CORONERS ACT, 2003

SOUTH *AUSTRALIA*

FINDING OF INQUEST

An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 24th, 25th, 26th, 27th, 28th and 31st days of October 2016, the 1st day of November 2016, the 7th, 8th and 9th days of March 2017, the 19th day of April 2017 and the 10th day of August 2017, by the Coroner's Court of the said State, constituted of Mark Frederick Johns, State Coroner, into the death of Stephen Herczeg.

The said Court finds that Stephen Herczeg aged 72 years, late of 11 Himalaya Drive, North Haven, South Australia died at The Queen Elizabeth Hospital, 28 Woodville Road, Woodville, South Australia on the 19th day of September 2016 as a result of bilateral pneumothoraces and pneumoperitoneum due to insufflation of the bladder with rupture with contributing infective exacerbation of chronic obstructive pulmonary disease. The said Court finds that the circumstances of his death were as follows:

1. Introduction

1.1. Mr Stephen Herczeg was 72 years of age at the time of his death on 19 September 2016. He died at The Queen Elizabeth Hospital in very unusual circumstances. An autopsy was carried out by Dr Stephen Wills of Forensic Science South Australia and he produced a post-mortem report[1] giving the cause of death as:

> 'Ia Bilateral pneumothoraces and pneumoperitoneum
> Ib Insufflation of the bladder with rupture
> II Chronic obstructive pulmonary disease'

I find the cause of Stephen Herczeg's death to be bilateral pneumothoraces and pneumoperitoneum due to insufflation of the bladder with rupture with contributing infective exacerbation of chronic obstructive pulmonary disease.

[1] Exhibit C14

1.2. Dr Wills gave evidence at the Inquest. He said that in addition to a ruptured bladder and bilateral collapsed lungs with gas present in the peritoneal cavity, X-ray examination revealed gas in the subcutaneous tissues in these areas. Dr Wills was asked about the gas in the subcutaneous tissues and what caused it to be there. He replied:

> 'I mean - I mean, anything that causes gas to go underneath the skin. You can sometimes see it in trauma or again, or anything that induces gas particularly under pressure within the body, it can percolate through the - through the tissue plains under the skin.' [2]

1.3. Dr Wills also expressed the opinion that the gas in this case was not caused by putrefaction[3]. He explained that in addition to the large spaces of gas around the organs and in the abdominal wall and in the subcutaneous tissues, Mr Herczeg's abdomen was distended, expanded and tight. Dr Wills also found gas within the penis and scrotum. There was some haemorrhage within the bladder wall where the rupture was found. Dr Wills thought the evidence suggested that the rupture to the bladder occurred while Mr Herczeg was alive. Dr Wills explained the sequence of events as follows:

> 'Firstly, the bladder ruptured and gas went into the tissue and within the abdominal space and that gas has then worked its way through into both sides of the chest. This has caused the heart to displace and for the lungs to collapse.' [4]

Dr Wills said that his principal finding was the very severe collapse of Mr Herczeg's lungs and the amount of gas within the abdomen. In effect, the mechanism of death was respiratory failure.

1.4. Mr Herczeg was found to have an oxygen supply tube which, if fitted at all, should have been fitted to his nasal cannulas. Instead it was fitted to the urinary catheter which was meant to be draining his bladder. This Inquest attempted to determine how the oxygen tubing came to be connected to the urinary catheter and I will come to that shortly. However, there is no doubt that it was connected and it was this connection which allowed gas, namely oxygen, to enter Mr Herczeg's bladder. The oxygen filled his bladder and caused it to burst or rupture. From there the oxygen filled the abdomen, pressed against the diaphragm and eventually caused the collapse of Mr Herczeg's lungs and the displacement of his heart.

1.5. Mr Herczeg's death was horrific. It was traumatic and there is no doubt that Mr Herczeg was in severe pain as a result of the mechanism of death. It is plain that

[2] Transcript, page 25
[3] Transcript, page 26
[4] Transcript, page 31

when gas enters a confined space and continues to fill it under pressure, considerable forces are exerted. In the awful and macabre circumstances of Mr Herczeg's death his body filled much like a balloon, causing internal disruption. The pressure of the gas prevented him from being able to fill his lungs and he died because he could not breathe.

1.6. Leaving aside the obvious pain and distress that would arise from the filling of one's body with a foreign gas under pressure with sufficient forces exerted to cause these internal disruptions, the other obvious source of pain was the rupture of the bladder. Indeed, the pain of the rupture would have been preceded by the pain of the filling of the bladder with gas and the obvious discomfort that would have caused.

1.7. There was evidence that Mr Herczeg was yelling and screaming before he was discovered in a state of collapse by the staff on Ward S1 at The Queen Elizabeth Hospital who became aware of the situation from the screams.

1.8. It goes without saying that this event should not have happened. Mr Herczeg came into hospital in the early hours of the same day as a result of what turned out to be a urinary tract infection. Such a condition should normally lead to an uncomplicated admission with the discharge of the patient following treatment. It would not normally be expected to result in death in a public hospital, and certainly not a death from traumatic injury as occurred in Mr Herczeg's case.

1.9. There was a considerable amount of photographic evidence showing the oxygen tubing and the catheter line and the associated drainage tubing and bags. Real evidence was placed before the Court[5] in the form of examples of oxygen lines, joiners, catheters and urinary draining tubing.

1.10. While he was in the ward Mr Herczeg was receiving oxygen via nasal cannula from the oxygen supply at the bedside. He also had an indwelling catheter to drain his bladder. The catheter had been inserted during a previous hospital admission approximately a month prior to 19 September 2016. He had been at home between those two admissions with the catheter insitu, draining urine. It was the presence of these two modes of treatment, the oxygen supply and the indwelling catheter, that set the scene for what happened in this case.

[5] Exhibit C15

2. How did it happen?

2.1. Clearly the most pressing issue at this Inquest was to answer the question, how the oxygen supply came to be connected to Mr Herczeg's catheter? From an examination of the photographs and the real evidence in this case I can conclude that it is a complex mechanical task to rearrange these devices, properly connected, to achieve the disastrous result that occurred in this case. The oxygen connection consisted of the nasal cannula which is two prongs which supply each nostril and which are moulded into a single tube which can be connected to the oxygen supply at the wall. In Mr Herczeg's case there was an extension line attached to the nasal cannula device. The nasal cannula tube was connected via a male to male connector to the extension tube which was in turn connected to the spigot at the wall. The indwelling catheter was a tube inserted into the bladder via the penis. The tube is approximately 30cm long with a narrow end which is intended to be introduced into the bladder. At the other end of the device there are two openings. One of those is for the introduction, via a syringe, of fluid which is intended to fill a balloon at the other end of the tube to stop the device from being pulled out of the bladder. The remaining opening is that through which the urine drains. That opening is connected to the drainage bag via a tube which has a male connector at the end. The diameters of the urine drainage tube and the oxygen tube are different, the latter being narrower. Nevertheless, it appears that it is still possible to connect one to the other via a male to male connector.

2.2. The following steps were necessary to cause this event. Firstly, it was necessary to disconnect the urine drainage tube from the opening of the indwelling catheter. It does not require a large amount of force to pull the opening of the catheter off the connector attached to the drainage tubing. The catheter itself is a rubbery, very pliable and soft material which is quite stretchy. However, for this reason, it does tend to grip the connector quite securely for obvious reasons. If one were to attempt to disconnect the connector from the tube simply by pulling on the connector there is no doubt that the patient would feel some considerable pain because of the stretching of the catheter tube within the penis, and the pulling of the expanded end of the catheter within the bladder against the resistance of the urethra through which the inflated end of the catheter could not travel. It follows that the disconnection of the urinary drainage bag from the catheter could only be effected using two hands in order to avoid an amount of pain that likely would have resulted in Mr Herczeg calling out in distress. It is clear that this

event could have only occurred by human agency. The possibilities are that Mr Herczeg himself effected these manoeuvres or that they were done by the hand of some other person. In either case, I am of the opinion that the process would have taken two hands in order to avoid pain that would have either caused Mr Herczeg to protest if the manoeuvre was being undertaken by someone other than him, or that would have caused him to desist if he was doing it himself. If it was to be done using two hands, then it was necessary to locate the hands one on the catheter itself towards the ending, and the other on the drainage tube near where it entered the catheter.

2.3. Secondly, but not necessarily in this order, it was necessary to disconnect the oxygen tube where the extension tube connects to the end of the tube feeding the nasal cannula. This tubing is not soft and pliable like the catheter itself. When the extension is attached to the cannula tubing via the male to male connector, the forces involved to disconnect them are greater than those required to pull the catheter from the drainage tube. In fact, the forces are not inconsiderable. As a matter of practicality, this manoeuvre would also require two hands to effect. That is because if one were to pull on only one side of the connector, in all likelihood because of the amount of slack in the tube at either end, nothing would happen. Thus, two hands would be required each side of the male to male connector and, as I say, a considerable amount of force.

2.4. Thirdly, it is necessary that when effecting the disconnection of the oxygen tubing, the male to male connector should remain attached to the oxygen supply side of the connection, and not to the nasal cannula side. If it is connected to the supply side it is then possible to introduce the connector from the oxygen supply into the opening of the urinary catheter. Obviously enough if the connector had remained on the nasal cannula side of the oxygen connection, there would be no means of attaching the oxygen supply to the urinary catheter. Thus it was necessary not only to disconnect the two pieces of tubing, but also to ensure that the outcome would be that the connector would remain on the oxygen supply side and not on the nasal cannula side.

2.5. The final step in the process is to connect the oxygen supply to the opening of the urinary catheter. Of course, if the oxygen supply tube had been connected to the other side of the urinary tubing apparatus, in other words the drainage bag end, the disaster could not have ensued. The oxygen would have inflated the drainage bag and may have caused it to burst or leak. But that would not have harmed Mr Herczeg. It was therefore necessary to select the correct piece of tubing, namely the catheter itself. It was also

necessary to avoid reconnecting the oxygen supply to the nasal cannula which obviously would not have caused any harm either. It would merely have re-established the flow to the nasal cannula.

2.6. The original tubing that accompanied Mr Herczeg's body to the mortuary was examined by police for fingerprints, however no suitable fingerprint ridge detail could be located on that tubing[6].

2.7. I return to the question, how did this happen? There was some evidence that Mr Herczeg himself was known to fiddle with his catheter tubing during his previous hospital admission. He had also been seen touching the Baxter pump near his bed for his intravenous infusion by one of the nursing staff. These two factors provide some support for the possibility that he did it himself.

2.8. Mr Herczeg was noted to be confused during his admission. This was most probably the result of his urinary tract infection, although the possibility exists that because he was a carbon dioxide retainer and he was in receipt of oxygen at times when he was not meant to be, his confusion may have arisen from the suppression of his drive to breathe which leads to sedation and confusion. This factor tends to weigh both ways. One might infer that because Mr Herczeg was confused he may have effected these manoeuvres with the tubing himself. On the other hand, as I have attempted to explain above, these manoeuvres are very complex and require coordination and some strength. A mistake, for example pulling only one side of a connection, may result in pain which would be likely to cause Mr Herczeg to desist. Thus his confusion is not probative of him having done it himself or someone else having done it.

2.9. There was no evidence of some other person having been seen interfering with Mr Herczeg's tubing, although he was not under observation for much of the time. It is difficult to believe that a member of the nursing staff would have effected the tubing changes. Certainly, a member of the nursing staff would be very unlikely to have effected these manoeuvres accidentally because of the complexity involved and the number of movements that are required. It is abhorrent to think that a member of the nursing staff would have done these things deliberately. However, as I say there is simply no evidence from which I can positively conclude that the tubing was not interfered with by a member of the nursing staff.

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[6] Transcript, page 39

2.10. There is also the possibility that another person who was not a member of the nursing staff could have entered the ward and interfered with the tubing. Once again there was no evidence to support that theory.

2.11. I am reluctant to reach the conclusion that Mr Herczeg did this to himself because of the complexity of the task and the multiple manoeuvres referred to above. However, I cannot exclude the possibility that he did it himself, implausible as it seems. I therefore find that the tubing was interfered with by an unknown person.

3. <u>Why was Mr Herczeg receiving oxygen at all on the ward</u>?

3.1. Mr Herczeg was brought into The Queen Elizabeth Hospital in the early hours of 19 September 2016 by ambulance. The paramedics had instituted oxygen therapy enroute to the hospital and that was entirely appropriate.

3.2. On his arrival at The Queen Elizabeth Hospital Mr Herczeg was originally cared for in that part of the Emergency Department known as 'Red Doors' for high acuity patients. Shortly after his arrival he was assessed by Dr Jolly and a series of tests were ordered by that doctor. Dr Jolly maintained the oxygen therapy at that point and one of the tests he initiated was a chest X-ray. It was entirely appropriate for the oxygen to be maintained pending the results of the X-ray. Professor Cade who reviewed this case on behalf of the Court thought that Dr Jolly's care was entirely appropriate.

3.3. Registered Nurse Suvas Kc was the first nurse to have charge of Mr Herczeg in the Emergency Department. He gave evidence that Mr Herczeg was confused as to time and place but could follow commands[7]. Nurse Kc said that due to his confusion it was necessary to monitor Mr Herczeg very closely. He said that Mr Herczeg was on 4 litres of oxygen at 4:38am and this is confirmed in the EPAS notes. Nurse Kc also said that the last observations he performed on Mr Herczeg were at 6:55am when Mr Herczeg was saturating at 96% on room air[8]. He was asked whether the nasal cannula would still have been attached given that Mr Herczeg was then on room air and he responded:

> 'Normally what it is, when they maintain the oxygen into the room air, we always take the cannula out of their nose and we take away from the patient, especially with confused patients, sometimes they might do anything, they might chew, they might throw it anyway, so we try to remove the objects from the patient if they're not in use.' [9]

[7] Transcript, page 49
[8] Transcript, page 65
[9] Transcript, page 66

That evidence was significant in light of later events. In my opinion the care and treatment provided by Nurse Kc was appropriate.

3.4. Mr Herczeg's care was handed over to registered nurse Stacy Woodward who commenced her shift at 7am that morning. She cared for Mr Herczeg until approximately 10:45am. During that period Mr Herczeg's condition stabilised sufficiently to allow him to be transferred to cubicle 2 in the Emergency Department which is the less critical area. Nurse Woodward made an entry in EPAS at 10:45am that day[10] in which she noted that Mr Herczeg was pleasantly confused and compliant with nursing care. In her evidence she noted that the confusion may have been caused by his urinary tract infection[11].

3.5. When Mr Herczeg was transferred to cubicle 2 in the Emergency Department by Nurse Woodward he was handed over to registered nurse Kirsty McCulloch. At that time Mr Herczeg was in receipt of 3 litres of oxygen via nasal cannula. During this time Mr Herczeg was being monitored continuously via a cardiac monitor and it was Nurse McCulloch's understanding that he was awaiting assessment by the respiratory team[12]. Nurse McCulloch performed observations on Mr Herczeg at 12:15pm when she recorded that he was in receipt of 3 litres of oxygen by nasal cannula. His observations were satisfactory and the respiratory team were in attendance and were assessing Mr Herczeg[13]. The observations recorded by Nurse McCulloch at that time were entered into the EPAS notes prior to the completion of the assessment by the respiratory team.

3.6. The respiratory team consisted of Dr Yong, the respiratory registrar and Dr Shanahan who was the respiratory intern. Mr Herczeg was well-known to them given his chronic obstructive pulmonary disease and previous admissions to The Queen Elizabeth Hospital. Dr Yong was informed by Dr Jolly of Mr Herczeg's history and presenting complaint[14]. Dr Shanahan was responsible for making the notes during the review and assessment and she typed an admission note into EPAS[15]. Dr Shanahan gave evidence that she had been experiencing problems with her EPAS login and she did not finalise the note at the time of her assessment. She saved the admission note in EPAS as

[10] Exhibit C12
[11] Transcript, page 88
[12] Transcript, pages 119-120
[13] Transcript, pages 132-133
[14] Transcript, page 421
[15] Exhibit C12

'incomplete' and it was her intention to finalise the note once she had had a chance to get it reviewed by Dr Yong and after her login issues were resolved later in the day. In the result, her note was finalised as complete at 4:38pm in EPAS.

3.7. I pause to note that this was the cause of some confusion at the Inquest until Dr Shanahan explained what had occurred in her oral evidence. On the face of the EPAS notes as printed and presented to the Court from SA Health in response to a direction from this Court, the admission note was recorded as having been made at 4:38pm. This raised the possibility that Dr Shanahan had in fact attended at Mr Herczeg's bedside at about that time. Had she done so that would have been very significant because it was only some 20 minutes prior to Mr Herczeg's collapse and it is likely that she would have witnessed what was occurring with him. The confusion was further exacerbated by the fact that some of the nursing staff were able to access the incomplete admission note and rely on it while other nursing staff regarded it as unreliable.

3.8. Dr Shanahan said that while the note was marked incomplete, it was nevertheless available in EPAS in its entirety and was accessible by all staff after she typed it in[16].

3.9. The Court also heard evidence from Mr Rhys Parker who is a registered nurse and is currently the Manager for Implementation and Business Change with the EPAS program. He was called to give evidence about EPAS and to assist in interpreting the printed EPAS notes. He also gave evidence that even though the note was marked as incomplete it was visible to all staff in EPAS immediately upon it being saved as incomplete[17]. Mr Parker's evidence was that the majority of EPAS users would interpret the incomplete document as signifying that someone would be coming back to it and potentially adding some more information, but that they would still review the content of the document[18]. In the result that is not what happened when Mr Herczeg arrived on Ward S1 later in the day, but I will come to that shortly.

3.10. The issue with Dr Shanahan's EPAS login was specific to Dr Shanahan. Mr Le Blanc, Executive Director of eHealth Systems and the Chief Information Officer for SA Health, provided evidence that Dr Shanahan had logged into three separate devices at the time (quite properly), but had changed her password while logged into one of the

[16] Transcript, page 569
[17] Transcript, page 741
[18] Transcript, page 742

other devices using her old password. This caused her to experience a temporary lock out[19]. It was this that caused her to have to save the admission note as incomplete.

3.11. Dr Yong's assessment was that Mr Herczeg's chest was relatively clear and Dr Yong arranged for Mr Herczeg to come off the oxygen supply for some 10 to 15 minutes to assess his saturations on room air. At that time the saturations were measured as 87%[20]. Dr Yong noted that Mr Herczeg was in rapid atrial fibrillation with a heart rate of 150 beats per minute. He also reviewed the chest X-ray results which had been ordered by Dr Jolly. These showed no acute changes and a CT scan was unremarkable. Dr Yong's plan was to admit Mr Herczeg under the respiratory team, change his antibiotic medication to treat the urinary tract infection and then repeat urine microbiology and encourage oral intake.

3.12. Dr Yong gave evidence that Mr Herczeg's acceptable oxygen saturation limits were modified within EPAS to sit between 85% and 92%[21]. This was on account of Mr Herczeg's chronic obstructive pulmonary disease. The modified figure of 85% to 92% was to apply whether Mr Herczeg was or was not receiving supplementary oxygen. Another modification was made to the acceptable limits for his heart rate. According to that modification it was acceptable for him to have a heart rate up to 120 beats per minute before a trigger for an alarm would be activated.

3.13. The modifications that I have just referred to were entered in EPAS at 12:40pm and these can be found in the printed EPAS notes[22]. Thereafter anyone caring for Mr Herczeg would be able to access these modifications in EPAS[23]. Dr Yong informed Mr Herczeg's family that he would be admitted under the respiratory team mainly for his urinary tract infection and that he was not suffering from a chest infection. He was to be admitted under the respiratory team as he was well-known to them and they could make sure his urinary tract infection was correctly treated. Dr Yong's evidence was that Mr Herczeg was to be admitted to South 1 which is a general medical ward. It is probable that this was the most suitable location other than the respiratory ward where

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[19] Exhibit C26, paragraph 7

[20] Transcript, page 426

[21] EPAS can be set so that various parameters of a patient's vital signs can be varied. A normal person would have an oxygen saturation of more than 92% on room air. Because of his chronic obstructive pulmonary disease Mr Herczeg's body was accustomed to a lower level of oxygen saturation. The modification in EPAS meant that if an observation was entered for Mr Herczeg of an oxygen saturation less than 85%, an alarm would be activated within EPAS. The alarm would have to be actioned by the EPAS operator before the observation could be saved into EPAS. Dr Yong did not set the system to activate an alarm for oxygen saturations above the upper limit of 92%

[22] Exhibit C12, page 61 and Transcript, pages 430-431

[23] Transcript, page 434

a bed was available. Dr Yong noted that Mr Herczeg had an indwelling catheter and that he was saturating on room air at 87%[24].

3.14. Professor Cade was of the opinion that Dr Yong's assessment and plan were appropriate. Professor Cade said that in his view Dr Yong was wise to recommend Mr Herczeg's oxygen saturations be kept within the range of 85% to 92% although Professor Cade personally would have preferred a range of 85% to 89% but he was certainly not critical[25]. Professor Cade was also of the view that staff who might review the recommended oxygen saturation range after Dr Yong had made the modifications ought to appreciate that the ranges were applicable regardless of whether Mr Herczeg was on room air or oxygen. Indeed, it was Dr Yong's intention that the saturations be universally applicable, and with respect that would only stand to reason. Maintaining an appropriate level of a patient's oxygen saturations is the object of the exercise. Oxygen would only be administered as necessary to maintain his saturations within that range should they fall below it. Of course, depending on Mr Herczeg's condition and the circumstances, it was possible that he might saturate above 92%. This would be more likely if he were on oxygen and for that reason it was implicit that oxygen was not to be administered while he was saturating between 85% and 92% on room air. Dr Shanahan's admission note[26] relevantly stated that Mr Herczeg's indwelling catheter had been changed on 10 September of that year, in other words nine days prior to the date of the admission. The note also recorded that his oxygen saturations on examination were 87% on room air. The result of the investigations showed that according to the chest X-ray there was no collapse or consolidation, the CT head was clear and that he was in rapid atrial fibrillation with no ischaemic changes. The impression was that he had a likely urinary tract infection and rapid atrial fibrillation and would be admitted under the respiratory team. He would be commenced on amoxycillin for the urinary tract infection and the following is particularly pertinent:

> 'Aim saturations between 85-92%
> Happy for HR of 120bpm whilst receiving treatment for infection'

[24] Transcript, pages 429-430
[25] Transcript, page 623
[26] Exhibit C12, pages 28-29

3.15. Nurse McCulloch made a casenote entry at 12:50pm after Mr Herczeg was assessed by the respiratory team and she noted that the respiratory team had modified his oxygen saturation to between 85% and 92%. She also recorded that:

> 'SaO2 currently 87% on room air. Home team have requested for nursing staff to not commence oxygen if possible.' [27]

That note is very significant and very clear. It was available in EPAS at all times from 12:58pm when it was entered. Interestingly, Dr Shanahan's incomplete note was saved into the system at 12:59pm that day[28]. Nurse McCulloch's note that the home team had requested for nursing staff not to commence oxygen if possible immediately after the note about oxygen saturations between being acceptable between 85% and 92% and the saturations at the time of the note being 87% on room air, was significant and should have been significant to any competent staff reading the notes thereafter. They clearly indicated that the home team wished Mr Herczeg to be maintained at the recommended level of oxygen saturations and for oxygen not to be commenced if possible. In other words, oxygen ought only be commenced if his saturations fell below 85% and once they returned to the acceptable level oxygen therapy should be ceased. If that plan had been properly implemented, it is likely that for much of the time he was on Ward South 1 Mr Herczeg would not have been in receipt of oxygen therapy. Had he not been in receipt of oxygen therapy at the crucial time it would not have been possible for the catastrophe to have occurred as it did.

3.16. Having completed her observations of Mr Herczeg between 12:50pm and 1pm, Nurse McCulloch completed her shift and handed Mr Herczeg into the care of the afternoon shift nurse. That registered nurse was Waimatai Fiorentino. She took over Mr Herczeg's care at approximately 1pm. Nurse McCulloch said that she told Nurse Fiorentino that Mr Herczeg had a quite rapid heart rate and what the modifications were[29] and a little bit about his background and crucially that he was not to be on oxygen as requested by the home team[30].

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[27] Exhibit C12. Page 22
[28] Exhibit C22a
[29] This is a reference to the modifications instituted by Dr Yong to the acceptable heart rate and the acceptable oxygen saturations in EPAS
[30] Transcript, page 134

3.17. Nurse McCulloch repeated her evidence about her handover to Nurse Fiorentino later in her evidence and was quite clear and specific about the information she passed on as to his appropriate oxygen saturation levels:

> 'That he was also confused and that he wasn't supposed to be on oxygen because of his – he's a CO_2 retainer, and his baseline is likely to be between 85% and 90% with his oxygenation.' [31]

3.18. I find that Nurse McCulloch made it very clear both in her evidence and in the written records that she entered in EPAS at 12:50pm[32] that the home team requested that nursing staff not commence oxygen if possible and that saturations were to remain between 85% to 92%.

3.19. Nurse McCulloch could not recall if she removed Mr Herczeg's nasal cannula, but she was certain that the oxygen was turned off at the wall outlet[33].

4. Nurse Fiorentino takes Mr Herczeg from the Emergency Department to Ward South 1

4.1. Nurse Fiorentino gave evidence that she did indeed take a handover from Nurse McCulloch. She produced a handwritten note of the handover[34] which she took on the day. The note records that the oxygen saturations were to be greater than 85%. In that respect it is not a complete note of what I find was communicated by Nurse McCulloch because it did not include the important upper limit for the oxygen saturation. The note also recorded that he was to be admitted to Ward South 1 under the respiratory team and that Nurse Fiorentino was to ring that ward at approximately 1:45pm to see if they were ready to receive him. The EPAS records show that Nurse Fiorentino performed a set of observations on Mr Herczeg at 1426 hours while still in the Emergency Department. Significantly, the observations recorded in EPAS under Nurse Fiorentino's name record that he was receiving 3 litres of oxygen via a nasal cannula at that time and that his oxygen saturation level was 91%[35]. This record was the subject of a considerable amount of evidence at the Inquest. Nurse Fiorentino's evidence was that Nurse McCulloch told her that Mr Herczeg had nasal cannulas insitu, but that he was on zero oxygen[36]. It is interesting that as I have already pointed out, her

[31] Transcript, page 143
[32] Exhibit C12, pages 22-23
[33] Transcript, page 135
[34] Exhibit C22
[35] Exhibit C12, pages 68-69
[36] Transcript, page 500

note of the handover[37] did not record anything about him being kept off oxygen if possible, or being on 'zero oxygen' as she said in her evidence. Nurse Fiorentino's evidence was that she was being assisted by a student nurse. The evidence showed that the identity of that student nurse was Ms Melissa Warren-Smith. Nurse Fiorentino said that she had asked the student nurse to do hourly observations on the four patients under their joint care. One of those of course was Mr Herczeg. Nurse Fiorentino said that she did not recall making observations of Mr Herczeg herself and when she was asked about the EPAS observations recorded under her name at 1426 hours, she said she did not recall entering those records[38]. Nurse Fiorentino said that it is possible for another person to make an entry under her login within EPAS. She said that if you do not logout, another person can use your login to use EPAS[39]. She said that it was her habit to leave EPAS open under her name because she would go from patient to patient in between sessions on EPAS[40]. The implication of her passage of evidence under examination-in-chief[41] was that it was possible that the student nurse, Nurse Warren-Smith, had used Nurse Fiorentino's login to make the entries at 1426 hours, although Nurse Fiorentino did not make that direct accusation in that passage of evidence. Nurse Fiorentino gave evidence that she learnt late in her shift about Mr Herczeg's death and accordingly she made a handwritten note of her involvement with him in light of that information. The handwritten note states as follows:

> 'Transferred 72 year old male patient, Stephen Herczeg from ED cubicle 2 to South 1 RN. Patient transferred from barouche to ward bed. Patient requested bed to be put close together so that he could transfer from barouche to bed. RN Fiorentino did verbal handover to South 1 RNs using printed admission note as attached. Also handed over that patient has an IDC insitu last changed 10 September 2016 and that morning RN handed over that nasal specs insitu, but running at zero rate. RN Fiorentino unsure of reason for this, nasal specs had extension line attached.' [42]

4.2. The reference to the printed admission note being attached to that handwritten note requires some explanation. The handwritten note was written on the back of a printout that Nurse Fiorentino had made from Mr Herczeg's EPAS records. The printout was printed at 1331 hours on 19 September 2016. Nurse Fiorentino gave evidence that when it was time for her to take Mr Herczeg from the Emergency Department to Ward South 1 she had printed the admission note that had been made by Dr Shanahan

[37] Exhibit C22
[38] Transcript, page 503
[39] Transcript, page 504
[40] Transcript, page 504
[41] Transcript, pages 503-504
[42] Exhibit C22a

following the examination of Mr Herczeg by Drs Yong and Shanahan at shortly before 1pm. It will be recalled that that admission note was entered at approximately 1pm by Dr Shanahan, and was marked incomplete at that time. It remained marked incomplete when Nurse Fiorentino printed it at 1331 hours. Nurse Fiorentino's evidence was that she took the printed admission note with her when she made the handover to the staff of Ward South 1 and I will deal with that aspect of the matter later. In any event it was on the reverse side of that admission note that she wrote the handwritten note quoted above[43]. Nurse Fiorentino was clear in her evidence that at no time during her care of Mr Herczeg was his oxygen supply turned on, or to put in another way, he was on 'zero oxygen'[44]. Nurse Fiorentino was also asked about a further EPAS record. That record is a modification alert status which is recorded as being in Nurse Fiorentino's name. It appears at page 67 of the EPAS record[45] at 1426 hours and actioned at 1430 hours by Nurse Fiorentino. At page 66 it can be seen that the trigger for that alert status was Mr Herczeg's pulse rate at that time which was 139 beats per minute[46]. It will be recalled that the acceptable heart rate as set by Dr Yong was lower than 120 beats per minute and, accordingly, it was the heart rate that caused the trigger to occur. It was Nurse Fiorentino's evidence that she was not aware of the modifications having been in place even though the EPAS records suggest that she was aware[47]. Nurse Fiorentino speculated that it was possible that another nurse had entered the observations into EPAS at 1426 hours under Nurse Fiorentino's login details and that was why it appeared under her name. Her evidence was that it would be necessary in order for the observations to be saved into EPAS for the proper user, in this case herself, to enter her password in order to save the information into EPAS after it had been entered. Nurse Fiorentino's evidence in this respect was wrong. Other evidence from the people with expertise in EPAS, namely Messrs Le Blanc and Parker, demonstrated that observations can be entered into EPAS and saved without the need to enter a password. Furthermore, even when the observations trigger an alert, it is not necessary for the user to enter a password in order to register that the alert has been actioned. However, this misunderstanding by Nurse Fiorentino of the need to enter a password does not derogate from her evidence that another person could have entered the observations under her login.

[43] Exhibits C22a and Transcript, pages 515-516
[44] Transcript, page 518
[45] Exhibit C12
[46] Exhibit C12, page 70
[47] Transcript, page 531

4.3. There are other actions within EPAS that cannot be saved except by the entry of a password, and indeed it appears that that applies to any other action that a nurse might take in respect of EPAS apart from the entry of observations and the actioning of alerts that have been triggered as a result of the entry of observations outside of the normal acceptable range. For example, if an entry is made under the progress notes a password is required to save that entry. Furthermore, if a modification is made a password is required to save the modification and if orders are made it is necessary to enter a password to save those.

4.4. Nurse Fiorentino gave some evidence about situations where another staff member had entered data falling into the latter categories under one nurse's name and go to save it and then realise that they do not know the password for the operator who is logged in at that time and that she had observed the practice amongst other staff of the operator simply keying in their password in that situation in order to save the data. She said that there had been instances where she herself had saved data on behalf of others in that situation[48].

4.5. Other evidence before the Court demonstrated that this practice is not permissible under the rules and policies regulating EPAS. Nonetheless, it is clear from the evidence not only of Nurse Fiorentino that the practice does occur. Overall it was quite clear that, as Nurse Fiorentino attested, it is entirely possible for data, including observations but not limited to observations, to be entered by one nurse under the login of a different nurse and for the nurse who owns the login to save the data using their own password contrary to SA Health policy.

4.6. In any event Nurse Fiorentino's evidence was that she could not positively recall that student nurse Warren-Smith had entered the 1426 hours observations, but she speculated that Nurse Warren-Smith may have done so because she herself did not believe she had entered the data[49]. When she was challenged on this proposition her evidence was that she did not recall that Mr Herczeg was on 3 litres of oxygen via nasal cannula.

4.7. Nurse Fiorentino was somewhat inconsistent in her evidence about the entry at 1426 hours. At one point she agreed with the proposition that the entry was simply wrong

[48] Transcript, pages 532-533
[49] Transcript, page 536

but in her next answer said that she did not recall that he was receiving 3 litres of oxygen, which seemed to leave open the possibility that the entry was not wrong. When confronted with that vagueness of position she responded that she could not explain the entry, but then said that Mr Herczeg definitely was not receiving oxygen at 3 litres at 1426 hours[50].

4.8. Later in her evidence it was put to her that because of her consistent position that Mr Herczeg was not receiving oxygen, it must follow that her position is that she did not make the note at 1426 hours. Her response was that she did not recall making the note. She was pressed on this and it was put to her that if she had written the note it definitely would not have said that he was receiving oxygen and therefore it must follow that she did not write the note. She prevaricated and continued to say she did not recall making the notes. It was put to her that she would not write in the notes that he was receiving oxygen when she was so sure when giving her evidence that he was not and she agreed that she had never seen him receiving oxygen at any time[51]. She was asked again why she would write in the notes that he was receiving oxygen and she agreed that she would not. Finally, she agreed that she was firm in her position that she did not write the notes[52].

4.9. By contrast, Nurse Warren-Smith presented as a very truthful and frank witness who gave her evidence with candour. She said that she was certain that she did not record the observations into EPAS at 1426 hours[53]. I accept that Nurse Warren-Smith did not make the entry and did not take the observations. The evidence is unsatisfactory in relation to the 1426 hours observations. Clearly enough they were entered under Nurse Fiorentino's name yet she maintains that at no time while in her care was Mr Herczeg receiving oxygen. Despite initially saying that she did not recall entering the observations, she eventually agreed that consistent with her position that he certainly was not receiving oxygen while under her care, she would not have entered an observation that was to the contrary. The clear evidence of Messrs Le Blanc and Parker was that it is possible for observations to be entered and alerts actioned within EPAS without entering a password and, accordingly, it is entirely possible for a person other than the logged in operator to enter the data, even without the logged in operator's

[50] Transcript, pages 537-538
[51] Transcript, page 547
[52] Transcript, pages 547-548
[53] Transcript, pages 594-595

knowledge. In the result I am unable to reach any conclusion as to who entered the data at 1426 hours despite the fact that it is under the name of Nurse Fiorentino. This leaves the question of whether Mr Herczeg was or was not receiving oxygen at 3 litres an hour at 1426 hours in the Emergency Department. I am equally unable to reach a conclusion one way or the other about that. Nurse Warren-Smith had no independent recollection of nursing Mr Herczeg and she was the only person other than Nurse Fiorentino who could cast any light on the matter[54]. As will be seen shortly the transfer of Mr Herczeg via the barouche further complicates the issue because the barouche had upon it a portable oxygen cylinder. The evidence was not clear whether the portable oxygen cylinder was connected during his transfer to his nasal cannula by an orderly involved in the transfer. Nurse Fiorentino's evidence was that she did not believe that he was connected while on the barouche, but she could not say for certain that he was not connected. The fact that he had the nasal cannula around his neck while it was unconnected from the oxygen supply may have caused a person who did not know that he should not be on oxygen nevertheless to connect him on the assumption that the presence of the cannula indicated that he was supposed to be on oxygen. Of course that would be a wrong conclusion to draw because the cannula were left insitu with no oxygen being supplied to them, against the possibility that the patient might at some later time require oxygen. Best practice would clearly be to remove the cannula altogether when oxygen is not being supplied, but it appears that in Mr Herczeg's case that was not done.

4.10. Nurse Fiorentino took Mr Herczeg to the ward on his barouche with the assistance of an orderly shortly before 3pm on 19 September 2016. Mr Herczeg was transferred with his nasal cannula insitu. He continued to have his urinary catheter. As I have mentioned an oxygen cylinder was attached to the barouche but it is unclear whether Mr Herczeg's nasal cannula tubes were connected to the oxygen cylinder for the transfer. Nurse Fiorentino handed over to the registered nurses Sioned Robertson and James Hunt. She did not recall if enrolled nurse Kayla Woodward was present at the handover, but Nurse Woodward's evidence was that she was in fact present. Nurse Fiorentino said that she made it clear to Nurse Hunt and Nurse Robertson that Mr Herczeg was not to receive any oxygen and that he had been on zero oxygen in the Emergency Department while under her care[55]. Nurse Hunt's evidence was that Mr Herczeg was

[54] Transcript, pages 585-586
[55] Transcript, page 511

transferred to the Ward on 2 litres of oxygen via nasal cannula. He said it was possible that there was a portable oxygen cylinder attached to the barouche[56]. He said that at handover he was told that Mr Herczeg had atrial fibrillation, had fallen at home, had a urinary tract infection and respiratory issues[57]. He said that he did not connect Mr Herczeg to the oxygen supply in the room. Nurse Hunt gave evidence that Nurse Fiorentino had handed over that Mr Herczeg had heart rate modifications in place, but he did not recall the mention of modifications with regard to oxygen saturations being mentioned[58].

4.11. Nurse Robertson's evidence was consistent in that she could not recall Nurse Fiorentino handing over any information with respect to oxygen. Nurse Robertson gave evidence that she would definitely recall if she had been told by Nurse Fiorentino that the respiratory team had requested for Mr Herczeg not to be in receipt of oxygen at that time[59].

4.12. Nurse Hunt gave evidence that he did not review Mr Herczeg's EPAS records, nor did he look in EPAS for any modifications at the time of handover, or shortly thereafter. He conceded that he should have referred to the casenote entries for that morning and any modifications that were ordered. He conceded that he should have done this prior to, or at the time of, Mr Herczeg's transfer to the ward or at 1455 hours when he acknowledged an alert[60].

4.13. Clearly enough if he had reviewed the casenotes and the modifications he would have been aware of the modifications with respect to the oxygen and possibly would have noted that Mr Herczeg's home team had said they did not wish him to be on oxygen. His evidence was that had he realised that Mr Herczeg should not be on oxygen he would have tried to wean him off slowly over the shift[61]. Nurse Hunt gave evidence that he did not connect the oxygen to the source in the wall.

4.14. Ms Kayla Woodward gave evidence that it was she who connected Mr Herczeg's tubes to the oxygen supply on the wall in the ward. She said that she asked Mr Herczeg how many litres of oxygen he was on and that he replied he was on 2 litres. She said that

[56] Transcript, page 361
[57] Transcript, page 359
[58] Transcript, pages 360, 362 and 389
[59] Transcript, page 226
[60] Transcript, page 110
[61] Transcript, page 362

nobody who was present disagreed that he should be on that amount of oxygen and accordingly she set the oxygen supply accordingly[62]. I note that in her statement[63] she had originally said that the emergency nurse agreed with Mr Herczeg's intimation that he was on 2 litres of oxygen. However, in her oral evidence Nurse Woodward moved from that position to say that she could not recall whether the emergency nurse had said that she agreed[64]. It was also Nurse Woodward's evidence that Mr Herczeg was connected to the portable oxygen supply on the barouche[65]. Nurse Woodward alone of the Ward South 1 staff made a written note of the handover which was tendered[66]. The handwritten note contains the following:

> '85-92% sat - ? MOD' [67]

She was asked to explain what she meant by this and she said that she wrote down 85-92% saturation:

> '… as I was informed the home team were happy with the patient saturating on room air between these numbers...' [68]

She said that she wrote the question mark next to that note because she needed clarification from the home team because she was 'informed the modification hadn't been completed'[69]. She elaborated that she recalled him being transferred from the Emergency Department with oxygen on the barouche, but was firm in her evidence that the home team had said they were happy for him to saturate at the desired levels on room air[70]. She explained that she connected him to the oxygen with his explanation about the 2 litres on the basis that:

> 'It was just a continuation of care from ED and so I did connect the oxygen to the oxygen supply in the wall.' [71]

4.15. Nurse Woodward said that she was not involved in the observations that were taken of Mr Herczeg soon after his arrival on the ward[72]. In fact those observations were taken

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[62] Transcript, page 322
[63] Exhibit C19
[64] Transcript, page 322
[65] Transcript, page 279
[66] Exhibit C19a
[67] Exhibit C19a
[68] Transcript, page 277
[69] Transcript, page 277
[70] Transcript, page 280
[71] Transcript, page 281
[72] Transcript, page 286

by Nurse Hunt and Nurse Robertson. What Nurse Woodward did do after handover was to page the respiratory team to make contact with them to ask the treating doctors:

> '.. to come up to South 1 to admit the patient onto the ward and clarify the modifications with myself and to complete the medication chart.' [73]

She explained that it was necessary for the medication chart to be completed because the pharmacy closed at 5pm[74]. She was asked in her evidence to read the EPAS notes which showed that the modifications about saturations had been made prior to her involvement with Mr Herczeg. She said that she was not aware of those entries in the notes at the time of handover, nor subsequently during her care of Mr Herczeg[75]. She said that she was not aware of the note in EPAS that the respiratory doctors had requested nursing staff not to commence oxygen if possible[76]. I note that that is not inconsistent with her understanding that the home team were happy with saturations to remain between 85% and 92%. That is based on her assumption that he had been receiving 2 litres of oxygen in the Emergency Department and that she must have assumed that at the time of his arrival he was saturating appropriately at those levels on 2 litres of oxygen.

4.16. At 2:55pm Nurse Hunt and Nurse Robertson carried out a set of observations on Mr Herczeg. Nurse Hunt was using the portable computer workstation and was entering the data into EPAS while Nurse Robertson was noting the observation results and calling them out to him[77]. He recorded the EPAS results as being that Mr Herczeg was saturating at 96% on 2 litres of oxygen via nasal cannula[78]. Nurse Hunt conceded that he did not have any understanding of the implications of administering too much oxygen to a CO_2 retainer[79].

4.17. Nurse Woodward's evidence as I have said was that she paged the home team. That is consistent with the evidence of Dr Shanahan who recalled that she received pages from Ward South 1. Dr Shanahan eventually was able to complete her admission note having checked it with Dr Yong and at 1638 hours she saved it as a complete record into EPAS which is how the record appeared when the notes were first referred to during this Inquest.

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[73] Transcript, page 289
[74] Transcript, page 289
[75] Transcript, page 290
[76] Transcript, pages 290-291
[77] Transcript, page 363
[78] Exhibit C12, pages 67-69
[79] Transcript, page 392

5. Why was Mr Herczeg on oxygen on Ward South 1?

5.1. Unfortunately I am unable to answer that question. It seems that an assumption was made by the nursing staff on Ward South 1 that because nasal cannula were insitu, Mr Herczeg was to have oxygen. However, there was also the EPAS entry under the name of Nurse Fiorentino at 1426 hours that Mr Herczeg was receiving oxygen at 3 litres per hour. If that entry was genuine then the explanation would be that despite her clear evidence to the contrary, Nurse Fiorentino had either herself placed him on oxygen at 3 litres per hour or had seen that he was on oxygen at 3 litres per hour and ought to have taken him off it. However, as I have already noted EPAS allows for the possibility of nurses making observation entries under another nurse's login and I am unwilling in the face of that possibility to make a finding against Nurse Fiorentino contrary to her clear assertions in evidence. Furthermore, the admission note that Dr Shanahan had entered was a further source of confusion because it was marked incomplete and was not finalised until 20 minutes before Mr Herczeg's collapse and that was because Dr Shanahan had been locked out of her EPAS account.

5.2. It is notable that when Dr Yong entered the oxygen saturation modifications into EPAS he did not set the system to require a respiratory alarm above 92%. Had he done so it would have been the case that when Mr Herczeg's saturations on 2 litres of oxygen at 1455 hours were entered into the system by Nurse Hunt, EPAS would have alarmed and that would have alerted Nurse Hunt to an upper limit of oxygen saturations and hopefully caused him to remove the nasal cannula and the supply from Mr Herczeg's room.

5.3. Professor Cade gave evidence that the saturation of 96% at 1455 hours was 'unwise'[80]. Professor Cade explained that the risk of too much oxygen therapy in a patient such as Mr Herczeg is the risk that the patient may stop breathing. He said it is referred to as CO_2 narcosis because it resembles a narcotic overdose. He said it occurs because with the CO_2 already high, the normal drive to breath has been lost and the patient relies instead on a relatively low oxygen level in their blood to keep them breathing. If that is interfered with by supplementary oxygen then both drives have gone and the patient is at risk of stopping breathing which can be a fatal complication[81]. He explained that the patient becomes progressively unconscious, drowsy and then comatose[82]. He said

[80] Transcript, pages 626-27
[81] Transcript, page 615
[82] Transcript, page 615

that if oxygen has to be given to such a patient it must be given 'in a very controlled way, the lowest dose that will give an acceptable PO_2, preferably with monitoring'[83]. Professor Cade said that he was disappointed to read in the transcript of evidence that a number of the nursing staff did not have an appreciation of that complication with a patient with chronic obstructive pulmonary disease who retains CO_2. He said:

> 'I think that's unfortunate, I think it's disappointing …' [84]

It was Professor Cade's position that staff ought to understand that a reference to a desirable oxygen saturation level between 85% and 92% would be that it is implicitly room air that is being referred to. Of course, if it fell below that level then oxygen supplementation would be needed but with close monitoring to ensure that the oxygen saturations do not exceed the upper limit. This tends to suggest that an upper RDR[85] modification was not required to be entered by Dr Yong. Nevertheless, had it been possible to enter an upper RDR modification it would add a further level of safety and assistance for staff who did not have a proper appreciation of the significance of oversupply of oxygen to a CO_2 retainer.

5.4. Professor Cade was asked about Mr Herczeg's levels of monitoring by staff on the ward. The evidence of what occurred after the observations at 1455 hours was provided by Nurse Hunt. He stated that some time after the handover he checked Mr Herczeg's Baxter pump for his IV infusion which was alarming. When he entered the room he noted that Mr Herczeg was trying to do something with the pump by pressing its buttons. Nurse Hunt went in and re-fitted the positioning of the IV tubing and the alarm stopped. He said that he went back a little later to ask Mr Herczeg if he wished to have water and got him a jug of water with a straw. The third time he entered the room was in relation to the administration of IV antibiotics[86]. Apart from those occasions Mr Herczeg appears to have had little attention between 1500 hours and 1700 hours. At most he was seen on three occasions during that time. By contrast, Professor Cade was of the view that the fact that Mr Herczeg was not on continuous pulse and oximetry monitoring was inadequate[87].

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[83] Transcript, page 616
[84] Transcript, page 624
[85] Rapid Detection and Response
[86] Transcript, pages 366-367
[87] Transcript, page 631

6. Mr Herczeg's collapse

6.1. The evidence in relation to Mr Herczeg's collapse need not be traversed in detail. I do note that it was Nurse Kayla Woodward who heard him yelling in pain at approximately 5:05pm. She entered his room and he was curled in the foetal position. She immediately went to obtain assistance. At that time Nurse Hunt also heard a patient yelling out 'it was quite loud and it sounded as if somebody was in pain'. He looked up and saw Nurse Woodward and thought that she was investigating. Nurse Hunt was in the middle of another task which was to deal with checking blood glucose levels on some diabetic patients. He encountered Nurse Woodward coming back to the nursing station after a short period of time. She told him that Mr Herczeg was in lots of pain and that Nurse Woodward was going to page a doctor to see if Mr Herczeg could be given any pain relief. At that point Nurse Hunt continued with his glucose level checking on the diabetic patients. He stated in his evidence:

> 'After I checked the blood glucose level in room 16, which would have taken about 30 seconds, I went to return the equipment back to the nurse's station and at that point I thought it was odd that I couldn't hear any sort of screaming, like pain, any yelling - screaming is the wrong word - yelling of pain and I thought I should probably go and look to see if there's anything I can do.' [88]

Later he added that:

> '… lots of patients on the ward yell out as part of their sort of baseline.' [89]

He said that:

> 'Something was unusual, yes. I just had a feeling that something was odd so I went, turned back, because he was screaming and the screaming stopped.' [90]

6.2. Nurse Hunt went into Mr Herczeg's room, found him unresponsive and immediately pressed the emergency call bell and this brought an emergency response team[91].

6.3. This passage of evidence does not speak to an environment of close monitoring. It demonstrates that yelling and screaming in pain was an unremarkable event that did not require urgent examination, at least for Nurse Hunt's part. Similarly, Nurse Woodward clearly did not appreciate the extent of the crisis that was unfolding in front of her when

[88] Transcript, page 371
[89] Transcript, page 412
[90] Transcript, page 413
[91] Transcript, page 371

she looked at Mr Herczeg in a foetal position and instead of acting herself, went to make inquiries as to whether doctors had ordered any pain relief.

6.4. From this I infer that the level of observation on Mr Herczeg for the two hours between 3pm and 5pm was inadequate. It was certainly inadequate for a patient such as Mr Herczeg who had some evidence of having been confused earlier in the day. As Professor Cade said, he required close monitoring if he was on oxygen to ensure that his oxygen saturations did not exceed the upper limit. They clearly exceeded the upper limit at 1455 hours when they were 96% and no action was taken.

7. Conclusions

7.1. Mr Herczeg's death by this appalling mechanism was cruelly painful. It was entirely preventable, at least on the assumption that nobody connected the tubing with the intention of causing his death. It is clear that if Mr Herczeg had not been on oxygen his death would have been prevented. True it is that Mr Herczeg's saturations may theoretically at some point during the afternoon have fallen below his baseline minimum of 85%. In that event he would have required the reinstitution of oxygen therapy, but as Professor Cade noted, that therapy should only have continued for as long as his oxygen saturations did not exceed the upper limit. As soon as they did he should have been removed from the oxygen supply. There is little point in a doctor such as Dr Yong setting a prescribed ideal oxygen range for a CO_2 retainer such as Mr Herczeg if nobody thereafter does anything to ensure that he remains within it. In effect, Mr Herczeg was put on a set and forget regime with respect to his oxygen supply on Ward South 1. While I do not make any findings with respect to whether he was on oxygen or not on oxygen under Nurse Fiorentino's care in the Emergency Department, it is plain to me that the nursing staff responsible for his care on Ward South 1 did not provide an adequate level of care and supervision to Mr Herczeg. Had they done so, this tragic event would not have occurred.

8. Some EPAS comments

8.1. I have already noted problems with the interpretation of the EPAS notes[92]. Exhibit C12 is Mr Herczeg's notes for 19 September 2016 for an admission spanning some 16 hours. The EPAS printout occupies 123 pages. The fluid balance chart is incapable of

[92] Exhibit C12

interpretation except with the assistance of expert advice from Mr Parker, who as I have said was the Manager for Implementation and Business Change with the EPAS program. The proper explanation of the fluid balance chart occupies some four pages of Mr Parker's evidence[93]. For example, it is plain from the evidence of Nurse Stacy Woodward at transcript, page 289 that she was unable to make any sense of the fluid balance chart and she would have required Mr Parker's assistance to interpret this written document. The portable workstations used by EPAS users are such that when a user logs in the system remains open for 20 minutes before the screen locks and the user is subsequently locked out after 30 minutes. However, during the active period observations and alert triggers can be actioned by any person other than the logged in operator. This means that in a situation such as arose in this case with Nurse Fiorentino's entry at 1426 hours, it is simply not possible to determine the correctness or otherwise of that entry and indeed who was responsible for it in the face of her denial that it was she[94].

8.2. It was notable that Mr Le Blanc, the Executive Director of eHealth Systems and the Chief Information Officer for SA Health was unable to make sense of the fluid balance charts either and said he would need to ask a specialist to explain it[95].

8.3. It is a singularly unhelpful feature of the EPAS printout that the systolic and diastolic readings of blood pressure for a particular time do not appear together in the printed record. They can be many pages apart and this is a clear indication that the system was never designed with the idea in mind that a written version of the records would ever be produced.

8.4. As I say Mr Le Blanc was the Executive Director of eHealth Systems and the Chief Information Officer for SA Health. At one point in his evidence he was unable to explain a particular entry in the EPAS printout. His response was:

> 'I think we need someone who understands this area of the system in great detail to explain what this means.' [96]

This really demonstrates to my mind a great difficulty with EPAS. A record of a patient's stay in hospital should not require a specialist interpreter other than to interpret

[93] Transcript, pages 722-725
[94] Transcript, pages 676-677
[95] Transcript, page 699
[96] Transcript, page 705

the medical aspects of the record. It should not be necessary also to need a computer expert to explain what the various entries mean. Mr Le Blanc acknowledged that the printed output from EPAS is very poor[97]. He said that SA Health was working to improve the formatting, readability and understandability of the printed output from EPAS[98] but he acknowledged that the printed readout in this case was not satisfactory[99].

8.5. It was notable that as the Executive Director of eHealth Systems within SA Health, Mr LeBlanc was called with a view to the Court obtaining assistance as to the meaning of the EPAS record which was produced to the Court as a result of a direction issued to SA Health by the Court in Mr Herczeg's case. It is hardly satisfactory that even Mr Le Blanc was unable to assist me in important respects. He acknowledged that the system was cumbersome and difficult to follow[100]. He conceded:

> 'That's correct. We would need someone who understands how this is produced. As I explained earlier this document is produced through a reporting function in EPAS which takes the data in the system and formats into some printed output. There are not even column headings on here so I couldn't begin to interpret what this means without getting someone who understands the system in some detail to provide an interpretation for us.' [101]

Mr Le Blanc went on to say:

> 'I think it's attributable as we've previously discussed to the poor formatting of the printed documentation that comes out of EPAS because the information in EPAS is best viewed online on a computer screen where it is well formatted and very clear and easy to understand.' [102]

He further admitted:

> '… the printed reports or the printed output of a patient occasion was never designed to be a replacement or a substitute or even a facsimile of a paper medical record.' [103]

8.6. In my opinion it is alarming and unacceptable that EPAS printouts are so unsatisfactory. It is simply not possible to expect every person who might have an interest in a patient's hospital records to attend at an SA Health hospital in order to read the full record within an EPAS environment on-screen. The fact is that there are people other than the daily users of EPAS who need to know what occurred and need to have access to the records

[97] Transcript, page 704
[98] Transcript, page 701
[99] Transcript, page 700
[100] Transcript, page 670
[101] Transcript, page 700
[102] Transcript, page 701
[103] Transcript, page 669

in their own environments and not in the EPAS environment. An obvious example is the Coroners Court of South Australia. Not only is it necessary for this Court to be able to interpret a patient's hospital records in an Inquest setting, but it is also necessary to examine them even in cases which do not go to Inquest. In every instance where a death is reported to the Court from the public hospital system it is necessary that the notes be obtained and that they be submitted to the forensic pathologists within Forensic Science South Australia for examination to determine whether an autopsy is necessary or not. It is necessary that that process take place as rapidly as possible in order that families can put in place their funeral arrangements at the earliest possible point and not be frustrated by the coronial system of this State in their desire to proceed as rapidly as possible with funeral arrangements. That is one reason why it is necessary that EPAS be able to print hospital records in a sensible manner.

8.7. But beyond the coronial system there are other Courts in this State which will from time to time need to have access to medical records in cases of medical negligence. There are external review agencies such as the Australian Health Practitioners Regulation Agency which would need to review hospital notes also. The State's Ombudsman might also require them, not to mention the State's Health and Community Services Complaints Commissioner. Furthermore, there will be occasions where police need to investigate hospital records for the purposes of investigating crimes. Last and not least the Freedom of Information Act in this State has for more than 20 years given users of the public hospital system a statutory entitlement to obtain copies of their medical records. It is simply no answer to say that every person who wishes to see a medical record must do so within the EPAS environment.

8.8. As to the matter of staff entering data under another user's login, Mr Le Blanc said that it is absolutely not permissible, but he conceded that it was possible for it to happen[104].

8.9. Mr Le Blanc was asked about the occasions when EPAS froze. He acknowledged that it is not an issue limited to The Queen Elizabeth Hospital and that it was quite widespread and an issue that SA Health has been putting significant effort into for some time[105]. He said that the EPAS team discovered about a dozen separate contributing

[104] Transcript, page 669
[105] Transcript, page 658

technical factors which, some in isolation, others in combination, can cause the problem[106]. He said that the goal is to have zero personal computers freezing[107], but acknowledged that it is still not completely eliminated[108]. He was also asked about black spots with the Wi-Fi system within The Queen Elizabeth Hospital but he explained that that problem has largely been eliminated[109].

9. Recommendations

9.1. 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.

9.2. There is no point in me making any recommendation with respect to improving printouts from EPAS. I was told that work is being done to improve them. Time will tell. In the present case the Court had the advantage of hearing witnesses very soon after the event while their memories were fresh. To some extent that compensated for the deficiencies in the EPAS printouts. Some witnesses still had their personal handwritten notes[110]. If this Inquest had been heard years after the event, it would not have been able to establish as much about the circumstances of Mr Herczeg's death as it has done, because the EPAS printout would not have provided an adequate record of the event.

9.3. I make the following recommendations directed to the Minister for Health:

1) That EPAS modifications for CO_2 retaining chronic obstructive pulmonary disease patients have both upper and lower limits on oxygen saturation levels;

2) That a password be entered into EPAS when observations are recorded;

3) That the practice of one person taking observations and another person entering data onto the EPAS system cease;

[106] Transcript, page 658
[107] Transcript, page 658
[108] Transcript, page 659
[109] Transcript, pages 651-653
[110] Exhibits C19a and C22a

4) That if respiratory patients are not admitted to a respiratory ward, the admitting doctor provides detailed instructions to staff leaving no room for error;

5) That patients exhibiting confusion undergo a risk assessment prior to their admission to the ward.

Key Words: Hospital Treatment; EPAS Records;

In witness whereof the said Coroner has hereunto set and subscribed his hand and Seal the 10th day of August, 2017.

State Coroner

Inquest Number 57/2016 (1808/2016)