

*Non Accidental Injury In Children.*



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*A Study of The Radiographers Role In Child Protection  
in New Zealand.*

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*Fellow 2008*

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Thank you all for making this scholarship so memorable.

## ***Introduction and Background***

My background is as a diagnostic radiographer, having qualified in 1990 with the Diploma of the College of Radiographers. It was whilst working clinically and studying for my radiography top up degree that I became interested in Non Accidental injury in children, due to performing skeletal surveys on children with suspected Non Accidental Injuries.

### ***What is Non Accidental in Children?***

Caffey (1946) was one of the earliest writers to highlight Non Accidental Injury (N.A.I.) in Children and Kemp (1962) coined the term the 'battered child syndrome'. Radiography has played a significant part in the diagnosis and treatment over the years and continues to do so. Indeed an initial investigation to help confirm or refute the signs of N.A.I. is a skeletal survey, which is a series of x-ray projections taken to show various bones and epiphyseal growth plates to look for fractures both new and in various stages of healing ( Carty 1997)

The value of radiography in relation to physical abuse in children was seen initially as a tool for case finding, and subsequently, as a useful guide to case management (Kempe et al 1962:105). Hobbs (1997;105) also argues that diagnostic imaging is the number one method of diagnosis in this area. Therefore if this is so what is the radiographer's role and input in this area?

The (1989) Children Act brought several issues to the fore for radiographers. Both the Department of Health (1993) and The College of Radiographers (1995), have stressed the need for health care workers (and radiographers specifically) to be aware of a

variety of issues, particularly with regard to their hospital's policy on restraint and consent to medical examination.

A variety of authors Sudbery et al (1997b;283),Hogg et al, (1999), Davis and Reeves (2004), Davis and Rigney (2004) have explored the radiographers role in image production in relation to x-raying children with suspected Non Accidental Injuries.

The term Child Protection is increasingly used to encompass N.A.I. and a series of other abuse. Perhaps the most striking use of this term is its reflection in change of approach in that the emphasis of society has shifted to one of protection foremost rather than prosecution.

#### Typical Radiographic markers of Non Accidental Injury



*Fractured ribs in a child*



*Handle Fracture Metaphyseal*

So it was with this in mind that I set out to see how radiographers in New Zealand approached N.A.I. in children.

***Why New Zealand?***

I chose New Zealand because English is one of its National languages which would make communication easier. The country is on the other side of the world and has a legal system which was originally based upon the British system. Therefore would there be similarities or differences in the measures to protect children and likewise the radiographer's role in child protection?

Additionally radiography training is different to that in Britain and radiographers have a different title, as radiographers in New Zealand are called, Medical Radiation Technologists (M.I.T.s)

I was also interested to explore the Maori culture and their approach to this area.

Also New Zealand has gone through a rapid period of change as identified by Blaiklock AJ, et al (2002) and I was interested to see how N.A.I in children was dealt with and the contribution of radiography in this area.



Queenstown South Island



Sulphur Springs Rotorua

## *Itinerary of the Fellowship*

*Scunthorpe to Manchester 22<sup>nd</sup> July*

*Manchester to Singapore 23<sup>rd</sup> July*

*Singapore to Auckland New Zealand 24<sup>th</sup> July*

*Clinical sites visited*

*Universities visited UNITEC /Te Whare Wananga o Wairaka*

*25<sup>th</sup> July -13<sup>th</sup> August*

*Middlemore Hospital X-ray Department 4<sup>th</sup> August*

*Starship Children's Hospital 5<sup>th</sup> August*

*Tepau Auckland District Health Board work shadowing 7<sup>th</sup> August*

*Unitec teaching on Radiography undergraduate programme and research seminars 8<sup>th</sup> -13<sup>th</sup> August*

*Work shadowing paramedics.*

*Fly to Christchurch 14<sup>th</sup> August*

*Christchurch University Radiography Education Centre CPIT. , clinical site visits, presentations, work shadowing. 14<sup>th</sup> -20<sup>th</sup> August.*

*Queenstown Radiographers Educational Forum, Presentations, NZMIT conference 21-24<sup>th</sup> August*

*Return flight to Auckland 25<sup>th</sup> August*

*Return flight to Uk 26<sup>th</sup> August*

*Land in Manchester 27<sup>th</sup> August*





*Map of New Zealand*

## Unitec A Radiography Training Institution.



Having arrived in Auckland, I made my way to Unitec which is University which trains student radiographers. I spent a couple of weeks in Auckland discussing child protection with colleagues, University staff and students, as well as visiting several clinical sites.

The student radiographers enrol on a three year course and study a variety of topics similar to students in the UK and Republic of Ireland, namely anatomy, pathology, physics, radiographic imaging, research and patient care. The way the course was structured meant that students spent part of each week in the clinical department, with semester one beginning in February and Semester two beginning in July. Students funded themselves with fees starting at 4700 NZD.

Although the students did not study child protection specifically, they learnt about the signs and symptoms of Non Accidental Injury, although no particular depth was given to the legal perspectives and issues which the radiographer may be drawn into regarding evidence collection.

Whilst at Unitec I had the opportunity to deliver a few teaching sessions to a variety of students on the radiographers role in child protection and issues which may arise from imaging a child with suspected Non Accidental Injuries. I was also able to take part in the University research seminars which gave me the opportunity to meet a

variety of clinical and academic colleagues and discuss the above, which gave me a broader perspective.

I used Auckland as my base for a couple of weeks which allowed me to visit clinical sites and work shadow radiographers as well as giving me the opportunity to discuss cases.

I felt very much part of the Unitec team, so much so that I had a leaving 'do; and was sad to leave and move on.

Night out my leaving do with Colleagues at Unitec



## ***Visit to Middlemore Hospital. 4<sup>th</sup> August 2008***

I met the Charge MIT here by the name of Beryl Kelly who had a staff of 70 radiographers. In the Uk she would be know as the Superintendent Radiographer, and in the Republic of Ireland her title would be Radiology Services Manager. We discussed my Fellowship and then I met the radiography staff including Anna and Russell from Kent in the Uk. I was impressed with the x-ray department; the equipment was new and the rooms were light, airy, well designed to give the impression of space and the hospital was clean.

I visited the resuscitation rooms which were well stocked and well equipped with a functional and easy to operate x-ray machine.

The resuscitation rooms were in bays with an opening to the outside, and the system for seriously injured patients was that an ambulance would back up to one of the four bays and unload the patient straight into the room where the staff were waiting to receive them. Each resuscitation room had a dedicated nurse. The x-ray equipment was isocentric and designed so that it could be shared between two resuscitation rooms. This meant that it was easier for the radiographer to use and obtain a good standard of diagnostically acceptable images even on the illest of patients.

I discussed the issue of N.A.I. in children and the radiographer's role in child protection as I was keen to learn about how they approached this topic in New Zealand.

Essentially it appeared that the radiographers (M.I.T.) would conduct a skeletal survey as via their protocol which is detailed overleaf.

I asked the question regarding what they would do if they were suspicious about a child's injuries. A similar answer came back from all of them in that they wouldn't necessarily report their suspicions or pass the information on. From the discussions I

had with my radiography colleagues they had no in house training once they were qualified. Some individuals had received training during their undergraduate course, although this depended on which centre and indeed which country they had trained in. Although this hospital commented that they received on average one N.A.I case a week, they added that the most serious injuries were transferred to the Starship paediatric hospital in Auckland.

I asked about the role of other professionals in this area, to see if there was an equivalent in New Zealand, particularly the Senior Nurse in Child Protection who is located in Uk hospitals and is available for staff to contact 24 hours a day via a bleep should they have any child protection concerns. It appeared that there was no such role in this hospital.

We discussed immobilisation and the staff showed me the Pygostat immobilisation device. The issue of immobilisation has been quite controversial in radiography with several discussions taking place via the professional journals on what is acceptable restraint. The radiographers here seemed to have similar concerns.

***Middle More Hospital***



***Immobilisation Device***



## Resuscitation Rooms with X-ray Equipment



X-ray facilities were well designed and integrated into the trauma rooms, so making it easier for radiographers when imaging a seriously injured patient.



Plaque at Middlemore

*Middlemore N.A.I. Protocol for Skeletal Survey.*

**PURPOSE**

*N.A.I.*

*Pathology*

*Congenital Abnormalities*

**RESPONSIBILITY**

*MRT (radiographer)*

**PROCEDURE**

*N.A.I. (Good quality images with bony detail are necessary)*

- *Skull- AP, Townes and Lateral*
- *Chest –AP (Lateral also in infants) with bone technique*
- *Abdomen- AP only (on separate film)*
- *Pelvis- AP only, to include upper femora- no gonad protection (on separate film)*
- *Both femora and tibia bones- AP centered on the knees, extra views as required to cover the whole area.*
- *Both feet- AP only*
- *Both humeri and forearms- AP only} both upper limbs- including shoulder elbow and wrist. X-ray both sides separately on an individual image plate.*
- *Both hands- AP only include distal radius and ulna.*
- *T- spine –Lat only*
- *L/S spine- Lat only*

*All N.A.I. studies must be shown to XX or YY if they are rostered to Middlemore or Superclinic. Even if they are busy you must get the patient to wait and show them to X or Y. If they are not here then the films are to be shown to a Consultant before the child departs. If the N.A.I. study is performed out of hours try and show it to the Registrar on call if available. Please note on form who has checked the films. Remember we often get only one chance to x-ray these children.*

*Skeletal Dysplasia (one side only for upper and lower limbs)*

- *Skull –Lateral*
- *Chest –PA and lateral*
- *Abdomen-AP*
- *Pelvis-AP (if not abdomen)*

## INFORMATION SHEET FOR NAI SKELETAL SURVEY

### *Examination*

- *Two adults are required to accompany the child to assist with the examination.*
- *The examination takes between 30 and 60 minutes to complete dependent on the child's co-operation.*
- *Approximately 12 x-rays will be taken of all the child's bones.*

### *Assistants*

- *If you are coming to the department to assist with holding the child you must not be pregnant.*
- *If you are involved with holding a child, you shall be given lead protection in the form of a lead apron and a thyroid protector.*
- *There is a negligible risk of receiving a small dose of radiation while holding children for this type of examination. Try to keep your hands out of the lit area as much as possible to reduce this risk.*
- *Your help in holding is vital to reduce the need for unnecessary repeat x-rays.*
- *Restraining devices may be needed to immobilise difficult children. These are used so that less repeat x-rays are necessary.*
- *The children who have these skeletal surveys may become quite upset. It is necessary therefore to complete the examination as quickly and efficiently as possible to try to make the examination less traumatic for all involved.*
- *The x-ray staff will explain the examination more fully prior to starting. If you have any concerns please let us know.*
- *The report will be completed as soon as possible and sent to the referring clinician/ward.*

## *Visit To Starship Paediatric Hospital*



This is a paediatric hospital to which all the complicated child cases are referred, especially any N.A.I. the hospital is run as a charity and relies on public funding.

I met Diana Browne who was the Charge MIT and ran the department.

It was also interesting to learn that in cases of suspected N.A.I. a security guard remained with the child 24 hours throughout its time in hospital. This was an interesting approach.

The security guards would be present during a child's skeletal survey, even if the parents were excluded from the x-ray room.

At this hospital skeletal surveys were undertaken between the hours of 9-5pm and were conducted by two senior radiographers (M.I.T.s) who would conduct the skeletal survey as per the protocol over leaf. A slight difference was the inclusion of a CT scan. I learnt that the child would be re x-rayed in two weeks to look for any subtle findings and any callus formation. I discussed this with the radiographers and the radiologists as this was different to practices within the UK and Republic of Ireland.

In addition every child was sedated as each child was having a CT head scan. Whilst I was in the department I had the opportunity to look at the child immobilisation and restraint devices, as this is an area which has had much debate within the radiography profession as a whole. The immobilisation devices were similar to those used in the UK, being foam pads. Whilst in the department I had the opportunity to speak with consultant radiologist Russell Metcalfe regarding imaging children with suspected N.A.I.

This was a warm and friendly department and the staff were happy to discuss their protocols and I learnt a lot about how radiographers in New Zealand approach this topic.

The main difference is that the skeletal survey occurs much later in the investigative process which has different implications for the radiographer in New Zealand compared with a radiographer in the UK.

## **Skeletal Survey Protocol**

Non Accidental Injury Surveys:

Skull 3 views

Chest AP and Lat

Both oblique ribs

Abdomen

Pelvis (incl upper femora)

Both Legs AP

Both Feet DP

Coned Knees AP

Coned Ankles AP

Both Arms AP

Both Hands

Lat Spine

NAI surveys must be requested via a consultant and be referred to Te Puaruruhau prior to the study NAI patients will usually have a CT head first, then skeletal survey under the same sedation so close liaison with CT and radiology nurse re sedation is necessary. Before requesting the patient to come to radiology, talk to nurse in charge of patient, ensure the reason for the survey has been discussed with parents/caregivers and that they realise that it involves a number of films (at least 15).

This is the responsibility of the requesting team and Te Puaruruhau social workers /nurses. Also explain that we require two non pregnant adults to hold child for x-rays. Follow up survey after two weeks is often requested. This should include everything above except skull views. Check with Radiologist.

***Visit to Te Pau Auckland District Health Board.***

I spent a day and a half with the above people who were very welcoming and helpful.

I met Katherine Newell Nurse Specialist /Team Leader of Te Puaruruhau which translated from Maori means 'sheltering the bud'

The above centre houses a multiagency team which was established in 2002. It is the only one of its kind in New Zealand, so I was lucky to be able to spend time there.

Te Puaruruhau was established for the investigation of alleged abuse of children and young people and to ensure that victims of abuse and their families can access the best possible services to help with treatment following abuse. The service which is accessible twenty four hours a day, seven days a week, sees on average twenty referrals per week. In the last sixteen months it has seen over three thousand children.

The morning was spent in a multidisciplinary case conference type meeting which was used as a supervision session for case decisions.

The meeting opened with a Maori Prayer, asking for guidance and wisdom in the decision making process.

I was fortunate to be able to sit in on this meeting which was a peer review multidisciplinary team meeting. These were held on a weekly basis, and included paediatricians, nurses and social workers. The purpose of the meeting was to review all the previous weeks' cases in a form of clinical supervision.

I was warned that some of the material may be distressing and not to feel embarrassed if I needed to leave. The staff seemed compassionate and caring and commented that they often had to leave the room in tears due to the nature of some of the cases.

I was shown the Concerto system which is a database that contains all the information relating to a child, typical things it would include are blood test results, laboratory

tests, histology reports, and radiological reports on films, images, CT and MRI Scans as well as the actual images. It was useful to see a scan that a child had had the evening before, reported and available on the system to review several hours later. All children who had been subjected to sexual abuse were screened for sexually transmitted infections and injections were recommended.

The staff followed a particular referral flow chart as detailed overleaf.

There was much discussion re Alerts for a child which would stay with the child's records until they were seventeen years old. This system would alert staff to child protection issues.

“A child protection alert should be created for every child or young person notified to the Department of Child Youth and Family Services for care and protection concerns. The decision to add an alert must be made in consultation with either Te Puaruruhau or Care and Protection Social Workers in Women's Health or Community Child and Family Services. Te Puaruruhau is the specialist team with ADHB which deals with cases of suspected abuse or neglect in children and young people”  
Auckland District Health Board (2008)

At the moment the Concerto database does not incorporate centres outside Auckland.

Although there are plans to link the system to other centres which will be useful.

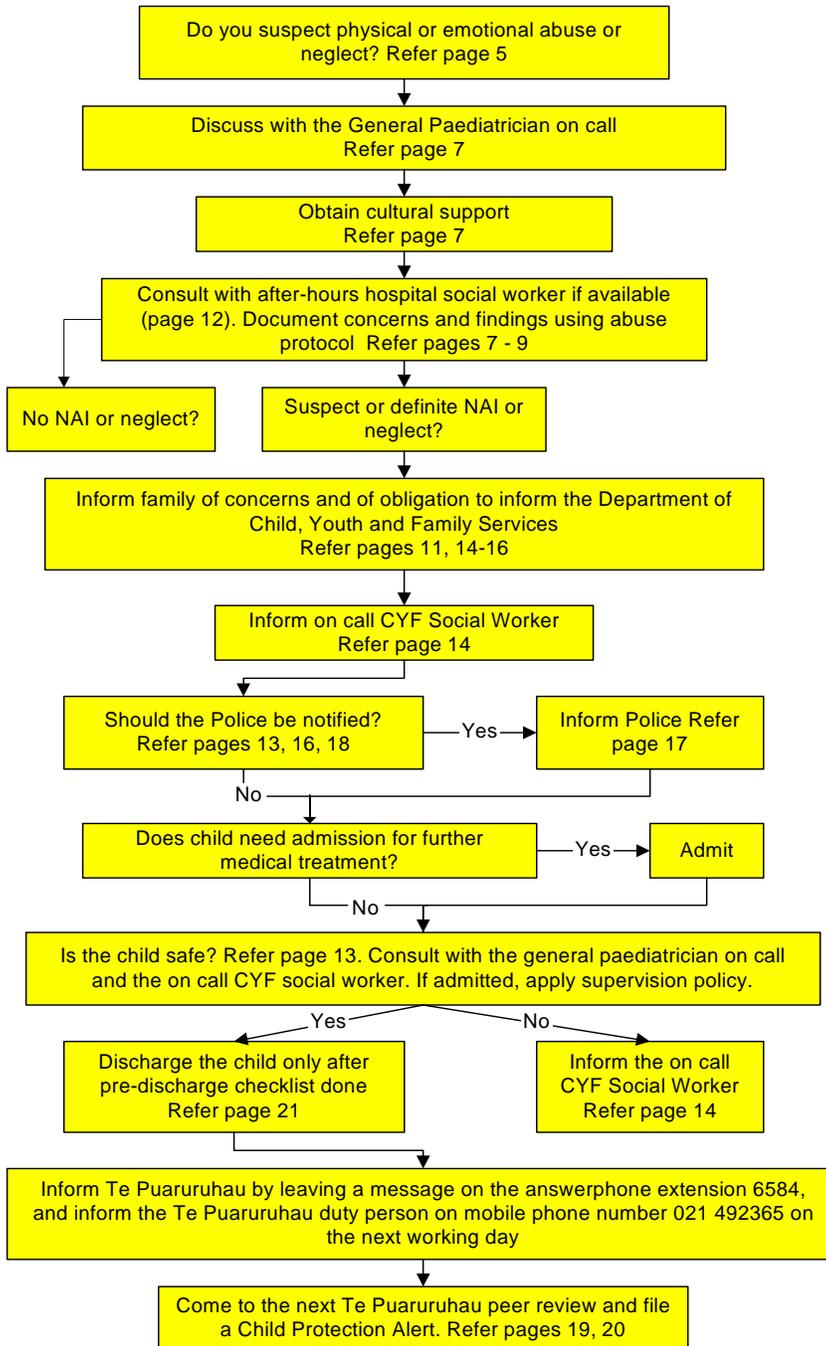
Alerts will stay with a child until they are 17 years old and will show up on a child when they are on a ward or in x-ray. So this can be a useful tool for a radiographer who may be x-raying such a child.

The referral process flow chart is detailed overleaf.



*Te Puaruruhau Building close to the Hospital.*

**Referral Process Flow Chart.**



**NAI and Neglect Flow Chart in Hours** 

**DO YOU SUSPECT NAI OR NEGLECT?**  
 Refer pages 5 and 6  
**CONSULT TE PUARURUHAU**

## Medical Assessment

### Use Te Puaruruhau Record Booklet

History and examination need to be thorough and to be documented completely. Record the date and time with all documentation, and document clearly who gave you the history. Informed consent should be obtained for all physical examinations and investigations (the relevant sections of the law are summarized in the appendix). This consent does not need to be written, if that is not standard practice for the procedure. However, it is wise to record the manner in which you satisfied yourself that consent had been given.

Several hours may be required. In hours, contact Te Puaruruhau, and you will be told which doctor is on call. After hours, the consultant general paediatrician on call is responsible for the management of physical abuse. The call-back paediatric medical registrar will normally be called in to perform the initial assessment.

All children assessed for possible abuse must be reviewed by a consultant, and if they have physical injuries, these must be seen in person by a consultant.

All examinations for sexual abuse, both within and outside normal working hours, require the presence of the Te Puaruruhau doctor on call.

A general approach for suspected abuse includes:

- **Brief assessment** to determine whether there is actual or suspected child abuse or neglect. Ensure that the child has adequate first aid and pain relief.

- **Contact the on call doctor** (see the flow charts). In the case of NAI after hours, this is the General Paediatrician on call. In all other cases, it is Te Puaruruhau. In normal working hours, ring Te Puaruruhau direct on xx or duty cellphone xx. After hours (sexual abuse), contact Te Puaruruhau through the operator.

- **Complete history.** A complete history includes the timing and nature of any injuries, a full past medical / family medical / developmental history, and a full social history. Ideally, the social history should be taken as part of a full assessment by a trained social worker (see below). After hours, this may not be possible. *Risk factors for non-accidental injury include factors particular to the child (handicap or behaviour problems), factors particular to the family (unplanned pregnancy, a family history of abuse or neglect, alcohol or drug abuse, domestic violence, mobility, depression or other mental illness in caregivers, absence of support for caregivers), and wider environmental factors (poverty, homelessness)*

- **Contact the GP.** If possible, contact the child's usual GP

- **Contact ACC.** During working hours, ring the ACC National Database, an ACC Claims Manager or the Starship Claims manager, and ask for details of previous ACC claims for injury.

### Complete Examination

- This must be a complete physical exam including percentiles for height and weight (and head circumference if less than 2 years old)
- Careful physical inspection from top to toe, including scalp, ears, oral cavity (including the frenula), trunk and limbs
- Careful documentation of **all** bruising and external injuries on a diagram. Comment on the colour, shape, outline and size of bruises. Describe in detail any pattern of injury. Note tenderness / swelling
- Examine the fundi through dilated pupils (mydriatics are available in Children's Emergency Department). If the child is < 2 years, contact the ophthalmology registrar on call to examine the

eyes. If retinal haemorrhages are found, urgent confirmation by a consultant ophthalmologist is mandatory.

**Investigations.** These are recommendations only

■ FBC and coagulation screen (APTT, INR) if there is bruising or bleeding. If there is a strong personal or family history suggestive of a bleeding disorder, consider a Von Willebrand's screen. (Establish the child's blood group, as VW Factor levels vary between blood groups). Do not perform a bleeding time - the sensitivity and specificity of this test is poor. If you remain concerned about the possibility of a bleeding disorder, discuss with a haematologist.

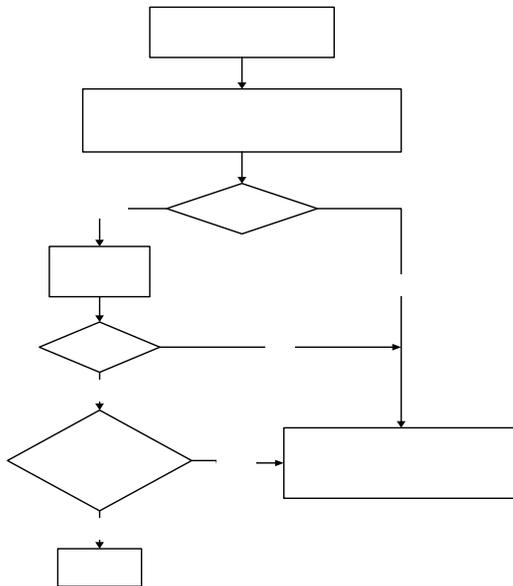
■ Skeletal survey in children less than 2 years old. (A skeletal survey may be justified in an older child as well). Organise this with the radiology department in advance. If possible, try to perform the skeletal survey during normal working hours. Ensure that the family understand the number of X-rays, and the reasons for them. Ask for a nurse and social worker to accompany the family during the survey. For children > 1 year, sedation is wise. If an abnormality is reported on X-ray, always ***obtain a consultant radiologist's opinion before you speak with the family.***

■ In infants, perform a repeat skeletal survey 2 weeks later if you suspect bony injury occurring immediately before your assessment. The alternative is an acute bone scan as well as an acute survey, but a bone scan is not specific around the physes of the long bones. If rib fractures are a possibility, a possible algorithm is suggested below.

■ CT brain scan, if < 2 yrs with a possible non-accidental head injury (even if the injury is trivial and there are no signs of concussion)

■ MRI brain scan if you suspect a "shaken baby". Include the cervical cord, and "gradient echo sequences" looking for old axonal injury.

■ Other investigations as appropriate.



■ **Photographs.** Photographs may be necessary to document complex soft tissue injuries. Even when not necessary for documentation, they may be helpful in explaining the injuries in a Family Group Conference or Court. In hours, contact the Hospital Photographic Department extension xx. After-hours it may be possible to obtain a photographer through the photography business manager on xx. If the Police are involved, they may be able to arrange photographs through the Police photographer, in which case the photographs will be the property of the New Zealand Police and will not be available in the hospital record.



*Te Pau Multi disciplinary team building view of rooms*

Multi Agency One Service  
**Puawaitahi**

Background

Puawaitahi was established in November 2002 as a multi agency-one service centre for investigating alleged abuse of children and young people and to ensure that victims of abuse, and their families can easily access the best possible services to help with treatment following abuse. The Centre houses specialist child abuse investigation professionals together under one roof, enabling them to work more closely and communicate more effectively with each other to streamline their processes and reduce delays for clients.

The concept of Puawaitahi derived initially from the systems and structures of several successful overseas models, referred to as child or family advocacy centres, in the USA particularly. The concept was then gradually developed and adapted to meet the circumstances and conditions within central, west and north Auckland.

Starship National Children's Hospital, Child Youth and Family and Police worked closely together – with the Auckland District Health Board, Starship Foundation and the wider Auckland community – to develop Puawaitahi. The project was driven by input from local staff and management, and led by a Steering Group of professionals of common vision, supported in the final stages by their regional and national offices. Puawaitahi took four years to establish from the original conception to opening of its doors.

In the 16 months since it was opened, the Centre has seen over 3000 clients come through its doors. Clients are reporting their satisfaction with the child and family friendly facilities and services received within the one location. Already there have been a number of successful examples of cases that have been speedily responded to in a tightly coordinated fashion, with excellent outcomes, across the key agencies.



Te Pau Philosophy



## *The clinical alert process is as follows,*

1. A clinical alert is identified
2. Complete a Clinical Alert Notification form
3. Fax to the Clinical Record Department
4. CRD staff will ensure Alert details are recorded in CMS (CHIPS Alert) and the CRIS Alert flag is turned on.
5. File the Clinical Alert Notification at the front of the patient's notes for the current visit.

All children receive compensation under the ACC, which is a Government scheme which pays for counselling and for any medical treatments a child might need for the rest of its life.

This is specific to New Zealand and does not automatically occur in the UK. There is victim compensation scheme in England. However the ACC scheme in New Zealand is an automatic and appears to be more proactive.

## ***Maori Cultural Issues.***

There are various taboos and cultural issues within the Maori culture of which radiographers need to be aware of when dealing with a child with suspected N.A.I.

I discussed these with colleagues from Tepau, many of whom were Maori.

In the Maori culture, touching and holding the head is taboo. Restraint is also not seen in a positive light. This means that the radiographer x-raying any child has to be careful with restraining the child or positioning it for a lateral skull x-ray.

Additionally the Maori culture are very family orientated and if a child can not be cared for by its parents then the rest of the Maori community will assume responsibility for the child and care for it. Therefore the concept of adoption as we know it in the UK is virtually unknown in the Maori culture.

Additionally during a skeletal survey x-ray, it may well be that Maori leaders would be present representing their tribe. This may well mean additional people in the x-ray room and so is a radiation protection issue for the radiographers involved.

Tepau staff also informed me that often at multidisciplinary team discussions Maori leaders would attend and open the meeting with prayers. I was told it wasn't unusual to have 50 plus attending such meetings. On reflection it would be unusual for this to occur in the UK.



## ***Visit To Christchurch Polytechnique Institute Of Technology South Island.15-18th<sup>TH</sup> August 2008***

I spent a day with Frances Cowie the Clinical Practice coordinator. We discussed the delivery of radiography education and it was interesting to compare the systems with the UK and Republic of Ireland.

The students at Christchurch Polytechnique Institute of Technology (CPIT) divide their time between clinical and academic in a 50:50 arrangement. These students work in a block system.

We discussed the curriculum and it transpired that the students learn about N.A.I, in the form of its signs and symptoms including typical fractures and protocols. There was no teaching as far as I could establish on the legal aspects in terms of the radiographers duty under the Children, Young Person and Families Act of 1989.

Whilst I was in New Zealand there were some very high profile N.A.I. cases which were reported in the press, one such one was by Binning in the New Zealand Herald (August 2008). This was a very distressing case as reported in the press, and contrary to procedures within the UK identifying features namely the child's name, photograph etc were printed in the national newspapers in New Zealand.

I spent a day with the staff at CPIT meeting them and listening to some classroom lectures on radiographic technique and anatomy and pathology. I had the opportunity to meet and talk with some of the students, who were enthusiastic and interested. On the following day I gave a presentation to staff, clinical colleagues and students on N.A.I. and the legal framework in the UK. This promoted much discussion and exchange of ideas.

Later the next day I visited a clinical site in a private radiology clinic and spent time with the radiographers there. I also visited a satellite private clinic and after a tour of

the facilities, sat and discussed how radiographers approached suspected N.A.I. cases in this department.

A common theme from my time in New Zealand seemed to be that radiographers and student radiographers were not aware of their duty of reporting beyond reporting as a member of the public under the 1989 Children, Young Person and Families Act.

Throughout my discussions with clinical and university colleagues we discussed the differences regarding the Republic of Ireland where radiographers are 'Designated Officers under 1991 Child Care Act. We also discussed similarities and differences in the role of the radiographer in this area in relation to countries such as UK, Australia, Slovenia and New Zealand. It was also useful to discuss the notion of two adults in the room whilst the skeletal survey was being undertaken. This led to an exploration of the different protocols and the idea of the chain of evidence from x-ray room to Court room.

On reflection of my time here it was interesting to reflect both upon the similarities and differences in radiographic practice. It was useful to learn about the different approaches to child protection and imaging children with suspected N.A.I.

It was also interesting to discuss the role of the Plunkett service which provides a free well child service for all children between the ages of 0-5years old. This system sounded similar to the system of the Health Visitor in the UK. Alternatively the Mother can adopt for a Maori approach and have the Health Visitor come to their house to make sure the child is meeting its milestones and that both Mother and Child are well. This system sounded to be a very holistic approach to Mother and Child, focussing upon medical, social, emotional and psychological issues.

*Christ Church CPIT*



*Images from South Island*

*Lake Moana*



*Lake Moana view*



*Wildlife*



*Kiwi*





*Dolphins*



*Bridge*



*Snow on the mountains*

*Images from the North Island*



*Michaela sailing Auckland*



*Unitec Medical Imaging/Radiography Department*

## ***Southern Cross Private Radiography Group.***

I spent a day at this radiography centre, touring the x-ray rooms and talking to the staff. The radiographic equipment which was mostly GE was new and the department was well laid out. The radiographers explained that they didn't x-ray children so had no dealings with N.A.I. in children. I then visited the emergency out of hour's service which was further down the road. Here the radiographers did x-ray children, although it was a private service. The staff commented that although they x-rayed children they didn't really x-ray many N.A.I. cases as these would be sent to Starship hospital in Auckland. This centre undertook lots of orthopaedic work and had seven operating theatres. It was here that I met Wendy Pollock the Charge MIT who gave me a tour of the department and allowed me to work shadow some of the radiographers. The x-ray department contained a lot of new equipment and was a well designed department. I spent the rest of the day in discussion with the radiographers about imaging children with suspected NAI and gave a lunch time presentation on the radiographer's role in the UK to the radiographers within the hospital. Later I visited the public hospital and spoke to Therese the Charge MIT there.

Whilst in the South Island I also got the opportunity to visit Akaroa which is an old French settlement. I took the opportunity to look around this old village with its wooden houses and then took a boat trip to view the famous Hector dolphins.

## *Day shadowing Paramedics. 11<sup>th</sup> August 2008*

Although this was not part of my fellowship, I was offered the opportunity through a colleague at Unitec to shadow a paramedic crew. I wanted to see how they worked in New Zealand and if their practices were different to UK paramedics. Perhaps the most striking difference is that the paramedic service is run by St Johns which is very different to its role within the UK. Here in New Zealand St Johns have a fleet of helicopters and ambulances ready to transport patients to and from often what are remote locations.

### *Ambulance Station Auckland*



Today I met Tim the clinical coordinator/ director at the central ambulance station in Auckland. I spent a couple of hours with him as he explained the four tier structure and their scope of practice.

#### **Primary Care**

Automated defibrillation, entonox, methoxyflurane, aspirin, paracetamol.

#### **Ambulance Officer**

All of the above plus nasopharyngeal airways, nebulised salbutamol, GTN spray, IM glucagon, laryngeal mask airway.

#### **Paramedic**

All of the above plus manual defibrillation, IV cannulation, IV fluid administration, IV glucose, SC lignocaine for IV cannulation, 12 lead ECG acquisition.

### **Upskilled Paramedic**

All the above plus morphine, metoclopramide, naloxone, nebulised adrenaline, IM adrenaline, IV adrenaline for cardiac arrest only.

### **Advanced Paramedic**

All the above plus laryngoscopy, endotracheal intubation, cricothyroidotomy, chest decompression, intraosseus needle access, adrenaline, atropine, frusemide, amiodarone, midazolam, 12 lead ECG interpretation, ketamine, pacing.

I later went to visit the communication centre where I saw ten or so people taking calls and dispatching ambulances across the area. The staff worked from flip cards with questions on that they used to prioritise patients. After which I spent the rest of the day with an ambulance crew Sean and Amanda, who commented that on average they transport 8-10 patients per day. The first patient was a patient with chest pain who needed to be transported from a nearby island to a hospital. Due to the remoteness of the area and the fact that the patient had chest pain the fastest way to reach this patient was by boat. Therefore the ambulance parked up on the quay and we all travelled by boat to collect the patient



*View of inside of Ambulance waiting on pier for patient.*

Having travelled half an hour by boat we collected the patient from the island, settled them on the boat and sailed back to Auckland. Whilst we were sailing the paramedics needed to put an intravenous line into this patient, which was impressive considering the size of the waves crashing up against the boat. This patient was also given an ECG, morphine and oxygen. I was impressed with the speed and versatility which the paramedics worked in such an environment. We had taken a lot of equipment with us, so that we were prepared for every eventuality with the patient. However although

this patient had an irregular heartbeat and was poorly, the patient survived the trip and was transferred into our ambulance at the pier and then transported to hospital.

As soon as the patient was handed over to staff in And E, we were sent straight to another job. This was a collapsed female, and we went to back up the response vehicle. The patient was fitting and had a low Glasgow Coma Score, which is a scale used to assess patient responsiveness. The patient was making incomprehensible sounds and was unresponsive, although she had her daughter with her so the paramedics were able to get a little history as to what had happened. An advanced paramedic was present on the scene and it was thought that this patient had had Cerebral Vascular Accident (Stroke) or similar. This lady was very poorly and needed suction. It was difficult to get intravenous access to this patient and put a line in her, although it was important for the paramedics to do this, in case she needed any emergency drugs. An intravenous line was established and the patient was transferred onto the ambulance. Due to the patients condition, the paramedics rushed this patient to hospital and she was taken straight into the resuscitation room.

Immediately after we had handed this patient over, we were dispatched straight away to a male patient with a suspected deep vein thrombosis. We had been out on the road for several hours and I was hoping for a cup of tea at some point (a typical English response, however it was not to be for a while!). We drove to radiology clinic, where a male patient had had an ultrasound scan and a deep vein thrombosis was confirmed. The patient was an English gentleman who was now living and working in New Zealand. The patient was transported to a large hospital and was given his ultrasound images and radiology report to take with him. When we got to the hospital it was closed to further intakes of patient. The radiologist from the previous clinic where the patient had been scanned rang this hospital and coupled with the discussions the

paramedics had, the hospital agreed to take this patient due to his condition. I was surprised that the hospital had closed, and was concerned as the next nearest hospital was several hours drive away. This patient was taken straight into the resuscitation room.

Whilst in this hospital I had a look at some of the facilities. The hospital was clean, light and airy. There was swipe card access in and out of the hospital. The resuscitation rooms were well stocked, and had good observational bays so that staff could see all the patients. We restocked the ambulance with linen and pillows ready for our next call out. I also managed to see some of the x-ray equipment in this hospital for x-raying patients in the Resuscitation room. Although the equipment differed from hospital to hospital and some was static and some mobile, depending on the work and patient presentation, all the equipment was clean, and well maintained. Just as we were leaving the hospital and I was visualising a hot cup of tea, we were called to a large house in Auckland, which turned out to be a type of male hostel. The house was in disrepair and there were approximately twelve males living there. The owner/manager had called an ambulance as he had an ill resident and didn't think he could cope with him. The patient in his thirties had a hearing impairment and lived in one room up four flights of stairs. I carried one of the large rucksacks up the stairs for the paramedics and was surprised at how heavy they were. The patient had very little in the way of possessions and appeared very thin. He reported feeling unwell for the last few days and had been living on orange and cranberry juice. Further assessment revealed that this patient had had a pacemaker fitted, however his ECG readings demonstrated an irregular heart rhythm with readings from 58 -140 and atrial fibrillation. This patient also had a low oxygen saturation rate so was given oxygen to help him breathe more easily. The patient requested to attend a particular hospital

although checks revealed that this hospital had closed its doors for the night due to the large number of admissions it had received over the day. This meant that the patient would need to be transported to the next nearest hospital which was 30 minutes or so away. This is one thing that surprised me about my time in New Zealand, the vastness of the country and the distribution of the hospitals within it, even within the cities. The other aspect I hadn't appreciated was that patients were required to pay for an ambulance, and most patients had a type of insurance and could give the details to the paramedic.

However this patient was not in position to pay and did not have any insurance. He was still taken to the hospital and one of the paramedics explained that the state would take steps to try and recover the money at a later date.

This was the last patient for the crew as their shift was drawing to a close and we made our way back to the ambulance station.

### ***Reflections of the Day.***

I enjoyed my time with the crew and it was useful to observe their work and the variety of cases they dealt with. The work seems similar to that of a UK paramedic; however there are a few differences. During my discussions with the crew they commented that many patients presented with complex health issues, this was in part due to the medical system and the way it was funded, which consequently meant that some patients did not seek treatment until their disease was well advanced which further resulted in them having additional health needs arising out of their initial disease. This could make diagnosis and treatment complicated.

On reflection I hadn't realised how far apart the hospitals were and their location, if one hospital chose to shut its Aand E department this could mean an hours trip by road for a patient to the next nearest hospital. I was initially surprised at the number

of patients who were helicoptered from hospital to hospital. A patient may have an operation in one hospital and then be flown to another hospital to recover. This was also similar in relation to imaging children as not all hospitals had paediatric facilities and so children were often required to travel. This had implications for the radiographers working in these centres. It was interesting to discuss some of the high profile child cases which were being reported in the press at the time I was in New Zealand with the paramedics and get their view point as often they were the first people on the scene.

It was interesting to meet Dillion the advanced paramedic who was part of team that responded to emergencies and terrorist incidents. Part of his job it appeared was to respond to the above incidents and help the police in any hostage situation.

## ***Reflections.***

By completing this fellowship I was in a position to reflect on practice, both my own and the practices I had seen across the North and South Island in New Zealand.

Radiography is a vital tool in the diagnosis of Non Accidental Injury in children particularly in relation to skeletal injuries (Carty 1997)

### ***Were There Any Variations If So Why Including Reflections On Tepaus Approach?***

I found Tepaus approach refreshing. Child protection is an emotionally difficult area to work in. I found them to be sympathetic, yet realistic as to what they could achieve. They had a pragmatic, sensible approach and were clearly passionate about their work. It was interesting and heartening to see a true interdisciplinary and multidisciplinary approach in child protection, with doctors, nurses and social workers working together for a common goal.

It was useful to reflect upon radiographers involvement later in the child protection process which meant conducting a skeletal survey when parents have been told the reasons why and various other tests have been concluded. As this is later in the child protection process, this is a very different way of working from that which I have seen in the UK and raises different issues for the radiographer.

I observed much good practice and on reflection there are many aspects of practice that I wish to take back to the UK.

It is thought provoking to reflect upon whether the Tepau model would work in Uk given the differences in culture. Although there are various multidisciplinary team models working within the Uk and a multiplicity of models of clinical supervision. I have not experienced anything similar to how TePau were working.

I met lots of radiographers (M.I.T.s) who were interested in hearing about the Uk and Republic of Ireland child protection system, and who were also willing to share their experiences of child protection in New Zealand.

I was also very fortunate to meet Lynda Duncan, and as President of NZ MIT (the professional body of radiographers in New Zealand), and explore a professional body perspective in this area.

It was also useful and interesting as I became involved in University life in New Zealand and delivered presentations on N.A.I. to student radiographers at the education centres both in the North and South Island.

Additionally I spent time delivering presentations to hospital staff with radiographers being bussed or taxied in from surrounding areas.

In conclusion this fellowship has given me the opportunity to learn about child protection in New Zealand and also explore some aspects of the Maori culture. It has afforded me the opportunity to reflect both on my own practice as a radiographer and radiography educator as well as reflect on clinical practice and multi disciplinary working as I had seen throughout New Zealand.

I was fortunate to be invited a few days before the conference to the annual New Zealand radiography Conference in Queenstown as a guest of the professional body which allowed me to network with a variety of colleagues from education and clinical practice. These discussions gave me a deeper insight into radiography in New Zealand and it was useful to discuss child protection and Non Accidental Injury in relation to

radiographers imaging such children. I was also asked to present a paper to the conference whilst I was there which sparked a lot of interest and discussion which was healthy.

I hope to use the knowledge that I have gained from the time I spent in New Zealand in order to further explore and develop multidisciplinary working within child protection. Additionally highlighting the usefulness of the radiographers role in this area through a variety of avenues.

These include a conference presentation to the UK Radiological Congress later this year to practitioners, radiographers and radiologists. Additionally through discussions with the professional body of radiographers, the College of Radiographers within the UK and the Irish Institute of Radiography in Southern Ireland. I have also been asked to help write some forensic guidelines for radiographers imaging children suspected of N.A.I. which I am currently engaged in.

I am also exploring the possibility of developing and delivering a series of University accredited modules for a variety of disciplines on child protection and N.A.I, specifically. Furthermore I have am in the process of writing several articles for publication in different professional journals across the world about my experience of the Fellowship and practice I have learnt which can be carried forward. Additionally I am hoping to share my experiences and have discussions with colleagues from the Higher Education Network for Radiography in Europe (HENRE), which I am hoping will lead to collaboration between New Zealand Radiographers and European Radiographers so that good, effective practice in this area can be shared. All of these I believe will help make an impact on the radiographer's role in child protection, and contribute to the body of existing knowledge and help share good practice to benefit children placed in such situations.

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