

SHERIFFDOM OF GLASGOW AND
STRATHKELVIN AT GLASGOW

DETERMINATION by JOHANNA JOHNSTON,
Queen's Counsel, Sheriff of Glasgow and Strathkelvin
following an Inquiry held at Glasgow into the death of
RONALD WILLIAM McALLISTER, born 14 May 1943
who normally resided at 8 Gardenside Crescent,
Glasgow.

Glasgow, 28 March 2013

PART I: INTRODUCTION

[1] This is an Inquiry under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 into the circumstances of a death of Ronald William McAllister who died within Stobhill Hospital, Glasgow on 13 October 2006.

[2] Mr Graham, Procurator Fiscal Depute appeared in the public interest. Mr Henderson, Solicitor, represented the daughters of Mr McAllister. Mr Stewart, solicitor, represented Greater Glasgow Health Board (GGHB).

[3] The Inquiry heard evidence and submissions over the course of the 14, 15 and 17 January 2013. The Crown led seven witnesses. The parties entered into a joint minute of agreement, which covered the cause of death and the treatment of Mr McAllister

at Stobhill Hospital. There was also agreement of a number of the documentary productions. The evidence led at the Inquiry was directed to the events at Glasgow Royal Infirmary on the 10 October 2006.

PART II: FINDINGS IN FACT

- (1) As at 13 October 2006 Ronald William McAllister was 63 years of age. He normally resided at 8 Gardenside Crescent, Glasgow.
- (2) Mr McAllister had suffered from myeloma, which led to end stage renal failure. His condition necessitated regular haemodialysis (dialysis). Mr McAllister had a fistula in his left arm to allow access to a vein and an artery for the blood flow during dialysis.
- (3) On 10 October 2006 at approximately 10pm Mr McAllister attended for routine dialysis at Ward 12 Glasgow Royal Infirmary. At this time he complained of left sided chest pain and tenderness. He was examined by the witness Dr Michaela Petrie who found bruising over his left ribs. He was very distressed and stated that he was in severe pain. He stated that he had fallen at home two days before. He found it painful to breathe deeply and was more comfortable standing or lying flat. Dr Petrie thought that it was possible that he had fractured ribs.
- (4) Dr Petrie decided that Mr McAllister required dialysis. She noted that he had signs of fluid overload and having sounded his chest, she was of the view that he was suffering from a chest infection. She was concerned that without dialysis fluid could move to his lungs.
- (5) Dr Petrie concluded it would cause too much discomfort for Mr McAllister to receive dialysis in a chair. She also considered that he would require some

morphine based medication for pain control, which can only be administered to an inpatient. She arranged for him to be admitted to ward 36 where a bed was available.

- (6) Mr McAllister was sent for a chest x-ray before admission to ward 36. The x-ray confirmed a left basal pneumonia was present but no fracture was noted. He was admitted to ward 36 at 22.45 hours and placed in bed 11. He was given a morphine based medication for pain relief. Mr McAllister had previously been prescribed this kind of medication for pain control at home.
- (7) The witness Staff Nurse Alex Oag prepared Mr McAllister for dialysis at approximately 23.00. The machine used was a Fresenius 4008E Haemodialysis Machine. Mr Oag set the timer on the machine and the amount of fluid to be removed from Mr McAllister. Mr Oag did not alter the alarm settings on the machine. It was not his practice to alter the settings and he did not know how to do so. The machine was on a default setting with the upper and lower limits for the venous alarm set symmetrically at 40 millilitres of mercury (mmHG).
- (8) Mr Oag placed two 15 gauge needles in the fistula in the left arm of Mr McAllister. The lower needle was to take the blood to the machine. The upper needle was to return the blood to the body from the machine. The needles each have two wings; one at each side, which sit flat against the skin.
- (9) Mr Oag taped each wing of each of the needles to the skin and then a third piece of tape at each needle was put under and across that needle. The lines of tubing attached to the needles were looped round the thumb and taped.

This was to secure the tubing and to ensure that the tubing moved with any arm movements by Mr McAllister.

- (10) The Fresenius 4008E Haemodialysis Machine was equipped with a venous pressure sensor. The pressure in the venous line was set at 100 millimetres of mercury (mmHg). The sensor was set at the default setting of 40 mmHg on each of the upper and lower limits. If the venous pressure rose above or fell below 40 mmHg an alarm would be activated and the pump would shut down. This is described as a symmetrical alarm system.
- (11) Mr McAllister remained in bed 11. That bed is at the end of the ward furthest away from the nursing station. The bed could not be seen from the nursing station. Other beds on the ward nearer the nursing station were occupied by other patients. Mr McAllister was to have hourly checks by nursing staff. Mr McAllister would have been due for a check at around midnight.
- (12) The witness Staff Nurse Leigh Anne McLeod saw Mr McAllister in bed and apparently asleep at around 23.20. At around 23.30, Dr Petrie checked to see if Mr McAllister was comfortable and if he needed any pain relief. She noted that he was in bed and asleep.
- (13) At 23.45 the alarm on the dialysis machine sounded. Staff Nurse Leigh Anne McLeod attended immediately and found Mr McAllister unresponsive and in a pool of blood. She sounded the alarm and Staff Nurse Oag and Dr Petrie attended. They found that the venous dialysis needle had become dislodged. Mr McAllister was still breathing but no cardiac output could be detected.
- (14) The venous needle had become dislodged at some point between being put in place by Staff Nurse Oag at 23.00 and the sounding of the alarm at 23.45.

- (15) The pump on the dialysis machine had been pumping blood at a rate of 300 millilitres per second. The loss of blood at that rate can result in severe brain damage occurring within 5 minutes.
- (16) Resuscitation was commenced and the cardiac team attended. Mr McAllister was successfully resuscitated and was transferred to the Intensive Care Unit at Stobhill Hospital at 04.40 hours
- (17) Mr McAllister remained at Stobhill Hospital. It was noted that he had suffered significant neurological damage. He did not recover from this damage and he died on the 13 October 2006.
- (18) A post-mortem was conducted by Dr John Clark on the 18 October 2006. Dr Clark concluded that the deceased died from hypoxic brain damage which was the result of having been deprived of blood and oxygen for a period of time following a cardiac arrest and thereafter developing bronchopneumonia in both lungs. The deceased had significant underlying heart disease which may have meant that he was more vulnerable to sudden blood loss and so more likely to suffer a cardiac arrest as a result.
- (19) The Fresenius 4008E Haemodialysis Machine was tested on 5 December 2007 at Scottish Healthcare Supplies (SHS) by the witness Duncan Ferguson and Andrew Wong. The SHS was at that time responsible for investigations relating to medical devices for the Scottish Government Health Department. It was established that the machine was working correctly and was accurately calibrated.

- (20) The optimum setting for the Fresenius 4008E Haemodialysis Machine is an asymmetric setting with the lower limit being set lower to detect a small loss of pressure.
- (21) The Redsense blood monitor was not developed until after 2006. That monitor operates by detecting blood which has leaked from a patient. The monitor is not wholly reliable and may fail to detect the loss of blood from a patient.

PART III: DETERMINATION AS TO THE CIRCUMSTANCES OF THE DEATH

The Sheriff having considered all the evidence adduced FINDS AND DETERMINES in terms of Section 6(1) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976:

1. In terms of Section 6(1)(a) that;

Ronald William McAllister, born 14 May 1943, who normally resided at 8 Gardenside Crescent, Glasgow, died at Stobhill Hospital, Glasgow at 16.45 hours on 13 October 2006.

2. In terms of Section 6(1)(b) that ;

- (i) The cause of his death was :-

Bronchopneumonia

due to

Hypoxic Brain damage

due to

Blood loss from dislodgement of dialysis cannula

due to

Chronic renal failure due to multiple myeloma.

- (ii) The cause of the accident was the dislodgement of the venous needle during haemodialysis. The needle was dislodged and the blood from the haemodialysis machine flowed out of the tubing. The pump on the haemodialysis machine continued to pump blood after the needle became dislodged and Mr McAllister lost a substantial amount of blood.
- 3. In terms of Section 6(1)(c) that the reasonable precautions whereby the death and the accident resulting in death may have been avoided are as follows:
 - (i) a check by a second member of nursing staff that the venous needle placed by Staff Nurse Oag was adequately secured.
 - (ii) the Fresenius 4008E Haemodialysis Machine should have been operating on its optimum setting with a lower setting on the venous line sensor than 40 mmHg. At a lower setting the alarm may have sounded closer to the point when blood loss commenced.
 - (iii) Mr McAllister was being dialysed whilst in bed and during his sleep. He was in pain from an injury and had been administered medication with a possible sedative effect. In all those circumstances he was at a greater than normal risk of venous needle dislodgement. He was in a bed in an area of the ward out of sight of the nursing station and at night when the staff to patient ratio was lower. A reasonable precaution in light of the increased risk and his position in the ward would have been for nursing staff to perform more frequent checks.

4. In terms of Section 6(1) (d) there are no circumstances of the death to be set out.
5. In terms of Section 6(1)(e) that any other facts which are relevant to the circumstances of the death are as follows:
 - (i) that within GGHB the training of staff operating the Fresenius 4008E Haemodialysis Machine dialysis machine may not have been adequate. The member of staff who treated Mr McAllister on the 10 October 2006 had not been trained on and did not know how to set the machine at its optimal setting of the venous line sensor.
 - (ii) that GGHB require to ensure that all relevant staff are properly trained in the operation of all dialysis machines in use in their renal departments; and
 - (iii) that GGHB require to ensure that a proper system is in place for the recording and documenting of all checks conducted on patients in the course of a session of dialysis.

PART IV: NOTE ON EVIDENCE

Decision to perform haemodialysis

1. I am satisfied that it was reasonable for Dr Petrie to decide that Mr McAllister required dialysis that evening. The evidence from Dr Petrie was that Mr McAllister was showing clinical signs of fluid overload and a chest infection. She considered that there were clinical signs of rib fracture although no fracture was shown on the chest x-ray. It is not unusual for a rib fracture not to show up on x-ray and the diagnosis is often done by reference

to the examination of the patient and the symptoms complained of or observed. In light of the condition of Mr McAllister it was reasonable for Dr Petrie to arrange for dialysis to be done whilst he was an inpatient and able to lie down during the procedure and be prescribed appropriate medication for pain control.

2. Dr Petrie examined Mr McAllister and reached the view that he was suffering pain and unlikely to writhe about when attached to the dialysis machine. She was also of the view that he was able to give her a full account and seemed a sensible person. In these circumstances she considered that he could undergo dialysis whilst lying in bed.

Securing of the venous needle

3. The evidence from Staff Nurse Oag was that Mr McAllister was a regular patient at the renal unit and that he had assisted him before with his dialysis. Mr Oag has 13 years of experience as a renal nurse. He has never experienced a venous needle becoming dislodged from a patient during dialysis.
4. That evening, Mr Oag secured the needles in the standard fashion. Mr Oag had some general conversation with Mr McAllister while he undertook the procedure. Mr McAllister did not appear to be drowsy or sedated at that time. Had the needle not been securely taped, Mr Oag was of the view that it would have become dislodged at an earlier stage. Mr Oag based this on the assumption that the needle did not become dislodged until around 45 minutes had passed. From the evidence, it is not clear at what point in the 45 minute period the needle dislodged.

5. When the alarm was sounded Mr McAllister was found lying on his back in the bed. A pool of blood had formed on the bed and on the floor. There was no indication of how the needle became dislodged and whether that was as a result of a failure to secure it adequately or by some other manner after it was secured.
6. Mr McAllister had experience of dialysis and had he been awake and fully conscious when the needle became dislodged, I am satisfied that he would have noticed that and raised the alarm himself.
7. Mr McAllister was seen during the period between 23.00 and 23.45 and appeared to be settled and asleep. He had been in considerable pain earlier on and had been given morphine based medication. The medication would have had some sedative effect upon him notwithstanding that he had taken it before.
8. In all these circumstances, I have been unable to conclude why the needle became dislodged and when that happened. It is possible that the needle was not secured adequately. It is also possible that Mr McAllister moved around and that caused the needle to dislodge. I heard nothing in the evidence, which would permit the inference that one circumstance is more likely than the other.

Observation and checks during dialysis

9. Mr McAllister was to have been checked by nurses once an hour after the commencement of dialysis. The needle became dislodged at some time between 23.00 and 23.45 and he would not have been due for a check until midnight.

10. Mr McAllister was in a bed that was in a part of the ward which could not be seen from the nursing station. That was the only bed available on the ward that evening. The staffing complement that night comprised two nurses and an auxiliary nurse. Dr Petrie was the on-call doctor.
11. Staff Nurses Oag and McLeod spoke to spending little of their time at the nursing station. A large part of their work was with patients at the beds in the ward. Mr McAllister was seen twice after he started dialysis, once by Staff Nurse McLeod and once by Dr Petrie. On each occasion he appeared to be settled and asleep.
12. In these circumstances, I have come to the view that it is possible but unlikely that had Mr McAllister been nearer to the nursing station the dislodgement of the needle would have been detected earlier. There may well not have been anyone at the nursing station at the critical time and the loss of the blood may not have been visible.
13. Mr McAllister was due to be checked every hour. He had been complaining of considerable pain from an injury to his chest and had been administered opiate based drugs. In those circumstances he was at greater risk of needle dislodgement when being dialysed at night and when in bed. At the time of these events, the staff on duty did not appreciate that the venous alarm was not wholly effective and relied upon it to alert them to any blood leaks.

The venous line alarm system on the Fresenius 4008E Haemodialysis Machine

14. I heard evidence from Duncan Ferguson from the SHS who examined the machine and has considerable experience of the operation of such machines. The examination was not conducted until around 15 months after the event.

Mr Ferguson stated that he was awaiting instructions from the Police or the Procurator Fiscal. He did not consider that the delay had affected the results of the examination. The machine calibrated correctly when switched on and that indicated that it was functioning in the same fashion as it had been in October 2006.

15. Mr Ferguson gave evidence that in this model of machine the venous line pressure sensor, which activates the alarm, is not wholly effective at detecting venous needle dislodgement. That is because the pressure difference from the venous needle dislodging is in the region of 13 -25 mmHg. This is a relatively small drop in pressure because some pressure is retained in the system when a needle dislodges and the blood still has to pass through the needle and the fistula. The lower limit for this type of machine is set at a minimum of minus 20 mmHG. If the machine is set at that lower limit the alarm may still not be activated when the venous needle is dislodged as the pressure may not drop by as much as 20 mmHG.
16. If the machine is set with symmetrical lower and upper limits it is likely to produce false alarms for the upper limit as when a patient moves around, the pressure increases. For that reason, the alarm system works best when the settings are asymmetrical. This allows for a higher setting for the upper limit, to reduce the chances of a false alarm, and a lower setting for the lower limit, which requires to be more sensitive to detect needle dislodgement.
17. The machine was at the default setting of 40 mmHG for the upper and lower limit during the dialysis treatment of Mr McAllister on 10 October 2006. When the venous needle became dislodged the lower limit of 40 mmHG was

unlikely to be achieved and the alarm activated. The alarm would have been more likely to sound if the lower limit had been set at the lowest limit for that machine, namely 20 mmHG. This could have been done manually but would not have guaranteed the alarm sounding as the pressure may not have fallen to that level.

18. Mr Ferguson also gave evidence that if the venous needle becomes dislodged the pump in the machine will continue to operate until it is shut off by the alarm mechanism. The machine pumps at 300 millilitres per second and the alarm is unlikely to shut down the pump immediately and there could be considerable blood loss in the period before the alarm sounds.

Redsense monitor

19. There was evidence from Duncan Ferguson that the Redsense monitor was not in existence in 2006 and has been developed since then. This monitor operates by detecting the presence of blood that has leaked from a dislodged needle. Mr Ferguson stated that the monitor is not wholly effective as it may not always detect a blood leak.

Research

20. I was referred to Crown Production 13 a paper written by Drs MacTier and Worth in 2007 and entitled "*Minimising the risk of venous needle dislodgement during haemodialysis*". The paper referred to studies of a number of cases, including that of Mr McAllister. It was noted that such incidents are rare.
21. The research for the paper showed that the drop in pressure caused by a venous needle becoming dislodged may not be enough to activate the alarm on the dialysis machine. The paper states that to have the machine operate at

its optimum level there should be an asymmetrical setting with the lower limit being set lower to detect a small loss of pressure. Even at such a setting, the alarm may still not be activated.

22. The paper stated that the research indicated that the securing and monitoring of the needles during dialysis was important. The paper supported the need for the optimal setting of the venous alarms. Reference was made to blood leak alarm devices possibly being a requirement for patients at a high risk of needle dislodgement.

Independent report by Dr Alastair Hutchison

23. Dr Hutchison was instructed by the Crown to produce an independent report on the circumstances of the death of Mr McAllister. Dr Hutchison sat in through the evidence of the Crown witnesses. He gave evidence that in his opinion the treatment of the deceased was reasonable and there were no systematic failures that might have contributed to his death.
24. It is the opinion of Dr Hutchison that venous needle dislodgement is not entirely preventable. He considered that the new protocol introduced within GGHB will be minimise the risk and the protocol is fit for purpose provided there is regular auditing of compliance.
25. Dr Hutchison gave evidence that in the normal course patients who are used to dialysis are careful of how their needles are taped by nurses. Having heard the evidence of Mr McAllister's condition that evening and the medication he had been given, Dr Hutchison was of the view that Mr McAllister may not have been able to take in what had happened during the taping of the needles by Staff Nurse Oag.

26. Dr Hutchison is now of the view that the alarm system in the Fresenius dialysis machine is not intended to detect venous needle dislodgement. In his own department they no longer rely upon blood detection devices. The department have in place a set of procedures to manage the risk, which include vigilance by staff in the securing of needles, the checking of patients, the documenting of all checks and patients are not given dialysis at night.
27. He considered that there was a possibility that the death of Mr McAllister might have been avoided had he been dialysed adjacent to a nursing station. He accepted that from the evidence led by the Crown that the beds near the nursing station were occupied by other patients that evening and that with the resources available it had not been possible to place Mr McAllister in a bed near the nursing station. He stated that Mr McAllister would have lost a significant amount of blood within five minutes of the needle being dislodged and that the blood leak would have had to be detected very quickly to have avoided a critical amount of blood loss.

Changes to procedures and practice in GGHB since 2006

28. Nurses are now required to carry out a formal risk assessment concerning the risk of needle dislodgement
29. There is now an additional check on needle security after the commencement of dialysis. This check is carried out by a nurse other than the one who inserts the needles.
30. There is an hourly check during the course of dialysis and the nurses must check and document that they have checked the security of the needles access point.

31. The Redsense monitor has been introduced across GGHB. The Haemodialert, which is another type of blood detection device has gone through a trial and has been ordered. Patients who fall within the higher risk categories in the risk assessment tool are given the Redsense or Haemodialert monitor as an additional precaution.
32. Routine dialysis for in-patients is no longer carried out overnight in Glasgow hospitals.
33. A programme of training about the risks associated with venous needle dislodgement has been undertaken by GGHB.

Training of staff in GGHB in the use of dialysis of machines

34. In the course of his evidence, Staff Nurse Oag stated that he was unaware of the practice of setting the limits on the alarms on dialysis machines. He had not seen any information on this issue on the wards where he worked.
35. Lead Nurse Isobel Brown, who gave evidence, stated that she was responsible for the maintenance of the standards of care in the renal service in GGHB. It was her understanding that it was the normal practice now to have dialysis machines operate with an asymmetrical setting on the venous alarm. She stated that the nurse operating the machine held the clinical responsibility for ensuring that the alarms were set asymmetrically. It was her understanding that staff were all given training on these procedures.
36. Mrs Brown indicated that an ability to change guard settings was something she would have anticipated renal nurses to be trained in. She accepted that if there had been evidence that any member of staff had not been trained,

GGHB would require to consider the issue of training. Mrs Brown stated that it would now be necessary to ensure that all staff received proper training

37. Mrs Brown could not point to, or name, any documents either in force in 2006 or now which set out the hourly policy of checking on haemodialysis patients nor could she point to such documentation in place now relating to the setting of the haemodialysis machine guards at asymmetrical levels.

Delay in the proceedings

38. At the conclusion of the proceedings I called upon the Crown to submit an explanation for the delay, which seemed considerable. I received a written explanation from the Crown by a letter dated 25 February 2013 from Anne Marie Hicks who is head of the West Team of the Scottish Fatalities Investigation Unit, which is part of the Crown Office and Procurator Fiscal Service. With the agreement of the Crown, I had this letter sent to the legal representatives, Mr Henderson and Mr Stewart. I indicated to all parties that I would hear submissions on this issue if required.

39. Mr Henderson submitted a letter in which he drew attention to certain aspects of the delay. Mr Stewart advised that he did not wish to make any further representations on the matter.

40. I caused the Sheriff Clerk to make enquiry within the court administration as to the progress of proceedings from the receipt of the petition from the Crown.

41. The following was part of the submissions in the letter from the Crown "*the case was not always progressed as expeditiously as it should have been and there were some periods of inactivity by the Crown throughout*". It is further explained

that there were staffing issues during the period of the investigation and that a number of different members of staff were involved and that the changes of personnel were a contributory factor in the speed of progress. The Crown has restructured the investigation of fatal accidents. It is the position of the Crown that Inquiries are now held within a far quicker time of the death than occurred here.

42. In his letter, Mr Henderson drew to my attention that he had corresponded with nine separate members of staff within the Crown Office and Procurator Fiscal Service in relation to the Inquiry. He wrote to the Procurator Fiscal on 9 December 2008 indicating that the family wished a Fatal Accident Inquiry to be held. He noted that the Crown did not petition the court for an inquiry until almost exactly three years later. Mr Henderson made it clear that he intended no criticism of Mr Graham who appeared for the Crown at the Inquiry; Mr McAllister's daughters had found Mr Graham to be helpful and of assistance during the hearing.

43. I was advised by the Sheriff Clerk that on receipt of the petition the court set out a preliminary hearing for the 17 September 2012 with the Inquiry to be held on the 19 November onwards. The court programme has provision for one week a month for the hearing of Inquiries. The date in November 2012 was the first date available when an Inquiry of this length could be accommodated. The Inquiry could not be dealt with in November 2012 as the date was not available and the Inquiry was adjourned to the dates in January 2013. I am satisfied that the Inquiry could not have been heard at any earlier date given the court programme.

PART IV: RECOMMENDATIONS

44. That a comprehensive review be undertaken by greater Glasgow Health Board as soon as reasonably practicable of the following;

- (i) the training of staff involved in the delivery of haemodialysis to patients;
- (ii) the procedures for documenting and recording the checks conducted on patients during sessions of haemodialysis; and
- (iii) the auditing of the practice and procedures in place for the delivery of haemodialysis.

PART IV: CONCLUSIONS

45. From the evidence led before me it is apparent that the dislodgement of venous needles during dialysis is rare and that it is a risk that cannot be wholly eliminated. The witnesses I heard from who had clinical experience in dialysis had little or no experience of another event of venous needle dislodgement.

46. Although it is a rare occurrence, if a venous needle does become dislodged the patient will lose blood at the rate of the pump in the dialysis machine. A patient can suffer substantial blood loss within minutes. There have been other fatalities in the United Kingdom from similar incidents.

47. In 2006 the medical and nursing staff at Glasgow Royal Infirmary involved in administering dialysis worked on the understanding that the venous pressure alarm system would promptly detect needle dislodgement. I am satisfied from the evidence of Dr Hutchison that this was the state of knowledge amongst practitioners throughout the country. On the 10^{October}

2006 the staff present relied upon the alarm to alert them promptly to any loss of blood during the dialysis of Mr McAllister.

48. The research in 2007 by Drs MacTier and Worth, which took into account the circumstances of the death of Mr McAllister, led to an understanding that the venous alarms could not be relied upon. There followed a reconsideration of the procedures in dialysis by health boards throughout the United Kingdom.
49. I am satisfied that there is now a greater understanding of the risk of needle dislodgement and the limitations of the venous alarm systems amongst medical practitioners and that GGHB and other health boards have brought into practice measures to manage and reduce this risk.
50. The Greater Glasgow Health Board has changed dialysis procedures in line with the improved understanding of the risks. There are now in place measures to reduce the risk, which I have detailed above. As I have noted, Dr Hutchison is of the opinion that these procedures are satisfactory with the proviso that there requires to be a regular audit of the procedures. I have reflected this in my recommendations.
51. I noted from the evidence of Dr Hutchison that in Manchester Royal Infirmary the renal department does not rely upon the venous alarm system or the Redsense monitor. The department has in place procedures to have the securing of the needle checked by a second nurse and regular monitoring and observing of the patients. The procedures are all documented and an audit of the adherence to the procedures is conducted regularly.
52. I am satisfied that at present there is no wholly reliable alarm or monitor available to detect blood loss from needle dislodgement. The risk requires to

be managed by a package of measures in which the venous alarm system and the Redsense or similar monitor may play a part.

53. It is for each renal department to have in place appropriate and adequate measures to manage risk. These measures may differ and there was no evidence before me that there was a standard set of measures. The management of the risk is a matter of clinical judgement. Different departments may take a different approach as is demonstrated by the evidence of the present practices in Manchester and Glasgow. For that reason, I have not made any recommendations about a national review directed at standardisation of practice and procedures.

54. I have recorded my concerns about the training and procedures in place within GGHB. Staff Nurse Oag had no knowledge of the settings on dialysis machines and stated that he had had no training on the matter. Lead Nurse Brown was unable to direct the inquiry to any documents in use by GGHB to record the regular checks of dialysis patients or the settings of guards on dialysis machines. I would urge GGHB to take the steps I have referred to in my recommendations and ensure that the issues are addressed in early course.

55. I consider that there has been an unacceptable delay in bringing the inquiry into the circumstances of the death of Mr McAllister to a conclusion. The periods of inactivity by the Crown are likely to have led to further upset and anxiety for the family of Mr McAllister. It is fortunate that the difficulties with the alarm system on the dialysis machine were highlighted by the

research in 2007 and changes made to practice in dialysis units and that this was independent of any Fatal Accident Inquiry.

56. I note the changes made by the Crown to their procedures for the investigation and conduct of Fatal Accident Inquiries. I urge the Crown to ensure that the procedures now in place are sufficient to avoid any family having to endure such long delays as occurred here.

57. It is to be hoped that with increased awareness and understanding of the risks associated with dialysis, the tragic circumstances of the death of Mr McAllister are less likely to happen again. That may be of some little consolation to his daughters who suffered the loss of a much loved father. That his death might have been avoided must be a source of great sadness to his family. I offer my condolences to the family for their loss in such sad circumstances.

Glasgow, 28 March 2011.

Sheriff Johanna Johnston, Q.C.