DETERMINATION BY SHERIFF MORRISON QC INTO THE CIRCUMSTANCES OF THE DEATH OF DARREN DENHOLM v.

SHERIFFDOM OF LOTHIAN AND BORDERS AT EDINBURGH

DETERMINATION

by

SHERIFF NIGEL MORRISON, QC, Sheriff of Lothian and Borders at Edinburgh

in Inquiry into the circumstances of the death of

DARREN DENHOLM

under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976

APPEARANCES

For the Crown:Mr Shiels, Principal Depute Procurator Fiscal

For the Denholm Family:Mrs Smith, QC, instructed by

Anderson Strathern, WS

For Poggo Anaesthetics Ltd:Mr Aziz, Legal Adviser, Poggo Group Ltd

For Mr Pedersen:Mrs Abernethy, Solicitor,

Simpson & Marwick, Solicitors

For Dr Evans-Appiah:Miss Maguire, Advocate, instructed by

Dundas & Wilson, CS

CONTENTS

5.Other relevant facts

6.Recommendations

B.SUMMARY OF EVENTS

C.CRITICAL QUESTIONS OF FACT

1.Was Darren scared of dental treatment or frightened of needles?

2.Did Darren require an extraction?

3.Were the risks of a general anaesthetic explained and options discussed?

4.Did Dr Evans-Appiah give Mr Pedersen the go ahead to start the dental procedure?

5.Did Dr Evans-Appriah suggest that Mr Pedersen give Darren a local anaesthetic?

6.Did Mr Pedersen inject the local anaesthetic intravenously?

7.Did Mr Pedersen know about the danger of adrenaline reacting with halothane?

8.Did Darren suffer ventricular fibrillation or electromechanical dissociation?

9.Was Dr Evans-Appiah a qualified anaesthetist?

D.EXPLAINING RISKS OF GENERAL ANAESTHESIA AND DISCUSSING OPTIONS

1.The duties of the dentists

2.The duties of the anaesthetist

3.Consent

E.THE USE OF HALOTHANE

1.Discontinuation of halothane in dental anaesthesia

2.Expense

F.MONITORING EQUIPMENT

G.THE PRACTICES AND PROCEDURES AT THE PEFFERMILL CLINIC

1.General

2.Consent forms

3.Syringes

4.Qualifications and training of staff

5.Resuscitation training and team practice

6.Emergency arrangement with hospital

7.Checking Dr Evans-Appiah's competence

H.THE PROCEDURES OF POGGO ANAESTHETICS LTD AND THE POGGO GROUP

1.General

2.Employment of anaesthetics

3.Testing competence of applicants

4.Checking dental surgeries for suitability and good practice.

I.THE ANAESTHETIST AND THE DENTISTS

1.Dr John Evans-Appiah, the anaesthetist

2.Mr Hallgier Pedersen, the treating dentist

3.Mr Paul Shields, the referring dentist

J.QUALIFICATIONS OF ANAESTHETISTS FOR DENTAL ANAESTHESIA

K.THE GENERAL MEDICAL COUNCIL

1.Registration as a medical practitioner with temporary or limited registration

2.Assessing qualifications of overseas doctors

3.Meaning of full registration and re-validation

4.Locums

5.Procedures for complaints about doctors with limited registration

6.Obtaining full registration

L.THE GENERAL DENTAL COUNCIL

1.Training for dentists in general anaesthetic dentistry

2.Training of anaesthetist's assistants

3.Guidance about the place for dental anaesthesia

M.AVAILABILITY OF DENTAL TREATMENT UNDER GENERAL ANESTHESIA IN DENTAL SURGERIES

1.General anaesthesia only in hospitals

2.Requirements if general anaesthesia is to remain available in dental surgeries

Edinburgh, 23 February 2000

My determination is:-

A.SUMMARY OF FINDINGS

1.Place and time of death

With respect to section 6(1)(a) of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976, Darren Denholm, who was born on 25 March 1988 and lived at home at 19 Woodend Walk, Armadale, died on Friday 9 October 1998 at about 5.35 pm in the Royal Hospital for Sick Children, Edinburgh.

2.Cause of death

With respect to section 6(1)(b) of the Act of 1976, the causes of Darren's death were:-

I acardiac arrthymia;

breaction to anaesthetic agents;

crecent general/local anaesthesia for a dental procedure.

3.Reasonable precautions by which the death might have been avoided

With respect to section 6(1)(c) of the Act of 1976 Darren's death might have been avoided by the following reasonable precautions.:-

(1)An examination of Darren's tooth by Mr Shields, the referring dentist, before Darren was referred on 7 October 1998 (see section I3).

(2)An explanation to Mrs Denholm of the risks of general anaesthesia and the options for treatment of Darren's tooth (see section D1 and 2).

(3)An assessment by Mr Pedersen, the treating dentist, of whether an extraction, or an extraction under general anaesthesia, was required (see section D1).

(4)The use of sevoflurane rather than halothane as the anaesthetic agent or the use of halothane with more care (see section E).

(5)The attaching of the ECG monitor to Darren immediately after he was anaesthetised and before Mr Pedersen began the dental procedure by testing Darren's tooth (see section F).

(6)An arrangement for emergencies with the local hospital whereby a patient could be attended to and transferred quickly (see section G6).

(7)The employment of an anaesthetist who was on the specialist register of the GMC as an anaesthetist or was under actual supervision of such a person (see section J).

4.Defects in the system of working which contributed to the death

With respect to section 6(1)(d) of the Act of 1976, there were the following defects in the systems of working which contributed to Darren's death:-

(1)The practice whereby the referring dentist did not discuss the risks of general anaesthesia and the options for treatment with Mrs Denholm and the treating dentist assumed that the referring dentist had discussed the options for treatment (see section D1).

(2)The referral form from the referring dentist did not explain why Darren required to have an extraction under general anaesthesia (see section D1).

(3)The failure to obtain informal consent (see section D3).

(4)The obtaining of consent at reception in the Peffermill Clinic before Mrs Denholm had spoken to Mr Pedersen or Dr Evans-Appiah (see section G2).

(5)The employment of an anaesthetist who was not a specialist or not under the medical supervision of such a person (see section J).

(6)The failure to employ a properly trained anaesthetist's assistant at the Peffermill Dental Anaesthetic Clinic (see section G4).

(7)The lack of proper training of, and team practices including simulated emergencies by, all staff (including the dentist and the anaesthetist) in the surgery at the Peffermill Clinic (see section G5).

(8)The lack of monitoring of training by Poggo Anaesthetics Ltd (see section G5).

(9)The unsuitability of the surgery at the Peffermill Clinic, and the failure of Poggo Anaesthetics Ltd to check the facilities properly and to check that good practice was maintained by its anaesthetists (see section H4).

5.Other relevant facts

With respect to section 6(1)(e) of the Act of 1976, other facts relevant to the death of Darren are:-

(1)A full medical history of the patient should have been obtained before anaesthesia was induced (see section D2).

(2)Dr Evans-Appiah did not keep a proper record on the anaesthetic record and fabricated an entry (see section I1).

(3)The use of non-aspirating syringes instead of aspirating syringes at the Peffermill Dental Anaesthetic Clinic (see section G3).

(4)The procedures of Poggo Anaesthetics Ltd for assessing the qualifications of anaesthetists were inadequate (see section H2).

(5)The procedures for assessment of the competence of anaesthetists by Poggo Anaesthetics Ltd were inadequate (see section H3).

(6)Mr Shields, the referring dentist, should have ascertained whether the facilities were adequate and the staff properly trained at the Peffermill Dental Anaesthetic Clinic before referring a patient there (see section I3).

(7)The apparent lack of proper assessment of medical practitioners with limited registration (see section K1).

(8)The fact that medical practitioners with limited registration who had temporary registration have reserved rights to practice with limited registration (see section K1).

(9)The fact that full registration entitles a medical practitioner to practice medicine in any field without supervision (see section K3).

(10)The fact that it is possible for a medical practitioner to pursue a career as a locum with little supervision (see section K4).

(11)The fact that an employer might not complain to the General Medical Council about a locum after he has left the employment (see section K4).

(12)The fact that complaints about medical practitioners with limited registration are dealt with only at the point of renewal of registration (see section K5).

(13)The fact that the application form for full registration as a medical practitioner contains no question about any dismissals from employment (see section K6).

(14)The fact that the General Dental Council gives no guidance about the qualifications and training that should be required of a dentist undertaking general anaesthetic dentistry (see section L1).

(15)The fact that the General Dental Council gives insufficient guidance about the qualifications and training required for an anaesthetist's assistant (see section L2).

(16)The fact that the guidelines of the General Dental Council do not contain a statement to the effect that general anaesthetics for dentistry is best administered in

a hospital and that there is no requirement of the referring or treating dentist to indicate that a hospital is the best place for a general anaesthetic (see section L3).

(17)The fact that general anaesthetic dentistry is available in dental surgeries (see section M1).

6.Recommendations

I make the following recommendations:-

(1)Only aspirating syringes should be used in administering local anaesthetic, in accordance with best practice (see section G3).

(2)Mr Maurice Beckett should be reported by the procurator fiscal to the General Dental Council for consideration for prosecution before its Committee on Professional Conduct (see section G1).

(3)Dr Evans-Appiah should be reported by the procurator fiscal to the General Medical Council for consideration for prosecution before its Committee on Professional Conduct (see section I1).

(4)Mr Paul Shields should be reported by the procurator fiscal to the General Dental Council for consideration for prosecution before its Committee on Professional Conduct (see section I3).

(5)Should Poggo Anaesthetics Ltd or the Poggo Group Ltd supply anaesthetists for general anaesthetic dentistry in the future, it should reform its procedures for checking and assessing applicants and undertake regular checks of its clinics for suitability and good practice (see section H).

(6)A dentist referring a patient to another dental practice for general anaesthetic dentistry should ascertain first whether the facilities are adequate and the staff properly trained (see section I3).

(7)The General Medical Council should consider further how to assess medical practitioners with limited registration (see section L1).

(8)The General Medical Council should consider whether medical practitioners with limited registration who have reserved rights to practice should continue to have those rights (see section K1).

(9)The General Medical Council should consider whether full registration as a medical practitioner should continue to entitle a person to pursue an independent practice in any sphere of medicine without supervision and what action might be taken, if any, to restrict that entitlement (see section K3).

(10)The General Medical Council should consider what steps might be taken to deal with the problem of locums practising unsupervised and the problem of employers not complaining about locums (see section K4).

(11)The General Medical Council should consider whether complaints against medical practitioners with limited registration could be dealt with at a stage other than only at the point of renewal of registration (see section K5).

(12)The General Medical Council should consider whether to amend the application for full registration to include a question about any dismissals from employment (see section K6).

(13)The General Dental Council should specify in its guidelines for dentists the qualifications and training required of a dentist who wishes to practice general anaesthetic dentistry (see section L1).

(14)No dentist should be permitted to undertake general dental anaesthesia unsupervised without adequate training in that form of dentistry and without advanced resuscitation training (see sections G5 and L1).

(15)The General Dental Council should specify in its guidelines the qualifications and training required of an anaesthetist's assistant (see section L2).

(16)Until dental anaesthesia is restricted to hospitals, the General Dental Council should consider whether to include a statement in its guidelines, Maintaining Standards, to the effect that, ideally, general anaesthetics for dentistry is best administered in a hospital, and to consider whether the referring or treating dentist should be required to inform patients that a hospital is the best place for such dentistry (see section L3).

(17)Consideration should now be given, by the Executive or Parliament if that is required, to the discontinuation of general anaesthesia for dental treatment in dental surgeries and to it being restricted to hospitals with intensive care units (see section M1).

(18)Should general anaesthetic dentistry continue to be available in dental surgeries, in addition to the existing restrictions in the guidelines of the General Dental Council, Maintaining Standards, there should be the following requirements:-

(a)the treating dentist has undertaken a post-qualifying course of training in general anaesthetic dentistry;

(b)there are annual inspections by health board inspection teams of dental surgeries with power to suspend a dentist from practice who does not meet the standard;

(c)the dental nurse, anaesthetist's assistant and dentist have advanced resuscitation and life-support training; and

(e)the anaesthetist's assistant has undertaken a recognised course to qualify for that rôle (see section M2)

B.SUMMARY OF EVENTS

Tragically, Darren Denholm, a healthy 10 year old boy, died on Friday 9 October 1998 when he went to the dentist at Peffermill Dental Anaesthetic Clinic in Edinburgh simply to have a tooth out under general anaesthetic. Something went wrong after the anaesthetic had been administered and Darren suffered a cardiac arrest.

Certain facts in the sad events which occurred are not disputed. Darren, who was born on 25 March 1988, had had a general anaesthetic before. In 1997 he had had eight teeth extracted under general anaesthetic at St John's Hospital, Livingston. He had taken some time to come round on that occasion, according to his grandmother. In February 1998 he had a filling without injection. In early September 1998 Darren was having trouble with his upper left sixth, one of his adult teeth. He was given a temporary dressing for the tooth on 18 September by a dentist while his own dentist was on holiday, but the pain did not settle. There was an emergency call on 20 September. He went to his own dentist, Mr Paul Shields of the Armadale Dental Clinic, about it on Mr Shields' return from holiday. Pain was now waking Darren during the night. Antibiotics were prescribed. The pain did not improve. Darren went himself on 2 October to see Mr Shields. He was given a local anaesthetic (citanest). But, when Mr Shields started working on the tooth, Darren could feel pain. Mr Shields gave Darren a course of antibiotics. On 7 October Mr Shields did not examine Darren. He advised that there had to be an extraction. His receptionist told Mrs Denholm that Darren would be referred to the Peffermill Dental Clinic. Mr Shields told the Inquiry he had not been able to get the tooth numb enough on 2 October to work on it to, so there was nothing left but to refer Darren for an extraction of the upper left six under general anaesthetic. He could have referred Darren to St John's Hospital, but referred him to Peffermill. Why he chose the surgery, rather than the hospital, was never gone into in the Inquiry.

The Peffermill Dental Anaesthetic Clinic at the Peffermill Dental Centre undertook dental anaesthesia and patients were referred there from other practices. Darren was to go for an appointment on 8 October but, because of a sore leg, for which he was seen at St John's Hospital, he did not go. Darren was given an appointment the next day at 4.00 pm, a day on which dental treatment under general anaesthetic was performed. There were about 12 other appointments that day. Darren had had nothing to eat or drink since 9.00 pm on Thursday when he went to bed. He went to the Peffermill Clinic with his mother and grandmother, arriving at about 3.45 pm. Mrs Denholm was given a form to fill in by the receptionist, Mrs Pringle. Mrs Denholm was asked to complete it at reception, Mrs Pringle having completed the patient's name and address. This was the form for consent to the operation (Crown production no. 11 (CP 11)). Mrs Denholm completed some of it, including the reference to Darren coming round slowly after the general anaesthetic in St John's Hospital in 1997. She signed the consent form. On the front of the form there is a statement that the procedure has been explained, although, when Mrs Denholm signed it, this had not been explained. She was also asked to sign a GP17 form (an example of which is in CP5). Part 10 of that form includes a statement that "I have had all the treatment". Darren was taken away for an x-ray and brought back to the waiting room.

Darren was then called into the surgery. He went in with his grandmother, Mrs Campbell. The dentist spoke to Mrs Campbell. The dentist, Mr Pedersen, the anaesthetist, Mr Evans-Appiah, and the dental assistant, Kirsty Thompson, were

there. Mrs Campbell said that Darren was in pain and she thought he had an abscess because of the antibiotics which had been prescribed. Mr Pedersen explained that that was not so; he showed her an x-ray and pointed out that there was a deep cavity in the tooth. Mrs Campbell explained that Darren had had asthma, she mentioned the previous general anaesthetic and said that there was no indication that Darren was not to have such an anaesthetic. Darren was placed in an almost supine position in the dentist's chair. Mrs Campbell was ushered from the surgery by Mr Pedersen as Darren went under the anaesthetic.

Dr Evans-Appiah anaesthetised Darren by inhalation with a mixture of 2% halothane gas and 98% oxygen. The mask was then removed from Darren's face. No nasal mask was used in its place.

According to Mrs Denholm, it was at about 4.10 pm that she heard Darren's name shouted. Sharon Guild, the recovery nurse, thought it was about 4.20 pm that Mr Pedersen came to fetch her. As a commotion developed Mrs Denholm and Mrs Campbell became concerned that they were not being told what was happening. They asked several times but no one came to tell them. At one point Mrs Denholm thought she heard the key being turned in the surgery door as she approached it. Eventually one of the ambulance crew came, took her to a private room and told her that Darren had had a cardiac arrest.

What had happened was this. After Darren had been anaesthetised, Mr Pedersen applied forceps to the tooth. As he did so Darren moved. Darren had to be held. Miss Thompson held his legs. Darren calmed down. Subsequently, Mr Pedersen administered a local anaesthetic to the area of the tooth. The circumstances in which he came to do so was much disputed and I shall deal with this later. The local anaesthetic was lignocaine special, a mixture of lignocaine and adrenaline. As he injected Darren, Miss Thompson noticed Darren's colour change. She mentioned this. Mr Pedersen noticed that Darren's colour had drained totally. Dr Evans-Appiah said that he noticed it. Dr Evans-Appiah intubated Darren. Next Darren's position was moved by Dr Evans-Appiah so that his head was over the side of the chair. Dr Evans-Appiah asked for Sharon Guild, the recovery nurse to come in. Miss Thompson shouted for her. Sharon Guild said Mr Pedersen came to get her. She immediately started heart massage (cardiopulmonary resuscitation ("CPR")). The ECG was attached to Darren's arms by Miss Thompson and Mr Pedersen. Dr Evans-Appiah said that it was not attached properly. Miss Thompson and Mr Pedersen checked and found it was correctly attached. The ambulance was called: Mr Pedersen went to the reception to make a call and Miss Thompson telephoned from the recovery room. Gareth Nicholson, the anaesthetist's assistant, arrived in the surgery from reception. Dr Evans-Appiah went to insert a cannula into Darren's right arm. It became dislodged. Dr Evans-Appiah asked for the defibrillator. It was brought in from the recovery room by Mr Nicholson and set up, but Dr Evans-Appiah did not use it. Dr Evans-Appiah asked for atropine, for which he had put in the cannula. He administered either 1/2 or 1 mg of adrenaline into the intubation tube. A drip was set up for administration of saline. Mr Nicholson and Miss Thompson took over CPR from Miss Guild until the ambulance arrived. CPR was not stopped.

The ambulance arrived at 16.22 hours. They were directed to the back door. The crew used their own defibrillation equipment. Darren was shocked twice by the

ambulance crew first at 50 joules then at 100 joules, manually. Mr Milne, the ambulance technician, called Medic 1 from his vehicle.

Medic 1 arrived. This consists of a team of two doctors, two ambulance crew and a staff nurse. The doctors were Dr Kathleen Houlihan and Dr Gillion Fabbroni. They were requested at 16.27 and arrived within five minutes at the Peffermill Clinic. When they arrived basic life support was being performed on Darren. Dr Houlihan took over care of Darren, and Darren was transferred to their cardiac equipment. Darren was in ventricular fibrillation. The cannula in Darren's right arm was not functioning. Dr Fabbroni inserted a cannula into his left arm at the second or third attempt. They gave Darren three successive shocks first at 50 joules then at 100 joules, and an injection of adrenaline. There was no cardiac output and no blood pressure. There was no response. Darren's skin was pale and he had cool peripheries. Darren remained in ventricular fibrillation without cardiac output. Adrenaline was administered again, the purpose being to affect the arteries to get blood to the heart or brain. Darren was transferred to the Royal Hospital for Sick Children. On the journey, Dr Houlihan ordered two doses of lignocaine to be administered. This drug is used when shock treatment does not work.

At the Sick Children's Hospital the cardiac arrest team was waiting and took over the care of Darren on his arrival at 17.12 hours. Attempts at resuscitation continued. But Darren did not recover and Dr Beattie, the Accident and Emergency Consultant, pronounced Darren dead at 17.35 (see CP62, p.1).

C.CRITICAL QUESTIONS OF FACT

The Inquiry raises issues of public importance and interest. There is much public concern about children dying under general anaesthetic while undergoing dental treatment in a dentist's surgery, even though such tragedies do not occur frequently. There are, however, certain important questions of fact which have to be determined before I deal with these issues.

1.Was Darren scared of dental treatment or frightened of needles?

Dr Evans-Appiah said that he understood from Mrs Campbell that Darren was frightened of needles. But Mrs Campbell said she never told Mr Pedersen or Dr Evans-Appiah that this was so. She said in evidence that Darren had even gone to the dentist himself on occasions. Mr Shields said that on 2 October 1998 he had administered a local anaesthetic to Darren. There was no evidence from Mr Shields of any such phobia. It is unlikely that Mrs Campbell would have said that Darren was scared of needles. It was not the reason Mr Shields gave for referring Darren to the Peffermill Clinic. Mrs Denholm gave no indication that Darren was referred to the Peffermill Clinic because he was frightened of needles.

Dr Evans-Appiah said that Darren looked frightened when he was in the dentist's chair. Mrs Campbell, Mr Pedersen and Miss Thompson did not describe Darren as frightened when he got into the dentist's chair. At most he was nervous or concerned. He was not panicking. Mr Pedersen understood that Darren was there because he did not feel confident with normal dental treatment. Mr Pederson thought it was made clear that a general anaesthetic was required because of the referral by

Darren's own dentist and his conversation with his grandmother. He agreed it might be correct that he had assumed that Darren was scared because he was referred and that possibly nobody had actually said anything about Darren being scared.

It is absolutely clear from the evidence of Darren's own dentist, Mr Shields, that the reason Darren was referred to the Peffermill Clinic was because Mr Shields thought he could not treat Darren under local anaesthetic. Darren had received a local anaesthetic on 2 October 1998 but had experienced discomfort. It had hurt when Mr Shields tried to work on the tooth. Mr Shields had even drilled and filled a tooth of Darren's on 12 February 1998 without local anaesthetic.

I conclude, therefore, that Darren had no fear of needles, was not frightened of dental treatment and that neither of these constituted the reason for the referral to Peffermill. Whether Mr Shields' decision to refer Darren was the correct one or not, it is clear that his reason for referring Darren was that he could not get Darren's tooth numb enough under local anaesthetic. Thus, in his opinion, a general anaesthetic was called for.

It appears that assumptions were made by Mr Pedersen and Dr Evans-Appiah which could not have been deduced from the referral form (CP4) or from a conversation with Mrs Campbell. This highlights the need for the referral form, which is completed by the referring dentist, to state the reason for the referral, that is to say whether the referral is being made for sedation or general anaesthesia, and why. It also highlights the need for the dentist and the anaesthetist to carry out the pre-treatment procedures to satisfy themselves that general anaesthetic is necessary. I deal further with these issues in section D below.

2.Did Darren require an extraction?

Preservation of the tooth by filling or by root canal was only an option if one were able to get the tooth numb enough, according to Mr Shields. It was not possible to do so. In his clinical opinion extraction was the only option. Mrs Denholm was advised that Darren had to have an extraction.

Mr Shields' original intention was to fill Darren's tooth. When he tried to work on Darren's tooth on 2 October 1998, Mr Shields used citanest as the local anaesthetic agent. As he started to drill Darren became uncomfortable. Mr Shields did not try another agent such as lignocaine then or before referring Darren to Peffermill, although lignocaine was more effective than citanest. He did not think other agents would have made the tooth any more numb. Furthermore, because Darren's reaction was so acute, he did not think that a double dose would have made any difference. Darren was then given antibiotics because his tooth hurt. On 7 October Mr Shields did not examine Darren but simply referred him to the Peffermill Clinic.

Mr Pedersen would have considered filling the tooth (under general anaesthetic), but not root canal treatment because that was very difficult on a child of 10. He could not, however, say if the tooth could have been saved. He did look at the x-ray of Darren's tooth taken at Peffermill (CP27) and saw the deep cavity. It appears that a number of factors contributed to his proceeding to carry out the extraction under general anaesthesia. He believed that Darren was scared. He believed that Mr

Shields would have assessed the possibilities. He assumed that the decision had been taken that extraction was the best treatment. Darren was referred for general anaesthesia. There was a culture of referrals for removal of even one tooth under general anaesthetic. There would not have been enough time to evaluate if a general anaesthetic was necessary to remove the tooth.

It would be speculation to conclude that Darren might not have needed an extraction or a general anaesthetic, because there was no assessment on 7 October by Mr Shields and no independent assessment by Mr Pedersen. Professor Rood, Professor of Oral Surgery at King's College, University of London, did think that extraction was an appropriate option. But an unfortunate question mark is left. This highlights the responsibilities of the referring and treating dentists. I deal with these responsibilities in more detail in section D below.

3.Were the risks of a general anaesthetic explained and options discussed?

The risks of general anaesthesia and options for treatment were not discussed by Mr Shields with the Denholm family. He said that he would expect the dentist and the anaesthetist undertaking the treatment to explain the risks of general anaesthesia and options. He did not explain the risks to Mrs Denholm because, in his opinion, there was no other appropriate treatment.

The risks and options were not explained by Mr Pedersen or Dr Evans-Appiah according to Mrs Denholm and Mrs Campbell.

Dr Evans-Appiah admitted that he did not discuss the options for pain control with Mrs Campbell. He said this was because she told him that Darren was afraid of needles. But this was not, in fact, true. It is apparent that he did not discuss the risk of a general anaesthetic because he did not discuss the options, he understanding that Darren would not accept a local anaesthetic and was afraid of needles. His understanding was, of course, erroneous. I do not believe that he had such an understanding. If he had had such an understanding, then he had not enquired of and discussed the risks and options with Mrs Campbell. He should have done. It is stated on the form of consent for operation under general anaesthesia or sedation (CP11), in a box which has to be signed by the anaesthetist, that he has explained the method of and options for anaesthesia. He had not signed the form before the procedure began. He tried to sign it when interviewed by the police officer, DS William Slaven, afterwards. Dr Evans-Appiah accepted in evidence that the anaesthetist had a duty to explain the options. He said that the choice of whether to use a general anaesthetic or a local anaesthetic was not made by the anaesthetist. But he did have a duty to explain the risks of general anaesthesia. These risks were not discussed.

Mr Pedersen assumed that Darren's own dentist had considered all the options. But he had no information about options having been discussed previously with the Denholm family. There was nothing on the referral form (CP4), blanks of which were provided by the Peffermill Clinic to the Armadale Clinic. It has to be said that there was no obvious place on the form unless it were included in the box "Other Information/Medical Conditions". It does appear that Mr Pedersen did consider whether extraction was appropriate. Professor Rood agreed that, though the treating

dentist had a professional duty to consider whether the treatment he was asked to give was appropriate, it was reasonable for Mr Pedersen to accept that it was reasonable to extract the tooth.

I conclude that the risks of general anaesthesia were not explained and that options for dental or anaesthetic treatment were not discussed by Mr Shields, Mr Pedersen or Dr Evans-Appiah with Mrs Denholm or Mrs Campbell. They should have been. I deal with why this is so in section D below.

Mrs Denholm said she would not have gone ahead with the general anaesthetic for Darren at the surgery if she had been aware of the risks. Darren did, however, have extractions under general anaesthesia in St John's Hospital in 1997. It is not clear, though, whether this would have been her position if there had, in fact, been no alternative.

4.Did Dr Evans-Appiah give Mr Pedersen the go ahead to start the dental procedure?

When Dr Evans-Appiah had anaesthetised Darren, he claimed he then moved to insert a venflon (a type of cannula) into Darren's right hand. As he was trying to do this he heard Mr Pedersen say that Darren had moved. Dr Evans-Appiah said that he did not, and thus could not have, told Mr Pedersen to start. He would have wanted to have put on the basic monitoring equipment, the ECG and the blood pressure cuff, before giving the dentist the command to start. He did not know that Mr Pedersen had started.

Mr Pedersen, on the other hand, said he never proceeded without an anaesthetist giving him the go ahead, never ever. This was only his fifth day of carrying out dental treatment under general anaesthetic. Therefore, he would not do anything without permission of the anaesthetist. Mr Beckett, the owner of the Peffermill Clinic, had told him always to follow the instructions of the anaesthetist. He could not recollect what Dr Evans-Appiah had said but he had no doubt that the anaesthetist had asked him to proceed. It was put to him by Miss Maguire, counsel for Dr Evans-Appiah, that, in his statement to the police (CP 52 at p 17), he had said that Dr Evans-Appiah had "motioned" to him to start. The implication was that Mr Pedersen had misinterpreted Dr Evans-Appiah's motioning Mrs Campbell out of the surgery as an instruction to begin. (Mrs Campbell had been ushered out of the room by Mr Pedersen when Darren was anaesthetised.) Mr Pedersen could not understand the word "motioned". He did not think he had ever used it. He thought it more likely he had said "mentioned" and that the police officer, DC Colin Brown, had written it down incorrectly, perhaps not understanding his accented English. (Mr Pedersen spoke excellent English.) He confirmed to his solicitor, Mrs Abernethy, that he had never seen his statement, though he had asked for a typed copy to check it. DC Brown, who took Mr Pederson's statement on 30 October 1998, confirmed that Mr Pederson had asked for a typed copy of his statement to read because of his English and remarks he had made about Dr Evans-Appiah that he wanted to think about. A typed copy had never been sent to him. DC Brown said that "motioned" may have been a word selected by him rather than Mr Pedersen. He remarked that later on Mr Pedersen had said that he was given the go ahead. DC Brown confirmed that, on

page 22 of the statement, Mr Pedersen had used the word "mentioned" in another context.

Miss Thompson said that it always happens that the anaesthetist tells the dentist when he can start. She had never seen a dentist start without being given the go ahead; although it has to be pointed out that she did not work regularly in the general anaesthetic surgery. Because she could not remember just how the instruction was given or what was said, she agreed with Miss Maguire's proposition that she might be assuming the go ahead was given because a dentist would never begin without it. Miss Thompson had some support from Mr Pedersen.

It is interesting to note that both Mr Pedersen and Miss Thompson say that Dr Evans-Appiah remained by the head of the patient maintaining an airway and did not, as Dr Evans-Appiah claimed, move to the arm to try to insert a cannula. It would have been reckless for him to have left the head and abandoned the airway. Dr Evans-Appiah accepted that it was his duty to maintain the airway. Mr Pedersen said that on this occasion Dr Evans-Appiah had not asked him to maintain the airway, although he had on other occasions. Dr Evans-Appiah accepted the possibility that he had not asked Mr Pedersen to do this. It is inconceivable that an anaesthetist would abandon the airway without ensuring that it was maintained. As Professor Aitkenhead, Professor of Anaesthesia at the University of Nottingham, said, to leave the airway on an unconscious child with no one supporting it would be reckless because the patient would almost certainly obstruct it. (Obstruction of the airway was not a cause of death found at post-mortem.) I think Dr Evans-Appiah remained at the head of the patient and did not try to insert a cannula. At the very least, therefore, Dr Evans-Appiah cannot maintain he would have been unaware of Mr Pedersen starting the dental procedure even if he did not give Mr Pedersen permission to start.

In my opinion, Dr Evans-Appiah did indicate to Mr Pedersen that he could start the dental procedure. I believe Mr Pedersen and Miss Thompson that Mr Pedersen would not have started the dental procedure without being given a clear indication that he could start. Dr Evans-Appiah had by that time anaesthetised Darren. I think in fact Dr Evans-Appiah did say to Mr Pedersen that he could start the dental procedure.

What Mr Pedersen did then was to look at the tooth to see what he was up against, and to test the tooth, to check the resistance with his forceps, before intending to proceed with the extraction. There was some question as to whether Mr Pedersen was testing the tooth or starting the extraction. If he was starting to extract it would have been best practice to prop and pack the mouth first, although that was not critical here according to Professor Rood. Mr Pedersen had not done that. Professor Rood found it difficult to understand why a dentist would want to test the tooth: once the forceps are in your hands you are going to extract. The only gain would be if the forceps were the wrong shape and one wanted to change them. While I accept that to test the tooth may not be necessary, I do not disbelieve that Mr Pedersen took this additional precautionary step. It is not, however, a critical question whether he tested the tooth or began the extraction.

At this point Darren moved. Mr Pedersen asked Dr Evans-Appiah what they were to do. I turn now to consider whether the reply was that Darren be given a local anaesthetic.

5.Did Dr Evans-Appiah suggest that Mr Pedersen give Darren a local anaesthetic?

According to Mr Pedersen, Dr Evans-Appiah suggested that Mr Pedersen give Darren a local anaesthetic and remove the tooth. Dr Evans-Appiah wanted to keep Darren lightly sedated. Mr Pedersen would be giving him a local anaesthetic anyway at the end of the procedure to take the edge off the pain after the general anaesthetic wore off. It was quite wrong, according to Professor Rood, to administer a local anaesthetic to gain control of the patient. He said it was outrageous for an anaesthetist to suggest it.

Dr Evans-Appiah denied that he told Mr Pedersen to give Darren a local anaesthetic. Indeed he denied all knowledge of a local anaesthetic being given until he and Mr Pedersen were waiting to give statements to the police or not until the next day (he could not remember which). When he was told that Darren was moving, Dr Evans-Appiah said he went back to the head of the patient to increase the concentration of halothane. He did not, of course, do so. There was no explanation as to why Dr Evans-Appiah would want to keep Darren "lightly sedated". Dr Evans-Appiah did not admit to saying this. What we do know is that Darren was, in fact, lightly sedated and that discontinuation of halothane would result in Darren rapidly regaining consciousness - in about 30 seconds. This was the evidence of Professor Aitkenhead.

Mr Pedersen was emphatic that he was not lying when it was put to him that Dr Evans-Appiah had never told him to administer a local anaesthetic. He denied the suggestion that Dr Evans-Appiah had told him to tell him when he was going to give the injection.

Miss Thompson at first indicated she did not know whose idea it was to administer the local anaesthetic. She did remember that there was talk about it. It was put to her by Mrs Smith that, in her statement a few days later to the police (CP53), she had said that Dr Evans-Appiah had said to Mr Pedersen that he should administer a local anaesthetic when Mr Pedersen asked Dr Evans-Appiah what to do. She agreed that if that was what she said at the time then it was true. It seemed to me that Miss Thompson was a straightforward, honest and sensible young woman. Her evidence, therefore, is some support for Mr Pedersen. I have no reason to doubt their evidence. Professor Rood said that if the anaesthetist did not instruct it, he could not see why the dentist would want to give a local anaesthetic at that stage. I conclude that Dr Evans-Appiah did suggest to Mr Pedersen that he administer a local anaesthetic.

If Dr Evans-Appiah did not suggest to Mr Pedersen that he give Darren the local anaesthetic, he certainly knew that Mr Pedersen had done so. He was at Darren's head when Mr Pedersen did it. According to Mr Pedersen, Dr Evans-Appiah knew about the injection because, while they were waiting to give statements to the police after the incident, Dr Evans-Appiah mentioned the possibility of the interaction of

halothane and adrenaline. In one of his statements to the police (CP45), on the Friday night, Dr Evans-Appiah states that the dentist gave a local anaesthetic. Dr Evans-Appiah at first admitted and then denied speaking to Mr Pedersen about this. Mr Pedersen also mentioned that Dr Evans-Appiah telephoned him the next morning to say that he had forgotten to tell the police about the injection.

When questioned by Mrs Smith, Dr Poggo, managing director of Poggo Anaesthetics Ltd ("Poggo"), said he went to see Dr Evans-Appiah in London on the Saturday following Darren's death. He said Dr Evans-Appiah told him that he had asked the dentist to give a local anaesthetic because he had not put the patient to sleep properly. Unfortunately, Mrs Abernethy asked Dr Poggo to repeat that piece of his evidence but his memory then failed him. He could not remember the details accurately except that there was talk of local anaesthetic being given during the procedure. That at least may indicate that Dr Evans-Appiah knew a local anaesthetic had been given, even if he did not suggest it. Dr Poggo also said, however, that it was unlikely that an anaesthetist would ask a dentist to use a local anaesthetic. It was quite clear, from Mr Pedersen and from what Mr Flavill, principal of the Carden Place General Anaesthetic Clinic in Aberdeen, said, that it was common practice to give a local anaesthetic at the end of the procedure to dull the pain when the general anaesthetic wore off. Miss Guild said she believed Dr Evans-Appiah knew that the local anaesthetic had been given. It was put to her by Miss Maguire that, in her statement to the police (CP 61 (DC Brown's notebook)), in the second last sentence she had said: "John (that is Dr Evans-Appiah) also said to me after the incident that he thought it was the local anaesthetic the dentist had given the patient prior to surgery but after anaesthetic and that he didn't know the dentist had given it". DC Brown said she was upset when she gave the statement and confirmed that she had not signed it and that she had been asked if she could sign a typed version. In her evidence she stated that, from what Dr Evans-Appiah had said, she thought that he knew that the dentist had given a local anaesthetic.

These several coincidental intimations do rather point to knowledge and, I think, tend to support rather than detract from the conclusion that Dr Evans-Appiah did suggest the administering of the local anaesthetic.

6.Did Mr Pedersen inject the local anaesthetic intravenously?

Darren had been moving before the local anaesthetic was administered. Miss Thompson had had to hold Darren's legs, though without pressure. She was asked by Mr Pedersen to hand her the local anaesthetic. She handed him the pre-prepared lignocaine special which contains adrenaline. Mr Pedersen said Darren was calm and not moving when he injected him. There was no problem with the injection. There was no blood, the presence of which would indicate that he had injected into a blood vessel.

He was not using an aspirating syringe. Such a syringe enables the dentist to see if he is injecting into a blood vessel because he can see if blood is getting into the syringe. The dentist then knows to stop and try again. Such syringes were not available at the Peffermill Clinic although it was better practise to use them.

Bruising was found at the site of the injection at post-mortem (CP 34 at p 2). Professor Rood thought this might have occurred because the patient moved and Mr Pedersen, therefore, injected into a blood vessel. Mr Pedersen said that it was not necessary to inject into a blood vessel in order for bruising to occur although he accepted that if one did inject into a blood vessel bruising was likely to occur. He could not think of any reason for the bruising other than the injection.

Professor Busuttil, Professor of Forensic Medicine at the University of Edinburgh, conducted the post-mortem examination with Dr Keeling. A bruise was found in the gum adjacent to the upper left sixth in Darren's mouth: see his reports in CP 33, page 2 and CP 34, page. 9. Evidence of the bruise extended into the left buccal fat (ie the cheek). It was about 1 cm in size. Dr Moody, a consultant oral pathologist who assisted with the autopsy because of his expertise, took photographs (CP Label 1) and specimens of the bruised area. Dr Moody said the bruising was consistent with injection for a local anaesthetic. Professor Busuttil said bruising could occur without the needle penetrating a vein; there are many capillaries in the mouth and bruising is likely. Bruising can occur just by injecting. Professor Busuttil agreed that the bruising could be caused by external pressure such as when putting an intubation tube into the mouth. Professor Rood did not disagree with this. Professor Busuttil and Dr Moody said it was not possible to say if local anaesthetic was injected into a vein.

It appears from the evidence of Professor Busuttil and Dr Moody that there were two separate injuries. The presence of iron in the area of haemorrhage indicated bruising at least seven days before. That would be consistent with the injection by Mr Shields on 2 October 1998. The presence of red blood cells was indicative of a recent event and was consistent with injection of a local anaesthetic by Mr Pedersen.

The presence of lignocaine in Darren's cardiac blood (toxicology report, CP 36) tells us little. If local anaesthetic stayed locally it should not have been found in cardiac blood. We know that the two doses of lignocaine were ordered to be injected into Darren by Dr Houlihan on the journey of Medic 1 from Peffermill to the Royal Edinburgh Hospital for Sick Children. Professor Busuttil said that he could not distinguish between any lignocaine injected intravenously as local anaesthetic (if such were the case) and the subsequent injections of it.

Professor Rood said that the risk of an intravascular injection with the co-operation of the patient at that site was very low and could be dismissed. It was highly unlikely that one would engage a significant blood vessel at this sight. One would probably not inject into a blood vessel. But there was always a chance one could damage a vessel and one would expect to see bruising if there were damage to tissue or a blood vessel. At one point, in cross-examination by Mrs Abernethy, he said the risk of injecting into a vein in this area was so small it should not be considered. It was possible to get bruising without an intravascular injection but this bruise was, he thought, a fairly significant one. He could not say how it occurred. A bruise of 1 cm was unusual from dental injections. But the most likely explanation was that the patient was moving. He did warn about the danger of making too critical comments on the basis of a two-dimensional slide (CP Label 1, slide 4 prepared by Dr Moody).

Professor Aitkenhead concluded that an intravenous injection of adrenaline was an improbable cause of Darren's collapse. This was because it would take some

seconds, he thought four to five, to leave the face and drain back to the heart and cause an arrhythmia. He thought that the greater the duration between the injection of the local anaesthetic and the change in the colour in Darren's face, the more likely it was that an intravenous injection of adrenaline contributed to the collapse.

Miss Thompson said that she noticed and pointed out that Darren changed colour while Mr Pedersen was giving the injection. He had not administered the whole syringe when he stopped because she shouted that Darren was "turning fucking green". Mr Pedersen, in his evidence said that he had not administered the whole cartridge (about half apparently) when Miss Thompson drew attention to the change in colour. He did , however, give a rather different account in his statement to the police (CP 52 p. 22); but it does not accord with Miss Thompson's evidence. Professor Rood thought it would take about 10 to 15 seconds to deliver half a cartridge (1 ml). (Professor Aitkenhead thought it would take 15 to 20 seconds). He also thought it would take longer for the adrenaline in the local anaesthesia to reach the heart than did Professor Aitkenhead. He thought it would take 10 to 15 seconds.

It would appear that Darren's face changed colour while the local anaesthetic was being administered. Placing that evidence beside the other evidence about the likelihood of an intravenous injection, it seems unlikely and improbable that Mr Pedersen administered an injection intravenously. The bruising at the site of the injection was explicable because there had been two injections at that site within a week and because bruising could occur without injecting into a blood vessel. There was also the possibility of the bruise being caused by external pressure during the emergency which followed.

I have come to the conclusion that Mr Pedersen did not administer an injection of local anaesthetic intravenously.

7.Did Mr Pedersen know about the danger of adrenaline reacting with

halothane?

Three pre-prepared syringes containing local anaesthetic, prepared by Miss Thompson, were available for use. One of them contained adrenaline. That was the syringe containing lignocaine special. Unless the patient had a heart problem or known allergic reactions, lignocaine special was used. The danger of adrenaline reacting with halothane to cause cardiac arrhythmias is generally well known. Mr Pedersen said he did not know at the time of Darren's death. Although even with this knowledge Mr Pedersen mentioned he would still have injected Darren with lignocaine special. Mr Beckett said he would not have explained the dangers of giving a local anaesthetic while a patient was anaesthetised to Mr Pedersen because he himself had not done this for many years.

Dr Evans-Appiah informed the Inquiry that he had told Mr Pedersen the reason why it was important to tell him when he was going to use a local anaesthetic. That reason was that halothane mixed with adrenaline could cause arrhythmias. He was not sure that Mr Pedersen was aware that he was using halothane although it would have been that or enflurane (with which there was also a risk of arrhythmias). But he also said that, if Mr Pedersen had told him he had given a local anaesthetic of

lignocaine special, this would not have made any difference to his diagnosis of electromechanical dissociation ("EMD"). It is difficult to see how this could be so since the danger of arrhythmias caused by halothane mixing with adrenaline should have been an obvious cause to him. Dr Evans-Appiah's answer was that, the draining of all blood and the tilting down of Darren's head not making any difference, led him to the conclusion of EMD. I do not believe Dr Evans-Appiah told Mr Pederson of the danger.

Professor Rood would not have expected a dentist to be aware of the danger. Even a dentist who was originally trained to do dental anaesthesia and had not done it for a while would probably forget. The most recent text book in 1998 makes no mention of the danger. Professor Rood said he had had to do some research in the literature for the purposes of this Inquiry to quantify the risk associated with injecting adrenaline. If he had to do that to find the answer, he would not have expected Mr Pedersen to have been aware of the risk. It was apparent, however, that Mr Flavill was aware of the danger; but he was a man of considerable experience.

Mr Pedersen had attended dental operations carried out under general anaesthesia at university. But he had had no practical training or experience before coming to Peffermill. The day Darren died was his fifth day carrying out dental treatment under general anaesthesia and his fourth day with Dr Evans-Appiah.

I think Mr Pedersen did not know about the danger. A dentist who practices general anaesthetic dentistry ought to be aware of the dangers. It is clear, however, that Dr Evans-Appiah did know of the danger and he knew that it was common for dentists to use lignocaine and adrenaline as a local anaesthetic.

8.Did Darren suffer ventricular fibrillation or electromechanical dissociation?

This is the most important question in this Inquiry. If Darren had suffered ventricular fibrillation, then Dr Evans-Appiah used the wrong treatment to resuscitate him.

The possibilities were that halothane reacted with adrenaline in the body causing a cardiac arrhythmia, in particular, ventricular fibrillation, or, as Dr Evans-Appiah thought, there was EMD.

If the patient is in ventricular fibrillation, the treatment is to shock the patient with a defibrillator. If EMD is present, one had to find the cause of the EMD and treat that. One does not treat EMD by administering shocks. In the case of ventricular fibrillation, the successful outcome of defibrillation depends on the cause of the ventricular fibrillation. If it is a temporary event and defibrillation is done immediately, the heart should, on a balance of probabilities, respond normally within two or three shocks. Professor Aitkenhead described the action of the heart muscles when the condition is ventricular fibrillation as looking like a bag of worms: thousands of muscle units contract, not synchronously, but independently. The heart does not pump blood but is using up oxygen. That is why it is important to defibrillate quickly. If not, the muscles will be damaged as they run out of oxygen.

It is clear that the problem must be identified quickly and the appropriate response acted upon promptly. I now consider the evidence as to which condition was present.

Professor Busuttil indicated that it could not be demonstrated at post-mortem that the heart went wrong at the time of the administration of the local anaesthetic. There would have to have been some activity going on for two to three hours before it could be detected under microscope. He was, however, able to exclude certain causes of death, namely, natural and congenital diseases and allergic responses. There was no evidence of obstruction to the airways. There was evidence that the brain was starved of oxygen which was the immediate reason for Darren dying. The most likely cause of that starvation was the heart going into an abnormal rhythm; that is ventricular fibrillation, or ventricular tachycardia whereby the heart beats fast and out of rhythm so that effective pumping action was not there and not enough blood was going to the brain. There are no tests at post-mortem which can determine what rhythm there was at the time. In a child of Darren's age ventricular fibrillation or ventricular tachycardia was the most likely arrhythmia. He could not say whether EMD was the rhythm. For that it would be necessary to look at the ECG monitor at or about the time of death.

There was no ECG monitor attached to Darren before he collapsed. The Peffermill ECG was attached during the emergency. Miss Sharon Guild, the recovery nurse, was called to the surgery by Mr Pedersen. She was asked to undertake cardiac massage. The ECG monitor had been attached to Darren before she entered the room by Miss Thompson and Mr Pedersen. Dr Evans-Appiah asked Miss Thompson to check it because he thought it was not working, although according to Miss Thompson and Mr Pedersen it had been attached correctly. Dr Evans-Appiah says the rhythm he saw was that of EMD. Miss Guild said that, when she looked at the monitor on going into the surgery, it was showing ventricular fibrillation. It always showed ventricular fibrillation during the emergency, according to her. She did not ever see a trace for EMD.

The ambulance crew, when they arrived, attached their own ECG monitor to Darren. Their monitor printed out readings. When Medic 1 arrived, the medical team attached their own cardiac equipment. Their ECG monitor also could print out a trace. Those traces, from both monitors, are the only recorded evidence available. Those traces were recovered and lodged by the Crown (CP62). I deal later with the interpretation of them by Professor Aitkenhead. There was no printout from the Peffermill Clinic monitor.

Although his knowledge was limited, Mr Pedersen thought they were dealing with venticular fibrillation. Mr Milne, the ambulance technician from the ambulance that arrived first, told the police that the Peffermill Clinic monitor he saw on arrival showed what he took to be a ventricular fibrillation reading (CP55, p 4). He said he would not have made that statement up. He was trained to recognise all ECG readings, two of which were ventricular fibrillation and EMD. His colleague, the paramedic Mr Stewart, was clear that their own monitor showed that Darren was in ventricular fibrillation. When Darren was transferred to the Medic 1 monitor, according to Dr Houlihan it showed the rhythm for ventricular fibrillation. Dr Fabbroni could not remember when he saw the rhythm on the ECG, but he was certain it was always ventricular fibrillation.

Only Dr Evans-Appiah claimed that the ECG showed EMD. He said that it was possible for EMD to change to ventricular fibrillation. Dr Houlihan confirmed that

shocking a patient who was in EMD could cause the rhythm to change to ventricular fibrillation. It could start as EMD and change to ventricular fibrillation, although Professor Aitkenhead indicated that that was rare.

Dr Evans-Appiah was convinced he was dealing with EMD. His reasoning was this. Darren's face appeared to drain of all blood. What could cause this is if there were no loss of blood to the body because Darren was not bleeding? Altering the position of Darren's head by placing it over the side of the chair, in other words tipping his head down, did not improve his condition. If the problem were relative hypovolaemia (where the capacity of circulation is greater than the blood volume) and Darren fainted, that should have cured the problem according to Professor Aitkenhead. Dr Evans-Appiah considered an infusion of saline, which would have been an appropriate response to a loss of blood. Darren had not eaten or drunk anything since 10.00 pm the night before. Dr Evans-Appiah concluded that Darren was not well-hydrated, that he was relatively hypovolaemic. In answer to questions from his counsel, Miss Maguire, he indicated that when he looked at the ECG monitor it was showing a slow heartbeat (bradycardia). With the electrical activity seen on the ECG, cardiac output not being present and there being no pulse (which was what he discovered), the conclusion was EMD. Causes of EMD include hypovolaemia and hypoxia. The cause could not be hypoxia because of the amount of oxygen he had given Darren. His conclusion was that it was relative hypovolaemia because of a lack of food and drink from the night before. He was aware of a Toronto research study which concluded that there was a risk if children had not eaten or drunk for some time. Two to three hours of fasting was adequate for children, and children did better if well-hydrated before an operation.

Professor Aitkenhead considered that hypoxaemia was an unlikely cause of Darren's cardiac arrest. Dr Evans-Appiah agreed with Professor Aitkenhead that halothane mixed with oxygen alone reduced the risk of hypoxia (which is an inadequate supply of oxygen to a tissue or organ). No one, not even Dr Evans-Appiah, saw Darren turn blue, which would have been a sign of severe hypoxaemia developing.

One turns then to consider the opinion of Professor Aitkenhead about Dr Evans-Appiah's conclusion of relative hypovolaemia. The problem was commoner when the patient was not lying flat. Darren was in a supine or almost supine position. Tipping Darren's head down as Dr Evans-Appiah did would have cured a faint. Professor Aitkenhead could find no evidence of relative hypovolaemia unless it was a faint. Professor Aitkenhead said an anaesthetist would not conclude there was relative hypovolaemia from a period of fasting. In his opinion Dr Evans-Appiah had misunderstood the Toronto study. Professor Aitkenhead, using a computer search of the literature, could find only one Toronto paper dealing with pre-operative fasting in children (CP57). Assuming this was the paper to which Dr Evans-Appiah was referring - and no other paper was put forward on behalf of Dr Evans-Appiah - it did not say what Dr Evans-Appiah claimed it did. Professor Aitkenhead said that the purpose of fasting was to reduce acid from the stomach getting into the lungs. The only reason for reducing fasting was to reduce the anxiety of the child. The study did not say that children did better if allowed to drink. It did not address this issue. It looked purely at the contents of the stomach. There was no mention in the paper of cardiac changes or hypovolaemia.

It is not possible to diagnose EMD without an ECG because one has to demonstrate that there is no cardiac output. Furthermore, the presence of adrenaline would have been obvious from the ECG. An ECG was not attached to Darren until after he had collapsed. Although Dr Evans-Appiah said that he saw EMD on the ECG monitor when it was attached, no one else did. As Professor Aitkenhead said, what Dr Evans-Appiah probably saw was the effect of heart massage on the ECG monitor which he wrongly attributed to EMD. Heart massage has to be stopped before looking to see what the ECG trace is. The evidence of those in the surgery was that heart massage (CPR) was not stopped before the ambulance arrived. Ventricular fibrillation can be confirmed by discovering if there is, for example, no pulse. Dr Evans-Appiah said there was no pulse.

Then there is the evidence of the ECG traces. Looking at the ambulance crew's and Dr Houlihan's, ECG traces that were recovered (CP62), there was no sign of EMD before 16.45.27 hours on the machine clock of Medic 1 after a shock of 100 joules. There were indications of ventricular fibrillation before that between 16.26 and 16.30.55 and afterwards at 16.47. At 16.24.46 there was a 'u' shaped depression on the trace which could be interpreted as EMD but the rest of the pattern (see 16.25.58) was clearly ventricular fibrillation. The pattern at 16.24.46 could be compared with that at 16.45.27 on the Medic 1 machine which was EMD. The earlier apparent EMD trace could have been the effect of the heart massage which Dr Evans-Appiah wrongly attributed to EMD. It was unlikely that EMD could move into ventricular fibrillation in a healthy child, according to Professor Aitkenhead. He had not seen it, although it could happen if there were coronary artery disease. Darren did not have such a disease. One end result of ventricular fibrillation not being treated is EMD which is what was seen at 16.45.27.

I appreciate that these traces begin some minutes after Darren's collapse, because the ambulance did not arrive until 16.22 hours. But one has to have regard to what Professor Aitkenhead says about the likelihood of EMD moving into ventricular fibrillation.

Dr Evans-Appiah, Mr Pedersen and Miss Thompson all mentioned Darren's rapid change of colour. Dr Evans-Appiah spoke of it being so rapid that it was as if there was loss of blood. But there was no apparent loss of blood. Darren was described as pale or palid by Dr Houlihan. In ventricular fibrillation everything goes pale, according to Professor Aitkenhead.

There appears to be little support for Dr Evans-Appiah's theory of relative hypovolaemia and EMD. Is there another possible cause consistent with the evidence?

Halothane sensitises the heart to the arrhythmogenic property of adrenaline. A painful stimulus will release adrenaline naturally in the body. In the presence of halothane there is more likely to be a reaction to the adrenaline in the heart to the heart rate and heart rhythm. An arrhythmia could be generated progressing to ventricular fibrillation. With halothane, the higher the concentration of adrenaline the greater was the risk of arrythmia and ventricular fibrillation. This was the evidence of Professors Rood and Aitkenhead.

It is necessary at this point to deal with the question of the source of the adrenaline before I proceed further. There are two possible sources. One was adrenaline introduced into the body by the local anaesthetic given by Mr Pedersen. The other was adrenaline produced endogenously, or naturally, by the body in response to a painful stimulus. With respect to adrenaline introduced by local anaesthetic, this could be done intravenously or simply subcutaneously. I have already determined that Mr Pedersen did not inject the local anaesthetic intravenously: see section C6 above. The next question, then, is whether the subcutaneous injection of lignocaine special could have contributed to Darren's death.

Professor Rood said his researches revealed three papers which indicated that one would need at least 5 ml, that is more than two whole cartridges of adrenaline to have an effect on the heart in a patient anaesthetised with halothane. Darren was given an injection of only about half a cartridge of lignocaine special (lignocaine and adrenaline). Professor Aitkenhead agreed that 1 ml (half a cartridge) of adrenaline over 15 to 20 seconds (the time it takes to administer it) in an adequately anaesthetised patient was unlikely to lead to ventricular fibrillation. He thought that one cartridge injected subcutaneously was unlikely to have an effect if everything else was normal.

Of course, Darren was not properly anaesthetised. Professor Rood considered that even a non-intravenous injection of the local anaesthetic introduced adrenaline into the system; although, if properly done, the adrenaline is absorbed quickly. He had used lignocaine and adrenaline when working in Manchester for 15 years with an anaesthetist who used halothane. There had been no problem, but that was an acceptable practice only so long as there were safeguards. Professor Aitkenhead did say that if Darren's colour changed at the beginning of his collapse then, for the local anaesthetic to be the cause, the injection of it would have had to be intravenously otherwise it could not have caused the collapse. I have concluded that Darren's colour changed while the local anaesthetic was being administered: see section C6 above. This would appear to indicate that the subcutaneous injection of adrenaline was not a significant or material contribution to Darren's collapse.

I was invited by Mrs Abernethy and Miss Maguire, in their submissions, to exclude the local anaesthetic as a cause and not to include it in the cause of death as Professor Busuttil had done (see CP38). I do note, however, that Professor Rood said that the injection of local anaesthetic was not helpful if there were already a cardiac affect. Professor Aitkenhead indicated that anything which contributed to the increase of adrenaline increases the risk of arrhythmia. I do not consider that the subcutaneous injection of adrenaline was a material contributory cause of Darren's collapse. But, in these circumstances, I do not think that I can omit a reference to local anaesthesia in the cause of death.

The other source of adrenaline in the body is adrenaline produced endogenously in response to a painful stimulus.

Darren did receive a painful stimulus before he was given a local anaesthetic. This was when Mr Pedersen "tested" Darren's tooth. Darren moved, because he could feel the pain and had to be held down. He could feel pain, of course, because he was not properly anaesthetised. It was Professor Rood's opinion that it was highly

unlikely that the injection itself, in the area of the mouth of the upper left six, would be painful.

Professor Aitkenhead said that it was possible for halothane and the manipulation of the tooth (the painful stimulus) to cause a cardiac arrhythmia. He said that it would be unusual, with the proper administration of anaesthesia, for ventricular fibrillation to develop. But Darren was not properly anaesthetised.

If Dr Evans-Appiah's diagnosis of EMD and relative hypovolaemia was correct, for which he was following the right protocol, one might have expected his attempts to resuscitate Darren to have been more successful. What he did not do when his efforts were unsuccessful, as Professor Aitkenhead pointed out, was to re-assess the situation.

It seems clear, as Professor Aitkenhead concluded, that the most probable cause of Darren's collapse was a cardiac arrhythmia leading to ventricular fibrillation brought about by increased adrenaline. In my opinion the material contribution to that collapse was the adrenaline produced naturally by the body in response to the painful stimulus felt by Darren when his tooth was tested by Mr Pedersen. That adrenaline affected the heart sensitised by halothane. This is consistent with the evidence of the ECG traces, and with what all the witnesses saw except Dr Evans-Appiah. It is even consistent with some of the findings of Dr Evans-Appiah about Darren's colour, his lack of a pulse, and even to the failure of a response when Darren's head was moved. Ventricular fibrillation is the rhythm classically found with halothane and adrenaline.

The specific treatment for ventricular fibrillation is defibrillation. It appears that even Dr Evans-Appiah considered it, because he called for the defibrillator. But he did not use it. Dr Evans-Appiah knew or ought to have known that ventricular fibrillation was a possibility where halothane and adrenaline were present. Dr Evans-Appiah knew that halothane and adrenaline can react to cause arrhythmias. He would know that adrenaline is produced naturally in the body. He said that he told Mr Pedersen about the danger of arrhythmias. I do not know why he never considered this possibility. It must have been staring him in the face. Professor Aitkenhead's opinion was that, on the balance of probabilities, if Darren had been defibrillated when he collapsed he would have survived.

9.Was Dr Evans-Appiah a qualified anaesthetist?

It was apparently lawful in October 1998 for Dr Evans-Appiah to anaesthetise Darren at the Peffermill Clinic, and to do so unsupervised. This was Professor Aitkenhead's evidence. There were two reasons for this. Firstly, because Dr Evans-Appiah held a current and valid certificate of full registration as a medical practitioner (see (CP17) last page) issued by the General Medical Council ("GMC") under the Medical Act 1983. Secondly, the General Dental Council ("GDC") guidelines, Maintaining Standards, published in November 1997 (CP20) and current in October 1998, did not prohibit him from administering dental anaesthesia even though he was not a specialist in general anaesthesia. A specialist is one who has specialist training, has passed the final examination of the Royal College of Anaesthetists ("RCA") and is on the specialist register of the GMC for anaesthetists. Paragraph 4.10 (administration

by a second person) of the GDC guidelines provided in October 1998 that the general anaesthetic must be administered by a second person who was not the dentist treating the patient and:-

"The second person must be a dental or medical practitioner with appropriate post-graduate training and evidence of relevant continuing clinical education."

I am not entirely convinced that Dr Evans-Appiah had "relevant continuing clinical education".

From 10 November 1998, 32 days after Darren's death, Dr Evans-Appiah ceased to be qualified to administer general anaesthesia in a dental surgery unless under a restricted kind of supervision. This was because of the amendments to the GDC 1997 guidelines introduced on that date (CP29). Paragraph 4.13 (ii) restricted administration of general anaesthesia to a specialist or to someone under supervision as laid down in that provision. I deal with this in more detail in section J below.

At one point in his evidence Mr Beckett said it was playing with words to say that Dr Evans-Appiah was not a qualified anaesthetist. In my view, it was playing with lives. Whatever the legal position of Dr Evans-Appiah at the time of Darren's death, one must not forget to consider whether he was competent. Professor Aitkenhead thought that Dr Evans-Appiah was not fit to practice anaesthesia without another anaesthetist in the room.

Two issues arise. Firstly, what should the qualifications be for anaesthetists working in a dental surgery. This has now been dealt with by the GDC: see section K3 below. Secondly, should full registration as a medical practitioner entitle a doctor to hold himself or herself out as qualified in any sphere? I deal with that issue in section K3 below.

Having reached certain conclusions on important factual questions, I now deal with the issues concerning precautions, defects and recommendations. It was apparent that, on a few issues, professional practice has changed since October 1998. Some recommendations by me are not, therefore, required. But it is important, nonetheless, for me to deal with all the issues raised in the Inquiry. They were wide-ranging.

D.EXPLAINING RISKS OF GENERAL ANAESTHESIA AND DISCUSSING OPTIONS

In section C3 above, I have noted that Mr Shields, Mr Pedersen and Dr Evans-Appiah did not discuss the risks of general anaesthesia and options for treatment with Darren or Mrs Denholm. Mr Shields and Mr Pedersen each assumed the other would do it.

1.The duties of the dentists

As at October 1998 the duties of dentists were set out in the GDC guidelines, "Maintaining Standards", dated November 1997 (CP20). Those guidelines were

explicitly silent on the duties of the referring dentist with respect to explaining the risks and options. Professor Rood indicated that it was reasonable for a referring dentist at that time to expect those undertaking the dentistry under general anaesthetic to explain the risks. He also said that it was, then, reasonable for the treating dentist to assume that options for treatment had been discussed by the referring dentist.

Those guidelines stated in paragraph 4.8 (risks of general anaesthesia) that:-

"A dentist who carries out treatment under general anaesthesia or sedation without ensuring that the conditions set out below are met is liable to a charge of serious professional misconduct."

One of the conditions was set out in paragraph 4.9 (full medical history and consent):-

"Prior to the administration of general anaesthesia or sedation, a full medical history of the patient must be taken and consent obtained. Patients must be given in advance clear and comprehensive pre-and post-treatment instructions in writing ..."

Reference in that paragraph is made to paragraph 3.7 (consent) which was in the following terms:-

"A dentist must explain to the patient the treatment proposed, the risks involved and alternative treatments and ensure that appropriate consent is obtained.

If a general anaesthetic or sedation is to be given, all procedures must be explained to the patient. The onus is on the dentist to ensure that all necessary information and explanations have been given either personally or by the dentist/sedationist. In this situation written consent must be obtained. *See also 4.9*".

But for what Professor Rood regarded as reasonable, the burden of that paragraph appears to fall on the treating dentist. But it is not clear. Paragraph 3.4 (accepting a referral) provides:-

"It is the responsibility of a dentist when accepting a referral to ensure that the request is fully understood. The treatment provided should only be provided where this is felt to be appropriate ....."

In November 1998, the guidelines were amended: see CP29. The purpose of the amendments was to reduce greatly the availability of dental treatment under general anaesthesia: see the covering letter in CP29 of the President of the GDC. The amendments make explicit what the duties of the referring and treating dentists are. Paragraph 4.9 (decision to refer) now provides:-

"The decision to refer a patient for treatment under general anaesthetic should not be taken lightly. As part of this decision, a full medical history of the patient must be taken and agreement to refer obtained following a thorough and clear explanation of the risks involved and the alternative methods of pain control available. Clear

justification for the use of general anaesthesia, together with details of the relevant medical and dental histories of the patient, must be contained in the referral letter ..."

Paragraph 4.10 (decision to treat) now provides the following duty on the treating dentist:-

"Before carrying out treatment under general anaesthesia a thorough and clear explanation of the risks involved and the alternative methods of pain control available must be given. *See also 3.4".*

Paragraph 3.7 now omits the words "The onus is on the dentist to ensure that" because he must do it or see that it is done by virtue of new paragraph 4.10. The reference to paragraph 4.9 is also omitted because new paragraph 4.9 imposes a clear duty on the referring dentist.

There was a failure in the system of working in October 1998 whereby the referring dentist did not discuss the risks and the options for treatment, and the treating dentist assumed that the referring dentist had discussed options for treatment, with Mrs Denholm.

It is now clear that both the referring dentist (paragraph 4.9) and the treating dentist (paragraphs 3.7 and 4.10) must explain the risks and discuss the options. It is not, therefore, necessary for me to make recommendations in respect of the confusion that existed at the time of Darren's death about who had what duty to perform. What is important is that each dentist does perform the duty incumbent upon him.

It is now required that the referring dentist provide a considerable amount of information in the referring letter: new paragraph 4.9. The referral form (CP4) was inadequate. The only information in it was that the upper left six should be extracted. The form was headed "Peffermill Dental Anaesthetic Clinic". Mr Beckett says the content was a pro forma of Poggo's. At the time it was part of a system of working which contributed to the death. It gave no information about why Darren was being referred. If it had, it might, for example, have dispelled the belief that Darren was afraid of needles.

It is apparent, however, that even under the GDC guidelines unamended, Professor Rood would have expected Mr Shields to explain the options to Mrs Denholm. He did not do so. It was Mr Pedersen's responsibility to ensure that the risks were explained and the consent formalities were gone through, even if he left it to the anaesthetist to do it. He did not do these things himself. Since these were not done by Dr Evans-Appiah, Mr Pedersen did not ensure that they were done. Mr Pedersen ought also to have assessed properly whether the treatment requested by Mr Shields, an extraction under general anaesthesia, was in fact appropriate: see paragraph 3.4. Had he done so, Darren's death might have been avoided.

Darren was not afraid of needles. Had that fact been ascertained and had the options for treatment been discussed, Darren might have been able to have had dental treatment under sedation.

Accordingly, Mr Shields failed in his duty to explain the options for treatment. Mr Pedersen failed in his duty to ensure that the risks of general anaesthesia, that the consent formalities were fully dealt with by Dr Evans-Appiah and that extraction was appropriate. Mrs Denholm said that if the risks of general anaesthesia had been explained she would not have allowed Darren to undergo it. Explaining the options for treatment and, or, the risks of general anaesthesia might have prevented Darren's death.

2.The duties of the anaesthetist

Professor Aitkenhead would not have expected Dr Evans-Appiah to question the decision to use general anaesthesia.

Dr Evans-Appiah had, however, a duty to explain the risks of general anaesthesia and the options for pain control. The consent form (CP11) required him to certify that he had done so. He did not do so with Mrs Denholm or Mrs Campbell. That he was not able, for example, to undertake sedation that day is no excuse for not explaining the options. The system of payment, whereby he was paid only for administering a general anaesthetic, hardly encourages an anaesthetist to explain the risks. He dealt with Darren's medical history, not by asking about each medical condition on the form, but simply by asking a general question about the medical history. Even Mr Beckett would have expected the medical history in the consent form to have been completed by the patient or the anaesthetist.

Dr Evans-Appiah failed to explain the risks and to take a full medical history. Mrs Denholm said she would not have allowed the general anaesthetic had she known of the risks. Had Dr Evans-Appiah explained the risks, Darren's death might have been avoided.

3.Consent

Mrs Denholm, as Darren's parent and guardian, was asked to sign the consent form (CP11) at the reception desk by Mrs Pringle, the receptionist. This was before any explanation of the risks of general anaesthestia, options for treatment or pain control was to have been, or was in fact, given. Professor Rood rightly described this as very poor practice. I think that it is putting it mildly. This was a defect in the system.

In this case there was not informed consent to the treatment Darren was to have.

E.THE USE OF HALOTHANE

1.Discontinuation of halothane in dental anaesthesia

Halothane was one of the anaesthetic agents for inhalational induction available to Dr Evans-Appiah at the Peffermill Clinic. Enflurane was another. Most anaesthetists would use halothane with a mixture of nitrous oxide and oxygen because induction of anaesthesia is achieved more rapidly than if used with oxygen alone. Dr Evans-Appiah used oxygen alone because otherwise, he said, some children cough and feel sick. He indicated that enflurane was not suitable for children because it made

them cough. According to Dr Evans Appiah there was also a risk of arrhythmias associated with enflurane.

There is a well known risk of cardiac arrhythmias associated with the use of halothane. Dr Evans-Appiah spoke of halothane and adrenaline reacting to cause arrhythmias. Mr Flavill said that halothane was well known for producing cardiac arrhythmias. Dr Poggo knew of the risk although he said he had used it safely himself many times. Professors Rood and Aitkenhead knew of the risks of halothane and halothane reacting with adrenaline to cause arrhythmias.

Sevoflurane is another anaesthetic agent on the market. It does not carry with it the same risk of arrhythmias. It is less arrhythmogenic than halothane. It was Professor Aitkenhead's drug of choice, although he acknowledged that halothane was still used by those familiar with it. He described it as similar to halothane in its smoothness of induction and of achieving it more rapidly. Dr Poggo described sevoflurane as a very good gas. The main reason for using it for children was its induction properties. Mr Flavill referred to its smooth induction qualities and that there were no significant arrhythmias.

By the time the Inquiry sat to hear parties's submissions before Christmas, it transpired that the Committee on Safety of Medicines had, on 29 November 1999, advised that "use of halothane in paediatric dental anaesthesia should be restricted to hospitals only". This advice followed a study published in The Lancet on 26 November which concluded that there was a significantly higher incident of cardiac arrhythmias in children who were undergoing out-patient dental extraction and who were anaesthetised with halothane compared with sevoflurane. A copy of the study from the Lancet was produced by Mr Aziz during his submission: see Poggo production no. 1 (PP1). This showed that 24(48%) of the 50 children receiving halothane had arrhythmias compared with four (8%) receiving incremental sevoflurane and eight (16%) receiving 8% sevoflurane.

In light of the advice of the Committee on Safety of Medicines there is little need for me now to recommend that halothane should not be used in paediatric dental anaesthesia.

Since the risk of arrhythmias when halothane is used was well known even in 1998, according to the witnesses including Dr Evans-Appiah, it is clear that appropriate safeguards would have to be adopted by the anaesthetist when using it including appropriate monitoring.

2.Expense

Sevoflurane is more expensive than halothane. Dr Evans-Appiah said that halothane cost £17 compared with £140 for sevoflurane for 500 or 250 ml (he could not remember which). Mr Flavill, who ran the Carden Place Clinic in Aberdeen, refused to use halothane and would not be guided by Poggo. The arrangement between Poggo and Mr Flavill was not the same as the arrangement between Poggo and Mr Beckett. Mr Beckett, of the Peffermill Clinic, did not take the stand that Mr Flavill did. He just accepted Poggo's list of available drugs which were halothane and enflurane. Sevoflurane was not on the Poggo list. His anaesthetist would receive the list and

review it and Mr Beckett accepted it. Dr Poggo said that they were conducting trials of sevoflurane within the group.

I was concerned that halothane might be being used because it was cheaper than sevoflurane. In other words a commercial decision was taken rather than one based on safety. But Professor Aitkenhead said that halothane was an appropriate agent to use and it was still used with those familiar with it. It was not wrong, or bad practice to use it. But obviously, because of its known risks, halothane had to be used with care.

FMONITORING EQUIPMENT

While Darren was being anaesthetised by Dr Evans-Appiah, only a pulse oxometer was attached to him. When Mr Pedersen tested Darren's tooth, the pulse oxometer was still the only piece of monitoring equipment employed.

The Poswillo report on General Anaesthesia, Sedation and Resuscitation in Dentistry by an expert working party to the Standing Dental Advisory Committee in March 1990 (Denholm Family production no. 1/1 (DFP1/1)) made certain recommendations. It recommended that an ECG, pulse oxometer and a blood pressure device were essential for the monitoring of a patient under general anaesthesia: paragraph 3.20 and recommendation (x) on page 16. The authors of the report recognise that, with the transient nature of most dental anaesthetics, the final decision on the level of monitoring must be a matter for professional judgment. (The remit of the working party extended only to England and Wales, though it subsequently acquired a Scottish member. The report has been regarded as having relevance in Scotland.) The Poggo Anaesthetic Protocol (CP14) provides on page 7 that:-

"Every case WITHOUT FAIL is monitored with pulse oximetry and ECG."

Professor Aitkenhead indicated that it was common practice for anaesthetists to monitor only oxygen saturation during induction. Only a pulse oxometer would be employed, attached by a clip to the finger of the patient. Attaching the electrodes of an ECG or a blood pressure cuff before induction could cause distress in children. So these monitors were often not attached before induction of anaesthesia. Dr Evans-Appiah was not criticised for not attaching these monitors before Darren was anaesthetised.

But, after induction and before any dental procedure is undertaken, Professor Aitkenhead was of the opinion that the ECG monitor and a blood pressure cuff should be attached. The ECG monitor is required to detect cardiac arrhythmias, or EMD.

Dr Evans-Appiah did not attach these pieces of monitoring equipment before Mr Pedersen began the dental procedure. His explanation was that Mr Pedersen started unbeknown to him, otherwise he would have attached the ECG. But I have determined in section C4 above that Dr Evans-Appiah gave Mr Pedersen the go-ahead to start after induction and, therefore, without the ECG being attached. Anne Stokes, one of the recovery nurses at Peffermill, said that one of her concerns about Dr Evans-Appiah had been that he did not always put the monitors on. The ECG was

not attached until after Darren collapsed. This was a serious error. It would have been a reasonable precaution to have attached the ECG immediately after Darren was anaesthetised and before Mr Pedersen treated his tooth. If this had been done the cause of Darren's collapse might have been detected immediately on the ECG and Darren's life saved.

GTHE PRACTICES AND PROCEDURES AT THE PEFFERMILL CLINIC

1.General

The practices and procedures at the Peffermill Dental Anaesthetic Clinic exhibited a catalogue of failures. The standard was below what the public should expect of a competent dental practice.

Mr Maurice Beckett, who qualified as a dentist in 1973, bought the practice in 1994 and began dental anaesthetic work in 1995. He entered into an arrangement with Poggo for the supply of anaesthetists and equipment. Poggo had approached him. Apparently there were about five dentists, 10 dental nurses and four clerical staff at Peffermill. There was a practice manager or administrator. For the first 18 months Mr Beckett had a full-time anaesthetist. In December 1997 he obtained the services of another full-time anaesthetist for four and a half days a week. Dr Evans-Appiah started doing Friday afternoon and Saturday work in the practice as an anaesthetist in June 1998.

Mr Beckett was not an impressive witness. He was evasive, at times belligerent, and complacent. Mr Beckett was so uninterested in the death of a patient on 9 October 1998 that he did not bother to go to the clinic when he was informed of the death.

After the death of Darren the clinic stopped undertaking general anaesthetic work for a week, but then stopped all together in November 1998 because of the amendments to the GDC guidelines, Maintaining Standards, in that month and because Poggo was giving up general anaesthesia. There was a report of 20 January 1999 (CP41, Appendix 1) of the first visit by an independent clinic group ("ICG") on 14 October 1998 led by Professor Wildsmith, Professor of Anaesthetics at Ninewells Hospital, Dundee. It recommended that the Peffermill Clinic should not administer general anaesthesia or conscious sedation. It was indicated in the second report of the ICG of 21 April 1999 (CP41) that it would not be reasonable to prevent sedation at Peffermill although the ICG could not guarantee the clinical quality of care or patient safety. The group which carried out the first visit stated in paragraph 4.1 that it was difficult to conclude that the Peffermill Dental Centre was a fit place for the administration of either general anaesthesia or conscious sedation at that time. That first visit and report followed a complaint by Mr and Mrs Yeaman in March 1998.

Mr Shiels, in his submissions for the Crown, invited me to recommend that Mr Beckett should be reported to the GDC for consideration for prosecution before its professional conduct committee in respect of the failures in the practices and procedures at the Peffermill Clinic. I do so.

2.Consent forms

It was apparent from the evidence of Mrs Pringle, the receptionist at Peffermill, that patients were asked to sign the consent form for the operation under general anaesthesia (CP11) at reception before the patient had spoken to the dentist or the anaesthetist. This is notwithstanding the fact that the part which the patient, or the parent or guardian, signs includes the statement:-

"I agree to what is proposed and which has been explained to me by the doctor/dentist ..."

This is wrong and cannot be best practice. Informed consent only occurs after all necessary explanations have been given. Professor Rood described this as very poor practice; there was no justification for it. Mr Beckett did not think the onus was on the Peffermill Clinic in October 1998. He said the referring dentist should discuss the options and explain the risks. Clearly Mr Beckett had, to put it mildly, an imperfect understanding of the GDC guidelines as they were in October 1998 (CP20).

In the report of 21 April 1999 (CP41) of the second visit on 29 March 1999 by the ICG, it appears, at paragraph 3.4.1, that time had by then been built into the surgery appointment for taking a medical history and obtaining informed consent.

The failure to obtain consent properly fell below the standard required in October 1998 and was a defect in the system of working contributing to Darren's death.

3.Syringes

At the Peffermill Clinic, dentists used non-aspirating syringes. Using such a syringe, it is not possible to see if one is injecting into a vein. An aspirating syringe has a ring on it which enables the user to draw back the plunger to see if blood is getting into the syringe. If so, then one may be injecting into a blood vessel and one can then try again.

Dr Moody and Professor Rood were agreed that it was not best practice to use a non-aspirating syringe. Professor Rood indicated that textbooks said it was mandatory to aspirate. In his opinion failure to use an aspirating syringe in 1998 fell below the standard required of a dentist. I agree.

Since I have excluded the possibility that Mr Pedersen injected the local anaesthetic intravenously, the failure to use an aspirating syringe was not a contributing factor in Darren's death. An aspirating syringe, should, however, have been used. I recommend that they are now used at the Peffermill Clinic.

4.Qualifications and training of staff

It was for Mr Beckett to employ a dentist's assistant or dental nurse and an anaesthetist's assistant. Miss Thompson was the former, having joined the practice in October 1997. She no longer works there. Mr Nicholson was, according to Mr Beckett, the anaesthetist's assistant. Mr Nicholson said that his duties were to assist the dentist and the anaesthetist although no one had told him he had a duty to stay to help the anaesthetist. Indeed, he was not present when Darren went into the

surgery. Mr Nicholson appears to have wandered off to the reception area. He went into the surgery only when the emergency arose and the ambulance had been called. Mr Nicholson came to Peffermill in February 1998.

Neither Miss Thompson nor Mr Nicholson, was qualified or trained and neither was yet qualified as a dental nurse when they gave evidence at the Inquiry. Miss Thompson was taking a two year course which she began in October 1998 qualifying in May 2000 at night classes. Mr Nicholson indicated that he was not undertaking any qualification or special training as a dental nurse, or indeed as an anaesthetist's assistant. Any training he had was "on the job" training. The training Mr Nicholson did receive was from Dr Timoney the full-time anaesthetist. Mr Beckett said Dr Timoney was of staff grade (that is to say not a consultant), but he did not have a certificate of specialist training as an anaesthetist. Mr Beckett was unaware that Mr Nicholson was not undertaking any college course and thought he was. I find it quite extraordinary that Mr Beckett did not make it his business to know, especially when he claimed that staff were encouraged to obtain qualifications.

Paragraph 4.11 (monitoring and resuscitation) of the GDC guidelines, Maintaining Standards, as at October 1998 (CP20) provides:-

"The anaesthetist must be supported by an assistant specifically trained and experienced in the necessary skills to assist in monitoring the patient's condition and in any emergency ..."

The current identical provision is in paragraph 4.13(ii) d) as amended in November 1998 (CP29).

The Poswillo report (DFP 1/1) emphasised the need for a trained anaesthetist's assistant in paragraphs 3.26 and 3.27. Mr Beckett stated, correctly, that the anaesthetist's assistant does not have to be an ODA (operations department assistant) as in a hospital. An ODA is highly qualified in the rôle of assisting the anaesthetist and is trained in crisis management. So far as Mr Beckett was concerned, rather complacently I thought, Mr Nicholson was sufficiently trained by Dr Timoney. Mr Beckett asked the GDC to explain the guideline at the request of his Dental Protection Society. But the GDC would not do so. It is to be noted that the first ICG report in CP 41, appendix 1 at page 15, did not regard Mr Nicholson as an acceptable anaesthetist's assistant.

It does not appear that the anaesthetist's assistant was sufficiently trained. This was a failure of the Peffermill Clinic to maintain standards. It was a defect in the system of working.

5.Resuscitation training and team practice

Dr Evans-Appiah knew that staff at Peffermill Clinic had resuscitation lectures but not what was in the lectures. He did not know whether they had practical training. Clearly Dr Evans-Appiah was not involved in training or team practice. He said he was concerned about resuscitation training and emergency procedures at Peffermill where the staff were less experienced than at the Carden Place Clinic in Aberdeen. The training at the Aberdeen Clinic was, in his opinion, superior.

Mr Pedersen had not been drilled in any emergency procedure. He had been told by Mr Beckett, when he started doing general anaesthesia, that there was to be a course for them all in the near future. Resuscitation was never practised by them as a team.

Miss Thompson did not normally work in the general anaesthetic clinic at Peffermill, although she had done so when she first started. She worked in the general anaesthetic clinic occasionally and had been asked to work there on 9 October 1998. She had received basic CPR training at Peffermill from someone in the Scottish Ambulance Service. She had not practised resuscitation with the general anaesthetic team.

Mr Nichoslon had had resuscitation training about six months before Darren's death. He had attended an advanced CPR course for an afternoon. He thought the course was run by an ambulance crew. He had not practised with anyone as a team.

Miss Guild had been involved in a practice of emergency resuscitation earlier that year. She had not been on a course since joining the Peffermill Clinic.

Mr Beckett said he thought a basic CPR course was held every six months for those in the general anaesthetic clinic at Peffermill and once a year for reception staff. He did not organise practices. His explanation for this was that employees come and go. He indicated later on that they did not have simulated emergencies because no anaesthetist wanted to do it. Instead Mr Beckett arranged for advanced CPR and regular talks. Mr Beckett wanted Mr Pedersen to have advanced (CPR) training.

The position at Peffermill has to be contrasted with that at the Carden Place Clinic in Aberdeen. The recovery nurse had advanced cardiac resuscitation training. She was a fully qualified teacher of resuscitation techniques and was permitted to teach the anaesthetist's assistants. Because Mr Flavill had an arrangement with BUPA, they had to have quarterly training, everyone, including the receptionist, had to have a resuscitation certificate and all were, according to him, trained to a very high level. They practised together as a team. The anaesthetist's assistants were trained to a high level: they were sent to Dundee to do a sedation course. A dentist would not be allowed to work at the practice without advanced life support training (advanced CPR). Mr Flavill is very cautious and concerned about the safety of his patients. It is clear he maintains a very high standard.

The Poswillo report (DFP1/1), paragraph 5.4, contains the statement:-

"We believe it important that each person should have their proficiency in these procedures of cardiopulmonary resuscitation (CPR) tested and certified."

It is apparent that Miss Thompson, Mr Guild and Mr Nicholson had CPR training. But they, Mr Pedersen and Dr Evans-Appiah had never practised emergency procedures as a team.

Paragraph 4.18 (collapse) of the GDC guidelines, Maintaining Standards (CP 20), provides:-

"....a dentist should ensure that all members of the dental team are properly trained and prepared to deal with an emergency. Training should include frequent practice of resuscitation routines in a simulated emergency."

Mr Beckett had not complied with that standard. His explanation, that anaesthetists did not want to do it, is lamentable. This was a failure to maintain a proper standard. It was another defect in the system of working at the clinic. Furthermore, Mr Beckett should not have allowed Mr Pedersen to give Darren dental treatment on 9 October 1998 without having had advanced resuscitation training.

Dr Poggo said that training was the responsibility of the dental surgeons (in this case Mr Beckett). Poggo just monitored that it actually happened. Clearly Poggo did not do that. This was a defect in the system of working which contributed to Darren's death.

6.Emergency arrangement with hospital

Dr Evans-Appiah said that he was told by Mr Beckett that there was a special arrangement with the hospital, which was close by, for emergencies. Mr Pedersen was expecting Medic 1 to arrive. The nearest hospital is the Royal Infirmary. It was clear there was no such arrangement at the time of Darren's death. The "arrangement" turned out to be simply dialling 999 for an ambulance. That is what Miss Thompson and Mr Pedersen did.

Mr Beckett claimed it was the responsibility of the anaesthetist to make any such arrangement. I find this to be another extraordinary statement of his. It may be that the anaesthetist should check that there was a special arrangement; Dr Evans-Appiah did not seem to have made such a check. But I would have thought that it was the responsibility of the owner of a practice either to make the arrangement or to ensure that it was done. Mr Beckett claims that he asked if there was an arrangement and that he was told by the recovery nurse and the anaesthetist that there was one. The anaesthetist in question was a Dr Howie supplied by Poggo about over three years previously. Mr Beckett could not recall Dr Evans-Appiah asking about it. With breathtaking off-handedness, Mr Beckett said that, if Dr Evans-Appiah or Dr Timoney wanted it, they should have checked it out. It seems to me that, if there had been any special arrangement, those in the surgery with Darren ought to have known or have been made aware of it. They did not know. If an arrangement had existed it would have been utilised.

Dr Poggo said it was not Poggo policy to have a special arrangement with hospitals for emergencies.

Paragraph 4.13 of the GDC guidelines, Maintaining Standards, as amended in November 1998 (CP29) provides that the dentist who makes arrangements for the provision of general anaesthesia for a patient must:-

"(iii)be satisfied that there is a written protocol, arranged in conjunction with, and agreed by the anaesthetist, for the provision for Advanced Life Support ... The protocol must include appropriate arrangements for the immediate transfer of a patient to a critical care facility....."

The responsibility is now clearly placed on the dentist providing the general anaesthetic facility. Nonetheless, I find Mr Beckett's casual attitude to this matter in October 1998 to fall well below the standard one would expect of a dentist. An arrangement with a hospital in the case of an emergency was a reasonable precaution whereby the death of Darren might have been avoided.

7.Checking Dr Evans-Appiah's competence

Mr Beckett left it to Poggo to check and assess the qualifications and experience of anaesthetists supplied to his practice. He relied on Poggo to do that, although Mr Beckett did accept that he had a duty to see that the anaesthetist was competent. He worked for one day with Dr Evans-Appiah to confirm his competence.

It was clearly Mr Beckett's responsibility, placed on him by the GDC guidelines current in October 1998, to satisfy himself that the anaesthetist was qualified and experienced. That is not done merely by delegating the responsibility to another such as Poggo. If there is to be such delegation then Mr Beckett should have satisfied himself about Poggo's procedures for assessing the qualifications, experience and competence of applicants. Had he done so, he would have found these procedures wanting: see section H below.

Mr Beckett did, however, receive a good reference about Dr Evans-Appiah from the Carden Place Clinic in Aberdeen. I can only assume that the anaesthetist received far better support from a far better run practice in Aberdeen. That must have made a considerable difference to Dr Evans-Appiah's ability to cope.

H.THE PROCEDURES OF POGGO ANAESTHETICS LTD AND THE POGGO GROUP

1.General

Dr Colin Poggo qualified as a doctor in Johannesburg in 1978 and came to the United Kingdom 17 years ago. He specialised in dental anaesthetics and sedation. He holds a certificate as a non-consultant anaesthetist on a register of the Royal College of Anaesthetists. He assumed the register did not now exist after the 1998 amendments to the GDC guidelines, Maintaining Standards. In about April 1990 he set up a referral centre in Thamesmead in south east London fully equipped for dental anaesthesia. That was shortly after the publication of the Poswillo Report in March of that year. This was, he claimed, the first centre of its kind. Later, as business expanded and requests came from all over the United Kingdom, he set up a company. That was about seven years ago. There are now a number of companies which are wholly owned subsidiaries of the Poggo Group Ltd ("Poggo") a holding company operating from Aylesford, and now Boxley, in Kent. Poggo Anaesthetics Ltd supplied the anaesthetists. Poggo Dental Ltd supplied dental nurses, receptionists and owned 15 clinics. In 1998 there was a supply company, Poggo Medical Supplies, which had since merged with Poggo Dental. All employees were employed by the holding company. In 1998 Poggo supplied some 40 clinics around the United Kingdom from Aberdeen to Torquay. Poggo operates in the National Health Service. The turnover of the group in 1998 was about £7 million and it made a loss of about £1/2 million. Poggo had never made a profit. Dr Poggo has a

40% shareholding in Poggo. The group holds annual conferences for its anaesthetists. (Anne Stokes said the yearly conferences on clinical updates for anaesthetists and nurses were very well run.)

A factor in the growth of Poggo was the restricted environment for general anaesthesia in dental surgeries in the United Kingdom following the Poswillo report (DFP1/1). That report recommended that general anaesthetics should be administered by "accredited anaesthetists": see Poswillo report, recommendation (iv) on page 15. This coincided with a decrease in the number of dental surgeons with experience in dental anaesthesia who carried out general anaesthetics. This occurred because of the retirement of surgeons and the fact that general anaesthesia was no longer part of the training of a dentist.

Poggo no longer provides anaesthetists for general anaesthesia, only sedation. Poggo stopped general anaesthetic work on 11 November 1998. This was after the 1998 amendments (CP29) to the GDC guidelines, Maintaining Standards (CP20). Paragraph 4.13(ii) of the amended guidelines provides in substance that the anaesthetist must be on the specialist register of the GMC or under supervision.

The arrangement between Poggo and Mr Beckett was a joint venture and not a partnership. There was a contract setting out the areas of responsibility. Mr Beckett was responsible for running the clinic, the staff, (except the anaesthetist), administration, appointments and checking patients. Poggo could advise on anaesthetist's assistants, but Mr Beckett was responsible for employing that member of staff.

Professor Aitkenhead, who was scathing in his criticisms of Poggo, did acknowledge that Poggo had tried to raise standards by improving anaesthetic equipment in dental surgeries. Mr Flavill, who has brought his arrangement with Poggo to an end, felt that Poggo was too commercial.

There were three areas of concern in relation to Poggo which arose in the Inquiry.

2.Employment of anaesthetists

An anaesthetist seeking to work for Poggo completed a "New Anaesthetists Enquiry Form" (CP16). A *curriculum vitae* had to be produced as well as a certificate of full registration and two references. Originally proof of identification also had to be produced, but this was discontinued because it was not working. Applicants did not like to part with their passports by post. In any event if an applicant were a fraudster, he could always produce a false passport.

To be considered by Poggo, Dr Poggo said, an applicant had to have two years' anaesthetic training in a hospital and hold a current position as an anaesthetist, keeping up to date, "or an awful lot of experience in the past". This was assessed by unqualified personnel of Poggo staff from the *curriculum vitae*. They decided, when in doubt, whether to put an application before Dr Poggo. They would do that if the applicant had no recent experience or no experience at all. Staff would check that the applicant's GMC certificate of full registration was current. It was not the practice to check with the GMC to discover, for example, if the applicant had ever been

disciplined. The fact that someone was registered as a doctor is, however, no evidence of his expertise in any particular area of medicine: see section K3 below.

The application of Dr Evans-Appiah (CP16) disclosed that:- "He last did anaes. in 1996". (Dr Evans-Appiah said in evidence that he had done locum anaesthetic work after 1996, in 1997. This was not on his *curriculum vitae* and it is not apparent that Poggo knew.)

Dr Evans-Appiah applied to Poggo in about May 1998. One of Dr Evans-Appiah's referees was Dr Onugha, a consultant anaesthetist at Grantham and District Hospital where Dr Evans-Appiah apparently worked from July 1994 to August 1994 (Grantham and Kesteven). He also appeared to have worked in Grantham at an earlier date from October 1987 to February 1988. Dr Onugha also worked as an anaesthetist for Poggo. Dr Evans-Appiah hardly fell into Dr Poggo's category of holding a current position. Yet Dr Poggo could not remember whether Dr Evans-Appiah's application had been referred to him. He could not be criticised for not being able to rely on his memory; but I would have thought it important for Poggo to keep a proper written record of any such reference to Dr Poggo and what enquiries were made.

Dr Onugha's reference in CP48, dated 8 June 1998, states:-

"I see no reason why Dr Evans-Appiah should not be employed as a registrar in anaesthetics."

It is significant to note that a registrar, although a senior grade, is a grade in a hospital which is ostensibly a supervised grade, that is to say the registrar can call on the consultant for advice or help but the consultant will not necessarily or rarely be present during the operation carried out by the registrar. Poggo took on Dr Evans-Appiah and supplied him to the Peffermill Clinic in an unsupervised role to which, strictly speaking, he had not been apparently recommended. If Dr Onugha did work also for Poggo he would, presumably, have known that Dr Evans-Appiah would be working unsupervised. It was, of course, lawful at that time for Dr Evans-Appiah, having full registration as a doctor, to work in an unsupervised capacity as an anaesthetist in a dental surgery.

Dr Poggo said that Poggo anaesthetists could contact Poggo's adviser in anaesthetics for advice. Originally this was Dr Challen, but he left Poggo in 1998. From October 1998 his successor was Dr Tarpey, who lived in Leamington Spa. Dr Poggo said anaesthetists would not know about Dr Tarpey and would have to contact Poggo and Poggo would put the anaesthetist in touch with Dr Tarpey. This was not much use in an emergency.

Poggo was set up to offer a specialised service but it employed people who were not accredited or specialised anaesthetists, that is to say having had specialist training and having passed the final examination of the RCA. Dr Evans-Appiah was not an accredited anaethetist, but under the GDC guidelines current at the time (CP20) he did not have to be. If there were two references provided, and only one was produced (in CP48) that did not, according to Professor Aitkenhead, recommend Dr Evans-Appiah for unsupervised employment.

Poggo's procedures for employing an anaesthetist were wholly inadequate.

3.Testing competence of applicants

The next stage in the application is for the applicant to observe an anaesthetist doing a dental anaesthetic list. The purpose of this is for the applicant to see if he or she would like to do the work. Then there is an assessment of the applicant doing a list. Dr Evans-Appiah observed at a clinic in Whitechapel and was assessed at Walthamstow on 5 June 1998 by Dr Gideon Bosch who had worked for Poggo for about eight years. There was no practice of obtaining a report by the assessor on the assessment of an applicant. Someone in personnel would have spoken to Dr Bosch. As a result of that conversation an entry would be made on the application form (CP16). To the question "Check with our anaesthetist if all went ok on 2nd visit", the answer, in Dr Evans-Appiah's case, was "Very well".

Professor Aitkenhead criticised the system for assessment. The qualifications of the assessor were not known. There was no formal assessment. It was not apparent to me that there was any criterion laid down for the assessment.

Mr Aziz submitted that Poggo was under no obligation to check the competence of anaesthetists it supplied and could have appointed a doctor simply on the basis of his certificate of full registration from the GMC. This argument is untenable. It ignores the fact that Poggo, purports to provide experienced anaesthetists. It overlooks the fact that a certificate of full registration is not an indication of fitness to practise in every field of medicine or, indeed, in any particular field: see section K3 below.

It does not seem to me that the assessment and the recording of the results of the assessment of an applicant are done in a sufficiently professional way. The procedures are inadequate.

4.Checking dental surgeries for suitability and good practice

Dr Poggo did not go himself to assess the suitability of the surgery and recovery room at the Peffermill Clinic for provision by Poggo of general anaesthetic equipment and anaesthetists. He sent an unqualified member of his staff to do that. This must have been in 1995. This member of staff had experience, Dr Poggo claimed, because she had visited many clinics with him. Peffermill was subsequently approved. After the initial assessment there was no system for regular checks of the clinics by Poggo. The state of the clinic did not concern Poggo. What mattered to Poggo were the equipment and the suitability of the surgery and the recovery room. Dr Poggo had, however, been to Peffermill four or five times, the last being soon after Darren's death. On one occasion he had substituted for Dr Timoney as the anaesthetist. None of these visits was for the purpose of carrying out a check on the facilities.

Dr Poggo had not seen the report into the Yeaman complaint (CP43) or the ICG reports on the Peffermill Clinic (CP41). The ICG first visit on 20 January 1999 was led by Professor Wildsmith, Professor of Anaesthetics at Ninewells Hospital. The report of that group concluded, in paragraph 4.1, that Peffermill was not a fit place for the administration of either anaesthesia or conscious sedation. The report contained

material which indicated that the recovery areas were very cramped and there was no room between the chair and the cabinetery when the chair was in the supine position. Professor Wildsmith wrote that "the practice was obviously cramped, dirty and untidy" (CP41, Appendix 1, p.13). By the time of the second visit, on 24 February 1999, work had been done to improve the facility and space in the surgery. Dr Poggo was shocked at this assessment when he was asked about it at the Inquiry.

If the surgery and recovery room were cramped in January 1999, one must assume that they were no less cramped when initially approved by Poggo.

Poggo had given no direct instructions about practising resuscitation; although it was regularly suggested according to Dr Poggo. Any communication was, apparently, more likely to have been with the anaesthetists than with the clinics.

I was surprised that Dr Poggo did not think that regular checks of the premises on behalf of Poggo were necessary to ensure that the facilities remained suitable and that proper and good practice was maintained by anaesthetists. It has to be said, however, that the equipment was well maintained by Poggo.

I think the fact that the surgery at Peffermill was not set up properly was a defect in the system of working. I think Poggo's failure to check the facilities at regular intervals was also a defect in the system of working. If Poggo were to continue to provide anaesthetists, I recommend that Poggo should introduce a system of regular checks of clinics for which it provides.

I.THE ANAESTHETIST AND THE DENTISTS

1.Dr John Evans-Appiah, the anaesthetist

Dr Evans-Appiah, aged 57 and originally from Ghana, went to the Kharkov Medical School in the Ukraine obtaining a degree in medicine in 1970. He came to the United Kingdom in 1973 and in that year obtained a diploma in obstetrics and gynaecology. He took and passed part I of the MRCOG examinations in 1978 and part I of the FFA examination in 1979. He did not take part II of the former, and failed part II of the latter, examinations. Since 1976 he had practised, he said, as an anaesthetist. He was not a qualified anaesthetist, that is to say he was not a consultant or one having a specialist qualification. He practised first with temporary and then with limited registration. He obtained full registration as a medical practitioner in February 1997. In 1997 he wished to train as a general practitioner and obtained his certificate to practice as such in February 1999.

Between 1973 and 1997 Dr Evans-Appiah had some 40 appointments, most of them as a locum and predominantly in anaesthetics. Professor Aitkenhead, who was scathing in his criticisms of Dr Evans-Appiah, described him as a failed trainee because he failed to progress and was operating in posts in which he was not being trained. According to Dr Evans-Appiah it was his choice to do locum work, to maximise his earnings. Indeed, it was for financial reasons that in response to an advertisement, he applied to Poggo in 1998 to work as an anaesthetist. He had family in Ghana to support and he was helping to finance the education of 12

students around the world. He denied that before doing anaesthetics for Poggo he last did anaesthetics in 1995, saying that he did locum work in anaesthetics in 1996 and 1997. All his anaesthetic experience before working for Poggo was in hospitals.

He observed anaesthetists at work in two Poggo clinics, in Whitechapel and Walthamstow and carried out anaesthetic procedures himself at Walthamstow where he was assessed. Having been thus assessed, Dr Evans-Appiah was put on Poggo's books. Dr Evans-Appiah was paid only for each general anaesthetic administered.

In Scotland, Dr Evans-Appiah worked first from May 1998 for about three days a week at the Carden Place General Anaesthetic Clinic in Aberdeen at which Mr Flavill is the principal. At that time the Carden Place Clinic used Poggo anaesthetists. Mr Flavill described Dr Evans-Appiah as very competent and there were no complaints about him. Dr Evans-Appiah started working also at the Peffermill Clinic, which also used Poggo anaesthetists, on Friday afternoons and on Saturdays. Mr Beckett, the owner of the Peffermill Clinic, worked with him for one day and was quite happy to work with him. Anne Stokes was a recovery nurse at the Peffermill Clinic for about four years until December 1998. She had been concerned about some of Dr Evans-Appiah's practices. He was casual. He had difficulty with intubations (these were not often done at Carden Place.) He did not always put the monitors on. She spoke to Mr Beckett and to Dr Poggo about her worries. She asked Mr Beckett to observe him; which he did. After she had spoke to Dr Poggo there seemed to be an improvement in his practices. Dr Poggo said that he spoke to her later and she seemed happy. If she worked with him she made a point of being in the surgery to make sure the monitoring equipment was attached to the patient and that procedures were followed.

Mr Beckett was critical of Anne Stokes: she had a tendency to make complaints. I took from this that Mr Beckett did not take her complaints too seriously because she was always complaining. He was satisfied about Dr Evans-Appiah when he worked with him. Dr Poggo remembered Anne Stokes telephoning him. He spoke to the Aberdeen Clinic and he was told that they were happy with Dr Evans-Appiah.

It cannot pass without comment that Dr Evans-Appiah was regarded as competent by Mr Flavill. The practices and procedures of Mr Flavill's clinic were far superior to those at Peffermill. I can only assume that the better quality of support there must have made a considerable difference to Dr Evans-Appiah's ability to cope.

Professor Aitkenhead, on the other hand, considered that Dr Evans-Appiah had many misconceptions about physiology and pharmacology in relation to anaesthesia. He gave examples of these from Dr Evans-Appiah's evidence. In particular he indicated that Dr Evans-Appiah's description of giving Darren a low concentration of halothane beginning with (2%) and increasing it to the level of anaesthesia was the wrong way to induce anaesthesia. The normal practice was to start with a high concentration (5%) and then reduce it. Dr Evans-Appiah's practice may partially explain a casual but telling remark made by Mr Pedersen. This was that, with Dr Evans-Appiah, "it happened all the time that patients moved when I started treatment". In other words, patients were often insufficiently anaesthetised.

There was an incident in Dr Evans-Appiah's past which was put to him in evidence by Mrs Smith, QC. This was that in 1993, when he was working at Falkirk Royal Infirmary he had mistakenly injected a patient, who had undergone a caesarean section, with the wrong drug. Instead of using a drug to contract her uterus, he picked up suxamethonium, a muscle relaxant, which endangered her life. He realised he had used the wrong drug and took appropriate steps to correct his error. He admitted he had made a mistake, although the syringe was labelled. He admitted he was sacked. His explanation was that the syringe was not well-labelled. Professor Aitkenhead agreed that it was a human error which all doctors can make. When further examined by Miss Maguire it transpired that after this, Dr Evans-Appiah's limited registration was continued by the GMC during which time he was to be monitored. He was granted full registration in 1997. At the very least this incident calls into question Dr Evans-Appiah's competence as an anaesthetist.

Later on in the Inquiry it became apparent that there was another incident at Falkirk which contributed to the termination of his contract: see CP63/13. It also transpired that Dr Cripps, Consultant Anaesthetist and Clinical Director of the Department of Anaesthetics at Borders General Hospital, had serious misgivings about Dr Evans-Appiah's abilities when Dr Evans-Appiah worked in that hospital in 1993. Dr Cripps had called into question the genuineness of Dr Evans-Appiah's medical qualifications: see his letter of 25 March 1993 to the GMC (CP54, 58 and 63/50). As these matters emerged after Dr Evans-Appiah had given evidence, they were not put to him. Miss Maguire pointed out that Dr Cripps never followed up his complaint with detailed evidence which would have enabled the GMC to consider it. During 1995 and 1996 he had favourable references, to be found in the GMC file in CP63. It is interesting to note that those in 1996 supported his further "supervised employment". Since Dr Evans-Appiah was granted full registration in 1997 it must be assumed he had favourable references then. At that time the GMC policy, no longer followed, was to destroy records leading to the grant of full registration. There was no evidence that Dr Evans-Appiah did not have a medical qualification, and the degree from Kharkov was recognised by the GMC as an accepted qualification which enabled him to obtain temporary, then limited, registration.

An extraordinary thing Dr Evans-Appiah did was to make an entry on an anaesthetic record (CP8) that he tried to complete after the emergency. He inserted a blood pressure reading. There was no entry on the original (CP7) which had got wet and trampled on during the emergency. He also told the police, in his initial statement on the Friday evening, that he had put on the blood pressure cuff and the ECG when he had not, in fact, done so: see CP44. His excuse was that he was in shock.

The evidence of Dr Evans-Appiah and Mr Pedersen was central to the Inquiry and important as to the events which occurred. Their evidence differed on critical issues. It has been necessary for me to determine who was telling the truth or whose recollection was correct with respect to these issues. I found that Dr Evans-Appiah was not a confident witness. Although for obvious reasons he would be nervous about giving evidence, he was very hesitant in giving it. This lended some credence to the evidence of Miss Thompson and Mr Nicholson that Dr Evans-Appiah was not in control of the emergency which developed. Miss Thompson said that everything was haphazard. Mr Nicholson said that to be in charge of such an emergency one needed to be calm. Mr Nicholson thought that Dr Evans-Appiah panicked. Dr Evans-

Appiah was not calm. He said himself that when Darren got into difficulties he was in shock; he did not panic at first, at first he was in control. He did say he was in turmoil. Mr Stewart, the ambulance paramedic, said there was an element of panic in his manner. In an anaesthetic emergency one would certainly expect the anaesthetist to be the one person to remain calm, confident and in control. Dr Evans-Appiah was not that man.

There are a number of criticisms that may be made of Dr Evans-Appiah. He did not take a full medical history of Darren. He did not explain the risks of general anaesthesia. He had an imperfect understanding of anaesthetics and worked unsupervised and without specialised training in anaesthesia. He did not anaesthetise Darren adequately and suggested he be given a local anaesthetic to gain control. He wrongly interpreted Darren's collapse as EMD caused by relative hypovolaemia. He did not defibrillate. He did not re-assess his diagnosis after his attempts to deal with Darren's collapse failed. He was prepared to work at Peffermill although he was unhappy about resuscitation training there. He fabricated a blood pressure reading on the anaesthetic record and did not keep a proper record (the original anaesthetic record (CP7) was blank). He anaesthetised Darren without the anaesthetist's assistant being present.

I was invited by Mr Shiels, in his submissions for the Crown, to recommend that Dr Evans-Appiah should be reported to the GMC for consideration for prosecution before its professional conduct committee. I do so recommend.

2.Mr Hallgier Pedersen, the treating dentist

Mr Pedersen, aged 49, was born and brought up in Norway. He studied dentistry for five years, obtaining his full diploma in 1984 from the University of Oslo. As part of his training he observed, but had no practical training in, dentistry performed under general anaesthetic. He was instructed in resuscitation on a basic course. He did dental surgery in the Norwegian armed forces during his year of military service. His training included dealing with collapses and resuscitation. He practised dentistry in Norway for eight or nine years until 1997 when he moved to Britain. He was registered to practise in the United Kingdom by the General Dental Council. He went to York to practise dentistry until 15 September 1998. He moved to Edinburgh. He had started doing one day a week at Peffermill in June 1998. According to Mr Beckett he worked in ordinary dental practice at fist until he was asked by Mr Beckett if he would like to do some dentistry under general anaesthetic. According to Mr Beckett it was at that point that he became aware that Mr Pedersen had no experience of dental anaesthetic practice. Mr Pedersen observed Mr Beckett for a day and then Mr Beckett watched Mr Pedersen to dentistry in the general anaesthetic surgery for a day. The practice of dentistry under general anaesthetic is not the same as ordinary dentistry because there is no response from the patient. Mr Beckett thought Mr Pedersen was very careful. Friday 9 October 1998 was Mr Pedersen's fifth day working with patients under general anaesthesia and his fourth day with Dr Evans-Appiah.

Mr Pedersen was a self-employed associate and paid per patient by Mr Beckett.

Mr Pedersen gave his evidence with confidence. He was open and frank. He was reluctant to criticise Dr Evans-Appiah. Where his evidence differed from that of Dr Evans-Appiah, Mr Pedersen was supported by the evidence of Miss Thompson and Mr Nicholson.

Mr Pedersen had insufficient training to perform, and was inexperienced in, dentistry with general anaesthesia. He had not received advanced CPR training. He had not been involved in any team emergency practices. He should not have been giving Darren dental treatment on 9 October 1998.

Mr Pedersen may be criticised in a number of respects. He did not ensure that the risks of general anaesthesia were explained. He did not make a proper assessment of whether an extraction under a general anaesthetic was appropriate. He allowed himself to practise general anaesthetic dentistry without proper resuscitation training. This last criticism has to be tempered by the fact that the GDC offers no guidance as to what is required: see section L1 below. Furthermore Professor Rood said it was not unreasonable for Mr Pedersen to assume that he had been suitably trained by Mr Beckett.

3.Mr Paul Shields, the referring dentist

Mr Shields was Darren's dentist at the Armadale Dental Clinic in West Lothian. Mr Shields has been a dentist for 18 years. In relation to his attempt to drill Darren's tooth on 2 October 1998, he said he could not get it numb enough. He prescribed for Darren a course of antibiotics. On 7 October he did not examine Darren again but simply referred him to the Peffermill Clinic for an extraction of the tooth under general anaesthesia.

Mr Shields was criticised in the Inquiry for three things. Firstly, he was criticised for not examining Darren's tooth on 7 October. Mr Macadam, a member of the GDC and a dentist for 28 years, thought that Mr Shields should have examined the tooth on that date. Professor Rood could not defend the actions of Mr Shields in sending Darren for general anaesthesia without conducting such an examination on that date. Professor Rood regarded that failure as below the standard required of a dentist. Had Mr Shields done so, he might have discovered whether he could have got the tooth numb enough or have considered other options. Mr Shiels, in his submissions for the Crown, invited me to indicate that Mr Shields ought to be reported to the GDC for consideration for prosecution before its professional conduct committee. I do so indicate.

Secondly, Mr Shields was criticised for failing to ascertain whether the facilities and competence of staff at the Peffermill Clinic were adequate. He said it was a national anaesthetic unit, a Poggo Clinic. He did not think he had any responsibility to satisfy himself about the clinic. He had not, he pointed out, checked the local hospital, St John's Hospital, and did not know what grade the anaesthetist was there. Professor Rood, however, was clear that, unless there was an emergency, Mr Shields had a responsibility to see that the facilities at Peffermill, to which he was sending patients, were truly adequate. I agree with Professor Rood.

Thirdly, Mr Shields did not discuss the options for treatment for Darren with Mrs Denholm. Instead he just referred Darren for an extraction under general anaesthesia. I deal with this more fully in section D1.

J.QUALIFICATIONS OF ANAESTHETISTS FOR DENTAL ANAESTHESIA

The Poswillo report of March 1990 recommended that "All anaesthetics should be administered by accredited anaesthetists" in dental anaesthesia: recommendation (iv), page 15. Professor Aitkenhead explained that "accredited" was the old word for specialist and that a person became a specialist by undertaking specialist training and passing the final examination of the RCA.

The GDC did not implement that recommendation. Paragraph 4.10 of the GDC guidelines, Maintaining Standards, published in November 1997 (CP20), provided that a general anaesthetic in dental surgery must be administered by a second person who was not the dentist treating the patient and:

"The second person must be a dental or medical practitioner with appropriate post-graduate training and evidence of relevant continuing clinical education."

It was, therefore, lawful for a person who was not a specialist in anaesthesia to administer dental anaesthesia unsupervised. This was not satisfactory.

From 10 November 1998 the GDC amended the 1997 guidelines. It did so after consultation with the RCA. Paragraph 4.13(ii) of the guidelines, as amended in 1998 (CP 29), provides that the anaesthetist must be:-

(a)on the specialist register of the GMC as an anaesthetist, or

(b)a trainee working under supervision as part of an RCA approved training programme, or

(c)a non-consultant career grade anaesthetist with an NHS appointment working under the supervision of a named consultant anaesthetist in an NHS anaesthetic department where the non-consultant anaesthetist is employed.

These categories are mirrored in the RCA document "Standards & Guidelines for General Anaesthesia for Dentistry", published in January 1999 (CP47). In that document, the RCA stipulates that these categories are those recognised by the RCA for the administration of dental anaesthesia. Once one has undergone the specialist training and passed the examination to which Professor Aitkenhead referred, one may be admitted to the specialist GMC register for anaesthetics.

The qualifications for administrating dental anaesthesia are now restricted to specialists or those acting in restricted supervised capacities. It is not, therefore, necessary for me to make any recommendations about the qualifications for anaesthetists operating in dental surgeries. Had the precaution been taken of employing an anaesthetist who was on the specialist register or under actual supervision as is now required, Darren's death might have been avoided.

As a result of this restriction, Poggo no longer provides anaesthetists for general anaesthesia. Another consequence is that this is a further limitation on dental practices which will reduce the number of general anaesthesias outwith hospitals. I discuss this further in section M.

K.THE GENERAL MEDICAL COUNCIL

The Inquiry had the benefit of considerable assistance from Mr Finlay Scott, Chief Executive and Registrar of the GMC about a number of issues which emerged during the Inquiry.

1.Registration as a medical practitioner with temporary or limited registration

There are just short of 200,000 medical practitioners in the registers of the GMC of whom about 25% (50,000) qualified outside the United Kingdom.

Dr Evans-Appiah obtained his medical degree from the Kharkov Medical School in the USSR in 1970. He came to the United Kingdom in 1973. How a doctor from abroad obtains registration as a medical practitioner in the United Kingdom depends on whether his qualification is "recognised" or "accepted". If the qualification is "recognised", the GMC may grant full registration as a medical practitioner under section 19 of the Medical Act 1983. A qualification is "recognised" if it is from one of 22 medical schools treated by the GMC as directly equivalent to a United Kingdom qualification. In theory, full registration entitles the medical practitioner to pursue an independent practice without supervision in any sphere. An overseas qualification is acceptable if it is "accepted" by the GMC. The majority of these are outside Europe. An accepted qualification leads to limited registration under supervision by a registered medical practitioner under section 22 of the Medical Act 1983 for a maximum period not exceeding five years. It confines doctors to hospitals or other approved institutions, in effect, all NHS hospitals. The purpose of limited registration is for doctors from abroad seeking to train in the United Kingdom. For that reason section 22 of the 1983 Act provides that a person with an accepted qualification may only obtain limited registration if he or she has employment to go to in a hospital or approved institution in the United Kingdom (or Isle of Man). A person with limited registration may apply for full registration under section 19 of the 1983 Act which may be granted by the GMC having regard to the applicant's knowledge, skill and experience: 1983 Act, section 25. About 6,000 doctors with overseas qualifications are registered every year.

A degree from the Kharkov Medical School is an "accepted" qualification. When Dr Evans-Appiah arrived in the United Kingdom, the legislation in force was the Medical Act 1956. Section 25 of the 1956 Act provided for "temporary" registration for persons with overseas qualifications intending to be in the United Kingdom temporarily for employment as a medical practitioner. Section 12 of the Medical Act 1969 substituted a new section 25 in the 1956 Act for temporary registration. Neither the original nor the substituted section restricted temporary registration to a maximum period of years. The 1969 Act amendment did provide for temporary registration being granted for a period of time; but there was no limit to the number of successive periods of time that could be granted. Hence, there could be any number of successive grants of temporary registration resulting in temporary registration for

well over five years. Then section 22 of the Medical Act 1978 created the "limited" registration, replacing temporary registration under the 1956 Act. The 1978 provision for limited registration is the same concept as limited registration under the 1983 Act which consolidated the Medical Acts 1956 to 1978. Act. A person with temporary registration under the 1956 Act could apply for limited registration under paragraph 4 of Schedule 5 to the 1978 Act. The application had to be made within six months of the end of the period of temporary registration. But a person with temporary registration who was granted limited registration was not subject to the five year limitation which would apply to applicants under section 22 of the 1978 Act. The 1983 Act did not affect, by virtue of the saving provision in paragraph 23 of Schedule 6 to the 1983 Act, the status of temporary registered practitioners who obtained limited registration under the 1978 Act without a maximum limit of time. Those practitioners with this form of limited registration have what is known as "reserved rights".

Thus did Dr Evans-Appiah obtain limited registration in the United Kingdom with no limit on the number of years that he could spend in the United Kingdom in that capacity. Dr Evans-Appiah applied for full registration in 1981 but was turned down. The reason for that is not on the GMC files. He obtained full registration in February 1997. He practised, therefore, with limited registration for about 24 years.

The significance of all this is that there is a loophole in the legislation which enables a person, with an overseas qualification who came to the United Kingdom with temporary registration, to be in practice on limited registration for well in excess of five years. Professor Aitkenhead was concerned that it was possible for Dr Evans-Appiah to spend over 20 years operating in training posts in which he was not being trained. Dr Evans-Appiah could, of course, be working in training posts without proper training even with full registration. He was, however, working within the system which operated. There is also a problem of ensuring that a person keeps within the restrictions of the limited registration granted. It appears that at one time in 1996 Dr Evans-Appiah was working in a post for which he was not covered by his limited registration: see letter from the GMC to Dr Evans-Appiah dated 25 April 1996 (CP63, p.62).

In 1976 the GMC introduced a test of knowledge, skill and experience. This is reflected in section 22(1)(e) of the Medical Act 1978 and now section 22(1)(e) of the 1983 Act. But, once granted temporary registration, a person was not asked to take the test after it was introduced.

One solution canvassed at the Inquiry was to require those with reserved rights to take the test of knowledge, skill and experience. Mr Scott thought that the view of the GMC was that assessment of performance in such cases was more important than a test. The test introduced in 1976 is undertaken for the purpose of obtaining limited registration in the first place. We did not consider in the Inquiry how and when such an assessment would be carried out. The GMC should give this further consideration.

I do not how many doctors with overseas qualifications, who had temporary registration before 1978 and obtained limited registration in 1978, remain in practice with limited registration. The purpose of limited registration is training and it must be

supervised. The GMC should consider whether to seek to close the loophole of reserved rights altogether. I appreciate that if something does need to be done, the solution will be a matter for Parliament.

2.Assessing qualifications of overseas doctors

No one knew very much about the Kharkov Medical School other than that it is an "accepted" qualification and was so in 1973.

In 1976, as noted in section L1 above, a test of knowledge, skill and experience was introduced for those with accepted qualifications. It is not necessary to take the test if there is other objective evidence. The position is, therefore, that a person with an accepted qualification now must (a) pass the test of knowledge, skill and experience, (b) have obtained certain post-graduate qualifications or (c) be sponsored by a medical royal college or university department. Those who obtained temporary registration before 1976 were not, of course, asked to take the test.

Within the European Union there are bilateral arrangements to exchange information about qualifications. Outside Europe in some parts of the world it may sometimes be difficult to obtain reliable information about such details as disciplinary proceedings which might have been taken against the applicant. The GMC is seeking to improve the position with other registration organisations. There are 1,500 medical schools world-wide. There are about 6,000 doctors with overseas qualifications registered each year. The task is not an easy one.

There is nothing I can usefully add to what the GMC is already doing on this issue.

3.Meaning of full registration and re-validation

Full registration as a medical practitioner entitles a doctor to pursue an independent practice without supervision. There are about 190,000 practitioners with full registration. A medical practitioner with full registration has full registration, at the moment, until he or she leaves or is struck off. There are about 400 statutory references to things a registered medical practitioner may do. A person could obtain full registration on the basis of practice and recommendation in one sphere of medicine with no constraint thereafter from practising in another. A person with full registration could practice in an area for which he had no specialist qualification or experience unsupervised. It was possible until 10 November 1998 for such a person to administer general anaesthesia in a dental surgery without a specialist qualification in anaesthesia. It might be possible, therefore, for someone to hold full registration and yet not be fit to practice medicine. So far as the GMC is concerned, once a person is registered, it is for the employer of the doctor to satisfy himself or herself about that person's experience and competence for any particular post. Full registration is not an expression of opinion on fitness to practice. Dr Poggo seemed to regard full registration as some indication of having reached a certain standard. It would appear to be a common public misconception that it is an indication of fitness to practice and that the practitioner is up to date. Mr Scott said he would be surprised if an NHS employer or locum agency would misunderstand the meaning of full registration. There was a risk, he accepted, with generic registration that a doctor may not be able to do particular work.

Mr Shiels, in his submissions for the Crown, suggested a way of dealing with the misconception. He thought that the certificate of full registration might specify the area of medicine practised on the date of first full registration and state that the certificate is not a guarantee of minimum standard of knowledge or experience. Professor Aitkenhead was asked about full registration limited to particular areas of practice. He thought this was a possibility, having similarities to the specialist registers. As most specialties had two parts to the qualification, the first now containing practical training, that part could be a requirement for full registration limited to an area of practice. It was, he said, a complex political issue. It was one which, in his opinion, should be investigated. One of the difficulties for the GMC is that its constitution is such that it does not deal with specialties; that is something for the specialist bodies.

The GMC has begun a validation procedure with a two year timetable to be set up in 2001. Mr Scott thought it might take a further four to five years to re-validate the whole register. The validation procedure, by which a doctor will have to satisfy the GMC that he or she is fit to practice and up to date every five years, does not wholly meet the point made about the generic nature of full registration. A system of re-validation at regular intervals is, however, clearly an appropriate and necessary procedure to maintain standards and confidence in the profession.

The issue was not taken very far in the Inquiry but it is one which merits further consideration in the first place by the GMC.

4.Locums

Professor Aitkenhead expressed concern about locum working in the medical profession. Many doctors do it because they cannot obtain a substantive or permanent post and they may be at the bottom of the range of ability. They rarely worked under supervision and their competence was not, therefore, monitored (normally a locum is supervised if in a training post). Their references may not indicate poor performance because monitoring was poor as they were unsupervised. There was no obligation or incentive for them to undergo further training. There was a fifth point which emerged in the Inquiry. This was that complaints might not be made about a locum once he or she had left the employment of the dissatisfied employer. This latter problem is recognised by the GMC in its booklet, Maintaining Good Medical Practice (DFP2/4, p.6 of 12):-

"There is some evidence that those who employ locums are not willing to report serious problems with them. It is not enough simply to decide not to employ the doctor again. The doctor may move on, to pose a threat to patient safety elsewhere."

Sixthly, Mr Scott mentioned that locums could not be suspended by their employers under local procedures, though they could be sacked. The GMC Preliminary Proceedings Committee could impose interim suspension if referring the complaint to the Professional Practices Committee: see section 42 of the Medical Act 1983. The doctor has four weeks' notice to consider a complaint.

These concerns emerged in the Inquiry because Dr Evans-Appiah had been employed in training posts, most of them as a locum, not having obtained a

permanent post, for the whole of his career in the United Kingdom stretching over 25 years. The system allowed for this. Dr Evans-Appiah explained that he chose to conduct his career in this way for financial reasons, to maximise his earnings in order to assist those he supported financially.

The GMC recognises that the locum system has disadvantages, but it also has obvious advantages. A balance has to be struck.

The GMC is looking at changes to its complaints and suspension procedures. I do not know the details of the validation procedure which I have mentioned in section K3. It may be that such a procedure would deal with the problem. I think the question of locums practising unsupervised may require further consideration by the GMC. I also wonder whether enough is done by the GMC to deal with the problem of employers not complaining about locums after they have left their employment.

5.Procedures for complaints about doctors with limited registration

Dr Evans-Appiah worked at the Borders General Hospital, Melrose, from June 1992 to July 1992 and from September 1992 to March 1993 in temporary posts as an anaesthetist. Dr Cripps was, and is, a consultant anaesthetist and clinical director of the department of anaesthetics at that hospital. On 25 March 1993 Dr Cripps felt constrained to write a letter to the GMC (CP54, 58 and 63, p. 50). The letter stated that:-

"... numerous incidents led us to consider that his standards of practice were not consistent with that required for somebody practising anaesthesia in the United Kingdom. We have become suspicious as to his actual qualifications and training. In view of this I have declined to sign a Certificate (SC2) 8 which would allow him to apply for full GMC Registration since I cannot certify No. 5 - that his service during the employment described was satisfactory."

Dr Cripps expressed doubts about the genuineness of Dr Evans-Appiah's medical qualification in the USSR in 1970. Concerns had been expressed by the theatre team (the ODA, nurse, and sometimes the surgeons) about his working practices which allegedly included filling in anaesthetic records before the events had occurred (eg monitor readings), patients becoming hypoxic (lack of oxygen) and Dr Evans-Appiah not reacting to it. A previous employer, Luton and Dunstable Hospital, had apparently refused to give a reference because of its concern. Dr Cripps said, however, that he and other consultants had worked with Dr Evans-Appiah and were satisfied with his work.

Dr Cripps received a reply from the GMC which indicated that the Council would not take the matter further unless details of the incidents were given. Dr Cripps did not follow this up. He said it was very difficult, when he was dealing with a pattern of events reported to him, to provide dates and times. He explained this in a further letter to the Overseas Registration Committee of the GMC on 3 August 1993 (CP63, p. 51). The letter contained more detail of the complaints but not dates and times. It included a reference to allegations that there were occasions when it was seriously in doubt that patients were adequately anaesthetised, ie possibly not asleep.

Complaints are normally considered under the fitness to practice powers of the GMC in Part V of the Medical Act 1983. There must be a statutory declaration or affidavit with the complaint. In 1993 the GMC had available to it only procedures for serious misconduct, which required the criminal standard of proof. A charge had to specify a particular date. It was not until 1995 that the GMC had power to deal with complaints of seriously deficient performance. This latter power was introduced by section 1 of the Medical (Professional Performance) Act 1995 which inserted section 36A into the 1983 Act. This would cover a pattern of poor performance and the criminal standard is not required. Thus one limitation on the GMC's powers has been removed.

There is another limitation on the powers of the GMC which remains and it appears to be self-imposed. This is that the GMC would not have considered Dr Cripps's complaint under the fitness to practice powers. Because Dr Evans-Appiah had limited registration, any complaint would have been considered at the point of renewal of a period of limited registration under section 22 of the 1983 Act in relation to the question of whether a further period of limited registration should be granted. The reason is that the enquiries might go beyond the end of the period of registration and could not thereafter be pursued. The preferred approach was, therefore, to consider the matter at the time of application for further registration. That could, in some cases, be a matter of years away. I am not convinced that this is wholly satisfactory. I think the question of when complaints are dealt with in respect of those with limited registration should be considered again.

It was also the case in 1993 that the GMC was more inclined to take the view that if a person was not inclined to press a complaint there was little the GMC thought it could do. Now the GMC would take active steps itself to follow up a complaint.

Mr Scott says that Dr Cripps's letters were, in fact, placed before the Chairman of the Overseas Committee, along with the correspondence about the incidents at Falkirk Royal Infirmary in July 1993. Dr Evans-Appiah was then granted further limited registration for one year from March 1993 (it will be noticed that this is two years after Dr Cripps's first letter) to March 1996 with a requirement that he be monitored during that period: see letter dated 20 April 1995 in CP63, p. 55.

Dr Cripps was criticised for not following up his complaint about Dr Evans-Appiah to the GMC. As employers might do in the case of locums, it was said that he did not follow up his complaint because Dr Evans-Appiah had left that employment. Mr Shiels invited me to recommend that Dr Cripps should be reported to the GMC for consideration for prosecution before its professional conduct committee for failing to follow the matter up. I am not persuaded to do so. Dr Cripps did follow up his complaint, although not with the detail that the GMC required. Under the procedures which operated in the GMC the complaint would not have been considered before the point of renewal of registration. The letters of complaint by Dr Cripps were considered at the point of renewal of limited registration by the Chairman of the relevant committee.

6.Obtaining full registration

Dr Evans-Appiah was granted another certificate of limited registration from April 1996 to March 1997 with a condition that he be monitored during those 12 months.

Dr Evans-Appiah applied for full registration on 28 October 1996. It appears from his application form that he had not worked in anaesthetics since July 1995: see CP63, p. 67.

There was concern expressed at the Inquiry that Dr Evans-Appiah was able to obtain full registration in February 1997 when the recent references in his GMC file (CP63), which related to monitoring of his last two periods of limited registration, indicated his suitability only for supervised posts in anaesthetics.

I have dealt with the question about the generic nature of full registration in section L3. above. There are three matters to note under this heading.

Firstly, Dr Evans-Appiah could not have obtained full registration without favourable reports. Unfortunately, before 1998, the GMC did not keep all documents in relation to an applicant before the grant of full registration, and it was the practice to destroy documents relating to limited registration thereafter. It was not necessarily the case that documents with a negative impact were all retained. There were references in CP63 in relation to Dr Evans-Appiah's application in 1981 for full registration which were very favourable (CP63, pp. 2-4). There did not appear to be any references in the file relating to the application in October 1998. Mr Scott did not know if references for his full registration included references from anaesthetic departments. Since 1998 it is the practice of the GMC to keep all documents.

Secondly, today, the GMC would look for two years' practice in the United Kingdom with supporting references from all supervising doctors. There does not appear to be any further issue here which requires to be looked at.

The third point relates to section 10 in the application form for full registration (CP63, p. 65). That section contains a question asking whether the applicant has ever been suspended from practice. There is no question asking whether the applicant has been sacked. Mr Scott indicated that the GMC would look at whether to include a question about dismissal during a contract of employment. I recommend that this is done.

L.THE GENERAL DENTAL COUNCIL

At my request the Inquiry had the benefit of considerable assistance from a representative of the GDC. Mr Thomas Macadam is a deputy president of the GDC and one of two representatives for Scotland on the Council. He has been a dentist for 28 years in general practice.

1.Training for dentists in general anaesthetic dentistry

The GDC does not explain its guidance, Maintaining Standards, amended in 1998. A dentist must make enquiries through, for example, his or her defence organisation as to whether a particular thing was appropriate. The only guidance a dentist from abroad receives is a copy of those guidelines.

Since 1993, a UK dentist must undertake a vocational one year course. He or she would not be able to do general anaesthetic dentistry without having done the

course, although I do not understand it to be a post-graduate course in dental anaesthesia. It includes business management. This course does not apply to a dentist from the European Union. Directives of the European Union apparently prohibit the GDC from imposing its own requirements. Thus it would be possible for a dentist from another European Union country to do general anaesthetic dentistry without training if it were not part of the training for dentistry in the home country. But there would be an ethical obligation to work within the area of competence.

The only guidance Mr Pedersen received from the GDC was a copy of the guidelines, Maintaining Standards. Professor Rood did not think the guidelines were much guidance for a foreign dentist engaging in general anaesthetic dentistry. The guidance offered in the guidelines is in paragraph 4.17 (equipment, facilities and training):-

"Neither general anaesthesia nor sedation should be employed unless ..... and staff trained in the anaesthetic or sedation procedure and resuscitation techniques."

It is not clear whether that guideline applies only to dentists doing anaesthesia or the dentistry.

Mr Macadam said the advice of the GDC to someone seeking guidance would be to approach the post-graduate Dean locally to find out what courses were available. In other words, it is left to the dentist to discover what to do and, it would seem, decide whether he or she is adequately trained. It is not satisfactory, as Mrs Abernethy and Miss Maguire pointed out in their submissions, that the GDC may prosecute for professional misconduct but not offer guidance about the standard required. Mr Macadam's response was that the GDC is a regulatory body and not an educational one. But this is inconsistent with the specification the GDC gives in the 1998 amendments to its guidelines, in new paragraph 4.13(ii), about the qualifications required of an anaesthetist: see section J above.

Professor Rood considered that new graduates were not sufficiently experienced in general anaesthetic dentistry to be able to undertake it without further training. As more restrictions are placed on that kind of dentistry in dental surgeries, fewer will have or gain the necessary experience.

It seems to me that the GDC should be more specific in its guidelines about the qualifications and training it expects of a dentist undertaking general anaesthetic dentistry.

2.Training for anaesthetist's assistants

Paragraph 4.11 of the unamended GDC guidelines, Maintaining Standards provided, and paragraph 4.13(iii) of the guidelines as amended in November 1998 provides, that the anaesthetist must be supported by "an assistant specifically trained and experienced".

The GDC offers no explanation of that phrase, as Mr Beckett discovered and as Mr Macadam confirmed. It is not clear what it means or what it should mean. Mr Flavill

sends his anaesthetist's assistants to a sedation course in Dundee. He mentioned that there are courses at Guys Hospital in London.

I recommend that the GDC considers specifying the training and qualifications required for an anaesthetist's assistant, if necessary by reference to identified available courses.

3.Guidance about the place for dental anaesthesia

Until dental anaesthesia is restricted to hospitals, I recommend that the GDC should consider whether the guidelines, Maintaining Standards, ought to contain a statement similar to that in the RCA guidelines (CP47, p.7), to the effect that, ideally, general anaesthetics for dentistry is best administered in a hospital. It is for consideration whether the guidelines should also require the referring or treating dentist to inform patients that a hospital is the best place for dental anaesthesia.

Mr Macadam said that the GDC would look at these matters.

M.AVAILABILITY OF DENTAL TREATMENT UNDER GENERAL ANAESTHESIA IN DENTAL SURGERIES

1.General anaesthesia only in hospitals

In 1967 there were two million general anaesthetics administered. Britain is the only country doing dental anaesthesia on the scale that it is now done (about 300,000 in 1998). Mr Macadam produced a document (CP64) which showed that the number of general anaesthetic claims by dental practices in Scotland for October 1997 to March 1999 totalled 33,666. In other countries they appear to appreciate the dangers more than we do. But here, because the public are used to it, the public is still demanding it. In the United Kingdom the number of general anaesthetics is more common in certain socio-economic groups and in certain parts of the country; for example, the North of England and the West of Scotland.

The Inquiry did not have any statistical evidence of the number of deaths in dental surgeries in recent years. The Poswillo report (DFP 1/1 p. 9) recorded deaths over the 10 years from 1979 to 1988 in England and Wales. In 1979 there were 9 deaths of which four were in dental surgeries. In 1988 there was one death, in a hospital. There was anecdotal evidence at the Inquiry that there are about two deaths a year in dental surgeries. There was an item in the newspapers on 26 November 1999, before the date on which I heard submissions, about a boy of five who died a month after suffering a cardiac arrest in a dental surgery in Portsmouth in September 1998.

One starts off with the presumption that general anaesthesia is never without risk and should be avoided. The Poswillo report contained this recommendation at page 15:-

"(i)The use of general anaesthesia should be avoided wherever possible."

The Poswillo report did not, however, support the view that dental anaesthesia should be provided only in hospitals. The authors of the report, in 1990, did not think

that that was realistic or in the interests of patients. It supported the view that many patients respond better to the relaxed and friendly atmosphere of an efficient dental practice: see paragraph 3.18 of the report.

Professor Rood, who acknowledged his view was not that of all his colleagues, said that the question was not so much where but by whom and with what facilities general anaesthesia should be administered. At the end of the day the anaesthetist must be familiar with the patient, properly trained in a facility with a routine able to cope with emergencies. In his opinion general anaesthesia should be done only in a hospital. The reason is obvious. In a hospital there are all the facilities required for an emergency. In a hospital they are more likely to provide all the staff and equipment necessary and the range of equipment. The anaesthetist can call on colleagues, whereas in a dental surgery there is no one to call on in an emergency. In a hospital, if a member of the team is off sick, or on leave, there are other staff to cover. When a critical event occurs, the time it takes to get to intensive care is minimised in a hospital compared with a dental practice. Professor Rood pointed out that, in the future, general anaesthesia for children may be restricted to administration by a paediatric anaesthetist. Paediatric dentistry was already a specialism and young anaesthetists were being trained and were specialising in this area. Professor Aitkenhead said that in a dental surgery there is a greater risk of things going wrong because the delays in emergency backup from a hospital will give rise to greater risk of injury to the patient. Professor Aitkenhead's opinion was also that general anaesthesia in dentistry should not be carried out outside hospitals.

The GDC has not so far said anything about the places where general anaesthesia in dentistry may be carried out. It has restricted itself to comment on facilities and training in its 1997 guidelines and its amendments in November 1998 (CP20 and 29). In contrast the RCA Guidelines state, at page 7:-

"Ideally, all general anaesthetics for dentistry should be administered within the administrative aegis of the range of services typically provided by, for example, an NHS District General Hospital."

Mr Macadam agreed with that statement. He agreed that a hospital is the best place but, he said, not the only place for dental anaesthesia and that the GDC guidelines should also state that that is so. He was confident that the GDC would address the question of the guidelines requiring dentists to inform patients that a hospital is the best place. He also indicated that one of the difficulties was in defining a hospital. He agreed with me that it might be defined as a hospital which has an intensive care unit.

As a consequence of the Poswillo report and the amendments in November 1998 to the GDC guidelines, the number of dental surgeries in which general anaesthesia is offered is reduced. As a rule, general anaesthesia is offered now in dental surgeries specialising in it because of the requirement for dentists experienced in general anaesthesia and for specialist anaesthetists.

It seems to me that this question is going to have to be considered properly. It is not satisfactory merely to react to each new problem by making general anaesthesia in dental surgeries more difficult by increasing the restrictions. As practical experience

of general anaesthetic dentistry is less, those with experience are fewer and the places where general anaesthesia may be performed will be fewer. I have not heard evidence from every quarter on this issue, but, having sat through this long Inquiry, my own impression is that general anaesthesia in dentistry should no longer be available outside a hospital which has an intensive care unit.

I appreciate that there have been reports within the last month of mistakes, unconnected with general anaesthetic denistry, made in hospitals, Dr Poggo pointed out that restricting dental anaesthesia to hospitals would not eliminate deaths in general anaesthetic dentistry. While these may be horrible truths, the point that matters is that in a hospital there is access to all the emergency facilities and fully trained personnel immediately and whenever required.

I recommend that consideration is now given, by the Executive or Parliament if that is required, to the discontinuation of administering general anaesthesia for dental treatment in dental surgeries.

2.Requirement if general anaesthesia is to remain available in dental surgeries

It is recognised that there may be practical difficulties in requiring all general anaesthesia in dentistry to be performed in hospitals. For example, it was suggested that in remote areas it might be unrealistic to require to travel some distance to a hospital. On the other hand, it would be unlikely in a remote area that there will be a dental surgery where general anaesthesia was regularly performed.

Both Professor Rood and Profess

or Aitkenhead were agreed that if general anaesthesia is to be available in dental surgeries there should be monitoring of those surgeries which provide it.

I think that, if general anaesthesia is to be allowed to continue in dental surgeries, there must be inspection and monitoring of those surgeries to ensure that standards are being maintained of ability, competence, experience, equipment and appropriate facilities. Mr Macadam said that as a spin off of the 1998 amendments to the GDC guidelines there were going to be general anaesthetic inspection teams. Paragraph 4.13(iii) of the guidelines as amended in 1998 provides that there must be a written protocol for the provision of advanced life support including appropriate arrangements for the immediate transfer of a patient to a critical care facility. As far as Mr Macadam was aware no such teams yet existed anywhere in the United Kingdom and their remit had not yet been determined. (Professor Aitkenhead thought there were inspections in England by local health boards.) They are an initiative of the health boards. Because of the written protocol, there had to be an inspection to see if intensive care could be provided. In other words, was there suitable access for an ambulance and how near was the dental practice to the hospital? He said the team would be open to criticise any aspect of the provision in the dental practice. Inspection would be at least annually. The team would consist of an anaesthetist, a dentist and a theatre nurse among others. If the team found serious shortcomings they would advise the practitioner to stop, and if he or she did not, the team would advise the GDC which has power to order interim suspension.

Apparently in Glasgow and Strathclyde, and Aran health boards there is an initiative for such a team already.

If general anaesthesia is to continue to be available in dental surgeries (which I doubt should be the case), I recommend that there is an annual inspection of them by health board inspection teams to maintain standards of competence, skills and experience of dentists, anaesthetists and staff and that consideration be given to a power to suspend the dentist or surgery not meeting the standard for performing dental anaesthesia. I do think, however, that this is a more expensive option than restricting general anaesthetic dentistry to hospitals.

In addition to the existing requirements, general anaesthetic dentistry could be permitted in dental surgeries if:-

(a)the treating dentist has undertaken a post-qualifying course of training in general anaesthetic dentistry;

(b)there are annual inspections by health board inspection teams of dental surgeries with power to suspend the dentist from practising who does not meet the standard;

(c)the dental nurse, anaesthetist's assistant and dentist have advanced resuscitation and life-support training; and

(d)the anaesthetist's assistant has undertaken a recognised course to qualify for that rôle.

APPENDIX

WITNESSES

who gave evidence to the Inquiry

(in order of appearance)

1.Mrs Islay Denholm, Darren's mother

2.Mrs Alice Campbell, Darren's maternal grandmother

3.Dr John Evans-Appiah, the anaesthetist, Peffermill Dental Clinic

4.Mr Hallgier Pedersen, the treating dentist, Peffermill Dental Clinic

5.Miss Kirsty Thompson, dental nurse, Peffermill Dental Clinic

6.Mr Gareth Nicholson, dental nurse and anaesthetist's assistant, Peffermill Dental Clinic

7.Mr George Milne, ambulance technician

8.Dr Kathleen Houlihan, MB BCh, BAO NUI, FRCSI, Medic 1

9.Mr Maurice Beckett, LDSRCS, proprietor of Peffermill Dental Clinic

10.Mrs Pauline Pringle, receptionist, Peffermill Dental Clinic

11.Mr Paul Shields, BDS, referring dentist, Armadale Dental Clinic

12.Dr Gillion Fabbroni, BSc, BDS, MB BCh, FDFRCS, Medic 1

13.Mr Allan Stewart, paramedic

14.Dr Colin Poggo, MB, BCh, managing director of Poggo Anaesthetics Ltd

15.Dr T P Cripps, BA, MB ChB, FRCA, Consultant Anaesthetist and Clinical Director, Department of Anaesthetics, Borders General Hospital, called on behalf of the Denholm family

16.Miss Sharon Guild, state registered nurse, Peffermill Clinic

17.Mr Brian Flavill, BDS, principal, Carden Place General Anaesthetic Clinic, Aberdeen, called on behalf of Dr Evans-Appiah

18.Professor Anthony Busuttil, MD, FRCPath, DMJ(Path), FRCPE, FRCPG Professor of Forensic Medicine, University of Edinburgh

19.Detective Constable Colin Brown, Lothian and Borders Police

20.Detective Sergeant William Slaven, Lothian and Borders Police

21.Dr Howard Moody, PhD, BDS, FDS.RCSEd, FRCPath, DFM, Consultant Oral Pathologist, St John's Hospital, Livingston

22.Anne Stokes, state registered nurse, recovery nurse at Peffermill Dental Clinic, called on behalf of the Denholm family

23.Mr Finlay Scott, Chief Executive and Registrar of the General Medical Council

24.Professor J P Rood, BDS, FDSRCS, MB BS, MDS, MSc, FRCS, Professor of Oral Surgery, King's College, University of London

25.Professor Alan Aitkenhead, MSc (Med Sci), MB, ChB, MD, FRCA, Professor of Anaesthesia, University of Nottingham and Honorary Consultant, Nottingham Health Authority

26.Mr Thomas Macadam, BDS, a deputy President of the General Dental Council and one of two council representatives for Scotland.