

Dr A, Ophthalmic Surgeon

Ms B, Nurse

Ms C, Nurse

A District Health Board

**A Report by the
Health and Disability Commissioner**

(Case 00HDC04660)



Health and Disability Commissioner
Te Toihau Hauora, Hauātanga

Parties involved

Dr A	Provider/Ophthalmic surgeon, Public Hospital A
Ms B	Provider/Circulating nurse, Public Hospital A
Ms C	Provider/Scrub nurse, Public Hospital A
Mr D	Consumer
Dr E	Ophthalmic registrar, assistant surgeon, Public Hospital A
Mr F	Service leader, operating theatre, Public Hospital A
Dr G	Clinical leader, Department of Ophthalmology

Independent expert advice was obtained from Dr Mark Elder, Associate Professor of Ophthalmology, and Ms Fiona Turnbull, registered nurse with ophthalmological expertise.

Complaint

On 1 May 2000 the Commissioner received a complaint from Mr D about Dr A, Ms B, Ms C and a District Health Board. The complaint was that:

During an eye operation in 25 March 1998 to repair an injury to Mr D's eye, Dr A, ophthalmologist, failed to:

- *ensure the eye operation procedure was followed correctly;*
- *ensure adequate communication with other members of the surgical team.*

Instead, 100% gas was injected back into Mr D's eye, which resulted in right eye blindness.

During the eye operation Ms C, scrub nurse, failed to provide Mr D with services in a manner consistent with Mr D's needs, by administering 100% gas into Mr D's eye instead of a solution of 40/60% gas mixture, resulting in right eye blindness.

During the eye operation Ms B, circulating nurse, failed to provide Mr D with services in a manner consistent with Mr D's needs, by not checking the 100% gas mixture to protocol.

An investigation was commenced on 21 September 2000.

Information reviewed

- Complaint letter from Mr D dated 20 April 2000
 - Response letters from Dr A
 - Response letters from Ms C
 - Response letters from Ms B
 - Letter from Dr E
 - Responses from the District Health Board
 - Letter from Mr F
 - Clinical notes from a general practitioner
 - Clinical notes from Public Hospital B
 - Clinical notes from Public Hospital C
 - Action notes dated 11 March 2002 and 30 November 2001
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Information gathered during investigation

Introduction

On 17 February 1998 Mr D sustained a penetrating injury to his right eye while cutting firewood. As a result of this injury Mr D suffered a detached retina (the image receptor and transmitter part of the eye detaches from the back of the eyeball). On 24 March a visiting ophthalmologist at Public Hospital C referred Mr D to Dr A, an ophthalmic surgeon at Public Hospital A. Mr D stated that the visiting ophthalmologist advised him that Dr A had just returned from overseas with a new method for re-attachment of the retina using gas. Dr A first saw Mr D on 24 March 1999 and stated:

“He had no signs of serious permanent damage to the retina at that stage, although his eye had been severely injured by the trauma in February and his anterior segment was quite deranged and moderately inflamed. His intra-ocular pressure was below normal at that stage. Examining his eye revealed that it was necessary to perform a vitrectomy procedure to reposition the detaching retina and prevent him from losing central vision on that side.”

On 25 March 1998 Dr A performed a vitrectomy operation (procedure that involves removing vitreous fluid in the eye temporarily to repair retinal disorders) on Mr D’s right eye. The surgical team assisting Dr A was new and had not worked together before. The team consisted of Ms C, scrub nurse, Ms B, circulating nurse, and Dr E, ophthalmic registrar and assistant surgeon. (The duties of scrub and circulating nurses are set out on pages 6-7 below.)

Ms C advised that Mr D’s vitrectomy operation was the first vitrectomy operation for which she had been scrub nurse. Ms C had “double scrubbed” (scrubbed alongside an experienced

nurse) for an ophthalmological operation previously, but in that operation gas had not been used.

Ms C stated that she heard Ms B tell Dr A that this was the first time she had scrubbed for a vitrectomy operation. Ms B advised that she could not recall advising Dr A that it was the scrub nurse's first vitrectomy.

Checking

Dr A stated that when he performed the operation on Mr D on the evening of 25 March he discussed the importance of choosing the correct dilution of gas with Dr E while the scrub nurse was standing "immediately beside" him. Further, Dr A stated that he specifically discussed the dangers of filling the eye with 100% SF₆ "as the eye would be virtually completely full of gas at the end of the procedure". The significance of this, according to Dr A, was that gas has the ability to expand to twice its volume, significantly increasing the intra-ocular pressure once the operation was completed. Dr E stated that he remembers Dr A discussing the gas dilution but could not be sure who was party to the discussion, what instructions were given about drawing up the gas or whether Dr A checked the concentration. Dr E said that the nursing staff were close by and "the discussion would certainly have been audible".

Dr A said:

"We decided that a 20% concentration of SF₆ would be appropriate in this situation as this should be non-expansile and one would expect the eye to be virtually completely full of gas having had all of its vitreous removed."

According to Ms B, approximately 30 to 45 minutes into the operation Dr A had asked for a 60ml syringe of gas.

Dr A stated that he gave detailed instructions to the scrub nurse to draw up 12ml of gas into a 60ml syringe and to dilute the gas "to a total of 60mls with filtered air". Further, Dr A stated that he addressed the scrub nurse by name and that no other person in the operating theatre indicated difficulty in hearing him, nor did they seek clarification or repetition of instructions. Although many ophthalmic patients are awake in theatre and discussions are normally conducted quietly, Dr A's operation notes for the vitrectomy on 25 March 1998 record that the operation was performed under a general anaesthetic. Ms C and Ms B stated that they definitely did not hear Dr A ask for the gas to be diluted. Ms C stated that during the operation Dr A requested 60mls of gas to be drawn up and she understood that she was expected to do this. Ms B stated that "the use of undiluted gas was not unusual. It had sometimes been used in other operations that I have been involved in, involving another eye surgeon." Mr F stated that undiluted gas can be administered depending on the technique the surgeon uses. Some surgeons administer undiluted gas with a small syringe and some dilute the gas themselves using a large syringe. Further, Mr F stated that some surgeons dilute the gas themselves and some do not.

Ms B advised me that she brought the gas cylinder into the theatre and, together with the scrub nurse, checked the label. Further, Ms B stated that as circulating nurse it was her responsibility to check the gas according to protocol. (The protocol for intraoperative medication/substance administration is set out below.) The protocol also required that the medication type, dosage, strength and expiration dates be confirmed and visually checked by both the scrub nurse and the circulating nurse. Both Ms C and Ms B stated that they checked the gas cylinder label and expiry date. Ms B stated that she checked the gas type.

According to the protocol the medication type, dosage and strength is also to be confirmed and visually checked by the operating surgeon/anaesthetist. Dr A stated that “our protocol involved a double check process” in which Dr A instructed that the gas be drawn up and advised the dilution. The circulating nurse then obtained the gas and checked the correct dilution with the scrub nurse. Dr A stated that he “did not look up and triple check the actions of two qualified nurses”.

Any syringes that are used in the dispensing of medication to the operative site must be labelled at the time the medication is dispensed from the circulating nurse to the scrub nurse. The protocol stated that labels for receiving syringes/containers are to be confirmed and visually checked by the scrub and circulating nurse. The medication/substance is drawn into or placed in a labelled syringe. Ms B and Ms C stated that Ms C drew up the gas. Ms C stated:

“I followed a sterile procedure and drew up 60mls of the gas into a sterile syringe and placed the syringe on my sterile trolley as the gas was not required to be used immediately.”

Ms B stated that, as the gas was not required for immediate use by Dr A the syringe was placed on the sterile table. According to the protocol, prior to administration the labelled syringe is to be checked with and acknowledged by the operating surgeon. Dr A stated that he continued with the surgery then asked the scrub nurse to hand him the syringe. Dr A stated that his “clear understanding at the time was that the syringe contained 20% SF₆”. Ms C stated that Dr A did not check whether the gas was diluted when she handed him the syringe. Ms C did not state the type of gas and its strength when she handed the syringe to the surgeon. Ms B was out of the theatre at the time Ms C handed Dr A the syringe. Dr A handed the syringe to Dr E who inserted the gas into Mr D’s eye. The operation proceeded uneventfully.

Responsibility for checking

Mr F, Service Leader for operating theatres at the District Health Board, advised me:

“In any case of drug administration it is the person administering who has responsibility. This is [the District Health Board’s] policy and universal policy in any medical area nationally and internationally. When presented with the drug it is the person administering, [Dr A] in this case, who has the responsibility for checking it before proceeding with administration. The gas was drawn up in a 60ml syringe as requested by [Dr A]. He would have had to ask the nurse about the strength as

the gas is clear. When a drug is drawn up at the operating table to be administered by the surgeon the nurse always checks with them. In this case [Dr A] accepted the drug that was given to him. It is clear in this case that there was a miscommunication over the gas being administered which later checking would not be apparent.”

Dr G, Clinical Leader of the Department of Ophthalmology, stated:

“Drugs are often drawn up by nurses in theatre on verbal orders prior to the surgeon administering them. The surgeon verbally asks for the drug and ensures that the nurse understands the dilution required and methods used for dilution. Accurate instructions are given, but the actual process is not normally watched by the surgeon, as time does not allow for this. The nurse checks the drug and the dosage with a second nurse or a doctor. Prior to insertion of the drug, the doctor again checks with the nurse that it is the correct dosage given to him. It is the nurse’s responsibility to ensure that she understands the surgeon’s instructions. If there is any misunderstanding, she must question the surgeon to ensure the correct dosage is given. She then draws up the medication according to instruction and has a second nurse or doctor check. When she hands the prescribed medication to the surgeon she should state the dosage given. It is the responsibility of both surgeon and nurse prior to administration to check that the correct dosage is being administered.”

Training

Dr A advised that when he was appointed as a consultant to Public Hospital A in January 1998 he became aware that his technique for vitrectomy surgery differed from that used by previous surgeons at Public Hospital A. Dr A advised that for this reason he explained the procedure by which the gas was drawn up, diluted and administered, to Ms B, the charge nurse of the eye theatre, so that nursing staff in the theatre understood the procedure. Ms B stated that she was “not aware of who had the responsibility of orientating staff to operating theatre in 1998”. Mr F stated that the nurses working with Dr A for this procedure received training in a number of ways including formal training programmes run by the Theatre Nurse Educator training organised and run by the theatre nurses themselves, and support from the clinical nurse specialists. New nurses receive competency development workbooks and staff are supervised until competent. When new procedures are introduced, the doctor responsible for the procedure works with the nurses to determine how the procedures are done. However, Mr F stated that Dr A did not provide formal training or instruct staff on the procedure as it was not a new technique but a variation on the current technique.

The District Health Board did not include the protocol for intraoperative medication/substance administration as a formal part of the orientation to operating theatre. As a result of Mr D’s operation, a separate protocol/process for the administration of intraocular gas was developed. Both protocols are now formally included in the orientation process.

Outcome

Mr D had extreme eye pain post-operatively, for which he was given intravenous morphine. Although Dr A expected that Mr D would experience moderately severe pain, the pain continued and the intraocular pressure remained raised. Dr A checked with Ms C that the gas had been diluted and was informed by her that the syringe had contained 100% SF₆ gas. Dr A told Mr D what had happened and removed the gas from his eye. Mr D became blind in his right eye as a result of the raised intraocular pressure caused by the use of full strength gas during the operation on 25 March 1998.

ACC

ACC did not consider medical misadventure in relation to the operation on 25 March, as personal injury cover was granted as an extension of Mr D's initial eye injury.

Independent advice to Commissioner

Nursing advice

Independent expert advice was received from Ms Fiona Turnbull, a registered nurse with ophthalmological expertise.

“Roles and Responsibilities of Scrub and Circulating Nurses

Scrub nurse

- provide instrumentation required for surgery
- prepare equipment ready for use for surgery
- anticipate when and if equipment is required for surgery
- prepare medication/substances as required for administration
- assist surgeon with surgery when required

Circulating Nurse

- ensures correct equipment is available for surgery
- assists scrub nurse with procedure set up
- opens and presents sterile equipment to scrub nurse
- attaches any sterile equipment as necessary to un-sterile sources required for surgery e.g. diathermy leads at machine end.

- assists scrub nurse as necessary with preparation of medication/solutions.
- anticipates when and if equipment is required for surgery
- acts as patient advocate, monitoring patient safety

Verbal request of Intraoperative medication

- Surgeon clearly communicates to the scrub nurse and/or circulating nurse a request for intraoperative medication.
- Scrub nurse and / or circulating nurse verifies with surgeon their request.
- Circulating nurse checks with scrub nurse medication/ substance – name, strength and date of expiry (one nurse being a registered nurse).
- Scrub nurse presents completed medication to circulating nurse to visually confirm the correct dose/amount has been prepared.
- The scrub nurse presents the medication to the surgeon clearly stating what the medication is and the dose.
- The surgeon verifies the medication and the dose with the scrub nurse if the nurse has not already stated what has been presented to them.

Standards for administration of Gas

The standard for gas administration complies with standards for administering any medications as described previously.

At [one] Hospital the following occurs.

- The operating surgeon requests to the scrub nurse and/or circulating nurse what gas and percentage they are wanting to use for the detachment surgery repair.
- The gas and the percentage are verified with the surgeon by the scrub and/or circulating nurse.
- The scrub nurse and circulating nurse calculate together, out loud, the required amount in mls to draw up, using a 50 ml syringe

e.g. a request of 18% gas = 9 mls of gas would be drawn up. Air would then be drawn up after the gas in the same syringe, using a filter, to the 50-ml mark to produce 18% gas.

- The syringe is capped.

- When the gas is requested for surgery the scrub nurse presents the gas stating what the gas is and its percentage.

Did [Ms C] and [Ms B] comply with these standards?

- The manner in which the circulating nurse and the scrub nurse checked the gas itself was acceptable, however they failed to confirm with the surgeon the correct dose.
- Although [Ms C] stated she was unaware of the requirement of gas dilution due to her unfamiliarity of the procedure, she failed to verbally state to the surgeon what the gas was and its dose when passed to him for administration.

[The District Health Board's] Intraoperative Medication/Substance Administration Policy.

[The District Health Board] policy would effectively provide guidance for staff.

- However, in my opinion, it clearly exceeds reasonable requirements e.g. the medication is checked visually by the operating surgeon/anaesthetist before mixing or dispensing. Somewhat disappointing when two professional nurses are not trusted to recognise the correct drug when requested. This policy requires the surgeon to unnecessarily check the medication twice. This case should not challenge the nurse's capabilities in recognising the correct drug, instead it should be highlighting the importance of correct and effective communication between the operating surgeon and the nurses involved in the surgery.
- The nurses' responsibilities, in regards to the preparation and administration of the medication required, is clearly stated.

Induction and Training

In the ophthalmology theatres, at [one] Hospital, nurses do not scrub when first exposed to vitrectomy surgery without another nurse 'double scrubbing' with them. This 'double scrubbing' will continue until the nurse is confident to scrub alone for this procedure. Vitrectomy surgery is very specialised where unfamiliar equipment is used, not like in any other ophthalmic procedure. The room is very dark, to aid in the surgeon's view, making the scrub nurse's role challenging when assisting the surgeon.

Like any surgical procedure an effective scrub nurse anticipates what instrument or piece ... equipment is required by the surgeon at a seconds notice, therefore the scrub nurse's knowledge plays an integral part to the efficiency and safety of the procedure. It is my opinion therefore that it was not appropriate for [Ms C] to have scrubbed for this procedure, being her 2nd time in the role as the scrub nurse for a vitrectomy. Full guidance from an experienced ophthalmic nurse should have been provided throughout the procedure. Training for vitreo retinal surgery would have been the ideal, but this is often not possible due to time constraints and lack of staff. Ideally an inexperienced staff nurse should not be put in a situation as [Ms C] was.

Checking and Labelling of intraoperative substances

It is not standard practice to label syringes within the sterile field. Certainly it wasn't at Moorfield's Eye Hospital, one of the largest Ophthalmology Departments in the U.K, nor is it undertaken in my area's ... ophthalmology theatres. Labelling is completed by the circulating nurse for un-sterile medications, which the scrub nurse may draw medication from using a sterile technique. The circulating nurse must however accurately document all medications including dose that were prepared and administered intraoperative. The gas was not fully recorded in the intraoperative records. The 'gas' was only documented as part of the 'operation performed'. The type of gas and the percentage should have been documented. They did however complete documentation for the administration of other medications given during the procedure e.g. Mandol – 50mg and Betnesol – 2mg.

In [my hospital's] Ophthalmology theatres the gas is written, by the nurses, on the intraoperative record form.

If correct documentation had occurred it should have read as:

Right vitrectomy, scleral buckle, heavy liquids/air/gas (C3F8 100%) exchange and laser.

This type of documentation would have quickly identified the mistake, eliminating the need to call the scrub nurse at home for verification of the gas percentage prepared.

Supervision

Before the case commenced [Ms C's] lack of experience should have been identified and discussed between the Charge nurse, the operating surgeon and the most senior nurse who would be present during the case. This communication and knowledge would have ensured that the procedure ran efficiently, effectively and safely. [Ms B], therefore as the most experienced staff nurse in the theatre, should have taken on the responsibility to supervise [Ms C] during the vitrectomy. The operating surgeon could then have also directed his discussion regarding the procedure to both the registrar and the scrub nurse rather than indirectly, which would have aided in the scrub nurse's ophthalmic education.

Relevant issues

- [Ms B] stated she had heard a request for 100% gas. A nurse who is trained effectively regarding vitreo-retinal surgery would have immediately raised questions as to how much gas was required. Their knowledge would alert them to the fact that 100% gas is only inserted in very small quantities e.g. 1 ml, due to its ability to expand in size. Only gas, which has been diluted, is inserted in large quantities. Therefore doubt in regards to the ophthalmic education provided to the nurses is a concern, especially since a similar technique had been used for 10 -15 years at [the District Health Board].
- The surgeon is responsible for the administration of any medications. It is their responsibility to ensure that what they have been given by the scrub nurse is what they

requested. In this case [Ms C] did not state what was in the syringe therefore the operating surgeon should have then asked her.

- Education of our nursing staff is taken very seriously as to prevent such situations, as this case, occurring. If there are any new or inexperienced staff in a vitrectomy theatre a more senior experienced nurse will be present throughout the procedure, to assist when required.
- Vitrectomy cases are one of the most stressful environments in all of the ophthalmic theatres. The surgeon's behaviour, related to stress, can throw a theatre into chaos due to unnecessary pressure placed on the nursing staff by the surgeons manner. As this was a post trauma case it could have been such an environment. Also with the addition of the case occurring out of hours and with there being a staff shortage the team may have been feeling tired after a full days work, therefore not working at their optimum skill level. This could also explain why the lack of communication occurred.”

Ophthalmology advice

Independent expert advice was received from Dr Mark Elder, a consultant ophthalmologist and Associate Professor of Ophthalmology.

“BACKGROUND:

The following details some background aspects of eye care and physiology as it pertains to the case.

1. Any eye incurring severe blunt trauma (such as this case) is often complicated by raised intraocular pressure. This case shows that after the initial trauma, there was significantly raised intraocular pressure that required substantial medical treatment to bring this under control. [Another doctor had] referred the case to [Dr A] and amongst his notes he has written ‘?molteno’. This is a surgical implant to control intraocular pressure. The importance of these details is that the complainant had significant intraocular pressure problems before his retinal detachment with surgery ...
2. The gas called SF6 expands approximately 2.5 times its original volume when injected into a body cavity or the eye. Therefore, an injection of 1ml will become 2.5mls over a 24 –36 hour period. It is entirely acceptable to inject small volumes of 100% SF6 (volumes such as 1.0mls). If an eye is completely filled with 100% SF6 (4mls), then it cannot expand to its normal 10mls but instead the pressure goes up according to the standard gas laws. Therefore this causes a very raised intraocular pressure, which diminishes over a number of days as the gas is slowly resorbed.
3. It would appear that previous retinal detachment and vitrectomy surgery at [Public Hospital A] has always used small volumes of SF6 at 100% concentration.

4. The patient saw 6/24 before his vitreo retinal procedure and saw no perception of light approximately three weeks [after] the operation. He had pressures recording as 50, 50 and 74 on day 1 and 2 after surgery. The clinical notes show that the patient developed vascular ischaemia. It is assumed that the eye became blind as a consequence of the raised intraocular pressure which developed after the retinal detachment procedure by [Dr A]. I would agree with this opinion.

OVERVIEW OF THIS CASE

The complainant is unhappy that he became blind as a consequence of retinal detachment surgery. The issues here are:

1. Preoperative factors
2. The surgery itself
3. The post operative care

PREOPERATIVE FACTORS

From the above, it is apparent that this patient was at risk of developing further episodes of raised intraocular pressure based on his history of trauma and previous episodes of raised pressure soon after his initial presentation.

Further, the notes show that he had 'angle recession'. This is a feature of change in the peripheral iris which predisposes to further raised pressure. The conclusion is that the complainant's eye was at risk of raised intraocular pressure in the post operative period after retinal detachment surgery.

THE SURGERY

- 1) It appears that there was a discussion between the consultant [Dr A] and his registrar [Dr E] about the importance of diluting intraocular gases such as SF₆.
- 2) The scrub nurse for the day was [Ms C]. She claims that she had no instructions about diluting the gas. There were no other staff nurses asked to check such a dilution. The circulating nurse [Ms B] was at tea when the gas was drawn up. [Ms C] announced on her arrival in the operating theatre, that she had never scrubbed for a vitreo-retinal case such as this. There is documentation that she had no idea that dilution of the gas was necessary.
- 3) It is my opinion that there was inadequate communication between the consultant [Dr A] and the scrub nurse. It is standard theatre protocol world-wide for any drug prepared to be used during a surgical procedure, to be checked by two nurses. If the scrub nurse had thought the gas should have been diluted, then she would have been unable to have this checked by the circulating nurse, [Ms B] because she was at tea. In this instance, a scrub nurse would ask another member of the medical staff or convey this to the surgeon. It would appear that no-one else was asked. The scrub nurse had never heard of diluting SF₆ and the protocol of drawing up 60mls, ejecting all but 12mls

and then reintroducing an additional 48mls of air is an unusual one. It is my opinion based on the documents provided by the Health and Disability Commissioner, that the scrub nurse was not asked to dilute the gas. It is my opinion that because she had never heard the gas should be diluted, she would have asked for some specific instructions on how to do this, as the whole notion would have been foreign to her. If she had been asked to dilute a drug, then she would have asked for appropriate volumes and assistance. There is no suggestion that this happened.

- 4) There is no evidence to suggest that the surgeon asked the scrub nurse if the gas dilution had been made adequately.
- 5) It is my opinion that there was discussion between the consultant and the registrar about diluting the gases. There is no evidence that an instruction was given to the scrub nurse to do this. At the beginning of a complex retinal detachment and vitrectomy case, the scrub nurse is exceedingly busy setting up complex equipment. This is even more so if you have never done this on your own before. If she was instructed to dilute the gas, she clearly cannot have heard these instructions, because if she had, she would have questioned this, asked how to do it, and got another qualified person to check it. This being the case, the surgeon cannot adequately have asked her if the gas was diluted before it was injection.

EXECUTIVE SUMMARY OF THE SURGERY

It would appear there has been a failure on behalf of [Dr A] to adequately communicate to his scrub nurse about diluting the gas and a second failure for him to check that this had been completed before he personally administered it into the patient's eye.

It is my opinion that theatre processes are irrelevant here, as the failure has been on behalf of the consultant and not the staff nurse.

POST-OPERATIVE MANAGEMENT

The patient was seen at the bedside on day 1 and a pressure measured of 50. He was given Diamox at 250mg at qid and Timolol drops 0.5%. He was not checked on the slit lamp that day nor was the pressure checked again that day.

On day 2 (27/3) the pressure was still 50 at the bedside. I cannot determine who made these observations from the handwriting and signature to the notes. The patient was seen at the end of day 2 at 1845 with a raised pressure and was taken to a slit lamp for the first time after surgery. The pressure was measured at 74. At this point, the scrub nurse was rung and the 100% SF6 injection was discovered. Some gas was withdrawn from the eye.

There are no notes for the dates of clinical examinations of 28/3 and 29/3. This is surprising. However, [a letter from Dr A] states that on 28/3 the pressure rose again to 52 and more gas was withdrawn.

On discharge several days later, the intraocular pressure was normal, but the patient had some vision says these notes. Medication was decreased and the patient was seen two weeks later.

COMMENT

The post-operative standard of care of [Dr A] could have been better. The intraocular pressure on day 1 should have been measured at a slit lamp which is more accurate. The method they had been using (a Perkins tonometer) is relatively inaccurate and indeed on day 2 post-operatively, the pressure of 50 with the Perkins tonometer was actually 74 when measured on the slit-lamp. The pressure should have been measured at the slit lamp on day 1, at which point more aggressive and appropriate management would have ensued (ie you would treat a pressure of 74 more than if it was 50. The patient should have had the pressure checked later in the day on day 1, to check an adequate response to the medication.

It is not infrequent that an eye full of gas, even appropriate diluted, can still have raised intraocular pressure for the first few days and this is particularly so of a patient with a past history of raised pressure. In this instance, release of the gas, irrespective of its dilution, would have been appropriate. Discharging the patient on decreasing medication and seeing them two weeks after the operation, is in my opinion too long in view of the circumstances. The records indicate some vision on approximately day 5 post-operatively (although the amount is not documented) but two weeks later, all vision was lost. We do not know what happened during this period, but if the pressure had gone up a third time, then this could have been the final term on the episode.

EXECUTIVE SUMMARY OF THE POSTOPERATIVE PERIOD

The patient could have been more appropriately examined on day 1 and early on day 2. The management could have been more aggressive and more active in reducing the intraocular pressure. We are missing clinical notes for two important days when the pressure went up on day 3. The discharge from hospital was followed by an inappropriately long follow up period, while having reducing medication for raised pressure.

OVERVIEW OF THIS CASE

It is my opinion that the key fault in this case was the fact that 100% SF6 case was injected into the eye at the time of surgery. The Hospital and the Surgeon have acknowledged that fact and indeed have written to the patient apologising.

The surgeon is adamant that he asked the scrub nurse to dilute the gas. The scrub nurse is adamant that she never was. But this is a 'I said, you said' situation and it is my opinion that there is no other evidence that will allow a conclusion as to whether she was asked to dilute the gas (the other nurse was at tea, the Registrar cannot remember).

It is my opinion that circumstantial evidence supports the scrub nurse. Further the surgeon did not appear to have asked if the gas was diluted when he administered it.

It is my opinion that this case is not a failure of the Hospital Systems. If the nurse believes that she was not asked to dilute the gas, she would not have had to invoke Hospital procedures such as checking this with another member of staff.

Hindsight suggests that the post-operative pressure rise could have been better dealt with by the surgeon. But the management of a post-op pressure of '50' was reasonable and many Ophthalmologists use the same instrument to check pressure postoperatively. His standard of care would be similar to that provided by other Ophthalmologists...."

Code of Health and Disability Services Consumers' Rights

The following Rights in the Code of Health and Disability Services Consumers' Rights are applicable to this complaint:

RIGHT 4

Right to Services of an Appropriate Standard

- 1) *Every consumer has the right to have services provided with reasonable care and skill.*
 - 2) *Every consumer has the right to have services provided that comply with legal, professional, ethical, and other relevant standards. ...*
 - 5) *Every consumer has the right to co-operation among providers to ensure quality and continuity of services.*
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Other relevant standards

THE DISTRICT HEALTH BOARD PROTOCOLS

Protocol: December 96 – First Draft
2.7.98 – Updated

INTRAOPERATIVE MEDICATION/SUBSTANCE ADMINISTRATION

Purpose: To ensure safe administration of prescribed medicines and substances during the intra-operative period.

Personnel affected: All nursing staff.

Precondition: The professional nurse acknowledges risk associated with the administration of medicines/substances during the intraoperative period.

Current certification in the management of basic I.V. therapy.

Exceptions: Enrolled Nurses who have undertaken appropriate instruction and demonstrate competency in this practice. (Area specific protocol).

Procedure:

1. Patient notes are checked to determine presence of any allergies.
2. Medications/substances are selected according to the preference/procedure documents/medicine chart/verbal order.
3. Appropriate labels are selected according to medication/substance.
4. Prior to mixing or dispensing to the sterile field (if this is the method of administration).
 - (a) All or any medication, type, dosage, strength is confirmed with and visually checked by operating surgeon/anaesthetist.
 - (b) Medication type, dosage, strength, expiration date are confirmed and visually checked by both scrub and circulating nurse.
 - (c) Labels for receiving syringes/containers are confirmed and visually checked by both scrub and circulating nurse.

Any syringes that are to be used in the dispensing of the medication to the operative site must be labelled at the time the medication is dispensed from the circulating to scrub nurse.

- (d) Medication/substance is drawn into or placed in labelled syringe/receptacle.
- (e) If more than one medication/substance is to be used each is drawn up and labelled – one at a time separately. After completing the process of dispensing and labelling for one medication, the next medication may then be dispensed to the sterile field.
- (f) Prior to administration the labelled syringe is checked with and acknowledged by the operating surgeon.

PROTOCOL/PROCESS FOR THE ADMINISTRATION OF INTRAOCULAR GAS

[Revised protocol following Mr D's operation]

- 1) Circulating nurse checks gas cylinder with surgeon and scrub nurse.
 - 2) Surgeon states amount of gas, in millilitres, to be drawn up to both circulating nurse and scrub nurse.
 - 3) Circulating nurse and scrub nurse check the amount of gas, in millilitres, as it is drawn up.
 - 4) Surgeon states the amount of air, in millilitres, to be drawn up to dilute the gas, to both the scrub nurse and the circulating nurse.
 - 5) Circulating nurse and scrub nurse check the amount of air as it is being drawn up.
 - 6) Scrub nurse states, in millilitres, the quantities of gas and air in the syringe as he/she hands it to the surgeon.
 - 7) The surgeon acknowledges verbally acceptance of the mixture as being correct prior to administration.
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Opinion: Breach – Dr A

Right 4(1)

Instructions about diluting the gas

In my opinion Dr A's failure to provide clear instructions about the dilution of the intra-ocular gas amounts to a breach of Right 4(1) of the Code.

I accept that Dr A discussed the dilution of gas with Dr E during the operation and that the nursing staff may have overheard the discussion. Dr A said that the protocol required that he instructed the gas to be drawn up and advised the dilution, and that the circulating nurse obtain the gas and check the correct dilution with the scrub nurse. Dr A stated that he gave the scrub nurse specific instructions regarding the drawing up and dilution of the gas. Dr E could not recall what instructions were given for drawing up and diluting the gas or whether Dr A checked the concentration before the gas was administered. Ms B and Ms C said they were instructed only to draw up the gas and were not instructed to dilute it. Ms C advised

me that she had never before had to draw up gas and was not aware that the gas needed to be diluted.

A discussion on the need to dilute the gas held with another doctor in the presence of nursing staff does not constitute an instruction to nurses on the dilution. My expert advised that at the beginning of a complex operation such as a vitrectomy, the scrub nurse would be exceedingly busy setting up equipment and may not overhear any such discussion. Although, there is agreement that instructions were given for drawing up the gas, there is no evidence that instructions for its dilution were given. I am not satisfied that Dr A asked Ms C to dilute the gas. As my advisor noted, Ms C was not aware that gas might need to be diluted. If she had been instructed to dilute gas, she would have sought instructions on how to do it either from Dr A or from Ms B. Ms B did not discuss how gas could be diluted with Ms C and did not hear instructions for dilution.

It was important that Dr A ensured his instructions were clearly delivered to those staff required to implement them. In failing to provide instructions for diluting the gas, Dr A breached Right 4(1) of the Code.

Checking that the gas was correctly diluted prior to administration

During the operation Dr A asked Ms C to hand him the syringe of gas. Ms B had left the theatre at this time. Ms C said Dr A did not check whether the gas had been diluted when she handed him the syringe. Dr A said he understood that the syringe contained diluted gas. However, Dr A did not advise me that he checked to ensure that the syringe contained diluted gas. I am satisfied that Dr A did not confirm the contents of the syringe and therefore the dilution of gas when he received the syringe from Ms C. Dr A's failure to check the dilution prior to administration of the gas was a clear departure from accepted standards for intraoperative administration of substances and constitutes a breach of Right 4(1) of the Code.

Opinion: Breach – Ms B

Right 4(1)

Supervision

My nursing expert advised that Ms B as both charge nurse and senior nurse present should have identified Ms C's lack of experience and discussed it with the surgeon, Dr A. Although Ms C recalls Ms B telling Dr A that this was her first vitrectomy, Ms B and Dr A could not recall this. Had Ms B communicated effectively with Dr A in relation to Ms C's inexperience, Dr A could have included Ms C in his discussion with Dr E and has thus assisted with Ms C's ophthalmic education. I accept that Dr A was unaware of Ms C's inexperience. Ms B, as the most experienced nurse in the theatre, was required to supervise Ms C during the vitrectomy. In my opinion the Ms B did not supervise Ms C effectively.

Checking medication and dosage with surgeon prior to dispensing

The District Health Board's Intraoperative Medication/Substance Administration Policy stated that prior to mixing scrub nurses and/or circulating nurses must confirm with the operating surgeon the medication type, dosage, and strength. Ms B, as an experienced nurse, should have been aware of this policy. Ms B was aware that Ms C was inexperienced. It followed that Ms B was unlikely to be aware of the policy or of common operative practice.

My nursing advisor stated that the standard practice when receiving a verbal instruction about medication or gas is to verify the request with the surgeon. Ms B should have taken the lead, given her colleague's inexperience, and repeated Dr A's instructions to him to confirm that they had understood his instructions correctly before Ms C drew up the gas. This would have been the correct procedure and would have assisted Ms C's learning.

My expert advised that Ms B should have been particularly vigilant in confirming verbal instructions with Dr A when she heard Dr A ask for 12ml of 100% gas, as a nurse trained in vitreo-retinal surgery would know that 100% gas can only be inserted in small quantities, for example, 1ml. As the senior nurse and the only one with previous experience in such operations, Ms B should have been aware that the dose was too high at that concentration, in these circumstances Ms B had a greater responsibility to check the instruction with the surgeon.

In failing to adequately supervise Ms C, or to check the gas mixture Ms B did not demonstrate the clinical leadership expected of a nurse and breached Right 4(1) of the Code.

Right 4(2)

Note taking

My expert noted that the circulating nurse has responsibility for entering the information about medications or substances prepared and administered during the operation in the operation records. Ms B did not record the type and amount of gas in the intraoperative records but rather documented the gas as part of the operation performed. According to my expert, correct documentation may have assisted in clarification of the dosage and would have assisted in rapid identification of the mistake when a review of the operation occurred following Mr D's continuing post-operative pain. In failing to accurately record medications in the intraoperative record, Ms B did not comply with professional standards and breached Right 4(2) of the Code.

Opinion: Breach – Ms C**Right 4(1)***Checking before administration*

Ms C was required to have the intraoperative medication (in this case gas) checked with and acknowledged by the operating surgeon prior to administration. Ms C said that Dr A did not check whether the gas was diluted when she handed him the syringe. Nevertheless, Ms C did not state the type of gas and its strength when she handed the syringe to Dr A. My nursing expert advised that the process for intraoperative medication administration involves the scrub nurse presenting the medication and clearly articulating what the medication and dose is. Ms C failed to do this. Even if Ms C had no knowledge of the District Health Board's Intraoperative Medication/Substance Administration Policy, Ms C should have known that this is accepted operating theatre practice.

In my opinion, in failing to check the medication and dosage with Dr A when handing him the gas, Ms C breached Right 4(1) of the Code. I acknowledge that the responsibility for checking before administration was the primary responsibility of Dr A.

Opinion: Breach – Dr A, Ms B, Ms C, District Health Board**Right 4(5)**

In my opinion there was a collective responsibility on the members of the theatre team to ensure the safety and wellbeing of the patient. Where a team is involved in delivering health care in theatre, the quality of that care is dependent upon co-operation and collective responsibility among team members. The District Health Board's Intraoperative Medication/Substance Administration Policy at the time of Mr D's vitrectomy operation, required team members to co-operate and communicate clearly to ensure the safe administration of intraoperative medications. Although the protocol did not specifically address the administration of intraocular gas, it did require that the medication/gas and strength be checked both by the nurses and by the scrub nurse and the surgeon on two separate occasions. This did not occur because of a clear failure of co-operation and communication. In my opinion, the team as a whole failed to adequately co-operate or communicate to prevent the mistake occurring, and thus breached Right 4(5) of the Code.

Opinion: Breach – District Health Board

Right 4(1)

Although the District Health Board had Intraoperative Medication/Substance Administration Policy in place at the time of Mr D's vitrectomy operation, this protocol was not part of the orientation for new theatre staff. The District Health Board did not have a policy for the administration of intraocular gas.

This was the first time that Ms C had scrubbed on her own for a vitrectomy operation. Further, Ms C had only once double scrubbed for a vitrectomy operation in which gas was not used. She had never before had to draw up gas and was unaware that gas was diluted for ophthalmic surgery. The District Health Board had a responsibility to ensure that all staff were orientated to operating theatre procedures and were familiar with the protocol for administration of intraoperative substances. Ms C had not been introduced to the protocol during her orientation.

My nursing expert noted that vitrectomy surgery is very specialised, using unfamiliar equipment and a darkened theatre. A scrub nurse's knowledge plays an integral part in the efficiency and safety of the procedure. In my advisor's opinion it was not appropriate for Ms C to have been scrub nurse for this operation, as it was only the second vitrectomy she had been involved with. The District Health Board has a responsibility to provide safe care for patients. This means ensuring that staff have sufficient expertise, experience and training before they are involved in the provision of services.

In my opinion the District Health Board failed Mr D and Ms C and breached Right 4(1) of the Code by failing to have systems in place to ensure staff received the orientation, training and support they required. Given the complexities of ophthalmological procedures, the District Health Board should also have had a specific policy in place for the administration of intraocular gas.

Opinion: No breach – Ms C

Right 4(1)

Checking medication and dosage with surgeon prior to dispensing

The District Health Board's Intraoperative Medication/Substance Administration Policy stated that prior to mixing the scrub and/or circulating nurses must confirm with the operating surgeon the medication type, dosage, and strength. I accept that Ms C was not aware of this policy and that it was not part of the induction into theatre. Ms B, as an experienced nurse, should have been aware of this policy.

My nursing advisor stated that standard practice when receiving a verbal instruction about medication or gas is to verify the request with the surgeon. Ms C should have repeated Dr A's instructions to him to confirm that she had received his instructions correctly before she

drew up the gas. Given Ms C's comparative inexperience, the lack of training, induction and support provided by the District Health Board, and the lack of clinical leadership shown by Ms B, I am prepared to accept that Ms C was not aware of her responsibilities and did not breach Right 4(1) of the Code.

Actions

I recommend that Dr A, Ms B and Ms C take the following action:

- Review their practice in light of this report.
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Further actions

- I have decided to refer this matter to the Director of Proceedings in accordance with section 45(f) of the Health and Disability Commissioner Act 1994 for the purpose of deciding whether any further action should be taken.
 - A copy of this report will be sent to the Medical Council of New Zealand, the Nursing Council of New Zealand, the Accident Compensation Corporation and Quality Health New Zealand.
 - A copy of this report, with details identifying the consumer removed, will be sent to the New Zealand Chairperson of the Royal Australian and New Zealand College of Ophthalmologists.
 - A copy of this report, with all identifying details removed, will be sent to the Royal Australian and New Zealand College of Ophthalmologists, and the Nursing Council, and placed on the Health and Disability Commissioner's website, www.hdc.org.nz, for educational purposes.
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Addendum

The Director of Proceedings considered this matter and decided not to issue proceedings before the Medical Practitioners Disciplinary Tribunal or the Human Rights Review Tribunal.
