

Report for the International Relations Committee (IRC) of AAGBI

Paediatric Anaesthesia
Red Cross Children's Hospital
Cape Town, South Africa

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I would like to express my thanks to the International Relations Committee of the AAGBI for the £750 travel grant. I hope that my report highlights why this was a worthwhile visit and how such visits may be developed in the future.

I am currently a 4rd year SpR in the Wessex Deanery. I was very keen as part of my out of programme experience (OOPE) to visit the Red Cross War Memorial Children's Hospital in Cape Town, South Africa to further my experience in paediatric anaesthesia.

I had in fact been at the Red Cross as a final year medical student in 1996 when I had worked for a month on the Paediatric Urological and Neurological wards and also in the Emergency Department. I was therefore very keen to return to see how the hospital had developed since then.

The Red Cross War Memorial Children's Hospital in Cape Town, South Africa was opened in 1956 through public subscription as a memorial to soldiers lost in World War Two. It is the only dedicated children's hospital in sub-Saharan Africa and as such sees a very wide and diverse patient group. The hospital has academic links to the University of Cape Town's School of Child and Adolescent Health, the University of the Western Cape Dental School and the University of Stellenbosch. It is regarded as South Africa's leading centre for post-graduate specialist paediatric medical and surgical training. The Red Cross War Memorial Children's Hospital is a state children's hospital. It is a unique hospital service providing first world healthcare in a third world country. A lot of the services of the hospital are funded through charitable donations from local business and overseas.

Red Cross War Memorial Children's Hospital



The hospital has a 300 bed inpatient service. It has the National Paediatric Burns Unit, Paediatric Liver and Cardiac surgery units as well as a large oncology unit. It is also well known the world over for its experience with Conjoined Twins – having separated 38 sets to date. The hospital had a helicopter emergency service – and trauma cases as well as critically ill children from a distance arrive to the facility via this service. The hospital treats 250,000 children/ year.

The anaesthesia staff consists of 3 fulltime senior consultants, 2 rotating junior consultants and 6 rotating registrars. An anaesthetic registrar also rotates through the Paediatric Intensive Care Unit. Registrars affiliated to the University of Cape Town Anaesthetic Department spend 4 years in specialist training. During this time they spend two 3month blocks at the Red Cross.

The majority of trainees who complete medical training in South Africa enter the private health care system or emigrate. A smaller proportion remains working within the state facilities. This leads to significant staffing crises for these institutions. Many doctors who work in the state system work long hours and are poorly paid. There appears to be little incentive to stay.

The Anaesthetic Department consisted of the “on call room” – one small room with a bed, table, few chairs, and computer in it. It was pretty crowded at lunch breaks!

Below: The Anaesthetic Department!

Right: Burns HDU Bed



The theatre services include 4 main theatres, a day unit theatre and a trauma theatre. Services are also provided to the cardiac catheter lab, endoscopy and MRI suite. It has recently undergone refurbishment with a new state of the art 8 unit theatre complex now in operation. Anaesthesia is provided for all major disciplines to children up to the age of 13. On average anaesthesia is provided for 750 operations / procedures per month – amounting to about 8000 cases /year.

Socio-demographics:

Being the only tertiary paediatric facility in sub-Saharan Africa the hospital treats a very diverse patient population. The majority of patients are coloured and black. The main languages spoken by the South African patients are: Afrikaans (42%), Xhosa (28%), Zulu (0.3%), Sotho (0.7%), Tswana (0.1%) and English (27%). There are in fact 28 official languages in South Africa. A whole variety of other languages are spoken including those of East Africa such as Swahili. The majority of nursing staff at the hospital were able to converse in 2 or more languages.

There are 3.5 million people estimated to live in Cape Town alone with only an estimated 760,000 formal households. About 80% of these have electricity and a flushing toilet. Many of the blacks and colored residents live in the Cape Flats Townships Cape Town having 2 of the largest in South Africa – Langa and Khayelitsha. So living conditions for the majority, are of very low standard, which impacts on disease.

46% of the population is under the age of 26 with only 5% over the age of 65years. 4.2% of children receive no schooling. Only 38% complete secondary school level education, with only 12% having education beyond this. The unemployment rate stands at 19.4% with 96% of these being colored or black.

The Minibus taxis are the standard form of transport for the majority of the population who cannot afford private vehicles. Although essential, these taxis are often poorly maintained and are frequently not road-worthy. They are often over filled and this along with the driving methods used leads to many accidents with high casualty rates.

Violence is often within the black and colored communities. Violence is related to unemployment, drugs and intergang wars. In particular are the infamous minibus inter-operator violence – “turf wars” - that flare up from time to time in relation to competition over lucrative taxi routes. Children were occasionally caught up in these incidents in the cross fire – however there was far less of this than I had expected to see.

Drugs and alcohol abuse are significant problems and contribute to the violence seen. Alcohol still remains the biggest drug of addiction and use. More recently in the past decade though has been the emergence of the use of TIC (methamphetamine). Cape Town appears to be the Tic capital of South Africa. The average age of users is early twenties. Rather alarmingly TIC use is becoming more prevalent within Adolescents in Cape Town. My main exposure to the effects of TIC was my involvement with a number of neonates born to TIC addicted mothers. These babies were ELBW in the region of 700-800g and had all the associated co morbidities of this.

There is still within South Africa a strong link with traditional healers. This has a number of effects. Firstly children present late to the hospital for treatment and often with advanced pathology. Secondly the herbal and other remedies which are administered can cause acid base / metabolic disturbance.

The cost of transport and distance to hospital means children often present late. Often children were alone – this was both because parents lived far away, and because of the pressure to maintain a source of income many were unable to leave work for fear of losing their job. Many children had also lost parents to HIV/AIDs and were accompanied by one or other Grandparent.

The various socioeconomic factors highlighted above led to the presentation of a number of conditions I had never encountered before as well as very advanced pathology which again would be rare in the UK. I shall enlarge on this later in this report.

My role during my three months:

- Clinical Support in the Operating Room**
- Education in the operating room and classroom**
- Exchange of Anaesthetic knowledge with local Anaesthetists and paramedical staff**
- Observe the functioning of the Anaesthetic Services & local presenting pathology**
- Observe local Anaesthetic practice – including the use of Ultrasound**

Clinical Support in the Operating Room

The working day commences at 7.30am and the theatres run nonstop until 5pm, when one theatre remains open for emergency cases. In general a lot of the emergency work is cleared during the day and early evening.

Both elective and emergency cases run throughout the day as theatre availability allows. The 4 main theatres are organised as follows:

Theatre A: Eyes / ENT / Urology

Theatre: Burns / General & Emergency

Theatre C: Neuro / General

Theatre D: Cardiac / general

Each theatre usually had 2 Anaesthetists assigned to it – a Consultant and Registrar. There was always a Senior Consultant available for advice and through which all emergency cases were booked. This again I think worked extremely well – since they were able to effectively triage the booked cases

as necessary and disperse the workload to the various personnel's experience in each of the theatres.

With each theatre having 2 Anaesthetists - this meant that the theatres really were used to maximum capacity – working through lunch and other breaks - by the Anaesthetic staff team partnership. It also meant that whilst one anaesthetist was in theatre with a case the next child could be assessed by the other half of the duo.

Patients were pre-assessed as much as possible the day before – with a fantastic team effort. The Registrars normally worked as a team – starting at the top of the hospital and working their way downwards to see all new cases. Normally there were in the region of 15-25 children to be seen.

The Sisters in theatre were fantastic to work with. They all have an immense amount of experience – if you were working solo they would cite the drips whilst you maintain the airway in a gas induction. They also helped me greatly with the language issues – my Afrikaans, Xhosa and Zulu weren't up to much – although I began to understand some Afrikaans over my 3 months there!

I was initially assigned as the Registrar to lists with consultants, but very soon found myself as acting Junior Consultant and supervising a Registrar on lists under the guidance of the Senior Consultants. So I became an integral part of the Anaesthetic team. They were very grateful for the extra pair of hands. My being there and boosting the workforce numbers also allowed some of the senior staff to take holidays which were long overdue.

Overall the theatre experience was like nothing else I have experienced before – great team working, with a tremendous work ethic – of getting on with things until the job was done. The Consultant staff were truly inspirational and so passionate about their work and similarly the Surgeons were also a pleasure to work with (most of the time).

❑ Education in the operating room and classroom

I was able to teach the visiting medical students from Stellenbosch University Medical School a variety of airway techniques whilst in the day surgery unit

In main theatres when I was on a list with the local Registrars – we would discuss an exam topic of interest, and exchange ideas regarding practices in SA and the UK.

I also was actively involved with the registrar tutorial programme where I presented and discussed a number of topics.

Whilst I was at the Red Cross I was able to write a couple of interesting cases up. These were submitted and have been accepted to various journals. The Professor was very grateful for this and has since contacted me – saying that it had been a real inspiration and stimulus - she has been approached by several of the Registrars seeking to undertake similar endeavours.

❑ Observe the differences in cases load presenting to the hospital vs. the UK.

A few of these examples included:

1. Burns – these were often very extensive – in the region of 20-60% and also often of late presentation.

The aetiology of these very often related to the living conditions of people in the shanty areas. Shack fires were a significant risk often as the result of the open fires therein. These led to the most

extensive burns that I saw. Other burns related to the cooking arrangements in these shacks – with children sustaining hot water/ hot food scalds and burns.

2. Neurological Cases

I recall in 1996 when I was at the hospital a ward full of opisthotonic children with Hib and TB meningitis. The DTP-Hib vaccine was introduced in June 1999 and since then there has been a dramatic reduction in cases of haemophilic meningitis.

More of a problem nowadays is the cases of TB and multidrug resistant TB meningitis.

I saw a number of children with severe hydrocephalus which had resulted from delayed presentation in the pathological pathway of development. These extreme cases of post meningitis hydrocephalus needed a variety of shunt procedures.

3. Caustic Ingestion

The hospital has a lot of experience in the management of children with caustic ingestion such as potassium permanganate and other house hold cleaning agents.

These children underwent String Oesophageal Dilatation Procedures in the day surgery unit – something very new to me!

Dilatation therapy is successful in approximately 40% of these oesophageal injuries.

4. Child Abuse and Rape

This is becoming a growing problem that the hospital staff deals with. In the year 2003-2004 statistics are that there were about 52000 rapes in SA of which 50% involved children. A recent study by the Red Cross between 2003-2005 highlighted 294 cases – 254 female and 40 male. Victims ranged from 10m to 13 years. Approximately 80% of assaults are by a perpetrator known to the victim, and almost 60% occur in the Childs own home. The number and severity of these injuries have increased yearly. These are alarming statistics. What is even more tragic is the number of children infected with HIV from this.

I saw a number of children who had sustained horrific injuries as the result of such attacks. I was immensely moved by just how brave and trusting these children were in the light of what had occurred.

5. HIV/AIDs are a huge problem in South Africa. Talking to local Anaesthetists and other members of the medical staff it is estimated that HIV is present in 60% of the children who present to the hospital. A truly devastating statistic if it is to be believed. Not all children are tested – since parental consent can be difficult to obtain.

This really has huge implications for the healthcare workers... There was a degree of anxiety in the workplace regarding this however despite this I found the local doctors very realistic and well informed about the risks of sharps incidents. Many staff did not wear gloves for cannulation and other procedures. I always made a point of this!

6. Tuberculosis is a big problem in South Africa. In fact South Africa ranks in the top 5 countries in the world with the highest incidence of TB. It also ranks in the top 5 of countries with Multi drug resistant TB (MDR -TB) and Extreme drug resistant TB (XDR –TB).

The main manifestation of this that I observed was the many children with TB meningitis and the after effects of this.

Very little in the way of precautions were taken by medical staff. If there was a definitely confirmed case then staff did often wear face masks – but these were often of the standard variety rather than the TB protective version.

Talking with the Anaesthetic Registrar's – it was apparent that there had been quite a high incidence of TB in the medical staff – about 1 registrar per year seemed to have undergone treatment for TB. I found this slightly alarming – however I think this is just a reality of working in this environment.

My big concern with a lot of the cases I saw was what happened in the long term to these patients? Talking to one of the ENT surgeons one day in theatre about the case of a 9 year old girl who had presented with a huge maxillary tumour. I asked – so what now? Once the tumour was out – what happened next – unfortunately – that is it seems. In the UK she would be slotted into a programme of continued observation and intervention as necessary to allow her to have a near normal life. Unfortunately in South Africa there just isn't the infrastructure yet or resources for ongoing reconstructive surgery in later years when she develops midfacial growth problems due to destruction of growth plates. Is this girl condemned to a life of disfigurement? Will she become a social outcast because of this? These are questions that remain unanswered for me and which I think are may have tragic answers.

Similarly a 12 year old girl and her cousin who later died from his injuries came in from a shack fire. She had 60% burns to her body and face. She came to theatre almost twice a week for most of my time there for burns dressing changes. However – what in the end will happen to her? The primary problem – the burn will be treated and her life will be saved. However what next. There will be an extent of further treatment – but nothing to the extent that would be seen in the UK. A sad statistic I learnt to hear about is that a lot of these severely burned kids take their own lives – simply because of their unhappiness and lack of support.

I found this aspect of my time at the Red Cross very enlightening. I learnt loads about the pathology of these conditions. It made me very grateful for the resources and infrastructure available to us in the UK

□ Observe local Anaesthetic practice & exchange of Anaesthetic knowledge

Much of the equipment is very similar to the UK – most notable the anaesthetic machines.

So what was different...well I came across quite a few things.

Patients and their parents / carers would wait in theatre reception – which was basically the corridor at the entrance to theatre. A fair proportion of children came to theatre with no carer. The main theatre Sister's role was to keep an eye on what was going on in each theatre and send for the next case when appropriate. Theatre turnaround time was a matter of minutes – a very slick and coordinated team effort allowed this. I have to say this was one of the most efficient systems I have ever worked in – it needed to be for the sheer volume of cases. I very rarely had to wait for the next case to arrive into theatre reception – unlike my experience in the UK. Very little paperwork was undertaken. This isn't to say that appropriate checks were not undertaken, but I think the excessive duplication that can stifle the systems in the UK did not occur here.

They were fastidious in their use of resources. Sevoflurane was kept under lock and key for one. Eyebrows were raised if you asked for too much. The rule in the Day surgery unit was that you could have 200mls for the vaporizer each day. My first time there I did have to plead with the sister to have some more – and after that I became very ruthless with my use of it. Induction only with as low a flow as possible – otherwise you were in trouble!

All Cd's were signed out in the morning to each of the theatres. Ampoules went a long way – for instance – morphine 10mg/ml was diluted to 1mg/ml in a 10 ml syringe. Then when you required some – you drew off the dose required. In this way the parent syringe was kept "clean" – and not a nanogram was wasted! Initially this took a bit of getting used to but I soon learnt.

Face masks were washed and reused along with LMA's. The bottom drawer of the anaesthetic trolley was the home of the face masks of all different colours and sizes.



Anaesthetic Equipment Trolleys for induction in theatre

Despite this I never felt we went without what we needed. It also made me realise just how wasteful we are in the UK.

With regard to the conduct of anaesthesia. Well again there were differences and I think this was partly because of the patients and partly local individuals practice.

Firstly the children were so compliant – even with no premedication. In fact the only ones premedicated were usually the burns cases and cardiac children. Children would just sit on mother's lap, or lie on the trolley and many accepted things with no complaints – a far cry from my experiences in the UK. I couldn't really understand why this was the case – were they terrified? Were they just

very submissive and accepting as a culture. I never really got to the bottom of this.

Nearly all children had a gas induction – I think partly this is the technique of choice for the institution, partly more acceptable culturally but also a much safer technique in the context of high HIV rates in the population. In fact I think in all my time there I only saw 2 rapid sequence inductions with suxamethonium.

Induction then is undertaken with inhalational agents and then once IV access was established – a very small 0.5mg/kg of propofol would be administered to assist with placement of endotracheal tubes. An alternative technique was the use of a device to allow topical anaesthesia of the laryngotracheal (& VC) mucosa with 4% lignocaine spray. This device was like nothing I had seen before – quite Heath Robinson. It consisted to two arms of tubing central to which was a modified sphygmomanometer balloon. One arm had a small receptacle which could be filled with the local anaesthetic and the other arm which was applied in the region of the VC at direct laryngoscopy a number of small holes so that the local anaesthetic was effectively atomized in the area. Following this the airway was held open again and the patient breathed spontaneously on the delivered oxygen for a few minutes and then an endotracheal tube was placed. My subjective assessment of this technique was that it allowed far fewer muscle relaxants to be used and less laryngospasm at extubation.

Other local differences I observed were in the analgesic and antiemetic requirements. Nearly all the children received intravenous paracetamol (perfalgan). Non steroidal were rarely used. Opiate

requirements seemed significantly less than in the UK. On a few occasions I was caught out by this fact. Again I don't know if this is because they are more stoical. However assessing the physiological response very few actually seemed in distress. Another difference was with the use of antiemetic. I saw very few being used. Even for the children having squint surgery – antiemetics were not used as a routine, and I never saw any children vomiting as a result. Was this a genetic difference?



Laryngotracheal atomization device!

The burns theatre was something else – and one of my most memorable experiences! 35 degrees and working with the Professor of Burns surgery was on occasions a very challenging experience. I would drink 5L in the day

to keep myself hydrated. There was always juice right outside the door of theatre and we would take it in turns to go and cool down. I think it was here that I really learnt a great deal with regard to general burns management, how to use ketamine and the resuscitation that can be required during these procedures.



Burns theatre – turnaround – with the surgeons cleaning the table! 33 degrees for burns cases

The recovery area was about 5m x 4m. The trolleys were lined up and the child attached to a sats monitor – however which monitor corresponded to which child was on occasions a mystery! Initially I found this quite stressful - when one of the monitors read 80% and because of the skin colour – it was difficult to pick out which chin was looking cyanosed. With time though I began to be able to assess cyanosis of pigmented skin more easily. Another local difference was the use of opiate based nasal drops – Tilidine (Valoron) in the recovery area. These weren't exactly prescribed – but were given by the nursing staff if required. The dose was 1 mg/kg (1 drop = 2.5 mg).



The recovery area with multiple monitors

So there were quite a few differences in practice. Initially I found some of them quite alarming, but soon got to grips with things. I had a lot of interesting discussions with the local trainees. In return I brought a few new thoughts, techniques with me – none of which I can exactly quantify – I guess it is all wrapped up in the art of anaesthesia.

❑ Learn about the use of Ultrasound in Paediatric practice

Unfortunately the Professor who undertook most of the Ultrasound work had emigrated to the USA by the time I arrived at the Red Cross and there was no one with quite his knowledge. However many of the senior anaesthetists used ultrasound for vascular access and I learnt a lot from them about its use in the Paediatric Population.

I was also lucky to be at the hospital and attend the PACSA (Paediatric Anaesthetists Congress of South Africa) meeting. Here a visiting doctor from Austria talked extensively about the use of ultrasound for vascular access in the paediatric population. He also later visited the hospital where we all were able to benefit from his expertise in this area.

Final thoughts & the future

I really got the impression that they were totally amazed that I had actually made it! With the bureaucracy entailed in obtaining the necessary paperwork I think a lot of people who have entertained the idea in the past have given up by all accounts! I think they were truly grateful for the extra pair of hands. My being there allowed some of the permanent staff to go on holiday! And the Registrars thanked me for being there to assist and lighten the load!

In summary the whole experience was probably one of the most challenging and rewarding 3 months in my career. Despite the great poverty and misery that surround the hospital there is a tenacious determination by all the staff there to get on with the job in hand. The staff were truly inspirational individuals. The whole system was one of immense efficiency – like nothing I have ever experience before in my practice. I think the NHS could learn a great deal from the work ethos I observed.



The Anaesthetic Team & Me in the Burns theatre

On this note I think it would be very helpful to facilitate other individuals visiting the hospital. This would most definitely benefit both parties – firstly by helping the Red Cross staff with the clinical work load and secondly the great educational benefit to UK trainees from the wealth of clinical material, and expertise that resides in the institution.

To this end I think a visiting fellowship programme from the UK could occur on an annual basis and I am keen to take this forward and facilitate this in conjunction with Professor Jenny Thomas – Head of Department.