

Care provided to man who died of pulmonary embolism

1. On 19 July 2021, the Health and Disability Commissioner (HDC) received a complaint from Ms A about the care provided to her partner, Mr B, at Middlemore Hospital (Health New Zealand | Te Whatu Ora Counties Manukau). Mr B experienced a pulmonary embolism (PE)¹ at 40 years of age as a result of a deep vein thrombosis (DVT) following knee surgery. Sadly, Mr B died in December 2018 at Middlemore Hospital, having presented twice previously on 14 and 15 December with increasing leg pain and purpling of his right² leg.

Information gathered

2. On 30 November 2018, Mr B underwent knee surgery at a private hospital to repair a torn meniscus.³ Mr B was discharged on 1 December. Following the surgery, Mr B developed pain and tenderness in his right calf when standing. On 13 December, Mr B was referred for an ultrasound, which identified an extensive DVT. A DVT is a blood clot that forms in a deep vein, most commonly in the legs. On 14 December, Mr B was referred to Middlemore Hospital and prescribed the blood-thinning medications clexane⁴ and dabigatran.⁵ Mr B was discharged that evening.
3. On 15 December, Mr B re-presented to Middlemore Hospital Emergency Department (ED) because of ongoing pain and discolouration of his right calf. He underwent an initial assessment in the ED at 12.20pm under the care of a senior emergency medicine specialist. The ED specialist documented Mr B's history of knee surgery, the diagnosis of DVT, and his previous visit to hospital. She documented: '[Mr B] notices that he is becoming more immobile – pain in the leg is such that he is not weight bearing and then in [the] shower today he noticed that his entire leg was purple ... Nil [shortness of breath]/nil chest pain ... admit [to general medicine] for elevation of leg and anaesthesia'.
4. Mr B was transferred to general medicine and reviewed by a general medicine house officer. The house officer was a junior doctor working under the broader supervision of a senior medical officer (SMO) and under the direct supervision of a registrar. The house officer conducted a physical examination and documented that Mr B's observations were stable, that his leg was tender along the posterior length of the calf, and that he was 'unable to [fully weight bear] due to calf pain and throbbing when leg not elevated ... [w]hen standing develops mild purplish hue from mid-thigh down after 10 secs'. The house officer

¹ PE is a blockage of one of the pulmonary arteries in the lungs, usually caused by a blood clot that travels from elsewhere in the body.

² There are inconsistencies in the clinical records about what leg was affected.

³ A C-shaped piece of fibrocartilage found in the knee joint.

⁴ An anticoagulant (blood thinner) medication used to prevent clots from getting bigger or stopping new clots from forming after hospital procedures or illness.

⁵ Another anticoagulant medication.

documented that his clinical impression was extensive lower limb DVT with symptoms of venous stasis.⁶

5. In a statement to the Coroner, the house officer said that, after assessing Mr B, he discussed his care with two medical registrars and advised them that he considered that Mr B was on the appropriate medical therapy for DVT and he did not consider that admission to hospital would necessarily add anything to his care. The house officer said that the registrars agreed with his clinical assessment. However, there is no documentation of these discussions.
6. A departmental adverse event review conducted after Mr B's death acknowledged that the house officer discussed Mr B's care with two registrars. The first registrar 'felt [the house officer] was discussing [Mr B] with her but did not ask for any advice'. The first registrar said that she offered to assess Mr B and suggested that, alternatively, the house officer could contact the registrar from his team (the second registrar). The second registrar said that he received a call from the house officer while he was doing a ward round. He said they discussed Mr B's clinical presentation and, as Mr B had no signs or symptoms of PE, the second registrar agreed with the house officer that Mr B could be discharged. After Mr B's death, the supervising SMO documented that Mr B's care had not been discussed with him but that his registrar was aware of Mr B's care.
7. Health NZ told HDC that, on reflection, the second registrar considered that he could have been clearer in his communication with the house officer and that, when discussing the case, he had assumed that the house officer had discussed Mr B's care with an SMO. Health NZ told HDC that it accepts that the documentation of assessments on 15 December could have been better, noting that the discussions with the registrars were not documented. Health NZ also accepted that greater senior oversight of Mr B's discharge was indicated in this case. However, Health NZ told HDC that there was no unequivocal indication to admit Mr B to hospital.
8. Mr B was subsequently discharged home with pain relief medication, instructions to continue with the DVT treatment (with no change to his anticoagulant [blood thinning] regimen), and information about PE symptoms. The following day Mr B collapsed at home and was taken to Middlemore Hospital by ambulance. While in the ambulance, Mr B experienced a cardiac arrest and underwent resuscitation efforts. A subsequent computed tomography (CT) scan indicated that he had experienced a subarachnoid haemorrhage.⁷ Sadly, Mr B later died and the Coroner's report found that he died as a result of a PE secondary to DVT.

Further information

Health NZ

Adverse Event Review

9. Health NZ completed a departmental Adverse Event Review (AER) and found that the care provided to Mr B was of an appropriate standard overall and that Mr B was not exhibiting signs of a PE during his presentation on 15 December and therefore did not require admission to hospital. However, it also identified that the house officer should not have

⁶ The slowing or stagnation of blood flow in the veins, most commonly in the lower legs.

⁷ A type of stroke where bleeding occurs in the space between the brain and the surrounding tissues.

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discharged Mr B without him being seen by a registrar. The review recommended that all patients being discharged should be reviewed by a registrar in person and a clinical note of the review recorded.

Responsibilities of house officers and registrars

10. Health NZ told HDC that the expectations for resident medical officers (RMOs – which include house officers and registrars) are and were defined and communicated in several ways, including through the orientation process, teaching, the RMO handbook, and localised documentation. However, given the passage of time, obtaining the specific documents from 2018 was not possible because the RMO handbook and other practical guides are not controlled documents and are regularly reviewed and updated. Health NZ further stated that expectations can be somewhat nuanced and shaped by different clinical contexts.
11. However, having spoken to staff who were RMOs in 2018, Health NZ confirmed that the expected practice in 2018 was for house officers to discuss patients who could be discharged with a registrar or SMO and that patients being discharged would be physically reviewed by a registrar or SMO. In some instances, the registrar or SMO may not have been available for an in-person review and so may have considered it appropriate to allow discharge based on a phone conversation. Health NZ said that, although the involvement of an SMO in discharge decisions may be regarded by some as ‘optimal care’ and is often the case, ‘this is not always possible or essential’.

The Coroner

12. The Coroner issued a finding based on the advice of a haematology expert, stating that the overall care provided to Mr B was of an appropriate standard. The expert’s opinion was that there were no symptoms or signs of a complicating PE on presentation to the ED on 15 December 2018, so the treatment provided was appropriate.

Responses to provisional report

Ms A

13. Ms A was given the opportunity to respond to the ‘information gathered’ section of the provisional report. Ms A told HDC:

‘[Mr B] ...underwent what should have been a straightforward procedure to repair a torn ligament. Despite the routine nature of this surgery, there was a systemic failure within the health system to identify, assess, and appropriately manage the significant risk factors that led to a pulmonary embolism caused by a deep vein thrombosis (DVT), which ultimately placed [Mr B] in grave danger.

....

It is vital that accountability is established and that meaningful changes are implemented to ensure no other family endures the same preventable loss. [Mr B’s] death should lead to genuine learning and improvement, not be dismissed as inevitable. He deserved better – and so do others who depend on the health system for their safety and wellbeing’.

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Health NZ

14. Health NZ was given the opportunity to respond to the provisional report. Health NZ accepted the proposed recommendations and stated:

‘We have carefully considered HDC’s comprehensive opinion, and, in principle, we agree with the provisional decision, and we accept responsibility for ensuring that we have systems and processes in place to support our frontline staff decision-making. We are committed to applying the learnings from this investigation to improve our service’.

Decision

15. I start by extending my sincerest sympathies to Mr B’s family and friends for their loss in such tragic and unexpected circumstances.
16. The key issue for my investigation relates to Mr B’s second presentation to Middlemore Hospital on 15 December 2018 and whether he was provided services of an appropriate standard and skill.
17. As part of my assessment of this complaint, I sought clinical advice from general medicine specialist Dr Richard Shepherd (Appendix A) regarding the standard of care provided to Mr B. Dr Shepherd acknowledged that he had formed his opinion with the knowledge that Mr B died after his second presentation to hospital.
18. I also acknowledge and take into consideration the Coroner’s findings, and the expert opinion given during that process, which found that the care provided to Mr B was of an appropriate standard.
19. However, I note that the coronial expert advice is brief in its analysis of the 15 December presentation and does not reason or question the broader systemic issues of relevance to my investigation – and, in particular, whether more senior clinical review before Mr B’s discharge would have been appropriate.
20. I further note that Dr Shepherd is a more direct peer of the clinical service (general medicine) that provided care to Mr B. Guided by my advisor Dr Shepherd, I have found some issues with the care, which I discuss in detail below.

Lack of senior oversight on discharge

21. Dr Shepherd advised that the assessment by the house officer was of a reasonable standard for a ‘junior doctor at his stage of experience and training’. However, he advised that Mr B’s symptoms ‘mandated a much better assessment by a senior more experienced colleague’. Dr Shepherd considered this failure to constitute a moderate to severe departure from appropriate standards, in that the house officer was not appropriately supervised in his management of Mr B. He also identified as a severe departure from the standard of care a failure in the standard of communication with senior clinical staff and documentation standards ‘especially in the setting of a house officer-led discharge from the ED following referral for admission by a senior ED physician’.
22. There is sufficient evidence to satisfy me that, before discharging Mr B, the house officer discussed his assessment with two registrars – the latter of whom agreed with the proposed

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discharge (in the absence of reviewing the patient themselves). It is also clear that the SMO was not consulted, either by the house officer or by the registrars. In addition, neither the house officer nor the registrars documented the conversations. The AER notes that the second registrar accepted they could have communicated better with the house officer by clarifying whether the SMO had been advised.

23. Dr Shepherd stated that the discussions between the house officer and the registrars should have been documented and that, in his view, it would be expected that any recommended discharge would be discussed with the supervising SMO. Dr Shepherd advised that such expectations are formally set out in a policy in his own workplace.
24. As noted, Health NZ acknowledged that the process in place in 2018 was that, before discharge, patients should be assessed in person by a registrar or an SMO and that this process should have been followed. It also accepts that greater senior oversight of Mr B's discharge was indicated. I note that the AER also found that Mr B should have been assessed in person by a registrar before discharge. However, Health NZ also commented that, although the involvement of an SMO in discharge decisions may be regarded as optimal care, and is often the case, it is not always possible or essential.
25. I accept Dr Shepherd's advice to the extent that I am critical that Mr B was not assessed in person by a more senior clinician and that the process for more senior oversight of the discharge process was not adequately effected. I am satisfied that the circumstances of Mr B's admission warranted the oversight of a more senior clinician. I also note that the house officer endeavoured to obtain senior assistance but that did not occur in the manner it should have.

Should Mr B have been admitted to hospital?

26. Dr Shepherd was also of the view that Mr B had symptoms and signs that strongly indicated hospital admission, particularly for aggressive leg elevation, which he identified as the standard of care. This was on the basis that there was evidence the existing medication regimen had not stopped the progression of his symptoms, and there were other patient characteristics that may also have supported an admission. Dr Shepherd considered that the failure to admit Mr B to hospital constitutes a moderate to severe departure from accepted standards, especially as the ED review identified that Mr B should be admitted for further investigation and treatment. He advised: 'This was a case of a junior doctor not recognising what they were seeing ... with the system for seeking senior input not having been adequately followed.'
27. Health NZ told HDC that aggressive leg elevation is not standard practice and there was no unequivocal indication to admit Mr B to hospital.
28. Additionally, Dr Shepherd was of the view that alternative diagnoses should have been considered in light of Mr B's symptoms. Specifically, the differential diagnosis should have

considered phlegmasia alba dolens (PAD)⁸ and phlegmasia cerulea dolens (PCD)⁹, both conditions associated with worsening DVT. Dr Shepherd advised that complicated DVT involving PAD and PCD is generally managed by an interprofessional team, including a vascular surgeon, specialist physician, and – depending on severity – a critical care specialist. He advised that patients who present with signs of PAD or PCD frequently require specialist inpatient input, including potential surgical intervention. In response to this advice, Health NZ told HDC that Mr B's symptoms were not consistent with PAD and that, although PCD may have been a differential diagnosis, it 'would have been both very mild and early in its course, and a more senior reviewer may well not have detected it on this basis'.

29. As noted, more generally, the Coroner's expert haematology advisor did not identify any departures from the standard of care, concluding that the decision not to alter Mr B's therapy and allow his management to continue at home appeared appropriate. While lacking detail, the advice is still relevant evidence for my investigation to consider.
30. Taking all this evidence into consideration, I am not prepared to draw the conclusion that Mr B should have been admitted to hospital, given that there is a divergence of clinical opinion, including as to whether aggressive leg elevation was the standard of care. In my view, the more critical failure was the lack of senior oversight of the discharge process and the lack of assessment by a registrar or SMO.

Conclusion

31. Health NZ had a responsibility to provide services to Mr B of an appropriate standard. I have taken into account the fact that the house officer was a junior doctor at the time of these events and that the process for obtaining senior oversight did not occur as it should have, including from the registrars. Further, I am concerned that important conversations between the house officer and registrars were not documented. These are failings that, in my view, should be attributed to Health NZ, rather than to the individuals concerned, and, therefore, I find Health NZ in breach of Right 4(1)¹⁰ of the Code of Health and Disability Services Consumers' Rights (the Code) for failing to provide services to Mr B with reasonable care and skill.
32. It is important to acknowledge that, although I have determined there to be a breach of rights, it cannot be said with any degree of certainty that the clinical pathway and ultimate outcome would have been any different had Mr B received a more senior review. Tragically, Mr B suffered a recognised but low probability fatal complication (PE).

Changes made

33. Health NZ told HDC that, after these events, it provided teaching to general medicine RMOs to advise that all patients being discharged require physical review by a registrar or SMO and that a clinical note of the review must be recorded. Health NZ said that it published an

⁸ A severe complication of a DVT where massive clotting in the deep veins of the leg leads to extensive swelling, pain, and a pale appearance due to secondary arterial compromise.

⁹ A rare and severe form of DVT where extensive blood clots in the leg cause significant swelling, pain, and a bluish discoloration of the skin.

¹⁰ Right 4(1) of the Code states: 'Every consumer has the right to have services provided with reasonable care and skill'.

RMO clinical handbook and RMO 'Orientation Housekeeping Guide', that rostering has been adjusted so that individual teams now take on new patients less frequently, and the number of house surgeons per team has increased from one to two, which 'reduces the pressure on RMOs to rapidly process admissions, minimising the risk of discharges without senior review'. Health NZ also said that messaging and communication is now consistent to encourage house officers to discuss all cases with senior colleagues, whether the cases are intended for admission or discharge.

Recommendations

34. I recommend that Health NZ Counties Manukau:

- Provide an apology to Mr B's family for the failures identified in this report. The apology is to be sent to HDC within 3 weeks of the date of this report for forwarding to Mr B's family.
- Develop discharge delegation of responsibility policies and procedures for house officers, registrars, and SMOs and include these policies and procedures in the orientation programmes and disseminate them to the relevant clinical teams. Such policy is to include expectations regarding the documentation of reviews and discussions between house officers and RMOs and whose responsibility it is to record the assessments/discussions. Health NZ is to provide these updated policies and procedures, along with evidence that they have been included in orientation programmes and disseminated to the relevant parties, within 6 months of the date of this report.
- Use an anonymised version of this case to conduct training to the Thrombosis DVT Service and resident medical officer (RMO) teaching programme and use this training as part of the RMO orientation programme around DVT/PE risk assessment and complications. Evidence of this training and its inclusion in the above service/programme is to be provided to HDC within 6 months of the date of this report.

Follow-up actions

35. A copy of this report with details identifying the parties removed, except Health New Zealand | Te Whatu Ora Counties Manukau, Middlemore Hospital, and the expert who advised on this case, will be placed on the HDC website, www.hdc.org.nz, for educational purposes.

Morag McDowell
Health and Disability Commissioner

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Appendix A: Independent clinical advice to the Commissioner

The following independent advice was obtained from consultant physician general medicine Dr Richard Shepherd:

“Independent Medical Advice to the Commissioner

Date: 28/08/2023

Complaint: Middlemore Hospital, Te Whatu Ora – Counties Manukau

Your Ref: C21HDC01632

My name is Dr Richard Shepherd. I have been asked to provide an opinion to the Commissioner on case number C21HDC01632 regarding the care the late Mr [B] received from Counties Manukau during his care in December 2018. I have read and agree to follow the Commissioner’s Guidelines for Independent Advisors.

I am a Consultant General Physician employed by Te Whatu Ora Waikato (previously Waikato District Health Board). I graduated from Otago Medical School in 1997 with a Bachelor of Medicine and Surgery (MBChB). I have attained fellowships with the Royal New Zealand College of Urgent Care, The Division of Rural Hospital Medicine and the Australasian College of Physicians. I have subspecialty interests in nephrology, emergency medicine and palliative care. I have completed the Auckland University Postgraduate Diploma of Community Emergency Medicine, the RACP Clinical Diploma in Palliative Medicine, the Otago University Certificate in Physician Performed Ultrasound and the Auckland University Postgraduate Certificate in Health Leadership, including quality and safety. I have no conflicts of interest to declare in this case.

I have been requested by the Commissioner to provide expert advice on the following issues:

Expert advice requested

Please review the enclosed documentation and advise whether you consider the care provided to Mr [B] at Middlemore Hospital was reasonable in the circumstances and why.

In particular, please comment on:

1. The adequacy of the assessments undertaken on 15 December 2018.
2. Whether appropriate regard was given to the symptoms of increasing severe pain and colour change in the leg.
3. The standard of communication with senior clinical staff and documentation in this regard.
4. Whether there was any clinical indication, based on the clinical scenario presented by Mr [B] on 15 December 2018, for hospital admission, further imaging or a change in his medication regimen.
5. Any other matters in this case that you consider warrant comment.

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For each question, please advise:

1. What is the standard of care/accepted practice?
2. If there has been a departure from the standard of care or accepted practice, how significant a departure (mild, moderate, or severe) do you consider this to be?
3. How would it be viewed by your peers?
4. Recommendations for improvement that may help to prevent a similar occurrence in future.

Documents Provided:

- Counties Manukau Clinical Notes Mr [B] 13 Dec – 16 Dec 2018.
- Specialist Radiology Report Ultrasound Right Leg SRG Greenlane Manukau 13 Dec 2018.
- Response to Coroner's Request for Information Dr D [...] 3 May 2019.
- Chief Medical Officer & Deputy CEO Dr [...] Response to the Office of the Health & Disability Commissioner 28 Sept 2021.
- Letter of Complaint [...] Advocate 16 July 2021.

Background Information Provided:

Mr [B] underwent knee surgery to repair a torn meniscus on 30 November 2018. Following the surgery, Mr [B] developed pain and tenderness in his [right] calf muscle, especially when standing. On 13 December 2018, Mr [B] was referred for an ultrasound, which found an extensive deep vein thrombosis. On 14 December 2018, Mr [B] was referred to Middlemore Hospital and was prescribed clexane and dabigatran and discharged that evening.

On 15 December 2018, Mr [B] presented to Middlemore Hospital due to ongoing pain and purple discolouration of his [right] calf when standing. He underwent an initial assessment in the Emergency Department and then further assessment in the Medical Assessment Unit. Mr [B] was discharged with analgesia and no change to his anticoagulant regimen.

In the early hours of [...] December 2018, Mr [B] collapsed and was taken by ambulance to hospital. While in the ambulance, Mr [B] suffered a cardiac arrest, and resuscitation was commenced. A CT scan indicated he had experienced a subarachnoid haemorrhage. Mr [B] was thrombolysed as part of the resuscitation process for a suspected pulmonary embolus. Mr [B] passed away later that morning. The Coroner's report indicated that Mr [B] died as a result of pulmonary emboli secondary to deep vein thrombosis.

Advice to the Commissioner:

1. The adequacy of the assessments undertaken on 15 December 2018.

In my view, the adequacy of the assessments undertaken on the 15th of December 2018 of Mr [B] likely met the expected *standard of assessment*, per se. I would, therefore, not consider there to have been a significant departure from the expected *assessment* standard from the two doctors involved in *assessing* Mr [B] on that day.

I would note that some of my colleagues would disagree with that optimistic view. I would, however, differentiate the *standard of assessment* on that day from the *standard of care* Mr [B] should have received. In my view, he did not receive the expected standard of *overall care*. I would regard that as at least a moderate to severe departure from the expected standard.

I would consider my peers would reach similar conclusions around that *overall standard of care* – (though I am mindful of retrospective bias in this case, i.e. being aware of Mr [B]’s death soon after his discharge and the influence of that on assuming there must have been a deviation from the standard of care). Those issues around the *overall standard of care*, rather than just *assessment*, are discussed in detail in further questions posed by the commissioner.

Background to opinion on the accepted standard of assessment:

On the 15th of December, Mr [B] was assessed by two doctors. The initial acute assessment in the Emergency Department (ED) at 1220hrs was performed by Dr [C] – an Emergency Medicine Senior Specialist – at that time of some 18 years as a specialist. The documentation of that initial assessment, in my view, would not meet the expected standard of assessment as a stand-alone consultation / medical review, i.e. to see, workup, diagnose, treat and discharge with follow-up arrangements. The available notes represent a narrative summary of events to that point, and an emergency department binary triage decision effectively between 1/ “*I need to see, workup and treat*” – (and therefore get significantly involved in this case) or 2/ “*this patient requires admission/specialist inpatient team review*” – (and therefore my input can be very limited as I am referring the patient on in a tertiary care setting).

The ED senior doctor's decision that was made at the time then was “*admit Med for elevation of leg and analgesia with thanks*” – essentially option 2/ above. That initial assessment then did not contain documentation of a detailed physical examination – including of the leg, involve any further investigations, or include any apparent documented consideration of a differential diagnosis or the cause of the patient's representation/worsening symptoms. Simply that “*admission for leg elevation and analgesia*” was recommended. In my view though, the “ED Triage to a Speciality Service” review approach that was taken in this case would not fall outside the care that would have been received at many tertiary care hospitals in NZ – where referral on to a “speciality service” was felt to be needed, and where ED volumes of presentations require rapid patient turn over to inpatient teams. In the terminology of the industry, this was a “quick ED flick” to General Medicine to sort out. At that time, and without

knowledge of what the speciality team would do next, I would struggle to be overly critical that a clear deviation from the expected *standard of assessment* in this niche setting occurred. Mr [B] had been deemed not fit for discharge by the ED and deemed it was someone else's (General Medicine's) responsibility to manage from there.

On the flip side of that thought process though, I would acknowledge that some of my colleagues may disagree with that view feeling that an ED specialist still has a duty of detailed assessment, investigation and differential diagnosis to ensure the 'right patient is triaged to the right service'. It could be considered that there were a number of red flags in that initial ED consultation. These could have raised the suspicion of an alternative differential diagnosis to a 'simple uncomplicated DVT' that could have been considered with further investigation and consideration of potential referral to the Specialist Vascular Team – and not 'just' General Medicine. In this case, it was documented by Dr [C] *'[Mr B] notices that he is becoming more immobile, pain in leg, such that he is not weight bearing and then in shower today he noticed that his entire leg was purple with proximal leg white. He was very concerned about this and phoned the haematology CNS, who told him to present to ED.'*

In the described and documented circumstances of this case then, a differential diagnosis of phlegmasia alba and cerulea dolens could have been on the ED differential diagnosis radar, rather than just a simple uncomplicated DVT for leg elevation and analgesia (*see appendix for an explanation of these terms*). Had such a differential diagnosis been considered, I would have regarded a detailed lower limb physical examination would have been documented, further laboratory workup considered, and ultimately a repeat venous right leg ultrasound performed to demonstrate any degree of venous thrombosis extension. Whether this was to be done by the ED, or via the referred to Speciality Service, in my view is a matter of debate and opinion.

In a tertiary care ED setting staffed by FACEMs (Specialists of the Australasian College of Emergency Physicians), even in 2018 some of my colleagues may argue that access to clinician-performed point-of-care diagnostic venous compression ultrasound (POCUS) by a Specialist Emergency Physician in a large urban ED would not fall outside of expected care. Had this been performed in the ED and had the anticipated progression of the 'extensive deep vein thrombosis' from the formal scan of 13/12/2018 been shown, in my view, a very different course of events would have occurred. The 'framing bias' referral to General Medicine of – 'uncomplicated DVT' for leg analgesia and elevation would have likely changed to an urgent referral (whether to General Medicine or on to the Vascular Specialty Team) for exclusion of potential phlegmasia alba progressing to cerulea dolens. This would be recognised as a high potential differential diagnosis for significant morbidity and mortality – including the elevated clinical risk of subsequent pulmonary embolism. In those circumstances, investigation, diagnosis, and treatment would have likely been significantly different – with the potential to change the outcome of this case.

In my view though, a POCUS in ED would not have been a reasonably expected standard in 2018 (it would have been ideal, but not an expected standard) and therefore, in my view, a referral to General Medicine was not clearly inappropriate either.

I have debated the above principles at length with ED and General Medicine colleagues and accept that no clear balance of opinion was achieved regarding the appropriate standard around the initial ED binary question: – option 1/ vs 2/ posed above. The influence of ED workload pressure and other critical ED presentations at the time must also not be overlooked.

In terms then of the second medical *assessment* by Dr [D] – (when Mr [B] was referred on to the General Medicine Team for admission by the initial assessing ED doctor). At the time, Dr [D] was a 2nd-year house officer (junior doctor or RMO (Resident Medical Officer)) yet to have achieved General Registration with the NZ Medical Council and therefore working under the supervision of his General Medicine Consultant – and operationally under the direct supervision of his Medical Registrar often a year 3+ General Registration Doctor who may, or may not, have started the Specialist Physician Training Program, but who is still working under the supervision of the on-call Specialist General Physician (who remains responsible for all discharges once a patient has been referred to their service). In my view, Dr [D]’s standard of assessment and documentation of the history and physical examination was of an overall reasonable standard to the level expected of a junior doctor at his stage of experience and training. There is no documentation, however, of his reasons for discounting the earlier Senior Emergency Physician’s opinion regarding the need for admission. There is no documentation of a differential diagnosis as to Mr [B]’s representation with new physical and clinical findings (the white/purple leg, deteriorating mobility and worsening pain), or most importantly, documented discussion with his Supervising Consultant (or Supervising Registrar) prior to him discharging Mr [B].

In my view, these issues do not meet the expected standard of practice for an RMO working under supervision. In his letter of response to the Coroner, Dr [D] identifies ‘*his [right] leg was mildly swollen and became slightly discoloured on prolonged standing, however I did not consider this was out of keeping with his established diagnosis*’. His notes written at the time of the consultation document ‘*Unable to fully weight bare due to calf pain and throbbing when leg not elevated - when standing develops mild purplish hue from mid-thigh down after 10 seconds*’.

In my view, these were highly significant clinical findings and in the overall circumstances mandated a much better assessment by a senior more experienced colleague. At House Officer stages of training, one does not always know what one does not know – particularly around rare complications of ‘simple DVT’. In my view, it is difficult to rationalise the later comments, ‘*mild swelling, and slightly discoloured after prolonged standing*’ with the circumstances documented and described at the time by both the ED doctor and Dr [D]. Dr [D]’s overall impression was documented at the time as ‘*Extensive Left lower Limb DVT* with symptoms of venous stasis*’.

**(I note the formal ultrasound report from 13/12/2018 and Dr [C]’s notes document a Right Leg DVT, whereas the Nurse practitioner’s notes document a Left Leg DVT but describe right leg abnormal findings. For the purposes of this review, I have assumed this was a ‘wrong side’ error repeatedly made by Dr [D] and the Nurse Practitioner from 13/12/18 in their documentation. I note this error appears to have been further repeated*

in the Chief Medical Officer & Deputy CEOs letter to the commissioner on 28th September 2021 and assume again this was a 'wrong side' error.

2. Whether appropriate regard was given to the symptoms of increasing severe pain and colour change in the leg.

In my view, and in the clinical circumstances of this case, appropriate regard was not given to the symptoms of increasing severe pain and colour change to the leg. In my view, there was a moderate to severe deviation from the expected standard of overall care, though this was more around the standard not being in keeping with delegation of authority principles governing the supervision of junior doctors in tertiary-level care hospital facilities.

Background to opinion:

In my view, the differential diagnoses of phlegmasia alba and phlegmasia cerulea dolens along the continuum of changing symptoms should have been considered, specifically examined, and investigated for and appropriate senior specialist input sought for what is a challenging condition with the well-recognised potential to lead to significant preventable morbidity and mortality. As discussed above, however, the nuances of lines of responsibility for such 'appropriate regard' are not so clear cut in this case. It would not be a reasonable expectation that a second-year House Officer would consider such differential diagnoses – or even be overly familiar with such presentations and the potential significance of such red flag symptoms. In my view, this was a case of a junior doctor not recognising what they were seeing and not knowing what they did not know – with the system for seeking senior input not having been adequately followed.

3. The standard of communication with senior clinical staff and documentation in this regard.

In my view, the standard of communication with senior clinical staff and its documentation fell well below the expected standard of care. I would regard that as a severe deviation from the expected standard – especially in the setting of a House Officer-led discharge from the ED following referral for admission by a Senior ED Physician. I would regard my colleagues as holding a similar, very negative view. For improvement, I would recommend a review of the delegation of responsibility policies and procedures RMO to SMO at Counties Manukau. If such explicit policy is not already present, I would recommend the inclusion of such expectations in the RMO orientation programmes and dissemination of such standard operating procedures to clinical teams if this represents a change or explicit statement of new policy.

Background to opinion:

There is no documented communication in the clinical notes regarding any discussion with the Supervising General Medicine Consultant or with the Supervising Registrar(s). In Dr [D]'s letter of response to the Coroner's Request for Information, he states *'After assessing Mr [B] I discussed his case with two colleagues, both of whom were medical registrars, Dr [...] and Dr [...]. I stated to these colleagues that I considered the patient*

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was on appropriate medical therapy for his DVT and I did not think that admission to hospital would necessarily add anything to his care. This was especially the case as he was coping with simple oral pain relief. My colleagues agreed with my clinical assessment and I rediscussed this with Mr [B].’ There is no documentation available in the clinical notes by the above registrars regarding that. There is no communication available to me from those registrars to the Coroner’s Enquiry. The Supervising Consultant documented in the clinical notes at the time following Mr [B]’s death 152018 *‘I advised this patient was not discussed with me, but my first contact was being advised of his death by Dr [...]. My Registrar Dr [...] was aware of this patient but had not informed me.’*

In my view, it would be accepted standard practice that a Medical House Officer reviewing Mr [B] in the ED would discuss the case with their Supervising Registrar and that the Registrar would be expected to also review the patient and document such a review – or at least ensure the House Officer documented such a review. It would then be expected standard practice that any recommended discharge from the ED would in turn be discussed with the Supervising Consultant Physician. Alternatively, direct House Officer discussion with the Supervising Consultant would likely also be an option. I would regard my peers as also holding those levels of expectation.

In my own institution, such expectations are formally set out in a policy document *‘Senior Medical Officer (SMO) and Resident Medical Officers (RMOs) Responsibilities and the Limits of Delegation of Responsibilities to RMOs – (July 2016, last update 31 Jan 2020 review due 2023)’* and a policy document *‘Specialty Referral Guidelines’*, which outlines the responsibilities of RMOs referred patients by the ED.

A request to Counties Manukau for any similar policies, guidelines, or RMO orientation information regarding the above expectations and standard practice was made. I was advised no such policies were in place on 15 December 2018. I am unclear if any such policy has been explicitly developed since.

4. Whether there was any clinical indication, based on the clinical scenario presented by Mr [B] on 15 December 2018, for hospital admission, further imaging or a change in his medication regime.

In my view, there was a strong clinical indication for hospital admission, further imaging, and consideration of a change to Mr [B]’s treatment, including his medication regimen. This was likely a moderate to severe deviation from the expected standard of care Mr [B] should have received. In arriving at that degree assessment, I would accept the potential pathway this may have taken cannot be known with certainty and that discussion is based around unknowns in terms of differing outcomes. I would, however, regard my peers as holding similar views, noting that the Senior ED Consultant reviewing Mr [B] at the time considered that admission and referral to a Speciality Inpatient Team was required, which is, of course, what occurred.

Recommendations around future improvement might involve specific teaching and presentation on complicated DVT to the nurse-led Thrombosis DVT Service and at the

RMO teaching programme. Inclusion into the RMO orientation programme around DVT/PE risk assessment and complications might also be considered.

Background to opinion:

In my view, there were a number of described red flags at Mr [B]’s re-presentation to the ED to suggest that his circumstances were not those of an uncomplicated DVT. Such circumstances have been discussed in detail in questions 1 and 2 above. In my view, at the very least, admission for aggressive leg elevation was mandated at the time of his representation – leg elevation to at least 60 degrees above the level of the heart – representing the standard of care under the principle of reducing further propagation of thrombus, reduced venous stasis, reduced venous hypertension and to increase venous return via patent collateral small veins. In my view, it would have been an unreasonable expectation that discharge would have fulfilled aggressive home elevation principles where there was already evidence that the existing enoxaparin regimen had not stopped the progression of Mr [B]’s symptoms. The lack of close follow-up advice, even if discharge had occurred, (which of course it did) perhaps demonstrates the lack of appreciation of what may have been occurring.

In Mr [B]’s circumstances, other factors may also have argued for admission (e.g. worsening symptoms despite enoxaparin, potential mild under-dosing of his enoxaparin in the community for convenience reasons (i.e. 1mg/kg dose for him being 130mg twice daily – he received 120mg twice daily as this is the size the pre-packaged syringe comes in). Factors such as his significant weight (130kg) and severe obstructive sleep apnoea may also have further potentially complicated decision-making around his safe discharge, his clinical course, and his ability to tolerate any subsequent PEs. Given the potential differential diagnosis and risk of ongoing progression, hospitalisation may also have allowed prompt and frequent re-evaluation of what can be a very dynamic condition as clot burden increases. Such expertise would be anticipated around decision-making for additional treatments such as implementing IV heparin, potential thrombectomy or catheter-based local thrombolysis. These would form part of the potential spectrum of care for complex DVT – complicated by extending thrombosis and impending venous obstruction – (i.e. the development of phlegmasia alba going on to phlegmasia cerulea dolens and the significantly elevated risk of subsequent PE).

5. Any other matters in this case that you consider warrant comment.

My comments, and the conclusions drawn above, are based on the documents I was provided with. I did not have access to the Counties Manukau Internal Mortality Review Report nor the Coroner’s report. I was declined access to the Coroner’s report by the office of the HDC based on maintaining an independent report. I am aware, however, from the Counties Manukau Chief Medical Officer and Deputy CEO letter to the commissioner, dated 28 September 2021, of the outcome of the Coroner’s enquiry. This states that the overall findings of the coronial inquiry were *‘that Mr [B] received appropriate treatment throughout and that the treatment decisions were of a good standard, and in accordance with evidence-based guidelines, both national and international and standard practice norms.’* That letter also notes, *‘we agreed with coroner’s [...] concluding remark that it is a tragedy for Mr [B]’s family, that he suffered*

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a recognised, but very low, probability, fatal complication, following appropriate treatment.'

I am not able to agree with those statements based on the information I was able to access and for the reasons discussed above. It is possible, however, that unknown additional information included in those reports may alter some of my above discussion and conclusions.

In my view, Mr [B] did suffer a recognised, but low probability fatal complication of DVT – a PE. Along the pathway to that, however, he was not given the best chance of investigation and treatment of the intervening progression of his DVT thrombus burden. The necessary specialist clinical expertise was not accessed, despite this being available in the setting where he was assessed. In my view, such further investigation and anticipated altered treatment, would have set about a very different care pathway. This ultimately could have given the best chance of preventing death by managing that clot burden, and its presenting complications, before embolisation to the lungs. In my view, the expected standard of communication and supervision from RMO to SMO was not followed.

Appendix:

Phlegmasia alba and phlegmasia cerulea dolens description:

Phlegmasia alba dolens (PAD) and phlegmasia cerulea dolens (PCD) are uncommon conditions that result from acute, massive venous thrombosis. These conditions are associated with DVT of the lower extremity and have high associated morbidity and mortality. Early diagnosis is critical for the reduction of overall morbidity and mortality, and treatment needs to be in a timely manner.

Phlegmasia is a term that has been used to describe extreme cases of lower extremity DVT, which may progress to critical limb ischemia and potentially limb loss. In 1938, the term PCD was coined – translating to 'painful blue inflammation,' differentiating it from the more commonly seen PAD or 'painful white inflammation'. PAD, also referred to as 'milk leg,' references the early stages of this process due to the compromise of arterial inflow secondary to extensive clot burden. PCD is a more advanced progression and can be a precursor to venous gangrene. PAD 'milk leg,' presents with the classic triad of oedema, pain, and blanching without signs of cyanosis or tissue involvement. The onset of symptoms has proven to be unpredictable. They may be gradual over the course of days or fulminant with severe progression in a matter of hours. In 50% to 60% of patients, PAD will precede PCD. PCD presents similarly with pain and swelling due to fluid sequestration. Its most pathognomonic feature is the presence of cyanosis (a purple discolouration of the skin). Cyanosis begins peripherally where it remains the most intense but may spread to involve the entire extremity. Pulmonary embolism is another clinical manifestation of phlegmasia as the disease process is highly emboligenic (the clot breaks off from the legs and travels to the lung). Death can result.

A significant portion of the diagnosis of DVT with phlegmasia is made clinically with a focused history and physical exam, including details regarding onset and duration of

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symptoms, and functional impairment related to the compromised limb. The overall prognosis can often be poor and worsens with the progression of symptoms. Overall mortality ranges have been estimated from 20% to 40%, depending on the stage of diagnosis, the degree of limb compromise and the distal embolism of clot burden.

Complicated DVT involving PAD and PCD is generally managed by an interprofessional team, including a vascular surgeon, a specialist physician and depending on severity, a critical care specialist. Clinically, this is an easily recognised entity if the condition is suspected. If diagnosed early, DVT can often be managed conservatively on an outpatient basis. However, patients who present with signs of phlegmasia frequently require specialist inpatient input including potential surgical intervention. Given the risk of significant morbidity and mortality, early diagnosis is vital, and patient and provider awareness and recognition are critical. Once the diagnosis is confirmed, the patient should promptly be placed on bed rest, the affected extremity should be elevated, and intravenous heparin bolus followed by infusion should be considered. Institutional resources and specialist expertise should be a consideration when determining the management of PCD. The use of systemic thrombolytic therapy has been trialled but is not recommended for the treatment of DVT and its sequela due to an increased risk of major bleeding – including intracranial haemorrhage. In appropriate patients, catheter-based thrombolytic therapy or mechanical thrombectomy in combination with systemic anticoagulation can improve treatment outcomes for patients who have failed to respond to systemic anticoagulation therapy alone.

Dr Richard Shepherd

Date: 28/08/2023

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