swelling, and previous DVT/PE.

'I acknowledge there are many potential causes of elevated D-dimer but once the elevated result was noted, I believe further assessment to determine the likelihood of PE as the cause was required given [Ms A's] history of previous unprovoked VTE and persistently elevated D-dimer, both of which placed her at increased risk of recurrent disease diagnosis.'

156. Dr Maplesden advised that appropriate management following receipt of the results would have been for Dr E to have arranged a face-to-face review to enable a more detailed assessment, including RGS⁶⁵ determination. On the basis that the negative USS from Month14 was a 'significant distracting factor', Dr Maplesden considers that Dr E's failure to undertake a face-to-face assessment was a mild departure from accepted practice.
157. I accept Dr Maplesden's advice. I consider that Dr E's use of the PERC rule during his telephone consultation with Ms A was clinically inappropriate, and he should have taken further action to investigate PE upon receipt of Ms A's elevated D-dimer result, in light of her clinical history and absence of alternative diagnosis.
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Opinion: Dr D — adverse comment

158. On 15 Month1 Dr D reviewed Ms A's symptoms, ordered a USS, blood tests and ECG, diagnosed DVT, and prescribed an anticoagulant medication. Dr D did not calculate Ms A's respiratory rate and did not document her WELLS score.
159. My clinical advisor, Dr Maplesden, advised that Dr D's management of Ms A's suspected DVT was consistent with accepted practice. Dr Maplesden also considered that Dr D appropriately raised the possibility of a PE in light of Ms A's history of SOBOE in association with possible DVT symptoms.
160. Dr Maplesden recommended that Dr D give consideration to recording respiratory rate in patients with respiratory symptoms (such as SOBOE) and using the Wells DVT score consistently in patients presenting with possible DVT. However, Dr Maplesden did not consider that this altered Dr D's overall management.
161. Dr Maplesden advised that once the DVT was confirmed, there was a potential issue with Dr D's management. Dr Maplesden said that many of his colleagues would have considered the possibility of a PE in light of Ms A's symptoms, and application of the recommended risk assessment tools (PERC score and RGS) would have likely resulted in a decision to admit Ms A to hospital for further assessment. Dr Maplesden noted that it is accepted practice, as per HealthPathways guidance, to refer patients acutely for a CTPA when PE is suspected.
162. Dr D told HDC that he felt that Ms A did not require hospitalisation because she was not in distress, had normal oxygenation, her chest examination was unremarkable, and her pulse

⁶⁵ Revised Geneva score — a tool used to determine the probability of PE.

had settled. He stated that Ms A could have received a CTPA in hospital that demonstrated a PE, but if so, she would have received the same medication for the same duration, and future application of the RGS would not have changed, as three points are given for either a previous DVT or PE.

163. Dr Maplesden agreed with Dr D that Ms A's medium-term management was unlikely to have changed had she been admitted to hospital. However, he advised that confirmation of PE does alter long-term management decisions, including monitoring for chronic thromboembolic pulmonary hypertension if the PE is significant, and having a high index of suspicion for recurrent PE if unexplained respiratory symptoms develop.
164. Taking into account a number of mitigating factors, including Ms A's stable vital signs, normal ECG and respiratory examination, non-acute onset of respiratory symptoms and the absence of other 'classic' symptoms of PE (eg, chest pain), Dr Maplesden was mildly to moderately critical that Dr D did not apply the recommended risk assessment tools in his management of Ms A's suspected PE.
165. I accept that a referral to hospital may not have resulted in a confirmation of PE. However, if PE had been confirmed, the clinicians involved in Ms A's subsequent care would have been on high alert when she presented with respiratory symptoms on multiple occasions between Month1 and Month22. I agree with Dr Maplesden that it was important for Dr D to apply the recommended risk assessment tools and take the action directed.

Opinion: Medical centre — adverse comment

166. Dr C and the medical centre have informed HDC of resourcing constraints at the practice that made working conditions more challenging at the time care was provided to Ms A.
167. The medical centre told HDC that currently it is struggling to provide GP coverage for its patient population. It is urgently and actively trying to increase staffing levels to make GP hours available at the level it considers is required (around 2.5 FTE), but GPs are currently available only for 1.5 FTE. The medical centre said that it was unable to undertake an internal review or investigation into the care provided to Ms A, and that this was 'symptomatic of the challenges facing small practices in that there are no independent clinicians available to conduct or lead such reviews'.
168. The medical centre stated:

'It is desire and intention of the management and ownership of the practice that the practice returns to a staffing level in which non-contact time allows for regular team meetings in which quality systems and patient case histories can be discussed and knowledge shared.'

169. Dr C also informed HDC of the pressure she experienced managing to maintain the medical centre in this context, and the additional demands arising from the COVID-19 pandemic. As I have noted previously, I appreciate the difficult circumstances within which Dr C was practising at the time and acknowledge Dr Maplesden's advice that high workload and communication barriers can increase the risk of cognitive errors, such as occurred in this case.
170. While I accept that the working environment may have had an impact on the standard of care Ms A received from clinicians at the medical centre, I consider that the deficiencies in care discussed in this report are the result of individual clinical decision-making and are not attributable to the medical centre at an organisational level.
171. However, I wish to address one concern in relation to the medical centre's practices and processes, for which the medical centre is responsible at an organisational level.

Delayed completion of nursing inbox request

172. The medical centre told HDC that Dr E sent a task to its nursing inbox on 21 Month20 to ask the nurses to contact Ms A to arrange further blood tests, following receipt of her elevated D-dimer result. However, this task was not completed until 9 Month21. The medical centre said that it was unable to ascertain why this delay occurred.
173. Dr Maplesden advised that he was moderately to severely critical of the almost three-week delay before the task was actioned, depending on the urgency with which the task was presented by Dr E (routine or urgent).
174. I accept this advice. It is concerning that there was a delay of almost three weeks in arranging further investigations for Ms A, and that the medical centre has been unable to establish what caused the delay.
175. I acknowledge that it eventuated that on 26 Month20 Ms A consulted with Dr C, who attempted to refer Ms A for an urgent test to investigate her ongoing shortness of breath. I also acknowledge that the bloods requested by Dr E were reported as normal, and Dr Maplesden has advised that the delay therefore had no particular bearing on Ms A's clinical course.
176. Nonetheless, in light of Ms A's recently elevated D-dimer result, I consider that it was crucial that any necessary further investigations requested by Dr E on 21 May were actioned by the medical centre in a timely manner. I have made a recommendation later in this report for the medical centre to review and address this issue.

Opinion: Te Whatu Ora — other comment

177. On 26 Month20, Dr C sent a referral for a chest CT to the community radiology service. The CT was requested within two weeks, and stated:
- ‘... DVT Oct 2019, elevated D di[m]er >2y — no cause found, but nor raised further, no hx travel or COVID risk ?? PE updated CR requested Thank you’
178. The community radiology service returned Dr C’s referral two hours later, noting that the request did not meet local access criteria, and advising Dr C to add additional detail, note that the request was a repeat, and re-submit if she considered the request should be reconsidered.
179. Dr C has accepted that she made an error in requesting a CT chest, as her intention (as recorded in the clinical notes) was to refer Ms A for an urgent CTPA.
180. Ms B queried in her complaint whether the community radiology service should have taken further action to advise Dr C of the appropriate next steps for management. The Coroner’s Medical Advisor raised similar concerns about the community radiology service’s decline message.
181. Te Whatu Ora provided HDC with comprehensive information regarding the community radiology service run by Te Whatu Ora, and locally agreed criteria for access to funded radiology in the region. It explained that the community radiology service is designed for less acute or non-urgent tests, while GPs can also access funded radiology through referral to specialist services, admission to hospital, or through Acute Demand Management Services (for acutely unwell patients). These criteria, along with the processes required to access tests, and the clinical pathways for management, are published on HealthPathways.
182. Te Whatu Ora explained that a ‘significant minority’ of requests are returned to the referring GP by the GP triager because the request does not fulfil the agreed criteria or clinical pathway, or the information is insufficient to make a determination. In this case, Te Whatu Ora explained that there were three reasons for declining Dr C’s request:
- a) Acute investigations are not provided by the community radiology service.
 - b) CT chest was the wrong test for Ms A. A CTPA was indicated based on the information available at the time, which raised the suspicion of a PE.
 - c) In the region, GP-requested imaging is not recommended for investigation of potential PE. HealthPathways advises acute specialist care instead. In addition, the locally agreed access criteria for CT chest specifies that a GP CT request is available only if the request includes hospital respiratory physician advice, a radiologist report advising CT chest, or an indeterminate pulmonary nodule found on chest X-ray.
183. Te Whatu Ora told HDC that it did not take further steps to establish whether a CT chest was the correct scan for Dr C to order, because neither CT chest without specialist recommendation nor CTPA are available by GP request.

184. Te Whatu Ora considered that it was clear to Dr C that her request had been declined, and the return advice appropriately directed her to the CT chest page on HealthPathways. Te Whatu Ora explained that the purpose of its return messages is not to provide clinical management advice, but to help the referring GP to find the required clinical information on HealthPathways to continue to manage their patient, establish what alternative clinical pathway is advised, and/or re-submit a request with different information if required.
185. I accept that the community radiology service's decline messages are not designed to provide clinical advice, and that referring GPs are responsible for the clinical management of their patients. I also note Dr Maplesden's advice that the community radiology service's management of the CT chest request was consistent with common and accepted practice and with established procedures at the DHB. Dr Maplesden advised that referring GPs should be aware of resources facilitating appropriate referral (in this case HealthPathways), and appropriate generic advice was provided in the decline message.
186. Nonetheless, as the community radiology service has designed its decline messages to direct referring GPs to HealthPathways guidance for management advice, I consider that it was open to the community radiology service to direct Dr C to the relevant guidance for the condition she was seeking to investigate. It is clear that the community radiology service established that Dr C was seeking to investigate PE; that a CT chest was the incorrect investigation for this investigation; that a CTPA was indicated; and that the CTPA needed to be arranged through acute specialist care. Te Whatu Ora cited these factors as part of the rationale for declining the request.
187. On this basis, I consider that there was an opportunity for the community radiology service to refer Dr C to the HealthPathways guidance for PE, which sets out the appropriate clinical pathway for managing this condition and for requesting investigations such as CTPA. The decline message was focused on the request not meeting the access criteria for CT chest but did not refer to the other reasons for declining the referral. While I reiterate that it is the referring GP's ultimate responsibility to direct their patients' clinical management, I consider it important for the community radiology service to provide the most relevant and helpful guidance to referring GPs, if it has made the decision to provide this guidance.
188. Te Whatu Ora has already identified this opportunity for improvement in its triaging process and has updated its decline messages to direct referring GPs to HealthPathways guidance on PE where PE has been mentioned in the request (see paragraph 195). I do not have any further concerns regarding the care provided by Te Whatu Ora.
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Changes made

Dr C

189. Dr C told HDC that while she approached caring for Ms A with the best intentions, there are aspects of the care that could have been improved, for which she will always be sorry. Dr C said that she took proactive steps to ensure that the same situation never occurs again, including:
- a) Carefully and fully reviewing Ms A's presentations over the history of her illness and considering where the standard of care could have been improved, with a specific focus on the interpretation of D-dimer results and the varied presentation of PE;
 - b) Instituting a review of all declines of referrals within her practice and how they are managed, with a view to ensuring that what happened in Ms A's case will not be repeated;
 - c) Making constant upgrading changes to her practice, focusing on thromboembolic event handling and diagnosis, and continuing to monitor for updates and changes to the management recommendations;
 - d) Constantly reviewing cases with a potential PE diagnosis and discussing any difficult and diagnostically unclear cases with her monthly GP peer group;
 - e) Ensuring that she closely follows up and reviews all procedure requests that are declined; and
 - f) Reviewing the reference on cognitive errors cited by my in-house clinical advisor, Dr Maplesden, using this information as an aid to identify when errors in clinical reasoning might occur, and how to reduce the risk of such errors occurring.
190. Dr C said that she now has a high index of suspicion for PE and a lower threshold for sending patients to ED if she has any concerns about PE as a potential diagnosis.

Dr E

191. Dr E told HDC that he would recommend discussing the clinical management of Ms A in the medical centre's next peer review meeting.

Medical centre

192. The medical centre told HDC that it is urgently and actively seeking to increase the number of GP hours available at the practice.
193. The medical centre also commented that 'it is desire and intention of the management and ownership of the practice that the practice returns to a staffing level in which non-contact time allows for regular team meetings in which quality systems and patient case histories can be discussed and knowledge shared'.
194. The medical centre said that regrettably, the current challenge of finding GPs means that 'none of the above can or will happen overnight'.

Te Whatu Ora

195. Te Whatu Ora identified one opportunity for improvement in the community radiology service's triaging process. For any future requests mentioning PE, or where the community radiology service GP triager considers that PE is a potential differential diagnosis, a change has been implemented so that the individualised decline message specifically directs the referrer to see the PE HealthPathway urgently. Te Whatu Ora said that this additional note will have the benefit of raising awareness of the alternative and more acute referral pathway for cases where a PE is suspected.
196. Te Whatu Ora stated that it will also add the PE HealthPathway as a link to the CT Chest HealthPathway.
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Recommendations

197. In response to the provisional recommendations, Dr C provided HDC with a written apology to Ms B for the breaches of the Code identified in this report. In light of the changes already made by Dr C (see paragraph 189), and the fact that she intends to retire in the near future, I have not made further recommendations with respect to Dr C's practice. However, should Dr C return to general practice, I recommend that she undertake further education/training on the diagnosis of PE. The education/training should be in conjunction with, or endorsed by, the Royal College of General Practitioners.
198. In response to my provisional recommendations, Dr E told HDC that he reviewed medical literature regarding the diagnosis and management of PE, and that he attended a webinar on this topic. I consider that these are appropriate steps to revise his knowledge regarding the clinical circumstances in which the PERC rule may be used to exclude PE as a diagnosis. I recommend that Dr E provide evidence of his attendance at this webinar, within three weeks of the date of this report.
199. I recommend that the medical centre:
- a) Review its policy and processes regarding nursing management of tasks and recalls, including documentation of task completion or attempts at patient contact. Evidence confirming that this review has taken place, and any changes made as a result of the review, is to be provided to HDC within four months of the date of this report.
 - b) Use this case as a basis for developing education/training on diagnosis of PE for staff. Evidence confirming the content of the education/training and delivery is to be provided to HDC within four months of the date of this report.
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Follow-up actions

200. A copy of this report with details identifying the parties removed, except the advisor on this case, will be sent to the Medical Council of New Zealand and they will be advised of Dr C's name.
201. A copy of this report with details identifying the parties removed, except the advisor on this case, will be placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: In-house clinical advice to Commissioner

The following advice was obtained from Dr David Maplesden, HDC's in-house clinical advisor, on 28 April 2021, with addenda provided on 29 June 2022 (in **bold**):

'CLINICAL ADVICE — MEDICAL + Addenda

DATE: 28 April 2021; **Addenda 29 June 2022 (bold); Addendum 18 April 2023 (s17)**

1. Thank you for the request that I provide clinical advice in relation to the complaint from [Ms B] (per Coroner) about the care provided to her late sister, [Ms A], by [Dr C] of [the medical centre]. In preparing the advice on this case to the best of my knowledge I have no personal or professional conflict of interest. I agree to follow the Commissioner's Guidelines for Independent Advisors. I have reviewed the following information:

- Coronial documentation including statements from [Dr C] and autopsy results
- Responses to HDC from [Dr C] and [Dr E]
- Clinical notes [the medical centre]
- Response and clinical notes [24 hour clinic]
- Response from [the DHB]
- **Addendum 29 June 2022: Responses to the preliminary advice have been received from the various providers and are incorporated below**

2. [Ms A] died at home on 18 Month22. Coronial autopsy established cause of death as acute and chronic pulmonary embolus (PE) secondary to lower limb deep vein thrombosis (DVT). [Ms A] had a history of DVT in Month1. She had attended her GP on several occasions since Month14 with symptoms of shortness of breath and leg swelling. Concern has been raised that a diagnosis of PE should have been considered over this period.

3. GP notes have been reviewed from 2003 onwards. There is reference to a history of elevated BMI (37.9 in 2020), malignant melanoma excised 1999 with no known recurrence, and renal calculus (2009). Blood pressure readings were variable with occasional elevation to 150–170/100 but normal at other times. There were no regular medications prescribed and [Ms A] was a non-smoker. Aortic regurgitation was noted on echocardiogram following referral in June 2014 for suspected systolic murmur. There is no reference to any respiratory symptoms prior to [Month1]. There is no reference to any family history of venous thromboembolus (VTE) or personal history of VTE prior to [Month1].

On the morning of 15 [Month1] [Ms A] presented to 24HS. Triage nurse notes include:

Painful L posterior knee and calf. Started out 3/52 ago in L foot and travelled up leg. Its red, warm and painful. Nil FLI [unsure of this abbreviation] symptoms. Pt reports had

recent trip [overseas] trip. Denies SOB, cough. No pain when walking, pain when sitting. Obs: t 36.3, pr 105, spo2 95–96% ra, wgt 90kg.

4. [Ms A] was then reviewed by [Dr D] who noted an unremarkable past medical history with comment *no recent travel* and:

[Female in sixties] with one month history of L leg swelling which has been getting worse. Over the last few days it is more warm, tender and swollen. She has also noted increased DOE [dyspnoea on exertion] for the last month as well, becoming SOB with stairs, and noted a little dyspneic walking to the treatment bays. No CP, palpitations, cough, fever, n/v.

O/E 36.3 105 95–6% 90 kg, alert, oriented, full sentences, no IWOB [increase work of breathing] at rest, CV normal PULM bilateral BS, no crackles, wheezes, rhonchi; ABD normal; LEGS L + swollen, warm, red, tender. ASSESSEMENT — likely DVT, ? PE.

5. [Dr D] referred [Ms A] for ECG (normal sinus rhythm, rate 81, no changes suggestive of PE), blood tests (normal troponin, D-dimer elevated at 2651 µg/L (reference range <500) and venous ultrasound. Ultrasound report dated 15 [Month1] concluded: *Below knee DVT present within the soleal veins. No evidence of above-knee DVT. Superficial thrombophlebitis.* [Ms A] was then administered Clexane 150mg SC with dose to be repeated daily for the next four days and commencement of dabigatran 150mg BD (120 caps supplied). She was referred back to her GP for administration of Clexane and follow-up of elevated blood pressure. Recordings taken prior to discharge were P 88, O₂ sats 96%, BP 167/100, T 37 and capillary glucose 7.0.

6. Comments:

(i) As a reference for recommended management of patients with suspected DVT or PE I have used the relevant [regional] Community HealthPathways guidance. A recent history of dyspnoea on exertion was noted coinciding with the development of left leg swelling. Initial assessment showed a mild tachycardia (P 105) with oxygen saturation 95–96%. Respiratory rate is not recorded but there was no obvious respiratory distress. Localised left calf swelling was noted. While calculation of Wells DVT score is advised in the DVT Pathway, I do not believe absence of this calculation altered overall management of [Ms A's] suspected DVT, with that management being consistent with accepted practice. This includes checking of D-dimer and proceeding with ultrasound when the D-dimer returned an elevated result. DVT was confirmed and the anticoagulation prescribed was consistent with accepted practice. Recommended duration of dabigatran therapy for a first unprovoked isolated distal DVT is three months in the current guidance. I recommend consideration is given to recording of respiratory rate in patients with respiratory symptoms (in this case a history of dyspnoea on exertion) and consistent use of the Wells DVT score¹ in patients presenting with possible DVT.

¹ <https://www.mdcalc.com/wells-criteria-dvt> Accessed 27 April 2021

(ii) The possibility of an underlying PE was appropriately raised by [Dr D] given the history of onset of dyspnoea with exertion in association with possible DVT symptoms.

The cited PE Health Pathway notes dyspnoea as a possible symptom of PE and *a PE is more likely if oxygen saturation below 95% or heart rate above 94*. ECG was performed as recommended and did not show any changes suggestive of PE.

I believe there was a potential issue in management once the DVT had been confirmed in that it raised the possibility [Ms A's] respiratory symptoms might be related to thromboembolic disease, with application of the PERC rule² (unable to exclude PE) and Revised Geneva Score³ (RGS) recommended in this situation.

On the basis of patient age, heart rate on discharge and unilateral leg symptoms and signs I calculate RGS of 11 in which case acute medical assessment is advised. With the benefit of hindsight, even had [Ms A] been admitted to hospital and PE confirmed on CTPA her initial management may not have altered (anticoagulant therapy for six months) although subsequent management (investigation for cause of unprovoked VTE, high index of suspicion for recurrent PE if unexplained respiratory symptoms develop) may well have altered⁴.

In summary, I believe many of my colleagues would have considered the possibility of PE in a patient with new respiratory symptoms (dyspnoea on exertion) coinciding with the onset of calf symptoms in a patient with confirmed (but untreated to date) DVT, and that application of the recommended risk assessment tools is likely to have resulted in a decision to admit [Ms A] to hospital for further assessment.

Noting the mitigating factors of stable vital signs, normal ECG, normal respiratory examination, non-acute onset of respiratory symptoms and absence of other 'classic' symptoms of PE such as chest pain and haemoptysis (estimated to occur in 66% and 13% respectively of patients with PE while dyspnoea on exertion or at rest occurs in 73%⁵) I am mildly to moderately critical that the recommended risk assessment tools were not applied although I cannot state with any certainty that hospital admission at this point would have resulted in a PE diagnosis or a change in management as discussed.

(iii) In a response to this advice dated 22 February 2022 [Dr D] recounts [Ms A's] presentation which is consistent with the description noted above. He notes:

[Ms A] had normal oxygenation and her pulse had settled. Her chest examination was unremarkable. She was in no distress, did not have an oxygen demand and further

² <https://www.mdcalc.com/perc-rule-pulmonary-embolism> Accessed 27 April 2021

³ <https://www.mdcalc.com/geneva-score-revised-pulmonary-embolism> Accessed 27 April 2021

⁴ Current Australia and NZ guidance recommends that patients with a proximal DVT or PE that is unprovoked or associated with a transient (non-surgical) risk factor require OACs for 3–6 months — see reference 7.

⁵ Thompson B, Kabrhel C, Pena C. Clinical presentation, evaluation, and diagnosis of the non-pregnant adult with suspected acute pulmonary embolism. Uptodate. Literature review current through March 2021. www.uptodate.com Accessed 27 April 2021.

evaluation would not change management, and therefore I felt she did not required hospitalisation. Hospitalisation would not have changed clinic management, although she might have received a CTA which demonstrated a PE, in which case she would have received the same medication for the same duration and future application of the Geneva Scale would not have changed (3 points is given for previous DVT or pulmonary embolism). [Dr D] has noted the benefit of using of clinical risk calculators.

I agree with [Dr D's] statement regarding hospitalisation being unlikely to change [Ms A's] medium-term management as discussed above. However, I remain of the view that it is accepted practice to refer the patient acutely for CTPA when PE is suspected (as per the cited HealthPathways guidance), and confirmation of a PE does alter longer term management decisions including monitoring for chronic thromboembolic pulmonary hypertension if the PE was significant, and having a low threshold for considering recurrent chronic or acute PE when a patient has otherwise unexplained respiratory symptoms. Therefore, I am not inclined to alter the advice provided in section 6 above.

7. On 18 [Month1] [Ms A] was reviewed by [Dr C]. Notes include:

DVT diagnosed 16-10-2018, told bp elevated

BP 128/74 On Clexane final tonight and switch to dabigatran tomorrow

also noted to be soboe last 1/12

SpO2 97% on air

pulse 103

reg full vol

chest clear, HS dual nil added no ankle swelling

JVP nil

T 37.2

?? CHF

check CX

8. Blood tests and urgent chest X-ray were arranged (I could not find results of these investigations on file). According to [Dr C's] response, the chest X-ray 19 [Month1] was evidently reported as normal and BNP blood test was recorded as normal (effectively excludes heart failure as a cause of respiratory symptoms).

I note the chest X-ray request form included clinical details of: *This lady was seen at 24h with dvt and placed on acute demand 16-10-2018. Hx for few months soboe, has had clexane and now transferring to dabigatran ??CHF ?other chest lesion. Could you arrange a CXR please low risk but ??PE.* The results were conveyed to [Ms A] on 23

[Month1] with nurse notes recording: *Still has SOB ... [Ms A] not keen to come back in for review, asking for advice.*

[Dr C] then contacted [Ms A] noting: *says thinks some improvement, close monitor, ??CT lungs.* In her response, [Dr C] notes her impression [Ms A's] respiratory symptoms preceded the development of her leg symptoms, and that had PE been considered a likely diagnosis this would have been excluded at the 24HS consultation on 16 [Month1]. [Dr C's] goal was to exclude other causes for [Ms A's] respiratory symptoms. Although the CXR request form implies PE was still a consideration.

9. Comment: [Ms A's] assessment on 18 [Month1] was adequate and I note a mild tachycardia was recorded but cardiorespiratory examination was otherwise unremarkable.

If [Dr C] was confident that the onset of [Ms A's] respiratory symptoms well preceded the onset of any DVT symptoms (in contrast to the history recorded by [Dr D] on 16 [Month1], but noting apparent denial of respiratory symptoms at triage the same day) I think it was reasonable to consider diagnoses other than PE as a cause of the symptoms, and appropriate investigations were arranged in this regard. A further mitigating factor is that [Ms A] was receiving appropriate treatment for VTE disease at this point. However, if [Ms A's] respiratory symptoms persisted without an identifiable cause, I believe further consideration of underlying PE was required. If it was established the onset of the respiratory symptoms coincided with or followed the onset of leg symptoms, I would be mildly to moderately critical that the diagnosis of PE was not considered further as discussed in section 6.

10. [Dr C] next reviewed [Ms A] on 13 [Month3] and there is no reference to complaint of ongoing respiratory symptoms. A further supply of dabigatran was provided to enable a six month total course which [Dr C] states was consistent with guidance at this time. Current NZ guidance for a distal DVT (as [Ms A] had) that has been unprovoked or with persisting risk factors is a three month course of a direct oral anticoagulant (OAC) such as dabigatran or rivaroxaban, or three to six months of an OAC for patients with a proximal DVT or PE that is unprovoked or associated with a transient (non-surgical) risk factor⁶. On 29 [Month4] [Dr C] again reviewed [Ms A] to discuss ongoing anticoagulant therapy and risk of recurrent VTE. There is no reference to complaint of ongoing lower respiratory or leg symptoms at this time or at the next consultation on 25 [Month10] when [Ms A] presented for a routine cervical smear, Anticoagulation was stopped in [Month7] after six months. I believe [Ms A's] management over this period was consistent with accepted practice assuming her respiratory symptoms had resolved.

11. On 26 [Month14] [Ms A] presented to [Dr C] with acute left leg pain and heaviness while walking. Previous DVT history was noted. Notes include:

⁶ Tran H et al. New guidelines from the Thrombosis and Haemostasis Society of Australia and New Zealand for the diagnosis and management of venous thromboembolism. 2019.
<https://www.thanz.org.au/documents/item/414> Accessed 27 April 2021

recent road trip in car 3h each way 3/52 ago

both lower legs upper tibia 41cm diam

BP 132/84

no dyspnoea

chest clear

HS dual nil added

pedal pulses all nad

WELLS score 3

refer D dimer and ? uss

D dimer ? DVT

12. D-dimer was elevated at 1140 µg/L and ultrasound of the left leg was performed and reported as *no left femoropopliteal or calf DVT*. [Dr C] evidently reassured [Ms A] and noted *see prn if not settling*. She states in her response that [Ms A] did not present any respiratory symptoms when questioned about this and therefore diagnosis of PE was felt to be unlikely. On 28 [Month14] [Ms A] spoke with the practice nurse: *wants to know if [Dr C] would like to do further investigations as pain has recurred 3x in same leg since having blood clot*. Advice from [Dr C] was recorded as: *All investigations have been done, just needs to re-present if pain happens again*.

13. Comment: [Dr C's] assessment of [Ms A] was adequate although lower limb assessment might have been more thoroughly documented (was there localised tenderness, pitting oedema etc). Wells score was evidently calculated as 3 (high risk of DVT) although I am unable to establish the basis for this score based on the recorded assessment findings. The previously cited Health Pathways guidance recommends a follow-up DVT ultrasound in 5 to 8 days if high pre-test probability score (2 or higher), D-dimer is positive (500 µg/L or greater), and the symptoms persist and an alternative diagnosis is not apparent. The basis for this advice relates to limitations of the DVT ultrasound recorded as: *Cannot reliably exclude a below knee DVT, although it may sometimes detect them; A follow-up scan is often needed when the initial test is negative as about 2% develop a positive test when rescanned 7 days later. A previously undetected below knee thrombus may extend into the thigh making embolisation more likely*. It appears the cause of the elevated D-dimer and calf pain was unexplained although there are multiple possible causes other than VTE for both findings. [Ms A] had been given advice to return if her leg symptoms persisted and I would expect repeat ultrasound to have been ordered per Pathways guidance if she had re-presented in the next week or so with persistent symptoms. However, it does not appear there was such a re-presentation.

14. [Ms A's] next presentation was 21 [Month17] ([Dr C]) with symptoms of ear discharge (diagnosed as otitis externa) and a bleeding nose. Blood pressure was normal. There is no reference to complaint of leg pain/swelling or respiratory symptoms.

Management of the symptoms presented was appropriate. On 16 [Month19] [Ms A] was administered a flu vaccination. I note subsequent consultations occurred during the period of Covid restrictions.

15. On 15 [Month20] (Covid alert level 2 from 14 [Month20]) [Ms A] had a telephone consultation with [Dr E]. Notes include:

Has had 2–3 episodes of SOBE

No chest pain. No orthopnoea.

Not coughing, no fever

Usually leg swelling but has venous insuff

Previously, has had suspected DVT with elevated D-dimer but -ve DV US

No international travel within the past 14 days, or been in contact with anyone who is a suspect/probable or confirmed case of COVID 19 infection

Following lockdown rules. No household sympt member

Recommended CXR, Bloods including BNP

With results will consider Spirometry

16. Blood test results 21 [Month20] showed normal BNP and CBC, mildly elevated CRP (16 mg/L) and elevated D-dimer (4499 µg/L). Chest X-ray was reported as showing normal lung fields and heart size with osteoporotic spine. On 21 [Month20] Dr E recorded review of the blood results as: *Hx of persistently elevated D-dimer Last at 4499 ?Cause. Possibilities include recent surgery, trauma, infection, heart attack, and some cancers or conditions in which fibrin is not cleared normally, such as liver disease. Normal LFT.* Further blood tests were ordered: iron parameters, coagulation studies, PTT, PT, fibrinogen — unremarkable results. On 26 [Month20] [Ms A] spoke with a practice nurse regarding her chest X-ray result and noted she was still having shortness of breath. Arrangements were made for a telephone consultation with [Dr C]. In his response, [Dr E] states his impression that [Ms A's] leg swelling was chronic (two years) and recurrent DVT had been excluded previously with ultrasound. Leg swelling was not presented as a new symptom. He states: *Due to a low PERC score, pulmonary thromboembolism was not suspected — nevertheless blood tests including D-dimer, and a chest X-ray were requested ... The D-dimer was 4499, but due to previously elevated results without current signs of DVT or pulmonary thromboembolism, non thromboembolic possibilities were considered ...*

17. Comment: [Ms A] had recurrence of dyspnoea symptom without chest pain or signs of infection. Chronic leg swelling was noted and I think it was reasonable for [Dr E] to assume, on the basis of the available notes, that DVT had been excluded as a cause and this symptom was not related to her current respiratory symptom. However, it is unclear why D-dimer was ordered if VTE was not suspected as a cause of either symptom and once the elevated result was received, the possibility of PE was raised (PE could not be excluded on the basis of the PERC score). The normal chest X-ray and BNP

score narrowed the potential cause of [Ms A's] dyspnoea symptom and I believe appropriate management following receipt of the results would be to have arranged a face to face review ([...] Covid restrictions at this stage) to enable more detailed assessment including RGS determination. I acknowledge there are many potential causes of elevated D-dimer but once the elevated result was noted, I believe further assessment to determine likelihood of PE as the cause was required given [Ms A's] history of previous unprovoked VTE and persistently elevated D-dimer, both of which placed her at increased risk of recurrent disease diagnosis. The negative leg ultrasound result from [Month14] was a significant distracting factor and, under the circumstances, I believe [Dr E's] failure to proactively recommend or undertake a face to face assessment of [Ms A] once all results were received, results which did not explain her current symptoms, was a mild departure from accepted practice.

Addendum 29 June 2022: [Dr E] and [Dr C] have discussed [Ms A's] case and the advice provided in this report at a peer review meeting. [Dr E] acknowledges the importance of proactive approach when PE is a diagnostic possibility. A response from the practice manager notes ongoing difficulties the practice has with adequate staffing of the centre and how this can impact on the availability of clinician non-contact time to work on quality improvement within the practice. The practice has been actively attempting to increase clinical staffing levels for some time and will continue to do so.

Addendum 18 April 2023: It was noted that the further blood tests ordered by [Dr E] on 21 [Month20] were not performed until 9 [Month21] and while this had no particular bearing on [Ms A's] clinical course (results were normal) the practice was asked to explore the reason for the delay. In a response from the practice dated 12 April 2023 it is noted [Dr E] is no longer at the practice and is unable to comment. There was no documented direct contact between [Dr E] and [Ms A] regarding the test request but *a task was sent to a nursing inbox to request the nurses to contact [Ms A]*. I have assumed this refers to a task from [Dr E] on 21 [Month20] but the content of the task has not been provided. Nursing staff eventually contacted [Ms A] on 9 [Month21], a copy of the lab request form was faxed to a local laboratory and [Ms A] attended for the test. If the task was presented as urgent, I would be moderately to severely critical of the apparent almost three week delay before the task was actioned. If the task was presented as routine, I would be moderately critical of the delay. There may be mitigating factors not presented in the provider response and I note from [Dr C's] response dated 13 September 2022 there were significant staffing and cultural issues within the practice at this time following a change in structure. Given the time that has elapsed since this event it may not be possible for the practice to accurately ascertain the factors leading to the delay and, as noted, I do not believe the delay contributed to [Ms A's] tragic outcome. Nevertheless, it would be appropriate for the practice to review their policy and process regarding nursing management of tasks and recalls (including documentation of task completion or attempts at patient contact) to minimise the risk of such a delay occurring in the future.

18. [Dr C] undertook a telephone consultation with [Ms A] on 26 [Month20] Notes include:

called to discuss dyspnoea with exercise any

scared to go walking as SOB and sweaty weak

no cough no chest pains, no nocturnal dyspnoea but feels cannot get air into lungs

PHx DVT 2018

needs urgent CTPA

Reviewed medical warnings, classifications, and current medications.

Next step to be undertaken by GP: Correspondence (e.g Referral) Today Urgent

Advice given to patient:

If condition gets worse, go to ED

refer ctpa urgent

[Dr C] states in her response she was *concerned this [Ms A's presenting symptoms] may have indicated a potential pulmonary embolus due to her associated symptoms ... I considered she need an urgent CTPA (to investigate the possibility of pulmonary embolus). I advised her that in the meantime she should present to ED if her symptoms were getting worse.*

19. Comment: [Ms A] reported worsening dyspnoea now with any exercise and associated with sweating and weakness when she tried to exercise. Noting [Ms A's] past history of VTE and the recent blood test findings of elevated D-dimer the history was certainly consistent with PE although an alternative cause such as cardiac ischaemia could not be discounted. On the basis of the history obtained I believe accepted practice would be to expedite an urgent face to face assessment despite Covid precautions, and this was most appropriately done by direct referral to ED via ambulance after discussion with the general medical registrar as per the previously cited Pathways guidance. I believe a majority of my colleagues would consider this to be accepted management in the clinical scenario described and it was inappropriate to attempt to try and organise a CTPA in the community. I believe [Dr C's] management of [Ms A] on 26 [Month20] represents a moderate departure from accepted practice.

20. [Dr C] sent an urgent e-referral to [the community radiology service] requesting *CT chest* rather than CTPA. Requested time frame was noted as 2 weeks (unclear if this was selected by [Dr C] or is an automatic addition) with clinical details of: *3/52 hx of dyspnoea of effort getting worse normal CXR. DVT [Month13] elevated D-dimer >2y — no cause found but not raised further [I note this is incorrect], no hx travel or COVID risk ??PE Updated CR requested.* The request was returned to [Dr C] later the same day noting: *Local agreement is that CT thorax requests must be accompanied by a recommendation from a hospital respiratory physician due to high radiation exposure and detection of many nodules of uncertain significance. Refer patients with pulmonary*

nodules to Respiratory Department nodule clinic for follow-up. Search 'CT Chest' on HealthPathways ... If you believe your request should be reconsidered then add additional detail, note the request is a repeat, and resubmit. Please communicate this outcome to your patient ... If you would like to query or discuss this decision further please contact us via the referral coordination service, contact details provided below.

...

21. [The DHB's] response explains the role of [the community radiology service], in particular that an acute service is not provided. GPs should be aware of the referral process for patients requiring acute imaging, and there are clinical pathways (as cited in this report) to facilitate appropriate referrals. The CT chest referral in question was declined because it did not meet the referral criteria for CT chest imaging, it was an inappropriate investigation for suspected PE and acute imaging was required. The decline letter sent is not providing clinical management advice as it is expected GPs will be aware of the relevant clinical management pathway for the condition in question or will seek further advice (per the decline letter) if the decline decision is queried. The decline note was sent to [Dr C] within two hours of the referral being received and it was expected [Dr C] would review [Ms A's] management using the appropriate clinical pathway and refer as per pathway advice if PE was suspected. Since the events in question, any decline note sent in response to a request for investigation of possible PE will include a direct link to the PE Health Pathway with advice for the provider to access this pathway.

22. Comment: I believe the management of the chest CT request by [the DHB] was consistent with common and accepted practice and with established procedures at [the DHB.]. The referrer should be aware of resources facilitating appropriate referral (in this case the relevant Health Pathways) and to follow these pathways. Appropriate generic advice was provided in the decline letter and the letter was provided promptly. The referral to [the community radiology service] by [Dr C] was clinically inappropriate in terms of the procedure requested (CT chest) and the mode of referral (if [Dr C] felt CTPA was required because of suspected PE, the appropriate action would have been referral directly to ED for urgent assessment and imaging). I believe it was a reasonable expectation that on receipt of the decline letter [Dr C] would review her management decisions and the relevant Health Pathway and refer [Ms A] urgently to ED as per the Pathway recommendations.

23. On reviewing the decline letter [Dr C] states: *My recollection is that I interpreted the declination as an indication that the investigation was not needed according to the information I had provided. This was clearly not the correct interpretation and with hindsight I realise I needed to have pushed for her to have a CTPA or to be seen in ED.* [Dr C's] actions following receipt of the decline letter are not entirely clear from the clinical notes — a laboratory form was generated on 26 [Month20] and blood tests performed on 29 [Month20] (renal function only — normal). [Dr C] states: *I arranged further bloods to look for other causes of her symptoms, but not a further D-dimer as I knew this was elevated.* There is a nurse note dated 28 [Month20] stating chest X-ray result was discussed with [Ms A] and she was informed further blood tests were

required. There is no reference to her ongoing symptoms or general wellbeing at this time.

24. Comment: I am at least moderately critical of [Dr C's] actions on her receipt of the CT chest decline letter. I do not believe the decline letter suggested CTPA for investigation of possible PE was not necessary, and I believe it is common and expected primary care knowledge that suspected PE requires urgent specialist review and investigation and this should have been arranged by [Dr C] ideally when she first considered the diagnosis of PE but certainly when the decline letter was received. [Dr C] had ready access to the relevant Clinical Pathway if there was any doubt regarding appropriate management of suspected PE.

25. On 9 [Month21] a practice nurse contacted [Ms A] to arrange repeat blood tests (iron studies, CBC, clotting screen per [Dr E]). The reason for the repeat tests is not clear from the notes and is not referred to in the response from [Dr E], but results were reviewed by [Dr E] and were unremarkable. On 12 [Month21] [Ms A] was notified of the results by a practice nurse. There is no reference to discussion of her current wellbeing. On 30 [Month21] nurse notes state: *Call to pt — appt made for review in 3/7 as per [Dr C] request.* It is unclear what led to this phone call or what was discussed during the call and it may be helpful to gain more detail around both the reason for bloods requested by [Dr E] and details of the call on 30 [Month22].

26. [Ms A] attended for review with [Dr C] on 3 [Month22]. GP notes include:

*sudden onset soboe 2 episodes since late [Month18]
3 epistaxis in [Month18]
no nocturnal dyspnoea , no chest pains
duration of episodes 2h then afterwards for few days still soboe
last episode 5/52 ago
now fearful will recur
OE JVP nil, HS dual nil added chest clear
ankle swelling summer and winter but normal mane
occasional cough but no wheeze
PF 330
chase bone density ? 2012 CH
check bloods BNP
spirometry ?? interstitial lung disease*

27. [Dr C] elaborates in her response: *I arranged for blood tests to be performed to check for congestive heart failure. I did not consider a pulmonary embolus from her history. I am unsure if the earlier refusal by the DHB had any influence on this decision.* Blood

tests performed on 3 [Month22] (iron studies, CBC, BNP) were normal. Spirometry was arranged and undertaken on 15 [Month22]. Nurse notes state: *Spirometry done pre and post ventolin inhaler via spacer. Was audibly wheezy on arrival and this disappeared after using inhaler. [Ms A] also felt much better. Spirometry printed for [Dr C] to review.* Spirometry results have been reviewed and are within the normal range with no clear evidence of reversibility — essentially non-diagnostic. [Dr C] states in her response: *This response to the bronchodilator [as per nurse notes] suggested the possibility of asthma as a cause for her symptoms. The results of the spirometry testing were inconclusive.* There is no subsequent documentation by [Dr C] discussing the differential diagnosis or management plan for [Ms A's] symptoms.

28. Comment: With the benefit of hindsight it is apparent [Ms A's] symptoms were likely related to episodes of pulmonary emboli with episodic acute dyspnoea lasting a couple of hours followed by several days of shortness of breath on exertion. There is no reference to acute lower leg symptoms suggestive of DVT, but there was evidently chronic leg swelling. D-dimer had been significantly elevated in [Month13] (negative lower limb venous ultrasound at this time) and even more elevated in [Month20]. [Dr C] had quite reasonably suspected PE as a diagnosis in [Month20] and arranged further investigation (CTPA) but this was never performed as discussed above. I believe PE was a logical unifying diagnosis for the history presented by [Ms A], particularly when investigation results (positive and negative) were taken into account (no evidence of heart failure, unremarkable spirometry results, no obvious lung pathology on plain X ray, persistently elevated D-dimer). I find it difficult to understand why [Dr C] apparently abandoned the diagnosis of possible PE when this diagnosis had not been excluded. I acknowledge PE can be a difficult diagnosis because of the varying clinical presentations (including subacute and chronic presentations as in this case) and for this reason a high index of suspicion is required to ensure the diagnosis is not missed. I am aware also of the risk of hindsight bias in a case such as this when the outcome is known. However, I am moderately critical that [Dr C] did not take appropriate steps to exclude PE as a diagnosis in [Month22] and [Ms A] was left without a clear diagnosis/differential diagnosis or management plan following her spirometry on 15 [Month22].

29. On the morning of 18 [Month22] [Ms A] contacted family members as she had become acutely short of breath. A family member went to her home and found [Ms A] collapsed and unresponsive. An ambulance was called and CPR commenced and continued by paramedics on their arrival but sadly [Ms A] could not be revived. Post-mortem examination showed evidence of recent (acute — days) and chronic (weeks to months) pulmonary emboli and left deep vein thrombosis with cause of death attributed to PE secondary to DVT.

30. [Dr C] notes in her response: *I have carefully and fully reviewed [Ms A's] presentations over the history of her illness and considered where the standard of care could have been improved. I have specifically focused on the interpretation of D-dimer results and the varied presentation of pulmonary emboli. I have also instituted a review of all declines of referrals within my practice and how they are managed.* I believe these are appropriate remedial actions. Diagnostic errors are common in medicine and

primary care is no exception. Misdiagnosis of pulmonary embolus features prominently in research performed in this area⁷ and these factors should be considered in the overall assessment of this case.

31. Addendum 29 March 2022: In a response to this advice dated 22 March 2022, [Dr C] includes the following points:

- On 26 [Month20] [Ms A] reported a three week history of SOBOE associated with being sweaty and weak, but no associated chest pain or cough. She did not appear dyspnoeic during the phone consultation. *Due to [Ms A's] described symptoms and the fact her D-dimer was 4499 just a few days earlier, I was concerned about the possibility of a potential pulmonary embolus. My clinical notes reflect that I considered she needed an urgent CTPA and advised that in the meantime, she should present to the emergency department if her symptoms got any worse. I considered this was necessary safety netting advice, that was well understood by [Ms A].*
- The intended imaging request was for CTPA with clinical details noting queried diagnosis of PE but CT chest was requested in error. [Dr C] notes: *... sadly, my diagnostic path was jolted off course by my incorrect interpretation of radiology's response. With hindsight I realise I needed to have pushed for [Ms A] to have a CTPA or to be seen in ED.*
- There is no new information provided regarding the consultation of 3 [Month22]. The spirometry result from 15 [Month22] was left for [Dr C] to review on her next working day (17 [Month22]). Had it shown any significant abnormality, the result would have been reviewed by another doctor the same day. The nurse undertaking spirometry provided a handwritten note indicating there was marked subjective improvement in [Ms A's] wheeze following administration of Ventolin. [Dr C] states a follow-up appointment was scheduled with [Ms A] following her review of [Ms A's] spirometry report on 17 [Month22] but sadly [Ms A] passed away before the follow-up took place.

There is no new information presented that changes my original advice. However, I appreciate [Dr C] has closely reflected on her practice and has made appropriate changes including seeking peer support and relevant education. Some mitigating factors associated with this case have been discussed and these include the acknowledged difficulties associated with diagnosis of PE which means it features prominently in the medical literature as a source of diagnostic error, often with severe outcome. In fact [Dr C] did consider PE as a diagnosis and attempted to confirm or exclude the diagnosis by way of CTPA but it appears a common cognitive error associated with missed or delayed diagnosis, that of "confirmation bias"⁸, may have featured when it appears she abandoned this diagnostic possibility after having the

⁷ Singh H, Schiff GD, Graber ML, et al. The global burden of diagnostic errors in primary care. *BMJ Quality & Safety* 2017;26:484-494.

⁸ <https://first10em.com/cognitive-errors/> Accessed 29 June 2022

request for chest imaging declined (the decline being perceived as an indication the imaging was not required and that PE was an unlikely diagnosis). Subsequent factors distracting [Dr C] from reconsidering this diagnosis included [Ms A's] apparent improvement in symptoms at the time of review on 3 [Month22], and the apparent (at least subjective) response to bronchodilators at the time of spirometry on 15 [Month22]. Factors that increase the risk of cognitive errors include high workload and communication barriers and I cannot exclude the possibility issues associated with the Covid pandemic were relevant in this regard. [Dr C's] clinical documentation and assessment illustrated by the clinical notes reviewed was of a good standard and the diagnostic issues noted in this advice appear to be isolated and atypical rather than representing a pattern of substandard practice. Nevertheless, there may be some benefit in [Dr C] reviewing the cited reference on cognitive errors or a similar resource as an aid to identifying when errors in clinical reasoning might occur and how best to reduce the risk of such errors occurring.'

Further advice was provided by Dr Maplesden on 18 April 2023:

'Thank you for requesting further advice on this file.

1. Consultation — 26 [Month14]

At paragraph [13] of your advice, you stated in relation to [Dr C's] assessment of [Ms A] on 26 [Month14]: "[Ms A] had been given advice to return if her leg symptoms persisted and I would expect repeat ultrasound to have been ordered per Pathways guidance if she had re-presented in the next week or so with persistent symptoms. However, it does not appear there was such a re-presentation." The clinical notes ... record that [Ms A] called [the medical centre] on 28 [Month14] to query whether [Dr C] wanted to undertake further investigations, due to recurring pain in the same leg. The advice returned to [Ms A] from [Dr C] was: "All investigations have been done, just needs to re-present if pain happens again."

Please clarify whether you consider [Ms A's] call of 28 [Month14] to constitute a re-presentation with persistent symptoms?

While it is not entirely clear from the notes, my interpretation of the message recorded by the nurse is that since the confirmed DVT in [Month1] [Ms A] had had three self-limiting episodes of left leg pain, the most recent of those being that which she presented to [Dr C] on 26 [Month14]. It appears she had not presented with the previous two episodes but she wanted [Dr C] to be aware the pain was recurrent. I have not interpreted the phone call as indicating the pain had recurred since the assessment of 26 [Month14].

2. Consultation — 15 [Month20]

Regarding his telephone consultation with [Ms A] on 15 [Month20], [Dr E] told HDC that he did not suspect PE due to [Ms A's] low PERC score ... The PERC score was not documented in the clinical notes.

At paragraph [17] of your advice, you found a mild departure with [Dr E's] management and stated: "[Ms A] had recurrence of dyspnoea symptom without chest pain or signs of infection. Chronic leg swelling was noted and I think it was reasonable for [Dr E] to assume, on the basis of the available notes, that DVT had been excluded as a cause and this symptom was not related to her current respiratory symptom. However, it is unclear why D-dimer was ordered if VTE was not suspected as a cause of either symptom and once the elevated result was received, the possibility of PE was raised (PE could not be excluded on the basis of the PERC score)."

Please assist with the following queries regarding use of the PERC score:

a) The PERC score (<https://www.mdcalc.com/calc/347/perc-rule-pulmonary-embolism>) cannot be used to rule out PE if any criteria are positive. The PERC score includes 1 criteria for age > 50, and 1 criteria for a prior PE or DVT. On the basis that [Ms A] was aged 68 at this time, and had a previous history of DVT from [Month1], please advise whether you consider it was reasonable in the circumstances for [Dr E] to utilise the PERC score to rule out PE on 15 [Month20]?

The PERC rule is used if PE is being considered in the differential diagnosis (implying [Dr E] was considering this diagnosis if he used the PERC score). In fact [Dr E] was unable to use the PERC rule during a telephone consultation unless he was able to determine [Ms A's] oxygen concentration and pulse rate (neither of which are recorded in the notes). Even without these measurements, the PERC rule in this case could not be used to exclude PE because, as you note, [Ms A] already had three positive criteria (age ≥50, unilateral leg swelling, previous DVT/PE). [Dr E's] reference to a "low PERC score" suggests a lack of understanding of the rule (unless he meant to refer to Wells score) as any positive criterion means the tool cannot be used to exclude PE as a diagnosis.

b) The PERC score includes criteria for HR and oxygen saturation. Please advise whether you consider it was reasonable in the circumstances for [Dr E] to utilise the PERC score to rule out PE over the telephone without assessing these criteria?

See above. I believe [Dr E] has misinterpreted the purpose of the PERC rule and he should revise his knowledge in this regard. It was not appropriate to use the rule in a telephone consultation unless there was the ability to accurately record pulse rate and oxygen saturation (assuming other criteria were negative).'

Appendix B: Management of DVT Policy

'Purpose: Safe Management of Deep Vein Thrombosis (DVT)

This policy uses Healthpathways Guidelines for the management of patients with DVT

About deep vein thrombosis

In a patient with suspected DVT, the diagnosis can usually be ruled out using any two of the following three criteria:

- a low-risk Canadian (Wells) score for DVT
- negative D-dimer
- negative ultrasound.

Acute Demand Services are utilised for the initial management and diagnosis of DVT.

Referrals are generated as per the guidelines. Clinical signs and symptoms of DVT examination findings often include unilateral pain, swelling, tenderness and redness.

Risk factors are explored and the likelihood of a DVT is then calculated using the Wells Score.

Investigations include D-dimer taken in clinic (alongside CBG, INR, APTT, CRN, LFT's and electrolytes) and DVT ultrasound arranged in collaboration with the Acute Demand Service at [the 24-hour clinic].

Once a DVT has been diagnosed clinical management is based on a balance of risks and benefits. The benefits of preventing clot extension, and complications which may include pulmonary embolism and death.

The risks of bleeding and complications of haemorrhage and death

Management is influenced by underlying risk factors and clinical co-morbidities. This management may be difficult to assess and general medical, vascular or haematological advice may also be required for complex patients.

Anti-coagulants are the mainstay treatment provided the benefits outweigh the risks.

Follow up DVT ultrasound may be considered 5–8 days after negative ultra sound if symptoms persist.'