

# CORONERS COURT OF SOUTH AUSTRALIA

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## INQUEST INTO THE DEATH OF MILLICENT GLENN

[2025] SACC 24

Inquest Findings of her Honour Deputy State Coroner Kereru

11 September 2025

### CORONIAL INQUEST

Examination of the cause and circumstances of the death of an elderly Aboriginal woman with chronic renal impairment who was prescribed the antibiotic gentamicin. The Inquest explored the appropriateness of the choice of the antibiotic as well as the appropriateness of its manner of administration and monitoring after administration.

Held:

1. Millicent Glenn, aged 89 years of Largs Bay, died at The Queen Elizabeth Hospital on 23 October 2019 as a result of acute-on-chronic renal failure on a background of ischaemic heart disease, hypertension, chronic congestive cardiac failure and gentamicin therapy.
2. Circumstances of death as set out in these findings.

Recommendations made.

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**Counsel Assisting: MR M KIRBY**

**Family: MS T CARTER, MR S MARKS & MS F LOCKWOOD**

**Counsel: MS E BOWERING - Solicitor: ABORIGINAL LEGAL RIGHTS MOVEMENT**

**Interested Party: SOUTHERN CROSS CARE**

**Counsel: MS K WAITE - Solicitor: O'LOUGHLINS LAWYERS**

**Witness: DR A BEGYGIRLIOGLU**

**Counsel: MR A KALALI - Solicitor: WALLMANS LAWYERS**

**Hearing Date/s: 13/03/2024-15/03/2024, 28/03/2024, 17/04/2024, 26/04/2024**

**Inquest No: 03/2024**

**File No/s: 2193/2019**

# INQUEST INTO THE DEATH OF MILLICENT GLENN [2025] SACC 24

## Introduction

- 1 Millicent Glenn (Millie)<sup>1</sup> was born on 1 December 1929.<sup>2</sup> She died on 23 October 2019 at The Queen Elizabeth Hospital (TQEH). Millie was 89 years old.
- 2 Millie had a number of comorbidities including chronic congestive cardiac failure, ischaemic heart disease with cardiomyopathy and bypass surgery in 2013, hypertension and chronic renal impairment.
- 3 At the time of her death Millie was a resident of The Phillip Kennedy Centre Residential Care (PKC) in Largs Bay, South Australia. She was first admitted for respite care in 2015 and later transitioned to a permanent resident.
- 4 On 3 October 2019, Millie, who was otherwise a vibrant and engaged resident of PKC, was observed to be unusually lethargic, having just recovered from a respiratory infection.
- 5 A urine sample sent for culture revealed the bacterial growth of the organism *Klebsiella aerogenes*.<sup>3</sup>
- 6 The visiting PKC general practitioner (GP), Dr Anne Beygirlioglu, prescribed a nine-day course of the antibiotic medication gentamicin,<sup>4</sup> to be administered intramuscularly at the dose of 80mg.
- 7 From 8 October 2019, Millie was still lethargic, refusing her food and requiring encouragement with fluids.
- 8 On 16 October 2019, Millie was transferred to TQEH where she was assessed to be in acute-on-chronic renal failure. She was very drowsy, dehydrated and bradycardic.
- 9 Millie received maximal treatment with her potassium levels improving, however her overall condition steadily declined. In discussion with her family, Millie was palliated and died at 3:37am on 23 October 2019.<sup>5</sup>

## Cause of death and reason for Inquest

- 10 Millie's death was reported to the South Australian State Coroner on 24 October 2019 by a Registrar by way of medical deposition. The reason for reporting her death was the identification of a '*potential iatrogenic cause of severe acute kidney injury*'.<sup>6</sup> The iatrogenic cause was reported as nine days of intramuscular administration of gentamicin in the setting of diuretic medication such as frusemide, spironolactone and candesartan. This was on a background of chronic kidney disease.

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<sup>1</sup> The family of Mrs Glenn requested that she be referred to as Millie during the Inquest as that was how she was known to her loved ones

<sup>2</sup> This was Millie's allocated birth date but her real birth date was not known due to her being removed from her family as a toddler and institutionalised (Exhibit C12, paragraph 4)

<sup>3</sup> A Gram-negative bacterium that is commonly found in the human gastrointestinal tract and typically causes infections

<sup>4</sup> Also referred to as gentamycin

<sup>5</sup> Exhibit C4, page 99

<sup>6</sup> Death Report to Coroner Medical Practitioner's Deposition

- 11 The deposition properly gave rise to the concern that Millie had been prescribed a medication that was unsuitable in the context of her underlying medical conditions, in addition to other medications prescribed, and that she had died as a result.
- 12 The concerns raised in the medical deposition were referred to Forensic Science SA (FSSA) for their consideration in a pathology review of the medical records. The pathology review was conducted by Dr Iain McIntyre. Dr McIntyre's findings were discussed with FSSA forensic pathologists, Dr Stephen Wills and Dr Karen Heath.
- 13 The suggested cause of death was '*acute-on-chronic renal failure in a woman with ischaemic heart disease, hypertension, chronic congestive cardiac failure and gentamicin therapy*'.<sup>7</sup> I have accepted this cause of death and so find.
- 14 The following comment was made by the pathologists at the conclusion of the pathology review:

'Although the cause of death appears clear, this referral was made on the basis that there may have been an iatrogenic component to the death. It is established that gentamicin is a nephrotoxic agent and it appears in this case, to have been administered to a woman with pre-existing renal failure who may have been dehydrated, due to her long-term diuretic therapy, which may, in turn, have compounded the effect of gentamicin.'<sup>8</sup>
- 15 A clinical review was suggested by Dr McIntyre to address the appropriateness or otherwise of the prescribed therapy of gentamicin. That review was sought from consultant geriatrician, Professor Craig Whitehead.
- 16 On 25 March 2020, Professor Whitehead provided a report that stated, in his opinion, there were a number of failings in the care of Millie while she was a resident at PKC relating to the treatment of her urinary tract infection (UTI) with gentamicin. Furthermore, Professor Whitehead opined that Millie's death was preventable had gentamicin not been administered.
- 17 Following receipt of this report, it was considered necessary to conduct an Inquest into the cause and circumstances of Millie's death.

### **Issues at Inquest**

- 18 There were a number of issues ventilated during the course of the Inquest. They included the reliability of the estimated Glomerular Filtration Rate (eGFR) test for renal function, whether gentamicin was contraindicated with Millie's condition, or an inappropriate choice, and whether Millie was appropriately monitored by both Dr Beygirlioglu and PKC.
- 19 As will be detailed below, I have found that, while it was not strictly contraindicated to have prescribed gentamicin to Millie, it was an ill-considered choice when there was an alternative medication that was not nephrotoxic (norfloxacin).
- 20 That decision was compounded by Dr Beygirlioglu's failure to monitor Millie for adverse side effects in the days following the commencement of the medicine.
- 21 I have also found that Millie's death was preventable.

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<sup>7</sup> Exhibit C2a

<sup>8</sup> Exhibit C2a, page 1

## Evidence at Inquest

- 22 The documentary evidence at Inquest comprised 16 exhibits.
- 23 In addition to the documentary evidence, oral evidence was heard from:
- Dr Beygirlioglu, general practitioner
  - Professor Craig Whitehead, consultant geriatrician
- 24 There were no witnesses called from PKC and the facility was not initially represented during the Inquest. When raised by counsel for Millie's family, Ms E Bowering, that there were to be criticisms levelled at aspects of Millie's care at the facility, they were notified and provided with the relevant documents and transcript of evidence as a matter of procedural fairness, in accordance with established common law principles.<sup>9</sup>
- 25 Southern Cross Care Incorporated (SCC) who owns PKC and other residential aged care facilities was granted to leave to appear in order to make both oral and written submissions. I have considered those submissions when coming to the findings that I have reached.
- 26 I wish to acknowledge the continuous attendance at the Inquest by Millie's family. Not only were they present to hear the oral evidence, but Millie's daughters, Fiona Lockwood and Tracey Carter, and her granddaughter, Ms Jasmine Lockwood, provided statements.<sup>10</sup> The statements were admitted into evidence. This information provided me with an insight into the remarkable life Millie lived, which I have summarised below.

## Hindsight bias

- 27 I warn myself concerning a vital consideration in the assessment of the evidence and any potential criticisms of witnesses in this Inquest, namely hindsight bias.
- 28 A description of 'hindsight bias' is given in the Australasian Coroners Manual, namely:

'The tendency after the event to assume that events are more predictable or foreseeable than they really were. What is clear in hindsight is rarely as clear before the fact. If it were, there would be far fewer mistakes made. It is an obvious point, but one that nonetheless bears repeating, particularly when Coroners are considering assigning blame or making adverse comments that might damage a person's reputation ...

Hindsight, of course, is a very useful tool for learning lessons from an unfortunate event. It is not useful for understanding how the involved people comprehended the situation as it developed. The distinction needs to be understood and rigorously applied.'

- 29 As stated, I am very mindful of this warning when considering the evidence in this Inquest.

## Millie Glenn

- 30 Millie Glenn was born at Glen Helen Station, approximately 200 kilometres west of Alice Springs in the Northern Territory. Her mother was an Aboriginal woman, and her father was a local station owner. Millie's birthdate was recorded as 1 December 1929 but this

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<sup>9</sup> *Annetts v McCann* (1990) 170 CLR 596 at p 601, 608

<sup>10</sup> Exhibit C12

was allocated to her along with the other girls who were removed from their families and institutionalised at Jay Creek mission.

- 31 Millie was taken to a mission named ‘the Bungalow’ when she was three years old, and her mother was forced to leave her there. That mission was relocated to Telegraph Station in Alice Springs and then relocated again when World War II broke out. Millie ultimately ended up at Mulgoa Mission, just outside Penrith, New South Wales.
- 32 When Millie’s first child was born, the baby was removed from her care in the hospital. The baby, named Tracey Carter, was adopted to another family.
- 33 Ms Carter later searched for and found Millie, writing her a letter in the hope of meeting her mother. In 2012, Millie and her two other children met Ms Carter (and her younger sister) for the first time. Ms Carter attended the Inquest along with her other family members.<sup>11</sup>
- 34 Despite the adversity faced in Millie’s life she achieved personal and professional success including:
- Becoming a nurse with a career spanning over 35 years at the Hampstead Rehabilitation Centre;
  - Cooking at St Francis House at Semaphore where boys from ‘the Bungalow’ resided while schooling in Adelaide;
  - Managing a hostel in Millswood for Indigenous girls who lived in rural areas and came to Adelaide to study;
  - Purchasing and paying off her own home.
- 35 Ms Lockwood recalled leaving Adelaide for Canada and that Millie, while sad to see her go, was happy for her to experience the adventure. It subsequently came as a shock to Ms Lockwood when PKC notified her of a sudden decline in Millie’s health. Ms Lockwood described the feeling of helplessness realising that her mother was dying and that she was unable to make it back in time to say goodbye.
- 36 Millie’s granddaughter, Ms Jasmine Lockwood, described her very close relationship with her Nana, seeing her every weekend and attending church with her every Sunday. Millie taught Ms Lockwood to knit, play card games and to cook, as well as educated her about her culture.

‘My Nana was a very loved member of her community; Nana was described as a social butterfly and loved by everyone. Nana would attend the local library and share her story with the community there. What breaks my heart the most is that my Nana did not get to see her 90<sup>th</sup> birthday which she was looking forward to as well as the rest of the family... My Nana did not get to pass down all of her knowledge of song lines, skin names and dreamings, among many other cultural learnings. This does not just impact my generation but my future children’s connection to their Aboriginal culture.’<sup>12</sup>

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<sup>11</sup> Exhibit C13, paragraph 6

<sup>12</sup> Exhibit C11, paragraphs 4-6

- 37 By all accounts, Millie was an inspirational woman who battled unimaginable adversity with incredible spirit and tenacity. The sudden and preventable nature of Millie's death was understandably a source of much pain and grief for her loving and devoted family.

### **Dr Anne Beygirlioglu**

- 38 Dr Beygirlioglu gave detailed oral evidence at the Inquest. She also provided an affidavit.<sup>13</sup> Dr Beygirlioglu obtained her medical degree at the University of Queensland in 2004 and holds fellowships in both the Royal Australian College of General Practitioners and the Australian College of Rural and Remote Medicine.
- 39 Dr Beygirlioglu spent the first six years of practice in rural areas in Queensland providing clinical care to Indigenous communities in Cape York and Masig Island in the Torres Strait, as well as a period as medical administrator in Townsville and Nambour Hospitals.
- 40 Upon moving to Adelaide in 2014, Dr Beygirlioglu took a position as a GP in a North Haven clinic and the following year opened her own general practice, exclusively for aged care residents, called Aged Care Medical Support. During this time, Dr Beygirlioglu attended on patients at a number of different aged care facilities, including PKC at Largs Bay.
- 41 In her oral evidence, Dr Beygirlioglu explained that she developed a particular interest in working with aged care patients and felt that it was an underserved area. Dr Beygirlioglu described it as being a very rewarding field of medicine (which included palliative care) as there was an ability to treat patients holistically.<sup>14</sup>
- 42 With her entire practice focused on aged care facilities, Dr Beygirlioglu explained in her evidence that her workload increased as facilities found it difficult to source GPs working at general clinics, who usually had limited capacity to take on aged care patients. Dr Beygirlioglu felt a responsibility to take on more patients who might otherwise have to rely on casual locums. Her on-call availability was initially 24 hours a day, 7 days a week, which unsurprisingly proved to be unsustainable. Dr Beygirlioglu estimated that at any one time during the period she ran Aged Care Medical Support, she had up to 350 patients at different facilities.<sup>15</sup>
- 43 It was in that context that Dr Beygirlioglu treated Millie for a UTI on 3 October 2019. This came at a time when Dr Beygirlioglu was struggling with her workload and was finding it difficult to take time away from her practice for much needed respite.
- 44 I did not understand that this evidence was given to excuse her role in the medication error that contributed to Millie's death, but rather to provide the context in which it took place. I observed Dr Beygirlioglu to be an honest and reflective witness who apologised to Millie's family during her oral testimony.<sup>16</sup>
- 45 It was evident that Millie's death had a considerable impact on Dr Beygirlioglu. Aged Care Medical Support was closed in 2021, and Dr Beygirlioglu moved to the Northern Territory to practise part-time locum work.

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<sup>13</sup> Exhibit C6

<sup>14</sup> Transcript, page 17

<sup>15</sup> Transcript, pages 19-20

<sup>16</sup> Transcript, page 42

### **Professor Craig Whitehead**

- 46 Professor Craig Whitehead is a consultant geriatrician who has been in consultant practice for 30 years. He is currently appointed as the Regional Clinical Director of Rehabilitation, Aged and Palliative Care in the Southern Adelaide Local Health Network. In his routine clinical practice he sees residents in residential aged care and has experience of managing general medical problems in this frail, elderly population. Professor Whitehead carries out his clinical work at the Repatriation General Hospital, Flinders Medical Centre, Noarlunga Health Service and also at Victor Harbor.
- 47 Professor Whitehead provided a report dated 25 March 2020 which was tendered to the Court.<sup>17</sup> He also gave detailed oral evidence. Professor Whitehead was well-qualified to provide expert evidence and opinion on the areas canvassed in this Inquest and I accept his evidence in its entirety.

### **Millie's medical care and treatment**

- 48 Set out in some detail during the examination-in-chief of Dr Beygirlioglu, and then written submissions filed on her behalf, was the treatment of Millie at the PKC over a period of four years. I will not delve into that level of detail in this Finding as the events leading up to administration of gentamicin were not concerning and of little relevance. However, it is important to mention Millie's recurrent respiratory illnesses as this provides context to Dr Beygirlioglu's postulated decision-making relating to the gentamicin prescription.
- 49 Dr Beygirlioglu's treatment of Millie commenced in October 2015 when Millie first entered PKC for respite care. This was following a hospitalisation for an episode of shortness of breath due to ischaemic cardiomyopathy. This was on a background of cardiac-related issues including a quadruple coronary artery bypass in 2013 and congestive cardiac failure.<sup>18</sup>
- 50 Millie transitioned to permanent residency at PKC in December 2015 due to other health related conditions including limited mobility and the monitoring of regular medications. Dr Beygirlioglu continued to provide Millie with general medical care and came to know Millie well. Dr Beygirlioglu recalled that she and Millie became friendly over these years, with Millie sharing the stories of her interesting life.<sup>19</sup>
- 51 Relevantly, over the course of the year in 2018, Millie suffered several episodes of significant cough and wheeze with production of sputum, sometimes stained with blood (haemoptysis). Investigations were inconclusive but ruled out malignancy. These presentations were treated with different antibiotic medication including roxithromycin, azithromycin and cephalexin.
- 52 Dr Beygirlioglu referred Millie to the Respiratory Clinic at TQEH in January 2019 and she was seen in February 2019. No definitive diagnosis was given. At that review pitting oedema to the knees was noted, with the left more affected than the right.
- 53 On 30 July 2019, Millie was again seen at the Respiratory Clinic, at which time it was noted that her mobility and cognitive function had declined. Bilateral basal lung crepitations were heard and pitting oedema to her knees was again noted, now bilaterally.

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<sup>17</sup> Exhibit C7

<sup>18</sup> Exhibit C6, paragraph 5

<sup>19</sup> Exhibit C6, paragraph 6

It was thought that Millie had pulmonary oedema and an increase in her diuretic medication was recommended. In addition to frusemide, a further diuretic, spironolactone, was commenced.

- 54 I pause here to highlight the contribution of diuretic medication in Millie's overall decline. Diuretics are used to reduce fluid in the body for a number of reasons, but in Millie's case it was due to her condition of congestive cardiac failure (CCF). By way of explanation, the condition of CCF impedes the heart from pumping blood effectively, causing it to back up in the body's vessels. This backup forces fluid out of the blood vessels and into other tissues, leading to swelling (oedema), especially in the legs and feet. Additionally, heart failure can impair the ability of the kidneys to remove sodium and water, further increasing fluid retention, being unable to effectively pump, but can impact on levels of hydration. While Millie's CCF was a chronic condition and the UTI was an acute infection, the diuretics prescribed for CCF (while appropriate for that condition) made Millie more vulnerable to dehydration in addition to the nephrotoxic effect of gentamicin. Professor Whitehead explained:

'So, as is common in medicine and this age group, there's never a single cause. The reality is that Millie would've been very prone to developing acute kidney injury from anything, and diuretic medication - which is furosemide and spironolactone - reduce your blood volume, and that is one of the stresses that can occur to the kidney....So, the issue here is that, at baseline, Millie was highly at risk of developing a worsening of her renal function - and another reason why I would be very cautious about using nephrotoxic agent like gentamicin.'<sup>20</sup>

- 55 On 6 August 2019, Dr Beygirlioglu arranged for bloods to be analysed as suggested by the Respiratory Registrar. Dr Beygirlioglu assessed the results of these tests to reveal '*stable renal function with mild to moderate impairment*'. This was based on a creatinine level of 92 and an eGFR of 48.<sup>21</sup> In her oral evidence, she defined these tests as reflecting stable '*moderate impairment*'.<sup>22</sup>
- 56 The records corroborate the evidence of Dr Beygirlioglu that Millie was trialled on a number of different antibiotics for her recurring respiratory issues and referred for specialist review at TQEH. This was all appropriate care.

### **The urinary tract infection**

- 57 On 26 September 2019, Dr Beygirlioglu reviewed Millie for a wheeze and cough and general malaise. Dr Beygirlioglu prescribed the antibiotic cephalexin to treat a suspected lower respiratory tract infection (LRTI). She also asked for staff to test a sample of Millie's urine for the possibility of infection. This was attempted by the nurse on the same day, but the sample was noted to be contaminated.<sup>23</sup> A nursing entry dated 27 September 2019 recorded that Millie's status had '*medically changed requiring increased nurse monitoring due to a LRTI*'.<sup>24</sup> This was in response to a direction by

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<sup>20</sup> Transcript, page 114

<sup>21</sup> Exhibit C6, paragraph 10, Annexure AB1

<sup>22</sup> Transcript, page 27

<sup>23</sup> Exhibit C3, page 251

<sup>24</sup> Exhibit C3, page 254

Dr Beygirlioglu. She explained that she had specifically asked nursing staff to increase the number of observations to ensure Millie did not deteriorate.<sup>25</sup>

- 58 Over the next few days Millie was noted to improve with the clinical records reflecting that she looked brighter and had attended the dining room for meals. A sample of urine was collected successfully on 29 September 2019. The results from the urine dipstick test were recorded in the following entry of the clinical records:

‘Leucocytes +++, Nitrates ++  
Protein trace ph-5  
Blood -moderate Sp gr 1.025  
MO informed as requested  
Sent to Clinicallabs Pathology as ordered’<sup>26</sup>

- 59 The above results reflected the presence of an infection in Millie’s urine. The reference to a sample being sent to the laboratory was to determine what organism (bacteria) was responsible for the infection, and what antibiotic medication could effectively treat it.

- 60 When Dr Beygirlioglu next reviewed Millie on 2 October 2019, the clinical records reflected that she had finished the course of cephalexin and was ‘*much improved*’.<sup>27</sup> Dr Beygirlioglu explained in her evidence that this was a reference to her respiratory symptoms, but that she was still not fully recovered with other symptoms such as lethargy.<sup>28</sup> A nursing entry below Dr Beygirlioglu’s entry reflected that Millie’s observation chart was to cease as the cephalexin antibiotic therapy had finished and that her observations were within normal ranges.

- 61 Another nursing entry from the same day recorded:

‘Issue:  
Chest infection requiring A/B therapy - Millie medically deteriorated during this period and a Vulnerability Assessment completed. This score identified Millie for increased clinical monitoring due to her risk.

Action:  
AB<sup>29</sup> are now completed. All vital sign monitorings were within normal parameters. Millie did require a stand lifter during this time and was reviewed by the AH team. Millie has returned back to her previous mobility status of physical assistance with mobility/ transfers.

Outcome:  
***Millie has returned to her previous status and no longer requires increased clinical monitoring. Millie’s chest infection has resolved with AB therapy.*** Accident Infection Form Completed.’<sup>30</sup>

- 62 The following day, however, Millie was observed to be drowsy, lethargic and displaying signs of confusion and was not finishing her meals. Her weight was also noted to have dropped seven kilograms in one month. In an entry made by the nurse care coordinator, the urine sample sent to pathology had returned the finding of a bacterial organism

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<sup>25</sup> Transcript, page 31

<sup>26</sup> Exhibit C3, page 256

<sup>27</sup> Exhibit C6, paragraph 12; Transcript page 32

<sup>28</sup> Transcript, page 32

<sup>29</sup> Antibiotics

<sup>30</sup> Exhibit C3, page 260 (emphasis added)

Klebsiella aerogenes. Dr Beygirlioglu was notified of this finding and Millie's son was notified of her weight loss. A 7-day food chart was recorded as being commenced.<sup>31</sup>

- 63 On 3 October 2019, Dr Beygirlioglu attended on Millie and observed that she was lethargic. The urine culture result was noted, and the following entry was recorded:

'Pt lethargic.

MSU m/c/s reported yesterday as multi-resistant Klebsiella aerogenes UTI. 80mg gentamicin IM charted stat then nocte for 9 nights starting tonight.

Ensure adequate oral hydration.

Pt's weight loss noted - this can be accounted for (at least to a significant extent) by the commencement of the current frusemide dose. D/w CM Mary.

Pt is on a weight-loss management plan (see previous notes re diet/dietician/etc) - this is to continue, and a food intake chart commenced and continued for at least 2 weeks. Please put a copy of this chart into my section of the Mancera MO folder after a week so that I may easily review.

Please notify concerns.'<sup>32</sup>

- 64 I pause here to note that in contrast to the monitoring that was instituted at Dr Beygirlioglu's instruction for Millie's respiratory infection (monitoring of Millie's vital signs), a similar regime was not introduced for the gentamicin therapy. Rather, a food intake chart was commenced to ensure that Millie was encouraged to eat and drink. While an appropriate measure in its own right in response to Millie's rapid weight loss, and to watch for dehydration, it did not address the requirement to monitor Millie's physiological response to the gentamicin therapy. This should have taken the form of increased monitoring as was seen for Millie's respiratory tract infection but with the order for regular blood tests. I will come back to this topic later in the Finding when addressing the criticism made against PKC's apparent slow response to Millie's clinical deterioration following the commencement of gentamicin.

### **Delay in collecting urine sample and treating UTI**

- 65 It was submitted that there was a delay in obtaining Millie's urine sample after this was requested by Dr Beygirlioglu. I note that there were attempts to collect it, but due to a number of confounding factors (including incontinence and contamination) the sample which revealed a UTI and then grew the organism Klebsiella aerogenes, was not collected for a period of three days. I understood that this criticism was levelled at the staff of PKC. There was also a suggestion that there was a delay in Dr Beygirlioglu's response to prescribing antibiotic cover for the UTI, before the results of the culture were available.
- 66 I have considered the delay and setting in which a sample of urine was requested. On 26 September 2019 Dr Beygirlioglu had diagnosed Millie with a respiratory tract infection and prescribed cephalexin. While a urine sample was appropriately requested at that time, Millie was already being treated for an infection in her respiratory tract with antibiotics that had broad-spectrum antimicrobial cover.<sup>33</sup>

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<sup>31</sup> Exhibit C3, page 260

<sup>32</sup> Exhibit C3, page 261

<sup>33</sup> Active with respect to gram positive and gram-negative microorganisms

- 67 Further, there were recorded attempts to obtain a sample in the days following the request by Dr Beygirlioglu, but there was no urgency recorded in the notes. An in-out catheter could have been used but, once again, against the background of the antibiotic treatment for the respiratory infection, this most likely seemed unnecessary.
- 68 When a sample was successfully obtained on 29 September 2019 the results of a urine dipstick were recorded and clearly reflected a UTI. Dr Beygirlioglu was notified and instructed that the sample be sent for culture. This occurred swiftly and was appropriately recorded in Millie's records. Dr Beygirlioglu was asked during her evidence why she did not provide antibiotic cover for the UTI while awaiting the result of the culture. She explained that Millie was already in receipt of antibiotics that could potentially treat such infections (cephalexin).<sup>34</sup> However, she did acknowledge that this therapy had been underway for three days when the UTI was diagnosed and was therefore unlikely to have been therapeutic.<sup>35</sup>
- 69 Dr Beygirlioglu waited for the results of the culture which were available on 2 October 2019. Gentamicin was commenced on 3 October 2019. While the process of obtaining the urine sample to the point at which gentamicin was commenced took seven days, I do not consider that it contributed to the adverse outcome. Professor Whitehead referred to this delay as '*far from ideal*'<sup>36</sup> however he balanced this against Dr Beygirlioglu's '*reasonable*' decision to wait for the culture results with the cephalexin antibiotic on board, and the delay in pathology results in an aged care setting.<sup>37</sup> As it happened, the organism found at culture was resistant to cephalexin.
- 70 Finally, there was no evidence that an earlier diagnosis of UTI would have changed the choice of antibiotics which ultimately contributed to Millie's death, rather than infection from the UTI itself. Following the conclusion of the course of gentamicin, it is likely that the UTI had resolved but that Millie was in acute renal failure. While the delay was not ideal, there were reasonable clinical reasons behind it. Accordingly, I am not critical of this aspect of Millie's care by either the staff of PKC or Dr Beygirlioglu.

## Gentamicin

- 71 Gentamicin is an aminoglycoside antibiotic and is used for the treatment of serious infections caused by strains of certain micro-organisms, including *Klebsiella aerogenes*.
- 72 In the monthly publication for prescription and non-prescription medications (MIMS), which was received into evidence, gentamicin has a number of special warnings and precautions for use. Of relevance to the Inquest was the following information from the MIMS publication on gentamicin:

'Gentamicin, as with other aminoglycosides, is potentially nephrotoxic...'

'**Use in renal impairment.** Gentamicin should be used with caution generally in premature infants because of their renal immaturity, in elderly people and generally in patients with impaired renal function';

'**Use in the elderly.** Because of its toxicity, gentamicin should be used with caution in elderly patients only after less toxic alternatives have been considered and/or found

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<sup>34</sup> Transcript, page 84

<sup>35</sup> Transcript, page 85

<sup>36</sup> Transcript, page 110

<sup>37</sup> Transcript, pages 109-110

ineffective ... Recommended doses should not be exceeded, the patient's renal function should be carefully monitored during therapy.' <sup>38</sup>

- 73 Nephrotoxicity is damage to the kidney that results from exposure to a drug, chemical or toxin. Professor Whitehead described the pathophysiological response of the body to gentamicin toxicity in his evidence:

'So, gentamicin, as it accumulates in the body, can precipitate cellular death in the kidney; and that's what's meant by acute tubular necrosis. So, in fact, once that's precipitated that may, to an extent, be irreversible cell death which is - and the kidney has some capacity to regenerate, so you would generally have a period where the kidney stops working all together and then they gradually improve. Now, in a younger person who had the capacity to withstand dialysis - which is very difficult to do in someone like Millie, who has a history of heart failure and her advanced age - you can tie them over that period of time until the kidneys turn back on. But, that's the general time course for gentamicin, so it is something that is best avoided.' <sup>39</sup>

- 74 This explanation was important in the context of Dr Beygirlioglu's decision to prescribe gentamicin. This decision, the route of administration and the length of the course (nine days) was the subject of considerable evidence.
- 75 The pathology report from the urine sample was produced and tendered in evidence. This report detailed the antimicrobial susceptibility, meaning what antibiotic treatment would be effective (or ineffective) against the organism. It was evident from this report that the organism was sensitive to only two antibiotic medications, gentamicin and norfloxacin. One antibiotic was considered an intermediate choice (nitrofurantoin). The organism was deemed resistant to the other alternatives. The report advised:

**'ANTIMICROBIAL SUSCEPTIBILITY:**

	Org 1
Amp/Amoxicillin	R <sup>40</sup>
Amox/clav.acid	R
Cephalexin	R
Trimethoprim	R
Nitrofurantoin	I <sup>41</sup>
Gentamicin	S <sup>42</sup>
Norfloxacin	S

**COMMENT**

Predominant organism in a mixed growth.

Asymptomatic bacteriuria with or without pyuria is common in older females and does not necessarily require antibiotic therapy unless new symptoms develop.

Probable haemolysis of red blood cells.' <sup>43</sup>

- 76 In respect of the decision to choose gentamicin, Dr Beygirlioglu gave evidence that it was her general practice to assess the options when there was a choice with antibiotics. She indicated that when considering gentamicin, she might have been influenced by the

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<sup>38</sup> Exhibit C9, page 5

<sup>39</sup> Transcript, pages 113-114

<sup>40</sup> R = Resistant

<sup>41</sup> I = Intermediate

<sup>42</sup> S = Susceptible

<sup>43</sup> Exhibit C6a, page 2

ongoing nature of Millie's respiratory infections as it was more effective than norfloxacin for that type of infection.<sup>44</sup>

- 77 The difficulty with this explanation was that Dr Beygirlioglu could not remember what her thinking was at the time she prescribed gentamicin, and it occurred at the time when the respiratory infection had been successfully treated with cephalexin. Her evidence was as follows:

'A. I always assess when there is a choice with antibiotics, it may be that I chose gentamicin because Millie had ongoing respiratory issues as well as the urinary tract infection, and gentamicin is more effective against respiratory infections than norfloxacin. It might be, that as you can see here, that the *Klebsiella aerogenes* was a prominent -

Q. When you say 'here', where are we looking, on the lab results.

A. In the lab result. There were other organisms, but *Klebsiella* was the predominant organism in a mixed growth, so there were other organisms there as well, it may be that I considered the gentamicin had a more likely effect against the other organisms.<sup>45</sup>

Q. When you have answered those three questions you have used the words 'might' and 'may'.

A. Yes.

Q. Was that your thinking at the time.

A. I don't at this time remember exactly why I chose gentamicin, I always do assess when there is a different antibiotic so I can choose, I am just thinking that that is likely that that was what I was thinking.

Q. So, you're giving evidence about your general practice and thought processes around the different types of antibiotics.

A. Yes.

Q. Because you don't have a specific memory of exactly why you chose gentamicin.

A. Of exactly why, no.'<sup>46</sup>

- 78 The other issue was that Dr Beygirlioglu did not assess Millie's baseline renal function prior to the commencement of gentamicin. As Millie had chronic renal impairment and gentamicin is nephrotoxic, bloods should have been ordered and assessed to monitor her response to the medication. Dr Beygirlioglu acknowledged that she was aware of this requirement when she prescribed the medication, but was unable to recall why she did not undertake the relevant tests.<sup>47</sup>

- 79 I note that there had been an assessment of Millie's renal function in August 2019, which Dr Beygirlioglu interpreted as revealing moderate renal impairment. However, Dr Beygirlioglu did not resile from her responsibility to exercise care before commencing the new medication, nor the failure to order the same test just prior to the administration of gentamicin. Further, as discussed below, Dr Beygirlioglu's interpretation of Millie's level of renal impairment was called into question by Professor Whitehead.

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<sup>44</sup> Transcript, page 39

<sup>45</sup> Transcript, page 39

<sup>46</sup> Transcript, page 39 and 40

<sup>47</sup> Transcript, page 40

- 80 Finally, Dr Beygirlioglu did not institute monitoring of Millie’s renal function while the nine-day course of gentamicin was being administered. She again acknowledged that this should have been done.
- 81 After prescribing the intramuscular antibiotics and making the entry on 3 October 2019 at 11:18am, as extracted earlier in the Finding, Millie received a stat dose at that time and then another dose later in the evening. The first day of treatment was therefore a 160mg dose. Following that, Millie received another eight days of 80mg of gentamicin *nocte* (in the evening), intramuscularly. Dr Beygirlioglu explained that she chose the dose and the dosing interval using the guidelines for patients with chronic renal impairment produced by the manufacturer.<sup>48</sup>
- 82 Dr Beygirlioglu’s next entry in Millie’s notes was on 15 October 2019. That was 12 days after she had prescribed gentamicin for Millie and three days after the nine-day course of the medication had finished.<sup>49</sup> There had been no monitoring of Millie’s renal function or the levels of gentamicin in her system in this period.
- 83 On 15 October 2019, Dr Beygirlioglu did not physically see Millie on this day as a family member had taken her to a pre-arranged appointment at the Respiratory Clinic at TQEH. However, the note reflected that Dr Beygirlioglu discussed Millie’s presentation with the clinical manager (CM). The entry was recorded as follows:
- ‘Discussed patient’s presentation with CM.  
Pt on weight reduction diet (current BMI 30.6) - intentional weight loss being achieved. However patient’s recent ongoing rejection of normal food/fluids noted. I will review patient with regard to this within the next week (pt currently at Respiratory OPD Clinic).  
Continue current management.  
Please notify concerns.’<sup>50</sup>
- 84 It was evident from this entry that PKC staff had concerns for Millie’s wellbeing, namely her ongoing rejection of normal foods and fluids. Later in the afternoon, Registered Nurse Mary Cotton wrote to Dr Beygirlioglu (presumably by email) to request time to discuss the clinical care of Millie due to her declining food intake, her reduction diet and a recently developed pressure injury to her sacrum. In this communication, she noted that Millie was ‘*slowly declining*’.<sup>51</sup>
- 85 The following day Millie was again recorded as ‘*lethargic, poor oral intake, decline in mobility and decreased alertness*’. In the same entry (at 9:55pm), it was noted that ‘*GP notified of resident’s health decline and has instructed to transfer resident to hospital tonight*’. Millie was conveyed to TQEH, where she later died.

### **The decision to choose gentamicin**

- 86 As touched on above, Dr Beygirlioglu had treated Millie for a number of years at the PKC and was aware of her medical conditions, for which she prescribed a number of medications. This included the diagnosis and treatment of Millie’s renal impairment, her congestive cardiac failure and recurrent respiratory infections.

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<sup>48</sup> Exhibit C6, paragraph 14 and 15; Annexure AB2 – Australian Product Information – Gentamicin Injection BP

<sup>49</sup> Last dose administered on 11 October 2019, Exhibit C3, page 269

<sup>50</sup> Exhibit C3, page 273

<sup>51</sup> Exhibit C3, page 273

- 87 While Dr Beygirlioglu did not recall her reasoning for choosing gentamicin over the other antibiotic, norfloxacin, I have accepted that her evidence on this topic was against the background of her longitudinal treatment of Millie.
- 88 Dr Beygirlioglu accepted that she should have ordered a baseline renal function test and then monitored Millie during the nine-day course. Therefore, the only real dispute that arose on this aspect of the evidence was why Dr Beygirlioglu chose gentamicin over norfloxacin in the first place, although this topic had a number of components to it.
- 89 Dr Beygirlioglu's position, as detailed in the written closing submissions on her behalf, was that it was open to her to prescribe and administer gentamicin to Millie on 3 October 2019 on the basis that it was not contraindicated. Further, that her only failure was to prescribe gentamicin without therapeutic monitoring.<sup>52</sup>
- 90 Professor Whitehead, in his expert report, stated that the choice of gentamicin for the treatment of Millie's UTI was not appropriate. He referred to a number of failings in this report, and stated the following:

'Firstly, I would not have used IM<sup>53</sup> gentamycin for the treatment of this urinary tract infection, particularly as there was an available oral alternative norfloxacin 400mg bd. The use of gentamycin really in patients with renal failure requires close monitoring of both electrolytes and gentamycin levels. In hospital if we were to use repeated doses of gentamycin in a patient we would generally administer one large dose for a lady such as Mrs Glenn. This would be somewhere between 180 and 240mg as a stat dose. We would then monitor her gentamycin levels daily until the trough level had dropped below the therapeutic range, we would readminister another stat dose of gentamycin at that level. This might occur once every three or four days with a renal function impaired as Mrs Glenn's. Administering 80mg for nine days almost certainly led to gentamycin accumulation given her very poor renal function. This would have precipitated renal failure and lead ultimately to her demise. It is not clear why the oral equivalent was not chosen by her GP.'<sup>54</sup>

- 91 There were a number of aspects to this opinion upon which Dr Beygirlioglu and Professor Whitehead gave oral evidence. I will deal with them individually.

### **Renal impairment vs renal failure**

- 92 There was no dispute that Millie suffered from a degree of renal impairment. What was called into question during the Inquest was the level of the impairment as at her last test in August 2019. Dr Beygirlioglu gave evidence that she considered Millie to have a moderate degree of renal impairment.<sup>55</sup> This was based on a number of tests over time, but in particular the results available on 6 August 2019. Professor Whitehead opined that in fact his assessment of this particular set of results (using a different calculation) was that Millie was already in severe renal failure.<sup>56</sup>
- 93 By way of explanation, to assess the function of the renal system, the usual suite of blood tests for general chemistry are taken. Of particular relevance to assess renal function are the tests for creatinine and the eGFR. Creatinine is a molecule that is produced by

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<sup>52</sup> Submissions of Anne Beygirlioglu, paragraphs 83.13 and 84

<sup>53</sup> IM = intramuscular route of administration

<sup>54</sup> Exhibit C7, page 2

<sup>55</sup> Transcript, page 27

<sup>56</sup> Exhibit C7, page 1

skeletal muscle in the body and the amount of creatinine produced is dependent upon the muscle mass of the individual. The other important factor in a creatinine level is how efficient the renal function is in excreting the creatinine from the body through urine.<sup>57</sup> An elevated level can therefore indicate kidney dysfunction.

- 94 In order to translate creatinine into the actual measure of renal function, a test called the Glomerular Filtration Rate (GFR) is used. In clinical practice a series of algorithms are used to estimate the glomerular filtration rate based on the creatinine level which produces an eGFR. The lower the number, the worse the renal function is.
- 95 Professor Whitehead drew the Court's attention to two commonly used ways in which the eGFR is calculated. The first is used by clinical laboratories called the Modification of Diet in Renal Disease (MDRD), which predominantly relies on age in the algorithm based on the premise that the older the individual, the less muscle mass they will typically have. The second method, recommended by Professor Whitehead, was the Cockcroft-Gault Equation, which uses weight, age and an adjustment for gender, as females have a lower muscle mass per weight than men. The reason Professor Whitehead preferred the Cockcroft-Gault Equation was that the simple calculation of merely age used in MDRD ran the risk of systematically overestimating renal function.<sup>58</sup> That was because it did not factor in the patient's gender or very overweight individuals, where there could be an increasing disconnect between weight and muscle mass.
- 96 Professor Whitehead indicated that the possibility of a falsely reassuring renal function test with the MDRD calculation was not widely known in the clinical community. Further, that as Millie was late in life, very immobile and had a higher body mass index, it is likely that her renal function would not have been accurately reflected in the eGFR result reflected in the general chemistry report dated 6 August 2019. This was reported as 45ml per minute. Using the Cockcroft-Gault Equation, Professor Whitehead estimated that her eGFR was more likely to be 27ml per minute, or possibly lower.<sup>59</sup> This was reflective of severe renal failure as opposed to moderate renal impairment as assessed by Dr Beygirlioglu.
- 97 Professor Whitehead explained:

'... So, normal renal function in a fit adult is around 100 to 120ml per minute, I estimated it at 27 but would not have been surprised if it had been lower than that. The unfortunate - well, the reality is that when you reach advanced age with the number of the comorbidities that Millie had, you're very likely to have a degree of renal failure and in my experience [from residential aged care] ... actually seeing patients with severe renal failure is quite common. It's one of the challenges in clinical practice is that you might look at a blood result of 105, which is only just outside the normal range and you might be beguiled into believing that that's relatively normal renal function but we very much teach our students and others and that actually you've got to calculate it and certainly, from a safety point of view, from a prescribing point of view, the single biggest measurement you need to understand if you want to prescribe safely, is the degree of renal function for a patient because many drugs are cleared by the kidney and in this case, particularly gentamicin is absolutely cleared by the kidney and it's one of the drugs where you risk toxicity if using it with significant renal failure, you have to be very cautious.'<sup>60</sup>

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<sup>57</sup> Transcript, page 104

<sup>58</sup> Transcript, page 104

<sup>59</sup> Transcript, page 106

<sup>60</sup> Transcript, page 106

- 98 Professor Whitehead accepted in cross-examination that he was a consultant geriatrician with a specialty expertise in the treatment of the comorbid illnesses of elderly people.<sup>61</sup> He also accepted that Dr Beygirlioglu and others in general practice may not be aware of the different methods of calculating the eGFR and it was not unreasonable for a GP to rely on the results as seen in pathology reports. Further, Dr Beygirlioglu conceded that she did not order a baseline renal function test prior to the commencement of gentamicin therapy and agreed that she should have done so. This would have better informed her as to Millie's renal function at the time the gentamicin was commenced. Therefore, in a sense the eGFR result from 6 August 2019 had limited relevance in respect of the gentamicin prescription.
- 99 However, Professor Whitehead's evidence had wider implications for the prescription and dosages of medications in the elderly which are processed through the kidneys. As he pointed out, it is a safety issue for those clinicians caring for elderly patients who frequently have a level of renal impairment purely by virtue of their advanced age. While I do not consider it necessary to recommend the preference of one calculation over another (as these methods may change and develop over time), I have considered a recommendation is desirable to bring to the attention of GPs the possibility of a falsely reassuring eGFR result in elderly patients, particularly when measured to assess the appropriateness or otherwise of certain medications.

### **The oral alternative - norfloxacin**

- 100 Norfloxacin is a medicine that belongs to the class of fluoroquinolone antibiotics. It is an oral medication and is a broad-spectrum antibiotic agent that is shown to be effective against various Gram-positive and Gram-negative bacterial species.
- 101 Norfloxacin is used to treat bacterial infections of the urinary tract, gynaecological infections, inflammation of the prostate gland and some sexually transmitted infections. It is associated with the following potential side effects:
- Gastrointestinal issues, including increased risk of *Clostridium difficile* associated diarrhoea;
  - Tendonitis and tendon rupture;
  - Cardiac issues such as QT prolongation, especially when used concurrently with other QT-prolonging medicines;
  - Neurological issues including peripheral neuropathy;
  - Adverse psychiatric reactions;
  - Dissection or rupture of an aortic aneurysm.
- 102 Dr Beygirlioglu gave evidence that while she could not specifically remember, she would have considered prescribing norfloxacin (as one of the antibiotics that the organism was shown to be sensitive to). She explained the possible reasons for her decision not to use it:

‘Q. What was it about norfloxacin that the risk outweighed the benefit in prescribing Gentamicin instead.

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<sup>61</sup> Transcript, page 183

- A. I can't remember my thoughts at the time, but there is also a potential adverse renal effect, although not as great as that with Gentamicin, if it's not monitored properly. I don't know. There's tendon rupture risk and Millie did have musculoskeletal issues. There's also the fact that I'd treated her multiple respiratory conditions over and over again with no total resolution, and her respiratory issues had not had a proper, like a definitive diagnosis, and norfloxacin isn't an antibiotic that's used in respiratory conditions. And I think most likely I considered those things. I would have considered those things. I can't remember exactly why I came down with Gentamicin.'<sup>62</sup>
- 103 Dr Beygirlioglu's reference to norfloxacin requiring close monitoring of renal function was unconvincing in light of her chosen antibiotic which carried a much greater requirement for monitoring which was not put into place. That is, if she had considered the monitoring requirements, it would not have favoured gentamicin.
- 104 Further, Dr Beygirlioglu was challenged on her postured consideration of gentamicin being of use for a respiratory infection that had clinically resolved. Her evidence was that it was not the most recent episode that required treatment, rather the recurrence of the episodes.<sup>63</sup>
- 105 Professor Whitehead did not agree with Dr Beygirlioglu's assertion that gentamicin was appropriate for a respiratory infection except in particular circumstances. He expressed the opinion that, while gentamicin was quite commonly used in cystic fibrosis and severe bronchiectasis sufferers (where there is colonisation on the lungs with pseudomonas), Millie's case fell into neither category. Under cross-examination, Professor Whitehead was taken to the Australian Product Information for gentamicin where it stated:
- 'Gentamicin may also be used for the treatment of the following conditions when caused by susceptible organisms: bacteraemia, respiratory tract infections, urinary tract infections, skin and skin structure infections, bone infections, peritonitis, septic abortion and burns complicated by sepsis, Aminoglycosides, including gentamicin are generally not indicated in uncomplicated initial episodes of urinary tract infection unless the causative organisms are not susceptible to less toxic antibiotics.'<sup>64</sup>
- 106 He explained that these guidelines are written by the pharmaceutical industry, and practitioners are not usually guided in their clinical practice by them, preferring the Australian Antibiotic Guideline or the Australian Medicines Handbook.<sup>65</sup> I observed also that Dr Beygirlioglu could only remember referring to the Australian Product Information to set the dosage for Millie and not for any other purpose.<sup>66</sup>
- 107 More generally, Professor Whitehead explained that norfloxacin is a very well-tolerated drug and does not cause renal failure. However, the main reason to restrict its use is to keep it only for organisms that are sensitive to it alone to avoid what is called '*quinolone resistance*' (nofloxacin is a quionolone). He explained that this related to the need to avoid a broader community drug resistance rather than to any concern of the specific toxicity of the drug to an individual.<sup>67</sup> That is, its use should be restricted to where it is needed, rather than wherever it could have an effect. This simply means that when alternatives are available, a careful evaluation must be made to determine the most

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<sup>62</sup> Transcript, page 82

<sup>63</sup> Transcript, page 83

<sup>64</sup> Exhibit C6, Annexure AB2

<sup>65</sup> Transcript, pages 196-197

<sup>66</sup> Transcript, page 81

<sup>67</sup> Transcript, page 118

appropriate option. Professor Whitehead said that Millie's case was a perfectly reasonable example of where the risk to the individual by the use of gentamicin meant that norfloxacin was appropriate, notwithstanding the potential to develop a resistance to that antibiotic.

- 108 Professor Whitehead was challenged on this evidence in the context of the Clinical Guidelines of SA Health in relation to the treatment of UTI.<sup>68</sup> The guideline stated:

‘avoid the use of norfloxacin ... when other antibiotic choices are available as there is rising quinolone resistance in Gram negative bacteria. These antibiotics are the only oral antibiotics available to treat *Pseudomonas aeruginosa*.’<sup>69</sup>

- 109 Mr Kalali of counsel for Dr Beygirlioglu postulated that while the guideline that was tendered in evidence post-dated the events involving Millie, the advice to the medical profession was to avoid norfloxacin in the treatment of UTI, unless treating the specific organism *Pseudomonas aeruginosa*.<sup>70</sup> It was put to Professor Whitehead that if the guidelines were applied in a case like Millie's, with a multi-resistant organism, gentamicin would be the only available choice. Professor Whitehead did not agree. He explained:

‘Well, again – well, I don't agree with that, in the sense that I've already explained my rationale about the difference. There is an indication of there are times that you use quinolones to treat UTIs. We have them there for that purpose. In my mind, this is the time you would do that because of the risks of gentamicin, in a vulnerable person with significant renal failure.’<sup>71</sup>

- 110 To provide context to his answer, Professor Whitehead's earlier evidence on this topic was:

‘So I guess it goes to how you choose a drug as a practitioner, and there are a range of factors that will drive that choice. And absolutely - and this is what this document is driving towards, and certainly is a very prevalent - increasingly prevalent conversation in the last five years amongst the medical community, is about how we avoid antimicrobial resistance. And so avoiding antimicrobial resistance by the avoidance of drugs such as norfloxacin and ciprofloxacin - in fact, even in 2019, the authority guidelines for those drugs where you have to ring up and get authority from the Commonwealth government, you know, it asks for you to justify that there's no other antibiotic that can be used. So that was actually known or discussed in 2019 to an extent. The reality is, though, of course, for an individual, there will be times when the choice of antibiotic will trump the need to avoid resistance; and in my opinion, if you're taking the risk to an individual about using a drug like gentamicin which can have a potentially fatal side effect, versus the broader issue in the community of antimicrobial resistance rather than an individual - 'cos in fact, the issue of antimicrobial resistance is actually a community issue rather than, usually, for an individual - then, you know, for that circumstance, that would be one of the times you would use norfloxacin.’<sup>72</sup>

- 111 In any event, the risk of antimicrobial resistance in the community was not a consideration advanced by Dr Beygirlioglu in her oral evidence.

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<sup>68</sup> Exhibit C8, Urinary Tract Infections (adult): Empirical Treatment Clinical Guidelines Version 2.2; Approval date 27.9.2023

<sup>69</sup> Exhibit C8, page 3 'Key stewardship points'

<sup>70</sup> Transcript, page 192-193

<sup>71</sup> Transcript, page 193-194

<sup>72</sup> Transcript, pages 190-191

- 112 While Professor Whitehead's opinion that gentamicin was inappropriate was premised in part on his assessment of Millie's renal failure, which was not revealed on the face of the Clinicallabs<sup>73</sup> report of 6 August 2019, Dr Beygirlioglu was aware that Millie suffered renal impairment and that gentamicin was the more nephrotoxic agent when compared to norfloxacin. Dr Beygirlioglu was also aware that Millie was prescribed two separate diuretic medications which had the potential to increase Millie's dehydration, and should have increased the need for baseline blood tests prior to the commencement of gentamicin.<sup>74</sup>
- 113 I understood Professor Whitehead to maintain his opinion that norfloxacin should have been the preferred antibiotic for Millie's UTI on 3 October 2019 and not gentamicin. While he accepted that gentamicin could have been used, he highlighted the need for it to be in a different dose schedule and monitored in a hospital environment. He opined:

'I think the point I am making is that this was a situation ripe for risk of renal toxicity from gentamicin because of her pre-existing conditions and the nature of the person – Millie's healthcare status at the time. I think the issue of it not being monitored and no blood measurement, I guess in making that statement, I've wrapped both of those into one comment, which is probably – and I think there's already been some discussion today about how those might be two slightly different separate things; the use of the drug versus the non-use of monitoring. I think, in writing that report I've joined those two together, to split them apart; both are issues in my view. If you were going to use gentamicin, I would not have done it this way and similarly, if I were going to use it, which I would argue I would not in this situation for the reasons outlined, the monitoring was inadequate.'<sup>75</sup>

### **The treatment regime and venue**

- 114 As detailed above, Millie was prescribed a nine-day dose of 80mg of IM gentamicin with a double dose on the first day. Dr Beygirlioglu gave evidence that at the time she prescribed gentamicin to Millie she was aware of what should have been put into place. At a minimum, Dr Beygirlioglu should have ordered a baseline renal function test, then ordered bloods to be taken every second day, sent to Clinicallabs, returned, interpreted and acted upon. I understood Dr Beygirlioglu's evidence on this topic to be prefaced on this regime occurring in an aged care setting.<sup>76</sup> There was no evidence before the Court that Dr Beygirlioglu contemplated Millie receiving this treatment in a hospital setting.
- 115 While Professor Whitehead did not resile from his opinion that norfloxacin should have been the preferred choice of antibiotic, he too gave evidence about the dose and administration route he would have used had he decided that gentamicin was appropriate. Though similar to that detailed by Dr Beygirlioglu, there were some important differences; the dose, the route of administration and the venue.
- 116 Focusing on what would have occurred in 2019, Professor Whitehead explained that if gentamicin was to be used, it would have been done in hospital with one dose given intravenously, lasting three or four days with oral norfloxacin concurrently. This would be monitored with regular blood test results, received within six to eight hours of them being measured, a review of the patient daily and adjustments to the medications in accordance with the blood results. He also highlighted that this regime would be difficult

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<sup>73</sup> Australian Clinicallabs is the pathology service used by PKC

<sup>74</sup> Transcript, page 139

<sup>75</sup> Transcript, page 207

<sup>76</sup> Transcript, page 76

in an aged care setting. In the context of Millie's treatment, this was unnecessary as an effective oral alternative was available that did not require that level of monitoring.<sup>77</sup> He also highlighted the importance of gentamicin being administered intravenously, therefore requiring IV access, as the absorption profile of IM administration was variable. If the aim was to hit the infection hard with a large dose of a strong antibiotic, an IM route would be less effective in achieving this goal.<sup>78</sup>

117 At the time Professor Whitehead gave his evidence (2024), he acknowledged that there had been an evolution in the services provided to aged care facilities, such as the Hospital at Home program which would now be able to administer a single dose of gentamicin with that support (as detailed above) in place. However, it was clear that the Hospital at Home program provided an additional clinical service over and above the standard low acuity care provided in an aged care facility, and certainly a greater level of monitoring than was provided to Millie in 2019.

118 Ultimately, I observed Dr Beygirlioglu to give evidence genuinely as to her belief that she thought gentamicin was an appropriate medication for Millie at the time she prescribed it. Dr Beygirlioglu maintained during her oral evidence that her error was not in the choice of antibiotic, but the failure to institute a regime of monitoring the effect of the medication following each administration. She stated:

‘I believe that gentamicin was an appropriate antibiotic. In hindsight norfloxacin may have been a better choice, but I believe that gentamicin was an appropriate antibiotic. I believe where the danger came was due to my failure to monitor it.’<sup>79</sup>

119 In light of that evidence it was established, and I accept, that gentamicin was not strictly contraindicated with Millie's condition,<sup>80</sup> and that if her renal function had been monitored after the institution of the medication, it is likely to have been appreciated that it was having harmful effects at some earlier time. However, as Professor Whitehead highlighted, the monitoring of such a medication should have occurred in a hospital environment where adverse side effects could be observed more closely than in an aged care setting. This is particularly so given Millie's other medical conditions for which she was prescribed medication that increased her risk of dehydration and put more pressure on her ailing renal system. In contrast, norfloxacin was able to be given in tablet form, was a susceptible antibiotic and would have been effective. Therefore, notwithstanding the lack of strict contraindication, I do not consider gentamicin to have been an appropriate choice in Millie's circumstances. Gentamicin was simply too potent a drug to be given to an elderly frail woman with a number of medical conditions who was then left in an aged care environment without a strict monitoring regime.

120 Taking into account Dr Beygirlioglu's years of experience as a GP, I have found it difficult to accept that if Dr Beygirlioglu had seriously turned her mind to the alternative antibiotic norfloxacin, she would still have prescribed gentamicin. This was evidenced in the lack of monitoring put into place and the environment in which the medication was given. Had this thought process taken place, there was simply no compelling reason to

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<sup>77</sup> Transcript, page 115

<sup>78</sup> Transcript, page 129

<sup>79</sup> Transcript, page 92

<sup>80</sup> Transcript, page 203

prefer gentamicin over norfloxacin, and Dr Beygirlioglu would either not have chosen it, or would have put a strict monitoring regime in place.

- 121 The events that ultimately transpired were consistent with Dr Beygirlioglu addressing the infection with a potentially suitable antibiotic but not having seriously considered the alternative antibiotic available to her, or the likely adverse effects of the antibiotic chosen in the context of Millie's underlying natural disease and existing medication regime. Dr Beygirlioglu's explanation of her crushing 60-hour-a-week work schedule and continuous on-call obligations over this period provided a context within which this error occurred.
- 122 When taking into account Millie's advanced years, her underlying chronic renal impairment and congestive heart failure (for which she was prescribed diuretics), the risk of adverse side effects was simply too great. Gentamicin should not have been prescribed to Millie on 3 October 2019. There was a safer, effective alternative which could have been prescribed to enable Millie to remain at the PKC during treatment, a desire she had expressed in her Advance Care Directive.<sup>81</sup>
- 123 For the reasons that I have stated above, the errors made by Dr Beygirlioglu were in fact threefold; firstly in the prescribing of gentamicin (in the face of a safer alternative) secondly when she did prescribe gentamicin, the failure to order a set of baseline bloods to establish renal function, and thirdly, the failure to monitor Millie by way of putting into place regular blood test monitoring.

### **Millie's deterioration**

- 124 I turn now to the period commencing 3 October 2019 to 15 October 2019. In this period of time Dr Beygirlioglu was not contacted by PKC staff and only became aware of concerns about Millie on 15 October 2019. Based on Millie's declining interest in food (which she had previously enjoyed) and then fluids, continued fatigue, the question was posed – should the aged care facility staff have escalated her care at an earlier time, thereby potentially preventing her death?
- 125 There were two potential opportunities raised by counsel for the family to have escalated Millie's care; 8 October 2019 and 12 October 2019.
- 126 Submissions on behalf of PKC observed that the argument advanced by the family (staff failed to detect that the UTI was not resolving or improving and call the GP) neglected to address the anterior questions of the appropriateness of the prescription for Millie, and the capability of adequate monitoring of that prescription in an aged care setting.<sup>82</sup> I accept that if gentamicin had not been prescribed there would not have been the need for close monitoring in the context of the alternative antibiotic, norfloxacin. However, I consider the issue of the choice of gentamicin to be separate from the PKC's responsibility to Millie to detect a deterioration.
- 127 I have found that gentamicin should not have been prescribed. But Dr Beygirlioglu did prescribe it and agreed that in doing so, she should have put into place certain instructions for monitoring. She did not. The question therefore arose, in the absence of those specific

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<sup>81</sup> Exhibit C3, page 467 – '*I prefer to stay here in the RACF if my comfort and treatment can be provided here. Please send me to hospital if it cannot be maintained.*'

<sup>82</sup> Submissions of Southern Cross Care (SA, NT & Vic), prepared by Ms K Waite, dated 23 April 2024, paragraphs 7-12

instructions, was there nonetheless a failure by PKC staff to detect a deterioration in Millie between 3 and 15 October 2019, knowing that she had a UTI for which she was receiving antibiotics.

### 3 October - 8 October 2019

- 128 As touched on earlier in the Finding, when Millie was diagnosed with a respiratory tract infection on 26 September 2019 there was increased clinical monitoring by the nursing staff for the period Millie was on cephalexin therapy. The increased clinical monitoring was specifically requested by Dr Beygirlioglu for the respiratory illness. When that course finished, so too did the monitoring, as Millie's observations were within normal ranges. The entry stated (in part):

'Millie has returned to her previous status and no longer requires increased clinical monitoring. Millie's chest infection has resolved with AB therapy.'<sup>83</sup>

- 129 This was evidence that PKC did have in place strategies to manage higher acuity issues when specifically directed to by the doctor. For the respiratory illness, Millie was highlighted as a '*resident at risk*' on the morning reads and the Seven-Day Handover Sheet.<sup>84</sup>

- 130 In contrast, When Dr Beygirlioglu ordered gentamicin for Millie for the recently diagnosed UTI, other than a request for '*ensure adequate hydration*', she did not request monitoring for Millie's response to the medication. Dr Beygirlioglu explained that the reference to '*ensure adequate hydration*' was an instruction to push fluids to ensure Millie did not become dehydrated.<sup>85</sup> However, it was not a specific warning to nursing staff to link with the risks of gentamicin. In addition, and rather confusingly, Millie had recently been placed on a food restriction diet by the dietician which was also referred to in the same entry about Millie's weight loss. This was attributed to the diuretic medication by Dr Beygirlioglu. This was by no means a straightforward picture. In fact, it likely clouded the ability of the care staff to clearly identify the subtle signs of decline. Other than '*notify me of any concerns*', there was nothing to sign post to those caring for Millie in the aged care facility of what in particular those concerns might be.

- 131 Dr Beygirlioglu gave evidence that she held certain expectations (quite reasonably) of nursing staff to monitor a patient who had been diagnosed with a UTI for continued signs of lethargy, confusion and inadequate fluid intake.<sup>86</sup> Professor Whitehead agreed that this was the role of nursing staff generally speaking, and that if Millie was not improving on day four or five of the antibiotic therapy, that would be concerning.<sup>87</sup> However, he tempered this evidence with the view that it was good clinical practice for the GP to be specific about what concerns the staff were to look for.<sup>88</sup> He also highlighted the difficulty of managing patients who were in receipt of aggressive medical treatment in an aged care setting, as these patients were often cared for by non-professional staff who then pass on information to the clinical staff (enrolled and registered nurses).<sup>89</sup>

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<sup>83</sup> Exhibit C3, page 260

<sup>84</sup> Exhibit C3, page 254

<sup>85</sup> Transcript, page 55

<sup>86</sup> Transcript, page 68

<sup>87</sup> Transcript, page 157

<sup>88</sup> Transcript, page

<sup>89</sup> Transcript, page 140

132 In addition, throughout this period, there were entries commenting on Millie's wellbeing; 'slept well', 'settled and comfortable',<sup>90</sup> 'feeling well and in good spirits', 'still sleepy at times but much brighter than past few days'.<sup>91</sup>

133 Millie's lack of appetite over this five-day period was noted in the clinical records but not afforded any particular significance. As highlighted by Professor Whitehead, the real clue in Millie's decline was in her blood picture, which was not being monitored. He was asked:

'Q. Do you say from your review of the Phillip Kennedy Centre notes that there was an indication for Milly to have been sent to the Queen Elizabeth Hospital or another tertiary hospital on the 8th of October.

A. Just to underpin the things in my reasoning, I think by the 8th she was not eating as well but I think the not drinking at all was by the 12th. I think it's a much harder decision for this care staff to have made on the 8th. Again, it comes back to that issue about monitoring and that in this situation you need blood tests rather than clinical observations and I think if blood tests had been taken on the 8th I reckon absolutely she would have been - gone and sent to hospital because I'm sure they would have been abnormal.'<sup>92</sup>

134 The significance of this period, in particular 8 October 2019, was two-fold. Firstly, it was the date Professor Whitehead indicated that Millie should have started to improve from the antibiotic therapy, and secondly if nursing staff had contacted Dr Beygirlioglu to raise concerns, and a blood test was ordered, it would have revealed an abnormal renal picture. Millie could then have been transferred to hospital. Had this all occurred at that juncture, the damage to Millie's renal system could have been reversible.<sup>93</sup> He indicated that at this time 'it was certainly more likely that it could have been reversed ... [but] not guaranteed'.<sup>94</sup>

135 The lack of specific instruction from Dr Beygirlioglu relating to the gentamicin therapy, the conclusion of the increased monitoring following the cephalexin therapy, and the fact that Millie remained in the low acuity aged care environment while in receipt of an aggressive medical treatment, were all factors that would have been reassuring to carers and nursing staff. Millie's wellbeing was also observed in mostly positive terms. Accordingly, I am not critical of the care provided to Millie in this period by the staff at PKC.

### 9 October – 15 October 2019

136 Following on from 8 October 2019 to 15 October 2019, there was more persuasive evidence that Millie's condition was not improving and was in fact declining.

137 On 9 October 2019, Millie continued to refuse most of her meals and was requiring encouragement to drink. Over the days that followed there were no further references to Millie being in good spirits, just that she was sleepy (but easy to rouse) and refusing food and fluid.<sup>95</sup> The entries over this period also revealed an increase in pressure sores which

<sup>90</sup> Exhibit C3, page 263 (5-6 October)

<sup>91</sup> Exhibit C3, page 266 (7 October)

<sup>92</sup> Transcript, page 163

<sup>93</sup> Transcript, pages 160, 163, 166

<sup>94</sup> Transcript, page 162

<sup>95</sup> Exhibit C3, page 270 (12 October)

required the application of dressings and implementation of wound charts. This was unsurprising given her increased drowsiness and decreased mobility.

- 138 On 14 October 2019, a registered nurse made an entry marking the completion of the gentamicin therapy and recorded that the UTI had resolved.<sup>96</sup> Later that day, an enrolled nurse recorded that Millie refused most of her diet, her fluid intake moderated and that she refused her medication.<sup>97</sup> By 15 October 2019, there was concern from nursing staff recorded in the note by Dr Beygirlioglu, extracted below.
- 139 While I have separated these two periods of time in order to consider preventability, the later period cannot be divorced from the earlier period when considering Millie's response to the antibiotics and her overall clinical picture. It was clearly documented that gentamicin was commenced on 3 October 2019 and finished on 14 October 2019. It was also noted that the UTI had resolved. In that context, something else must have been awry, and awry for a number of days. That gave weight to the submission that nursing staff should have escalated Millie's care in that later period.
- 140 The most obvious period fell between 12 and 14 October 2019, where Millie was recorded as being lethargic and, on four separate occasions, refusing most diet and fluids.<sup>98</sup> These observations were recorded by an enrolled nurse rather than a carer. Concerns were raised on 15 October 2019 with the Care Manager, who then spoke with Dr Beygirlioglu. Once again, the weight reduction diet was mentioned. The entry stated:

'Discussed patient's presentation with CM.

**Pt on weight reduction diet (current BMI 30.6) - intentional weight loss being achieved.** However patient's recent ongoing rejection of normal food/fluids noted. I will review patient with regard to this within the next week (pt currently at Respiratory OPD Clinic).

Continue current management.

Please notify concerns.'<sup>99</sup>

- 141 Had Millie not been on a weight reduction plan at the same time as the gentamicin therapy; it is possible that the staff may have been alerted to her reduced oral intake earlier. Although, even with the concern being raised, there did not appear to be any real urgency by Dr Beygirlioglu expressed in her entry on this occasion. In fairness, Dr Beygirlioglu was unable to assess Millie on this occasion, as she was at an outpatient appointment.
- 142 Later that day, a registered nurse emailed Dr Beygirlioglu asking to discuss Millie's clinical care as she was '*slowly declining*'. This was the escalation that ultimately saw Millie transferred to hospital the next day.
- 143 Submissions on behalf of PKC inferred that from 12 October 2019 onwards, it was becoming apparent to nursing care staff that Millie was not eating and there had been a decline in her fluid intake.<sup>100</sup> The submissions highlighted that an escalation of care to

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<sup>96</sup> Exhibit C3, page 270

<sup>97</sup> Exhibit C3, page 271

<sup>98</sup> Exhibit C3, pages 270-272

<sup>99</sup> Exhibit C3, page 273 (emphasis added)

<sup>100</sup> Submissions of Southern Cross Care (SA, NT & Vic), prepared by Ms K Waite, dated 23 April 2024, paragraph 38

hospital from that point would not have prevented Millie's death, with the renal damage being irreversible.<sup>101</sup> That was Professor Whitehead's expert opinion, which I accept.

144 With that said, there was certainly an opportunity for nursing staff to have contacted Dr Beygirlioglu with their concerns before 15 October 2019. As touched on above, there were concerning features recorded between 12 and 14 October 2019.

145 Conversely, I remind myself that Millie was 89 years old and had a number of comorbidities. As Professor Whitehead observed, one of the challenges about care at this end of life is that detecting deterioration is not always straightforward.<sup>102</sup> It is difficult with this picture in mind, certainly from the perspective of PKC staff, not to return to the lack of direct instructions from Dr Beygirlioglu on the dangers of gentamicin therapy in an aged care setting, particularly when Millie's observations (oxygen saturations, temperature, blood pressure and respiratory rate) were within normal limits.

### Food and fluid charts

146 Another tool to monitor Millie's wellbeing, as highlighted by Professor Whitehead, was to accurately monitor oral intake, in particular fluids. When ordering gentamicin, Dr Beygirlioglu requested PKC staff to commence a food intake chart for at least two weeks. This was not requested in the context of the gentamicin therapy but occurred concurrently. Dr Beygirlioglu speculated that it related to the long-term weight loss management plan and a concern that Millie's intake was decreasing.<sup>103</sup> There was also the direction from Dr Beygirlioglu to PKC staff to '*ensure adequate hydration*' in the context of Millie's UTI.

147 In some detail, Professor Whitehead was taken to the Day Food and Fluid Chart. While he was not critical of the way in which her food intake was documented, Professor Whitehead expressed concern relating to the fluid intake. He explained:

'...I would describe this as a food chart, not a food and fluid chart. I mean obviously it's semantics. So when I would request a food chart I would be requesting, you know, volume of food eaten at meal times, which is what this document is. Obviously people drink in between that time and that's in no way documented. And obviously - in fact the majority of fluids you would take actually would be in between meals in the average person. And as I mentioned before, this is where we get into the difficulties about what's the quality standard for an aged care provider in terms of measuring fluid intake, because it's not prescribed by the commonwealth is my understanding ... In practical terms, however, you would need to see a volume of liquid consumed in a day. You can estimate volumes of fluid that come from food because obviously about a bit under half of your food, actual water in the day comes from the food you consume. The other half comes from what you drink, but we would be interested in the volume of liquid that she consumed over that time period. In my experience of looking in files of aged care, it's very variable to see it documented, actually volumes of liquid. In fact that's probably the exception rather than the rule...' <sup>104</sup>

148 Professor Whitehead gave evidence that in addition to the unreliable nature of a food chart (to measure fluid intake), there was also the observation that this was likely to have been completed by the carer, who would be responsible for assisting with meals. This circled back around to the point he made earlier in his evidence, that there was an extra layer of

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<sup>101</sup> Transcript, page 163

<sup>102</sup> Transcript, page 151

<sup>103</sup> Transcript, pages 60-61

<sup>104</sup> Transcript, page 145

communication in an aged care facility, from carer to clinical staff member to the doctor, which did not occur in hospital environments, creating more room for error.<sup>105</sup>

- 149 Professor Whitehead was of the view that a fluid balance chart could have been helpful in Millie's situation, in order to set a parameter from a deterioration point of view. However, it would have been difficult to write a highly structured policy around the subtle changes experienced by Millie after the administration of gentamicin. Most deterioration policies focus on changes in vital signs.<sup>106</sup>
- 150 It was acknowledged in the submissions of PKC that the deficits in documentation, most relevantly the ability to accurately measure fluid intake, has been independently addressed by Southern Cross Care, leading to the change from iCare to the implementation of a Person Centred Software system that enables fluid measuring and charting for monitoring where required, and flags where inadequate intake has occurred.<sup>107</sup> I consider this to adequately address the general issue of monitoring fluid intake in aged care residents.

## Conclusions

- 151 The findings I have made are set out in accordance with the issues above. I have come to these conclusions on the basis that I am comfortably satisfied each of them were established on the evidence.
1. Millie was an 89-year-old Aboriginal woman with comorbid illnesses not uncommon in her age group.
  2. She was a resident in the Phillip Kennedy Centre aged care facility at Largs Bay.
  3. Dr Beygirlioglu was Millie's regular GP at the PKC from 2015 to 2019.
  4. Millie had congestive cardiac failure for which she was prescribed spironolactone, carvedilol and frusemide.
  5. Millie suffered a degree of renal failure.
  6. Millie's renal failure was reported in the Clinicallabs report as reflecting a moderate degree of renal impairment in August 2019.
  7. It was reasonable for Dr Beygirlioglu to rely on this report in the interpretation of Millie's renal function as of August 2019.
  8. Millie had recurrent respiratory infections for which she received different antibiotic therapy over time.
  9. On 26 September 2019, Dr Beygirlioglu prescribed her cephalexin for a LRTI. A sample of urine was requested by Dr Beygirlioglu.

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<sup>105</sup> Transcript, page 177

<sup>106</sup> Transcript, page 181

<sup>107</sup> Submissions of Southern Cross Care (SA, NT & Vic), prepared by Ms K Waite, dated 23 April 2024, paragraph 27

10. Dr Beygirlioglu requested nursing staff increase the clinical monitoring for the LRTI which was duly recorded in the notes.
11. Attempts were made to obtain a urine sample on 26 and 27 September 2019 with a successful sample collected on 29 September 2019. A dipstick test revealed the presence of an infection. Dr Beygirlioglu was notified and requested that it be sent to the laboratory for culture. This was all appropriate care.
12. On 2 October 2019, the results of the culture revealed the presence of an organism, *Klebsiella aerogenes*. The pathology report detailed that the organism was only susceptible to two antibiotics - gentamicin and norfloxacin.
13. This was at the same time as an entry in the clinical records reflected increased monitoring was to cease as the respiratory infection had resolved.
14. Dr Beygirlioglu prescribed gentamicin therapy to be given in a stat dose and then nine days of 80mg intramuscularly.
15. Based on Millie's renal impairment and the diuretic medication she was taking for congestive cardiac failure, Dr Beygirlioglu should not have prescribed gentamicin which was nephrotoxic.
16. Dr Beygirlioglu should have prescribed norfloxacin, the oral antibiotic.
17. When Dr Beygirlioglu did prescribe gentamicin, she should have undertaken the following:
  - a. Ordered a baseline renal function test to assess Millie's renal function prior to the commencement of gentamicin;
  - b. Ordered regular blood tests to monitor Millie's response to the gentamicin therapy;
  - c. Considered sending Millie to hospital for the gentamicin therapy to be administered.
18. Following the order for gentamicin therapy, Dr Beygirlioglu requested the PKC staff to ensure adequate hydration and call her with any concerns. This direction was inadequate in the face of an aggressive treatment in an aged care setting.
19. Had Dr Beygirlioglu prescribed norfloxacin instead of gentamicin, Millie's death would have been prevented.
20. If Millie's care had been escalated from PKC to hospital on or before 8 October 2019, there was an opportunity to have prevented her death. There were however no obvious clinical indications of her deterioration by this time.
21. Between 12 and 14 October 2019, there were more obvious signs of Millie's decline. Even if PKC staff escalated Millie's care in this timeframe, the damage to her renal system was, on balance, not reversible.

## Recommendations

- 152 Pursuant to section 25(2) of the Coroners Act 2003 I am empowered to make recommendations that in the opinion of the Court might prevent, or reduce the likelihood of, a recurrence of an event similar to the event that was the subject of the Inquest.
- 153 As highlighted by counsel for Dr Beygirlioglu, the Inquest into the death of Millicent Glenn served as a timely reminder to general practitioners, particularly those working in aged care, of the appropriate use of the antibiotic gentamicin in comorbid patients with renal impairment.
- 154 I make the following recommendations directed to the Royal Australian College of General Practitioners and the Australian College of Rural and Remote Medicine.
1. That the general practice community is alerted to the risks involved in the prescription and/or administration of gentamicin in a non-tertiary hospital setting and the importance of monitoring.
  2. That the general practice community is alerted to the dangers of falsely reassuring renal function results (eGFR) as reflected in pathology reports when prescribing nephrotoxic antibiotics.
  3. That the general practice community is alerted to the need for accurate fluid observation charts when treating aged care patients who are at risk of dehydration and renal failure.

## Acknowledgments

- 155 I acknowledge the valuable assistance of all counsel in the Inquest.
- 156 I would like to convey my sincere condolences to the family and loved ones of Millie.

*Keywords: Aged Care; Gentamicin Therapy; Renal Failure*