

**SHERIFFDOM OF TAYSIDE CENTRAL & FIFE
AT DUNDEE**

**UNDER THE FATAL ACCIDENTS AND SUDDEN DEATHS
INQUIRY (SCOTLAND) ACT 1976**

DETERMINATION BY

Sheriff Andrew Grant McCulloch

In

FATAL ACCIDENT INQUIRY

Into the death of

MARGARET MCREADY MCGINNIS

Dundee May 2007

The Sheriff having considered the evidence adduced, Determines in terms of section 6(1) of the Act

1. That in respect of subsection (a), Margaret McReady McGinnis (date of birth 19/07/46) died at Ninewells Hospital, Dundee on 30 July 2003, life being pronounced extinct at 1420.
2. That in respect of subsection (b), the cause of death was an arrhythmia brought on by chronic rheumatic heart disease, (previous mitral valve surgery).
3. That in respect of subsection (c), there were no reasonable precautions whereby the death might have been avoided.
4. That in respect of subsection (d), there were no defects in working which contributed to the death.
5. That in respect of subsection (e), there are no other facts relevant to the circumstances of the death.

REPRESENTATION

[1] The inquiry was led by Mr Wiseman, Procurator Fiscal Depute. Mrs Glen, Solicitor, represented the family and Mr Fitzpatrick, Advocate appeared for Tayside Health Board.

[2] The Procurator fiscal led evidence from the following witnesses:

1. Mr Peter McGinnis, the husband of the deceased
2. Dr Dennis Miller, GP, Ardler Surgery, Dundee
3. Dr Jacqueline Beale, Accident & Emergency Dept, Ninewells Hospital
4. Dr Nigel Reynolds, Consultant Physician, Gastroenterology Dept, Ninewells Hospital
5. Professor Derrick Pounder, Professor of Forensic Medicine, Dundee
6. Dr Adrian Brady, Consultant Cardiologist, Glasgow Royal Infirmary
7. PC Darren Smith, Tayside Police
8. Dr Jill Davies, SHO, Ninewells Hospital, Dundee.

Mr Fitzpatrick, Advocate for Tayside Health Board led evidence from:

1. Dr William Stephen Waring, Consultant Physician in Acute medicine and Toxicology, Royal Infirmary of Edinburgh, and Hon Senior Lecturer in Pharmacology, the University of Edinburgh.

LEGAL FRAMEWORK OF THE INQUIRY

[3] The purpose of an inquiry under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 is for the Sheriff to make a determination setting out the following circumstances of the death so far as they have been established to his satisfaction: --

- a) where and when the death and any accident causing the death took place
- b) the cause or causes of death and any accident resulting in the death
- c) the reasonable precautions, if any, whereby the death and any accident resulting in the death might have been avoided
- d) the defect, if any, in any system of working which contributed to the death or any accident resulting in the death
- e) any other facts which are relevant to the circumstances of the death

[4] The court proceeds upon the evidence and information placed before it, and the Sheriff's powers generally do not go beyond the making of a determination in relation to the circumstances established to his satisfaction from the evidence following investigation by the procurator fiscal, and other relevant parties. It is not truly an inquiry, and is not the appropriate forum for determining negligence, or civil liability and thus such inquiries should not enter into a discussion of negligence. This is in contrast to the position which existed under the previous legislation. Accordingly, in the context of this inquiry, it is not the function of the court to look for evidence of fault in the clinical management of the late Mrs McGinnis.

MEDICAL HISTORY

[5] Margaret McGinnis was born on the 19th of July 1946. She resided with her husband, Peter McGinnis at 80 St Giles Terrace, Dundee. She had rheumatic fever as a child and, as a result, she suffered from rheumatic heart disease in adulthood. This condition later causes thickening and narrowing of the heart valves. In her case it was the mitral valve which was affected. In 1993 she had a balloon mitral valvotomy. In addition she suffered from Crohn's disease, and generally could not be described as being in good health.

[6] During 2003 her ill-health caused her to be an inpatient at Ninewells Hospital, Dundee on three separate occasions. The first of these was between 19th February and 21st March when she was treated with antibiotics for a presumed infective endocarditis, although this diagnosis was never confirmed, cultures proving negative. The second admission, from 13th to 25th April was for a pyrexia of unknown origin. The third admission, from 30th June to 17 July was again for a pyrexia of unknown origin although on this occasion it was considered that she might have a vasculitis. Biopsies were taken and she was due to return to the clinic on 1 August 2003. During this time she was under the care of Dr Johnson, consultant cardiologist, and his specialist registrar Dr Jason Hill.

[7] During these admissions she consistently displayed elevated markers in particular her platelet count and her C.-reactive protein (CRP). Additionally her heart rate had varied quite considerably when tested during these periods. Her heart rate was noted at various counts between 40 and 150 beats per minute. Her normal pattern was one of atrial fibrillation. This is a condition where the heart's two upper chambers quiver instead of beating effectively. It manifests as a rhythm disturbance. Blood is not pumped completely out of the upper chambers causing the risk of clotting and stroke. Medication can be used to slow down the rapid heartbeat associated with atrial fibrillation. Digoxin is a drug which has been used since the 18th century in cases of atrial fibrillation. It works on an enzyme controlling the sodium potassium pump system on the surface of cells in the heart. In one group of patients, it slows the heart beat; in another it increases ventricular output. Mrs McGinnis had been prescribed digoxin for many years, perhaps from 1975 and certainly from 1991.

[8] For a number of days leading up to 29 July 2003, Mrs McGinnis felt unwell. She told her husband that she thought her heart was failing, going slower, and that she felt lightheaded. She told him that she was thinking of not taking her digoxin. Her pulse rate was hard to find, but appeared to be about 40. She went to see her general practitioner, Dr Miller, on 29th July. She saw him at about 4 p.m. and he noted that her heart rate was 44 which he thought was dangerously low, and warranted admission to hospital. He noted from her that she was breathless, tired and fatigued. He performed an ECG, the printout for which showed that her heart was in first degree AV block. Heart block occurs where one part is pumping out of phase with the other, and thus not beating effectively. This is a pattern that the heart cannot sustain for long. Dr Miller considered endocarditis as an explanation, as she had previously been investigated for that condition, it being known to cause heart block. Digoxin toxicity was not considered by him as an explanation as Mrs McGinnis did not present with any symptoms of vomiting, diarrhoea or abdominal pain, symptoms which one would normally expect in cases of digoxin toxicity. He was aware that she had been breathless on admission to hospital before, and that her most recent admission had led to the hospital believing her to have a multi-system vasculitic process. Dr Miller called the hospital, spoke to Dr Hill, who was the senior registrar on duty in the medical receiving ward, Ward 15. He explained that

he was sending in a patient who was extremely ill, believing her to have endocarditis. In his evidence, Dr Miller considered the matter urgent; without hospital admission she would not have survived another 24 hours.

[9] Mrs McGinnis was taken by her husband to Ninewells Hospital, arriving direct to Ward 15 at about 5:25 p.m. She took with her a note from Dr Miller, and the ECG trace taken by him. On arrival she was put on a heart monitor and had her history taken by nursing staff. It was noted then that she complained of her heart being slow and irregular, that she had omitted taking digoxin that day, that she felt a light thumping in her chest, and had been light headed for 3 days. It was also noted that she was bradycardic on arrival. Thereafter she was clerked in by Dr Davies, a preregistration house officer, who was on the ward for a four-week rotation as part of her six-month training in general medicine. According to the medical records, Dr Davies considered that Mrs McGinnis looked well. By now she was not noted as being breathless. It was decided to carry out a 12 lead ECG investigation, and check bloods generally, and specifically for digoxin levels. No documentary evidence of an ECG being carried out at the hospital was found, despite a search by the police and considerable investigation by medical staff. Accordingly I am unable to conclude that one was carried out; indeed it is more probable that it was not, as all other medical notes, charts and sheets were presented to the Court. Dr Davies could not recall this patient, and therefore could not recall whether or not an ECG was carried out. She did not think that it was likely that she would have marked in the records as a plan of action that one would be carried out and then change her mind, without reference to a senior doctor, in this case Dr Hill. What is certain, from the evidence of Mr McGinnis, is that his wife was attached to a three lead heart monitor which would show some, but not all, of the heart's functions.

[10] Dr Hill then saw Mrs McGinnis. Unfortunately Dr Hill did not give evidence, he now holding a position as a Consultant in New Zealand, and choosing not to return for this inquiry. As at July 2003 his consultant was Dr Reynolds, who spoke of various conversations that he had had with Dr Hill. Dr Reynolds had not seen Mrs McGinnis, and given the circumstances of her death, which may have taken place as a result of decisions made "on his watch" he wanted as full an

explanation as possible from Dr Hill. Dr Hill had told him that after seeing Mrs McGinnis, he had found nothing urgent, and had not been thought that a great sense of urgency had been imparted to him by Dr Miller. She had been in her normal atrial fibrillation, and was stable on the monitor. He had requested a note of the digoxin levels and when they came back in the low to normal range, he interpreted that as showing that her current symptoms were not caused by an excess of the drug. He knew that she was due to return three days later for a prearranged appointment. He took the view that she could be discharged, as he knew her well. He confirmed to her that she should take her digoxin tablet as normal the next day. Accordingly Mrs McGinnis, relieved at not being once more admitted to hospital, left with her husband. They stopped for fish and chips on the way home, and retired to bed. Mr McGinnis indicated that he thought Dr Hill had been surprised by the low reading for digoxin, having expected it to be higher.

[11] The next morning, Mr McGinnis went to work, later than usual. His wife came downstairs, still complaining of feeling generally unwell. He took her pulse, and was concerned to note it at 32 and 36. She said she had taken it herself at 40. She asked if she should take her digoxin, the tablets being beside her. Mr McGinnis asked her to call her consultant heart specialist, Dr Pringle, if she had any concerns. She said she might do that, and Mr McGinnis left for work. He telephoned home at 0930, and a few times later in the morning, without success. He returned home at about 1335, and found her lying on the floor in the living room doorway. He called an ambulance, which arrived at 1339. She was unresponsive, Cardiac compression was commenced and she was taken to Ninewells Hospital, arriving at 1406. She was seen by Dr Beale at 1415, who noted that she had been asystole for about 40 minutes, and decided to cease cardiopulmonary resuscitation. Life was pronounced extinct at 1420. On being informed of his patient's death, Dr Miller refused to issue a death certificate.

MATTERS OF CONCERN

[12] A number of issues have been highlighted before and during this inquiry. In particular concern was expressed on behalf of the family, in no particular order of importance, about the following matters. Firstly the apparent

failure of the hospital to perform a 12 lead ECG, as part of the noted management plan. Secondly the apparent failure of medical staff to read and interpret the ECG recording taken by Dr Miller and sent to hospital with Mrs McGinnis. Thirdly the apparent failure of nursing and medical staff to inquire of Mrs McGinnis when she had last taken her digoxin dose. Fourthly, the decision taken by Dr Hill not to admit Mrs McGinnis for observation overnight, but to discharge her home. Finally, the instruction to continue as normal with her prescription of digoxin. I shall deal with these in turn.

[13] All medical witnesses confirmed that it would be normal, and good practice in circumstances such as displayed on the arrival in hospital on 29 July 2003 of Mrs McGinnis, to employ a 12 lead ECG. That was clearly what was intended by Dr Davies, as it forms part of her management plan. It did not happen, in all probability. However a 3 lead heart monitor was used throughout the five or so hours that Mrs McGinnis was on the Ward. There are advantages of a 12 lead over a 3 lead, and vice- versa. Monitoring allows a dynamic and continuous recording of the patient's heart rate and may detect things that are happening on an intermittent basis, for example, periods of heart rate slowing or speeding up. A 12 lead ECG looks at more aspects of the heart and allows diagnosis of a variety of different conditions, but it is a snap shot over a ten second period, when the ECG is taken. The use of both is clearly desirable, but there was no evidence before me to indicate that the use of the 12 lead ECG would have made any difference to the decisions taken by Dr Hill, namely to discharge Mrs McGinnis, and to permit the taking of her digoxin dose the next morning. Dr Hill certainly observed the 3 lead monitor, using it as an aid whilst talking to Mr and Mrs McGinnis. I do not consider that the failure to use a 12 lead ECG contributed in any way to her death. The use of a 12 lead ECG might have shown what was causing her slow heart rate, which might have been ischemic heart disease, which then might have been checked by cardiac enzyme tests. But this is highly speculative, and not borne out by the facts, particularly the post mortem.

[14] There was no evidence to suggest that medical staff saw the ECG print taken by Dr Miller, and brought to the Ward by Mrs McGinnis. Practice was

that such traces and referral letters would be taken by nursing staff, to assist the creation of a new file of notes for the new admission. It was unlikely that this would have been done in the relatively short time that she was on the ward. Evidence from hospital doctors was that in any event they preferred their own ECGs, as those done by GPs could be unreliable. Not much attention would have been paid to the GP trace, even if it had been seen. Although this is unfortunate, and perhaps the result of a different way of thinking, I do not consider that the failure to see it contributes much. The hospital did place her on a heart monitor. The notes refer to her pulse rate, to her blood pressure, to bradycardia, to her previous mitral valve disease, and to her atrial fibrillation. She had no chest pain or orthopnoea, no dizziness or feints. The general consensus was that the heart monitor would also have shown the block and bigemini noted on the GP trace. I do not consider that the fact that Drs Davies and Hill did not see and interpret the GP trace (if that be the case) contributed in any way to the death of Mrs McGinnis. Indeed the belief of Drs Reynolds and Brady was that Dr Hill had more likely than not seen the GP ECG, as he had called for a digoxin level check. Such a check would not have been routine, and would likely be prompted by observing the ECG trace, although it might have come from observing the 3 lead heart monitor.

- [15] The next issue is whether there was a failure by hospital staff to find out when Mrs McGinnis had last taken her digoxin, and what, if any, effect that had. Both Dr Miller and Mr McGinnis spoke of Mrs McGinnis as being compliant in taking medicine. It is noted in the nursing notes that when she arrived she said that she had not taken her digoxin today; “omitted taken digoxin dose today” as it was written by the nurse. Later, Dr Hill records “check digoxin level; omit dose today”. Mrs McGinnis did not volunteer that she had not taken the digoxin for a few days, although this was her husband’s suspicion. It does not appear that she was tested on this point, her statement about missing “today” being accepted as meaning “only today”. The importance of this is obvious when considering the amount of digoxin in the body, and whether or not there is a sensitivity or toxicity developing. However, given the evidence from Dr Waring, which is noted later, it is clear to me that the reintroduction of digoxin by Mrs McGinnis on 30 July, whether after missing one dose, or more, did not cause her death. Accordingly, failing to enquire when the last digoxin dose was taken might have been poor practice, but did not

contribute to her death in any way. Finally, there was no evidence that Mrs McGinnis took her digoxin tablet on 30 July. She was not seen to do so, indeed was reluctant to do so. I am unable to find that she did.

[16] The decision to discharge Mrs McGinnis home may be seen, with hindsight, as erroneous. However, in the context of this inquiry, one must consider that decision in the circumstances in which it was made. It was a clinical judgement, made by a registrar with considerable knowledge of Mrs McGinnis. In the view of Dr Reynolds, the decision was a difficult one for a registrar to make, but one which was within clinical boundaries. He did not like to see patients discharged late at night, preferring where possible to admit for observation. There were no pressures on bed availability at that time, the Ward not being full. He accepted that doctors have different views, practices and personalities, with different decision making processes. He felt that it was rare to discharge as quickly as Mrs McGinnis had been, especially by a Junior doctor. He believed that Dr Hill has been complacent, given his prior knowledge of her. He had even written "I know Mrs McGinnis well" in his note of examining her at 8pm. In a discharge letter to the GP, dated 24 July 2003, Dr Hill had rehearsed her recent medical history at length, being somewhat dismissive of an earlier treatment for endocarditis. Dr Reynolds believed that Dr Hill had been a bit blinkered in his approach, but had considered the issue of digoxin toxicity. He had properly called for the level to be tested. Subsequently, he was assured by the reading of 1.0, that she was not toxic. From the heart monitor he had noted readings of 40, 60 and 80, within her normal range (even if 40 was at the bottom of that range). He decided that it was safe to discharge her, to return for her already arranged appointment 3 days later. Although Dr Reynolds would have done it differently, on a clinical analysis, it was not wrong to discharge her. It would also have to be borne in mind that Mrs McGinnis did not want another admission, already having spent three quite long periods in hospital in 2003, the last resulting in discharge a mere 12 days before. Dr Miller had expected Mrs McGinnis to be kept in for observation, commenting that if he had been aware of her discharge he "would have taken her straight back". As he was aware that she had had three unexplained admissions already in 2003, Dr Reynolds would have kept her in for observation, lest the new presentation was connected. However, whether she would have survived longer was open to doubt. He was aware that Dr Brady, in a report,

had indicated that admission would have led to a 50% chance of resuscitation the next morning, but having considered that view with senior colleagues, had believed that assessment to be over optimistic. Thus in my view, whilst admission would have been sensible, the decision to discharge was, on balance, one open to Dr Hill to take, and did not of itself lead to her death.

[17] The final area of concern highlighted for the family related to the instruction to take her normal dose of digoxin the next morning. Dr Hill said that it should be taken, having seen the blood test result. Although he had probably been expecting a high reading, it was in fact at the low end of her normal range. Dr Reynolds believed that Dr Hill must have seen the GP ECG trace as he was considering heart block caused by digoxin toxicity. That was why he had called for the test, and why he apparently expected a high reading. Accordingly he must have discounted digoxin toxicity as a problem currently affecting her, once the reading came back at 1.0, well within the “no concern” range. Therefore his decision to tell her she could take it as normal was reasonable. However, the Inquiry heard much evidence about digoxin, and its effects on patients.

[18] Dr Brady, like Dr Reynolds, was critical of Dr Hill’s handling of Mrs McGinnis. Dr Brady was a consultant cardiologist from Glasgow, and had viewed the hospital and GP records independently. He rehearsed the medical history, concluding that she had not been in the best of health on 29 July. It was however quite typical to have good spells, followed by illnesses requiring admission and treatment. She had always had a slow and irregular heartbeat, but a fairly regular pulse. The GP ECG showed that something was substantially wrong. AV block, taken with her known system, needed attention, perhaps by the use of a temporary pacemaker or drugs. Dr Brady commented that bigemini was the classic appearance of digoxin effect. As digoxin was used to reduce the rate of conduction within the heart, he was worried that a rate of 44 meant that she had either become sensitive to digoxin, or she had conductive problems. The GP was correct to send her to hospital. There, she should have been admitted for observation, and if necessary intervention. Digoxin should have been withheld, as this would likely increase the heart rate, to a range where Mrs McGinnis would be more comfortable.

If necessary, a pacemaker to regulate the heart could be fitted. What should not be done is to give the drug that you think is causing the problem (digoxin). Here the ECG trace showed the textbook pattern for digoxin toxicity. It was good practice to check the levels, as here. One should monitor the therapeutic effect, by testing 6 – 8 hours after ingestion. Digoxin is taken in the morning, so a blood sample taken at say 7pm would be about 10 hours after the dose. Dr Brady believed that if she had taken digoxin that day, then the result of 1.0 was on the high side, but reasonable. However, as it was reported that she had not taken that day's dose, then such a reading was indicative of sensitivity to it. In his opinion, she should not have been told to take digoxin the next morning. Whilst sending her home was not good or normal practice, it was acceptable, provided she was told not to take her morning dose.

[19] Dr Brady indicated that none of the usual symptoms of digoxin sensitivity were present here as Mrs McGinnis did not report nausea, fatigue, dizziness or palpitations. However her general report of being unwell, taken with the ECG should have alerted Dr Hill. In his view Dr Hill had been too preoccupied with his familiarity with the patient, and probably was sticking to his earlier view, from two weeks before, that she had vasculitis. She had previously been seen for "Pyrexia of unknown origin", and several tests had proved inconclusive. Endocarditis had been considered and treated, but it was never found to be present in tests. Crohn's could also cause pyrexia, as could vasculitis. Her pulse had been broadly similar on her previous admissions, and taken with similarly elevated CRP and platelet counts, this may have induced Dr Hill to believe that she was back in with the same issues as before. To Dr Hill, thought Dr Brady, this was just another visit to hospital by Mrs McGinnis; in fact it should have been considered as standing alone in cardiac terms, warranting a new critical approach. Dr Brady opined about the cause of death. He felt that it was most likely that this was a severe slowing of the heart. His reasoning was that there was a disturbance to the heart rhythm caused by sensitivity to digoxin, so that when she took her dose as instructed on the morning of 30 July, it caused the heart to slow to the point where it could not sustain the body, and death followed. He conceded that the post mortem had not found signs of toxicity, but indicated that these would be hard to find in a standard post mortem. Finally, he confirmed that it was possible for a patient such as Mrs

McGinnis to improve or deteriorate hour by hour. She could have improved significantly between seeing Dr Miller, and seeing Dr Hill about 4 hours later. But in his opinion she would still be sensitive to digoxin, and that was the critical point of his evidence.

[20] Dr Waring was led on behalf of Tayside Health Board. He was a consultant Physician at Edinburgh Royal Infirmary, with a speciality in Pharmacology and Toxicology. He runs a hypertension clinic and did a research doctorate on cardiovascular matters. He had considered the hospital records, the reports produced by Dr Brady, and had been provided with a synopsis of Dr Brady's evidence. He agreed with Dr Brady's medical history of Mrs McGinnis, although he placed different emphases on episodes in it. He considered that her digoxin dosage and concentrations were within normal therapeutic range. These had been unchanged over 10 years. Additionally her serum creatinine and potassium levels were normal over time. He considered that the level of digoxin at 1.0 was below her lower level of therapeutic efficacy, the plausible explanation for which was the omission of the dose on 29 July. He was of the view that it was unlikely that digoxin had any relationship whatsoever with the eventual outcome.

[21] According to Dr Waring, she had been on digoxin for 30 years. The effects of it vary significantly between individuals, but a key factor would be altered levels of serum potassium in the blood. Low levels would render a person vulnerable to digoxin. Poor renal function would lead to a build up or concentration of digoxin, as it is excreted from the body by the kidneys. Mrs McGinnis did not have an altered level of potassium nor did the tests show any poor renal function. Her serum creatinine levels had remained good throughout, indicating that her kidneys' ability to excrete drugs like digoxin had remained constant. Her digoxin level on 29 July was low. There is no such thing as digoxin withdrawal effect, and taking her normal dose on 30 July would just have brought her levels back to normal range. The mode of action of digoxin is such that one would expect 12 – 24 hours to elapse before any change in dose would have a significant clinical effect. Peak level occurs 3 – 6 hours after ingestion, then decline, but clinical effects lag behind by several hours. It requires time to penetrate tissue, before achieving its

desired aim. In his view, supported by the co-author of his report Professor Bateman, digoxin did not have a significant role in the death. Accordingly, he disagreed with Dr Brady. He was unaware of any case of digoxin toxicity with normal potassium levels. When asked about Dr Miller's view, that whilst symptoms of digoxin toxicity were absent, nevertheless her time on it may have rendered her sensitive to it, he said that this was unlikely. What was more likely was a new complication affecting the heart. When it was suggested that Dr Reynolds had considered that she had an ongoing disease process in her heart, Dr Waring agreed that to be more in line with his view.

[22] Dr Waring was critical of the post mortem. No potassium or digoxin levels were taken, and accordingly all subsequent enquires involved speculation. He felt that to be unfortunate, in all the circumstances. Indeed, Dr Reynolds had also been critical of the post mortem, in not checking the heart valves or conduction tissue for endocarditis. Dealing with the information before him, Dr Waring agreed that the GP ECG was abnormal, but not dramatically so. It did not indicate digoxin toxicity to him. He felt that it was difficult to say that she should have been admitted. She had been in hospital before, effectively with an undiagnosed medical problem, and it appeared to him that there was no new medical problem on presentation on 29 July. At hospital her appearance was not life threatening, nor did she attend "in extremis". She had not come by ambulance. A patient should be assessed in hospital by medical staff, notwithstanding what assessment a GP might have made. He profoundly disagreed with Dr Brady's view that heart block and bigemini are the classic appearance of digoxin toxicity. It would be extremely rare for these to be caused by digoxin. They are caused by ischemic heart disease. In Mrs McGinnis's case it was highly unlikely that digoxin had any influence on her death given her low level of it, and the absence of any other factors to support toxicity, such as nausea, vomiting etc, and altered potassium levels. There was nothing in her notes to suggest that she had a high level of digoxin. The only explanation he could arrive at for why Dr Hill considered that her digoxin level might be high, was because he believed her regular dose of 250 mcg to be a high dose in itself. But it was not. In any event to take her dose in the morning would not have made matters worse, given the time it takes to have a significant effect on the heart. His evidence was that it was not possible or likely that the normal dose of digoxin taken on 30

July would be capable of causing sudden death. Dr Waring believed that it was likely that she had taken digoxin on 28 July. It has a half life of 30 – 50 hours, so even if she had last taken it on 27 July, by back extrapolation she was still within her normal range on the evening of 29 July. Reduced digoxin levels take some considerable time to manifest themselves, and in Dr Waring's view, they had not in this case. Accordingly there was no indication to stop digoxin. In his view digoxin was a red herring, well down in the list of possibilities. He was also asked about the possible fitting of a pacemaker, as had been suggested by Dr Brady. He believed that a rate of 40 bpm would not indicate the use of a pacemaker, at least in Edinburgh hospitals. He felt confident in disagreeing with Dr Brady on digoxin because of his specialist training in toxicology. It was not normal to monitor digoxin, unless symptoms appeared, which they had not in this case.

[23] Dr Waring agreed that the cause of death was properly noted on the death certificate. He could not go so far as to say that nothing could have been done for Mrs McGinnis, nor that she would not have died if admitted to hospital. He acknowledged that she had had a "feverish" illness for some weeks, which remained undiagnosed. She had an arrhythmia which is commonly caused by ischemic heart disease. Quite why that had happened when it did was impossible to say. She might have had a recurrence of endocarditis, which was not fully excluded by the post mortem examination, but neither was it actually found. Crohn's would not have caused it. Vasculitis was not noted at the post mortem either, but nor was it specifically ruled out. It could affect the conducting tissues of the heart.

OBSERVATIONS

[24] Drs Reynolds, Brady and Waring are all eminent in their fields, and I greatly appreciated the time that each had obviously taken in preparing for this inquiry. Where they differ, largely over the effect of digoxin, I have preferred the evidence of Dr Waring, given his background training and specialisms. Digoxin is a widely used drug, but digoxin poisoning is rare; it is unlikely that Drs Brady and Reynolds would have dealt with many such cases, whereas Dr Waring indicated that he saw and dealt with hundreds of such cases in the UK as a toxicologist and while working with the National Poison Service. His formal training in clinical pharmacology was of significance. I found his approach logical, and fundamentally

more fitting to the medical facts of Mrs McGinnis. There is no doubt that she had a long and complex medical history, with several recent admissions for unexplained illnesses and relapses. It is unfortunate to be unable to say with absolute certainty what the cause of death was, but in my opinion, I can rule out digoxin as a material cause. That done, were there any reasonable precautions that could have been taken whereby the death might have been avoided? I do not stray into the realms of clinical negligence; in any event I do not find that the exercise of a clinical judgement by Dr Hill in discharging Mrs McGinnis was unreasonable. Thus it is not open to say that his failure to admit is a precaution that he should have taken. In any event, on the evidence it could not be said that it would likely have prevented her death. Might her death have been avoided by admission? That is a possibility, but when one has regard to the statutory provisions governing this Inquiry, I cannot make a finding where the precaution is not reasonable, given the exercise of clinical judgement. A precaution would be a measure to take account of a known or foreseeable risk. The death of Mrs McGinnis was not foreseeable at the time of discharge on 29 July 2003.

[25] There was much comment, mostly adverse, on the content of the discharge notification, Production 3. This gave as a diagnosis “Digoxin induced bradycardia”. It was written by Dr Davies, although she was unsure if it had been before or after Dr Hill had seen the results of the digoxin levels. She said that it was a differential diagnosis, and would come after she had spoken to a senior doctor. It was described by Dr Reynolds as “woeful”, as it should tell a patient what to do, and in any event was just wrong. A new form has been created for use at Ninewells, to ensure better communication. This matter played no part in the death of Mrs McGinnis.

[26] In his submissions, Mr Wiseman for the Crown commented that the failure to carry out a 12 lead ECG was personal to Dr Hill, that there was no evidence that others failed in their duties to Mrs McGinnis, but that such failure as there was by Dr Hill did not fall within the scope of this Inquiry. I agree with that stance. Any such failures by Dr Hill may be considered in the context of other proceedings. I have rejected the submissions for the family, as either being

speculative, or not borne out by the evidence, or rejected by Dr Waring, whose evidence I have preferred.

[27] Mrs McGinnis had a background undiagnosed medical problem through 2003, which was under close review by Gastroenterologists and Cardiologists. At the time of her presentation on 29 July, it did not appear that Dr Hill considered that she had a new problem; rather, to him it was a continuation of her undiagnosed condition. The only comment that I can make, at the conclusion of this Inquiry in the public interest, is that it is vital that an open mind be kept at all times, following admission or readmission to hospital, to ensure that familiarity with a patient does not lead to erroneous action or inaction.

[28] I have made no findings under paragraphs d or e.