RCH Alumni

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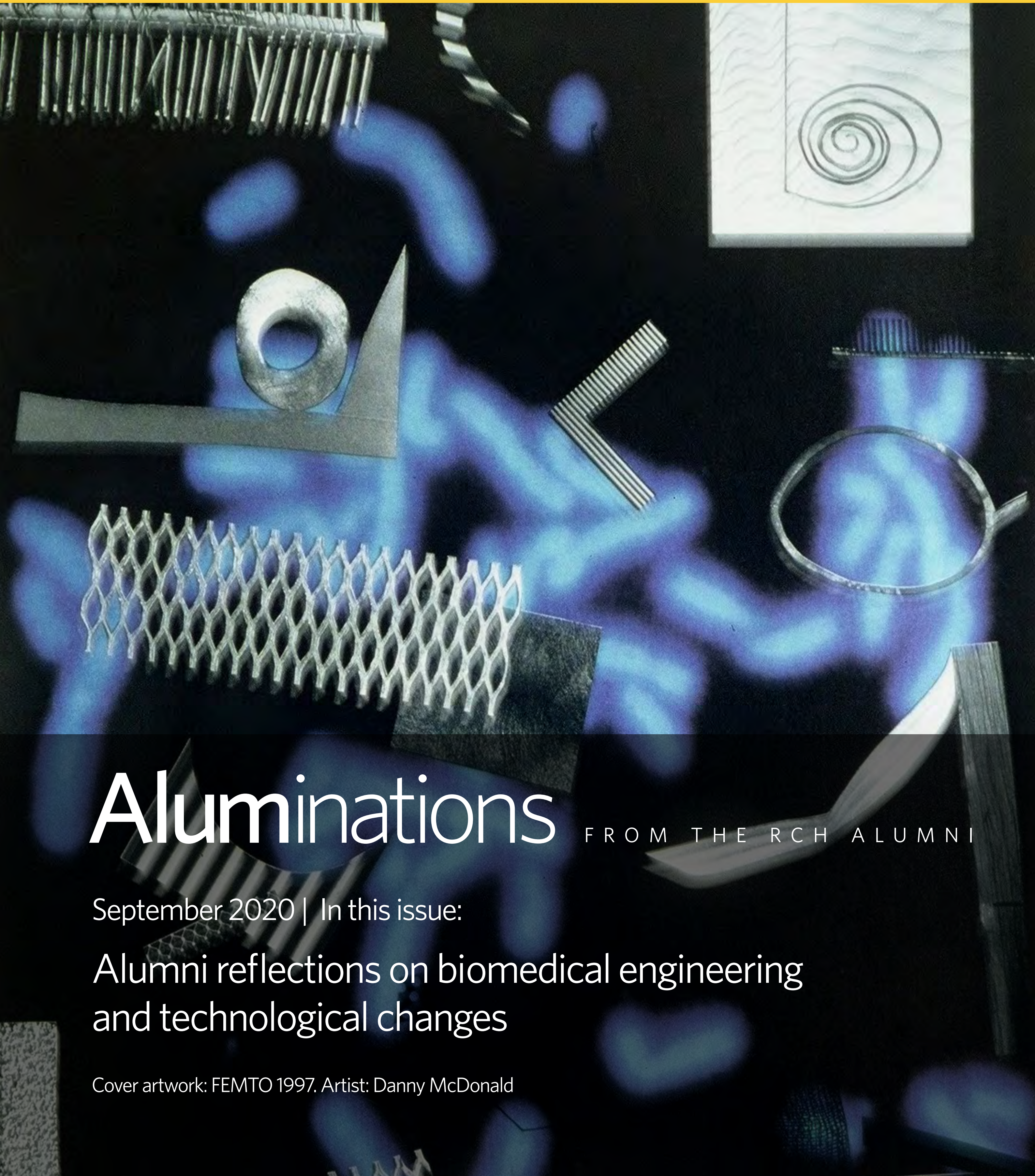


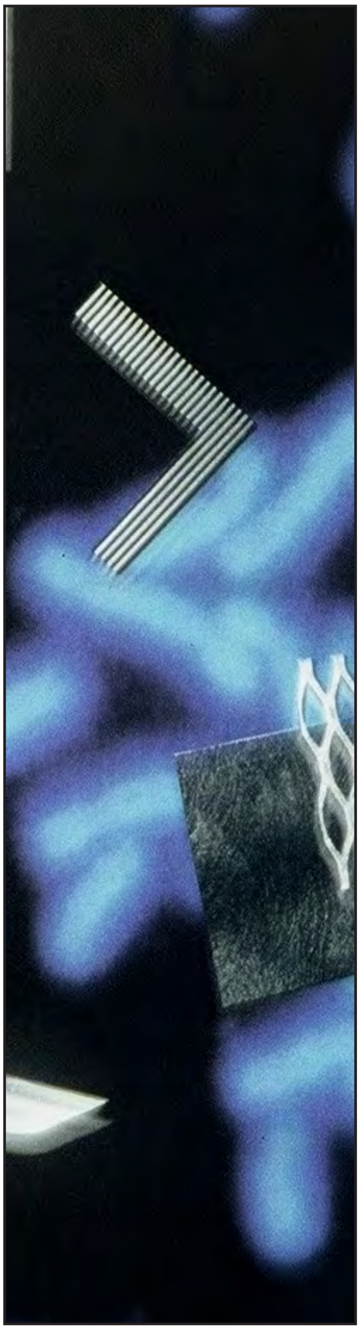
Aluminations

FROM THE RCH ALUMNI

September 2020 | In this issue:

Alumni reflections on biomedical engineering and technological changes

Cover artwork: FEMTO 1997. Artist: Danny McDonald



Contents

Cover artwork: *Femto 1997* by artist Danny McDonald. For the full artwork, commentary from the artist and interpretation from Garry Warne and Andrew Sinclair, turn to "Science as Inspiration for Art" on page 30.

Credits

Aluminations Editor
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Greetings from the President

Ruth Wraith OAM

When you receive this edition of **Alum**inations, Melbourne folk will have been in levels 3 or 4 of Covid-19 lockdown for around six months and our interstate and overseas colleagues will have experienced variations of this restricted lifestyle. Adaptability has been one of the pillars for negotiating these changes. Maintaining social connectedness is another pillar.

The Alumni Executive has been nimble footed in this 'new normal' and each member has contributed generously and skilfully to meeting our goals and the challenges therein.

With the Alumni Association ever evolving it became timely to engage in some rebranding. Under the stewardship of Garry Warne, the Newsletter has become a lively medium for communication between members encompassing a wide range of topics including social commentary, wonderful photography and personal and holiday memoirs. Christine Unsworth suggested a more engaging title for the Newsletter, '**Alum**inations', which we adopted with enthusiasm. Currently a section of **Alum**inations is focussed on the theme of 'Reflections' and is coordinated by Bronwyn Hewitt. The first theme in the July edition introduced itself in these Covid 19 times - Infectious Diseases and Epidemics. This edition is drawing on biomedical engineering and the interface with the clinical practise of members with, once again, rich and varied experiences and observations.

The second re-branding is Lunch Meetings, now called '**Alum**inars'. Transferring the Meetings to the Zoom platform has been popular with members with an increased number of attendees including interstate and overseas colleagues and also local people for whom coming to RCH is difficult. The feedback we have received will guide our planning for 2021. Caroline Clarke with Gigi Williams have steered us through the previously unfamiliar Zoom territory, a significant learning curve for all of us.

The isolation restrictions mean we have had to cancel our Annual Dinner in November, however we have booked the Kew Golf Club for 2021, anticipating an energetic celebration. The AGM for 2020 will be held as planned on 10th November but via Zoom. Emeritus Professor Lou Landau has kindly agreed to be Guest Speaker via Zoom from Perth. Details will be forwarded closer to the date.

Other events that will proceed with a Zoom format are the Aluminar on 10th September, Vernon Collins Oration on 7th October and the Alumni/CRI Seminar on 26th November. Details of these events are in this issue and on the Alumni website.

The Alumni Association RCH 150 project 'Turning Points' continues to be a work in progress having been interrupted by Covid-19 requirements. The RCH Foundation provided funding to support the production of a limited number of podcasts. Many members offered contributions and the topics were grouped into three pre-dominant themes. Unfortunately, some suggestions were outside these however we are hoping to capture the special advances and contributions to paediatric health and wellbeing in the ongoing Aluminations Reflections. They are too precious to be lost.

Recently Jim Wilkinson arranged with RCH for a parking discount to be available for Alumni members when attending Association functions at the campus and will be available on registration for those gatherings.

We have clarified that non-honorary appointee RCH Alumni members are eligible to access the RCH library services. Registration for this purpose will be effected by contacting Garry Warne.

As I write this it is with sadness that I learned of the death of Professor Margot Prior who was a valued member of the Alumni Executive for a number of years. Margot was a caring and principled colleague and friend and I will miss her. There is a Tribute to Margot on the Alumni website.

The Alumni website has a section called 'Alumni Profiles'. We would like to encourage members who have not yet done so to add their profile by forwarding it to the Honorary Secretary, Garry Warne at rch.alumni@rch.org.au. The styles of presentation are as individual as the members.

Warm greetings to each of you.

2020 Calendar of Events

DATE	TIME	EVENT	SPEAKER
Past events			
3 MAR	12 PM RCH FOUNDATION	"The impact of human activity on the health and well-being of Antarctica's wildlife"	Dr **Knowles Kerry** AAM
8 JUL	12 PM ZOOM	"Researchers behaving badly"	Prof **David Vaux** (Deputy Director, Science Integrity and Ethics, WEHI)
10 SEP	12 PM ZOOM	"22 years in China — A dynamic View of the Australia-China Relationship. A short talk and a long Q&A session with a China Expert working in the Parkville Biomedical Precinct"	**Ed Smith**, Director, RMH Foundation, and son of Arnold.
Coming soon			
7 OCT	12:15 PM ZOOM	Student award presentations, followed by the 2020 Vernon Collins Oration: "Championing child rights midst the chaos of COVID-19"	Distinguished Professor **Elizabeth Elliott** AM FAHMS FRSN
28 OCT	12 PM ZOOM	Interactive biomedical ethics forum: "Should children be told the truth about their medical condition - always?"	Professor **Lynn Gillam** AM, Professor, Children's Bioethics Centre and Melbourne School of Population and Global Health
10 NOV	12 PM ZOOM	Annual General Meeting Guest speaker "The influence of what one says or does"	Emeritus Professor **Louis Landau** AO, former Executive Dean, Faculty of Medicine and Dentistry, UWA
26 NOV	5:30 PM ZOOM	Joint CRI/Alumni seminar "Indigenous child health, children's rights and the law"	The Hon. **Alastair Nicholson** AO RFD QC and **Ruth Wraith** OAM, co-chairs. Dr **Niroshini Kennedy**, Mr **Justin Mohamed** and Magistrate **Jennifer Bowles**

Reflections invitation for this edition

Bronwyn Hewitt, former RCH archivist

At the April 2020 Executive meeting of the RCH Alumni, it was agreed that to help engage our members in such uncertain times, one idea would be to provide you with a platform and invite you to draw upon your personal experience or research on subjects of interest, which members may then like to reflect upon.

You will by now have seen the collection submitted on our first topic, published in the July edition of 'Aluminations', the Newsletter of the RCH Alumni. We hope that you enjoyed reading them.

So, for our second topic this edition, we again invited you to reflect upon a new subject – The early clinical application of advances in Biomedical Engineering at the RCH.

We are all familiar with the high tech equipment we see in health, and even in sports settings these days. Seeing dozens of portable ventilators being wheeled into the major hospitals during the current pandemic should give us pause for thought. Not so long ago, this equipment could only be dreamed of when, for instance, the first heart-lung machine used at the RCH was cleverly built in-house at the beginning of an era of cardiac surgery.

The emergence of paediatric specialties which arose post-WWII drove the need for technological invention and changing practises in paediatric medicine. At the RCH, this started with technological innovation to facilitate better outcomes for patients with a variety of medical conditions. Coupled with research, a widening availability of antibiotics and a focus on diagnostic accuracy, operations for congenital abnormalities became possible for the first time. The rise of various Allied Health specialties also largely contributed to improved outcomes for patients with many different medical conditions.

From 1957 when the Electronics Dept, (later named Biomedical Engineering) was established, headed by the innovative engineer Glen Johnston, it was instrumental in working with the emerging specialist clinicians in their various roles, an activity which was greatly encouraged by the hospital's administration. Fundraising, particularly by the Uncle Bobs Club, made it possible to fund the new clinical technologies.

Many of our Alumni have been intimately involved in these developments or worked with the Biomedical Engineering team. We invited you to share your personal anecdotes and reflections from an historical perspective as 'eye witnesses' and/or participants at that exciting time and we are delighted to share your contributions in this edition.

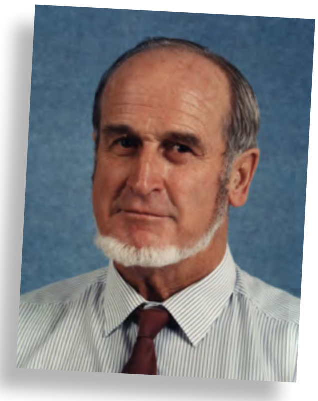
Reflections invitation for the next edition

Biomedical engineering and renal medicine

Early Advances in Peritoneal Dialysis at RCH

Harley Powell

Before the 1960's, a diagnosis of severe acute or chronic renal failure was often a death sentence as no renal replacement therapy was available. In the mid 1960's David McCredie (pictured), with the help of his first two Renal Fellows, John Herron and Steve Dixon, developed the ability to provide peritoneal dialysis at RCH for patients with acute, temporary renal failure, resulting in vastly improved survival rates.



However the technique was not suitable for long term use for children with chronic renal failure as the dialysis catheters needed to be re-inserted every few days.

Haemodialysis became available but was difficult to do for more than a few weeks as it involved full time medical staff attention, there being no trained dialysis nurses. In the early 1970's "chronic" peritoneal dialysis became possible with the development of soft, flexible Tenckhoff peritoneal catheters permanently inserted through the abdominal wall.

Well-funded adult renal units began using expensive peritoneal cycler machines for their smaller adult patients with chronic renal failure. The cycler machines cost about $5000 in 1970 dollars and, as at that time no paediatric renal units around the world were offering long-term dialysis, the then RCH administration decided not to fund the purchase of any machines for children.

In 1975, David McCredie and I went to see Glen Johnston in the Electronics Department (below) and, with the enthusiastic contribution from Terry Hunt (right) in that department, we designed and built a peritoneal cycler for $150.

It consisted of 3 clock timers, in a tool box, which controlled the time dialysis fluid flowed into the abdomen, dwelt in the abdomen, and then flowed out.

The clocks connected to clamps on the in and out tubing. Volumes of dialysate could not be measured but we soon found that the flow was always about 100ml/minute on the in-cycle so were able to dial a number of minutes on the in-flow clock according to the size and capacity of the child's abdomen.

The system was easy to use and nursing staff and parents quickly learned to run it. It was very safe and proved quite effective for both hospital and home use. Bacterial contamination leading to peritonitis occurred every few weeks for patients managed by general nurses in hospital (there were no specifically dialysis-trained nurses) but home patients developed peritonitis only once in 9 months on average, probably because parents became more careful and experienced.

A dozen of these peritoneal dialysis cyclers were built over the next decade and were used by over 100 children with chronic renal failure, most of whom were eventually transplanted. They converted a condition with a 0% survival to a 95% 5-year survival.

Dr Harley Powell FRACP, Director of Nephrology 1979-1994, Senior Nephrologist 1995-2017

Evolution of Renal Replacement Therapies at RCH

Harley Powell

The following is a description of some of the major therapeutic procedures in nephrology, especially those related to renal replacement, since the 1960's. Some of these procedures have been abandoned, but it is instructive now to understand why they have been abandoned.

In the 1950s and early 1960s, the 10-12 children who presented to RCH each year with end-stage chronic renal failure, defined as a glomerular filtration rate less than 3% of normal (<3ml/min/ 1.73m2) always died within a few weeks.

Haemodialysis was really only a temporary, short term reprieve. Transplantation was unavailable but in 1954 a successful renal transplant between identical twins was performed in Boston, USA, with long term survival of the recipient without immunosuppression.

Immunosuppression with azathioprine (Imuran) became available from the early 1960s and, with prednisolone, made it possible to consider transplantation between non-identical humans.

The first such transplant in Australia was performed by Professor Maurice Ewing and Dr Priscilla Kincaid-Smith at the Royal Melbourne Hospital in 1964 and soon after Mr Robert Fowler (right), with the help of Dr David McCredie (nephrologist) and Dr Arthur Clark (haematologist/ immunologist), did three renal grafts at the Royal Children's Hospital, including an en-bloc kidneys and aorta from an anencephalic donor. These grafts all had primary non-function and were lost.

Renal transplantation at RCH ceased for more than 15 years. A few older children were transplanted at RMH in the 1970's, after long-term dialysis at RCH, including one who still has a functioning graft more than 40 years later.

However smaller children needing renal transplants were a major problem and after a run of 7 successive grafts to small patients at RMH in 1981 and 1982, which all had primary non-function and were lost, Priscilla Kincaid-Smith informed Harley Powell, the head of Nephrology at RCH, that RMH could no longer provide transplantation services to children.

Similar problems were being experienced with small children in other centres around the world. In 1983, at the sixth triennial meeting of the International Paediatric Nephrology Association in Hanover, George Haycock, a surgeon from Guy's Evelina Children's Hospital in London suggested that smaller children undergoing transplantation needed a very large intravenous fluid push to ensure adequate perfusion of the new kidney.

Previously standard practice had been to dialyse the patient dry in anticipation of a period of low urine output post-operatively. Renal transplantation at RCH was restarted at RCH in 1983 using fluid loading and was immediately successful.

Cyclosporine was introduced soon after and the transplantation program at RCH became as good as anywhere in the world, with better patient survival than the adult services. Deaths from chronic renal failure are now less than one every few years

Many therapeutic advances quickly followed. Newer anti-rejection drugs like tacrolimus, basilixumab, mycophenolate, and the much less toxic sirlolimus, became available, making transplant survival even better.

Recognition that some rejection is not always due to cell-mediated immunity, but may be antibody induced, has led to some patients needing plasma exchange. Living donor transplantation, usually from a parent, is now at least as common as deceased donor grafts. Patients with body weight as small as 10-11 kg can now be grafted successfully.

Long-term dialysis at RCH began in 1975 using haemodialysis with a Travenol machine which looked like a large washing machine with an open water bath of dialysate on top into which the blood coil was inserted.

This machine was quite dangerous as dialysate sometimes got into the electrics causing electric shocks to the operators!

Harley Powell and John Burke ran this machine every weekday, for 4 hours each day, for 12 months in 1975 dialysing 2 children with end-stage renal failure without help from any dialysis nurses or technicians.

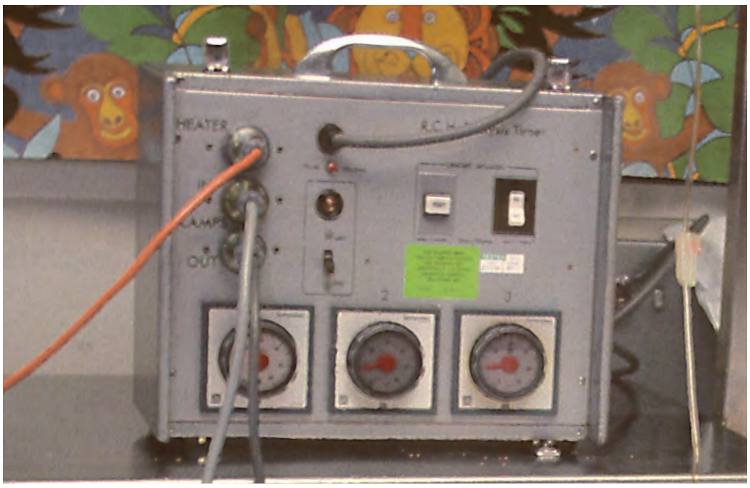
In retrospect, it is a miracle that no fatal complication occurred as the patients were often left alone on the machine for an hour or two while the doctors attended other patients.

A haemodialysis technician was finally appointed in 1976 and an efficient Drake-Willock machine purchased.

Peritoneal dialysis for acute renal failure was introduced at RCH by Dr David McCredie in the early 1960's using stiff plastic catheters which were inserted by physicians under sedation and local anaesthesia. Dr McCredie trained his research fellows, Drs John Herrin (1967-8), Steve Dixon (1969-70), and Harley Powell (1971-3) in this technique which worked well, but the technique required a painful tight purse-string suture to hold the catheter in place, and the catheters needed replacement every day or two.

Introduction of the soft, cuffed Tenckhoff catheter in the 1980's became a major advance and, when surgically inserted under general anaesthetic by Mr Justin Kelly (right), allowed for the possibility of long-term peritoneal dialysis for chronic renal failure.

Despite the efforts of the RCH school at the time, inpatient dialysis for chronic renal failure was very disruptive to children's schooling, and long-term over-night home peritoneal dialysis was investigated as an alternative.



Dr John Dawborn at the Austin Hospital Nephrology Department had built a peritoneal dialysis cycle timer, the design for which was modified and developed in the RCH Electronics Department. The RCH cyclers consisted of a tool box containing 3 clocks attached to 2 line clamps, on the inlet and outlet tubing. These peritoneal dialysis cyclers were built at a unit cost of only $150 each, and proved to be safe and efficient for both home over-night and inpatient peritoneal dialysis.

In the late 1980's continuous ambulatory peritoneal dialysis (CAPD) was introduced as an alternative to overnight cycling peritoneal dialysis. CAPD involved no special equipment and just a single tubing line from a bag of dialysate to the patient's Tenckhoff catheter. When the dialysate had run in, the empty dialysate bag was kept in the patient's pocket, still attached to the catheter. At the end of the dwell period, the used dialysate was simply drained out into the bag and a new bag attached. With 4 bags of dialysate cycled each day the quality of dialysis was as good as overnight cycling. Later, the catheter was simply plugged after running in the fluid, so the patient did not need to carry an empty bag. However, CAPD seems to have been largely abandoned now, mainly because of the inconvenience of having to spend 30 minutes changing bags 4 times a day, and the greater convenience of overnight cycling while asleep.

Unlike today when kidney harvesting from deceased donors is organised and performed by specialised health professionals from Donate Life, kidney harvesting in the 1970's and 1980's had to be done by the nephrologists and urologists of the Renal Unit. Two or three brain-dead donors were referred to the nephrologists at RCH from the Intensive Care Unit each year. It was found that parents invariably agreed to donate their children's kidneys if they were asked in the following way: " I'm so very sorry to hear about ....'s death. It's a real tragedy. Not much good comes out of a tragedy like this, but there is one good thing that you may like to consider, and that is kidney donation. We have several children, who are being kept alive by dialysis, whose lives could be saved by a new kidney."

No family approached like this ever refused to agree to donation. After donation, the donor's families were always sent a letter two to three weeks later telling of the results of the transplants, which all went to young adult recipients in other hospitals, and fortunately all these paediatric kidneys functioned . All the donors were over five years old. We rarely heard back from the donor families but on the three-four occasions that we did, it was clear that they derived much comfort from knowing that their child's death had not been totally in vain, and someone's life had been saved by their loss.

The evolution of diagnostic and therapeutic procedures in the RCH Nephrology Department in the last 60 years has kept the management of children with renal disease at world class standards at all times, and in many cases, like patients needing renal transplantation, RCH patient survival exceeds world standards.

Pioneering paediatric urologist Douglas Stephens with David McCredie and Harley Powell

Glen Johnston, Biomedical engineer

Kay Gibbons

My own memories of Glen at RCH begin with Pelham Street, in the raggedy collection of buildings (or as I remember it) and then in Flemington Road. Glen and my mother were at the opening of Flemington Road by Queen Elizabeth and can be seen in the panoramic photo (if you know where to look). After the RCH moved to the later site in Flemington Road he visited the new hospital and had a tour of the BioMed. department.

I also took him through the Food Services Department where he charmed the women staff, who spoke about him for months.

In the early days of Cardiac Surgery Glen was actively involved in the theatre and he would often go in at weekends and evenings if a patient needed 'by-pass'. Glen became friendly with the family of one of the very early 'open heart' surgery patients, from Oakey in Queensland, and they kept in touch until his death.

I am enclosing a copy of a letter from Kester Brown (who remained a good friend of Glen's) because it includes reference to a couple of key initiatives and activities, including the disconnect alarm (below).

One of Glen's key interests and concerns was patient electrical safety; an increasing risk as electronic applications developed.

I am attaching the opening pages of an article on this subject (next page).

Glen consulted and presented at several international conferences on this area. Another key area of his work was in the nephrology area – with Jock Whittaker, Harley Powell and David McCredie.

There are a couple of photos (next page) of an early ventilator in ICU, with the original disconnect alarm, dated 1968-69 (mentioned in Kester Brown's letter). I remember that ICU set-up with dozens of leads and tubes!

Professor Kay Gibbons was Chief Dietitian and later Manager of Food and Nutrition Services at RCH (1991-2015). She is currently Adjunct Professor, Institute of Health & Sport, Victoria University.

Dear Kaye,

I was sad to see in the paper that Glen had died. He had a long innings.

Glen was a wonderful man – one of the most respected people that I worked with at the Childrens Hospital.

He was a pioneer biomedical engineer and played an important part in monitoring during the early years of Cardiac Surgery. He was responsible for the disconnect alarm for ventilators which was important as disconnection could lead to hypoxia and death.

He ran an excellent department with some dedicated people who spent years there.

Glen also participated in what I regarded as one of the most important events at RCH – the Lorne weekend where, for the first time, Committee of management members spent a strategic planning weekend with members of the staff from a wide range of departments, not only doctors. It was successful in bringing these groups together and bringing freer discussion between them. The decisions made were to form divisions and to extend the car parking! Not as important as the opening of communication.

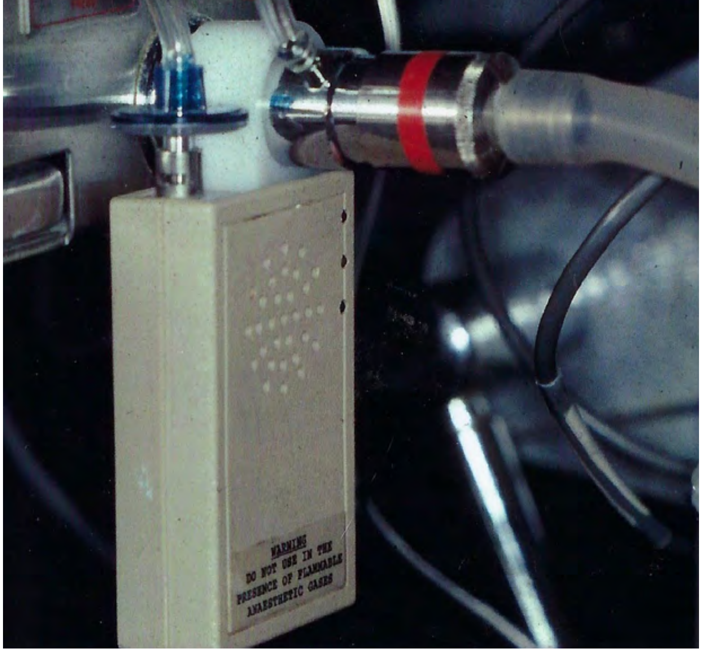
Glen and I shared a very unofficial role in the hospital as ombudsmen. People often came to us with problems – sometimes serious ones. He was trusted by everyone.

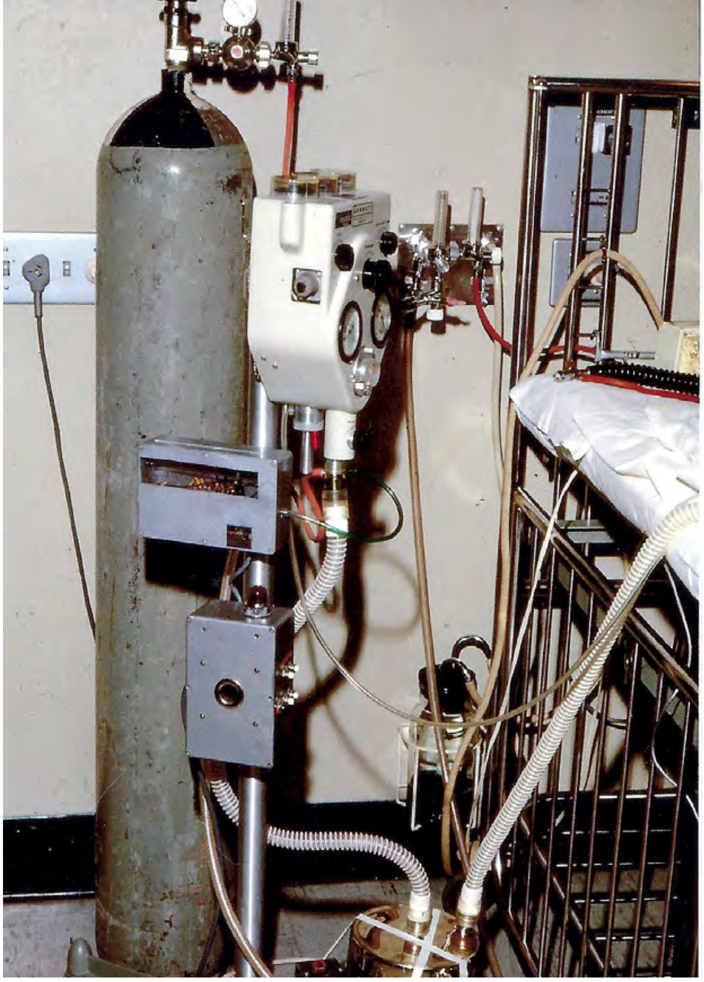
He contributed a excellent section to my book, "Anaesthesia and Patient Care" which was written for nurses and medical students. It represented the clarity of thought and explanation which were a hallmark of his teaching.

He was a wonderful man and a good friend.

Best wishes

Kester Brown





An early ventilator in ICU (pictured right), with the original disconnect alarm, dated 1968-69 (above, left)

Below, opening pages from Glen Johnston's chapter in *Anaesthesia and Patient Care* by T. C. K. Brown. Published by Blackwell Scientific Publications, 1982

CHAPTER 9

Electrical hazards and safety in the operating theatre

By Mr Glen Johnston

ELECTROMEDICAL SAFETY Basic physics of electricity. Electric shock and electrocution. Sources of electric shock. Modes of shock. Equipment classification. Earth connection. Environmental protection. Marking of classified areas and equipment. General Precautions.
DIATHERMY Cutting. Coagulation. Earthing. General precautions with the use of diathermy.
LASER RADIATION

Electromedical safety

Various items of electrical equipment are commonly used in operating theatres. These include surgical equipment such as diathermy and various endoscopes (bronchoscopes, cystoscopes etc); monitoring equipment such as ECG, pressure and temperature monitoring devices; patient support systems such as electrically driven ventilators, heart lung machines and electronic heart pacing devices; and a variety of other specialized diagnostic aids.

In the past before electrical equipment was widely used the main hazard was from fire and explosions of flammable anaesthetic agents such as ether and cyclopropane. Because static electricity was a potential cause of ignition special conductive floors were installed, anaesthetic machines had chains to earth them to the floor and antistatic rubber was used in anaesthetic circuits. The increasing use of electrical equipment and the introduction of better non-flammable anaesthetic agents has led to the virtual disappearance of cyclopropane and ether from anaesthetic practice in many places.

The main hazard associated with the use of electrical equipment now is electrocution with the potential for causing burns or ventricular fibrillation. Patients who are anaesthetized, heavily sedated or unconscious may not respond normally to electric shock or heat so that these complications may not be immediately recognized.

It is important that people working in operating theatres and adjacent areas should be aware of the potential electrical hazards and the precautions that should be taken with electrical equipment so that maximum safety is provided for the patients and theatre personnel.

Basic physics of electricity

Some basic electrical knowledge is desirable before considering the hazards of electric shock and electrocution and the precautions to be observed when electromedical equipment is used.

The three fundamental elements of any electrical circuit are the voltage, or electrical pressure applied, the resistance of the material concerned and the current or flow which results. The relationship between these three elements is expressed in Ohm's Law which says that

$$\text{I (current)} = \frac{\text{V (voltage applied)}}{\text{R (resistance)}}$$

or conversely $V = IR,\ R = \frac{V}{I}$

The basic unit of current is the ampere, but in electromedical applications, it is frequently necessary to employ smaller units such as the milliamp (amperes/1000) or even the microampere (amperes/1 000 000).

The basic unit of electrical pressure is the volt. The AC mains supply is usually 240 V and an ordinary torch battery provides a nominal 1.4 volts. In patient situations, much smaller voltages (millivolts or even microvolts) may be significant.

The basic unit of resistance is the ohm. Good conductors including metals, especially copper, have low resistances. Body tissue and blood are good conductors, but the human skin, if dry, offers high resistance to current flow.

Electric shock and electrocution

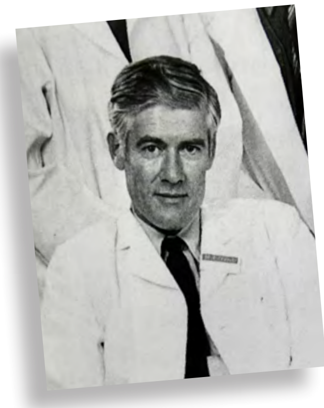
The most common hazard in hospitals is equipment operating from the 50 Hz (cycle/s) AC mains supply and the supply itself.

Murray Schillinglaw, Biomedical Engineer

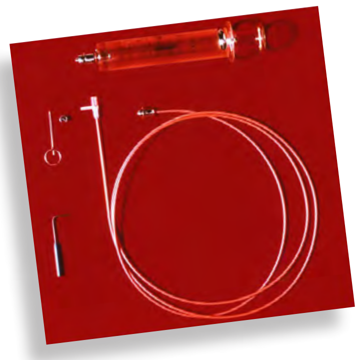
Graeme Barnes AO

Biomedical Engineer, the late Murray Schillinglaw, deserves recognition for his part in the discovery of rotavirus at RCH in the 1970's.

I was Research Fellow in Gastroenterology at RCH in 1971 and 1972, working with Rudge Townley (right) as my supervisor. Rudge had revolutionized the technique of small bowel biopsy in children, used by Charlotte Anderson for diagnosis of coeliac disease and other causes of failure to thrive in infancy.



Rudge had discussed the limitations of this investigation with Murray. Murray then came up with a method to modify the base of the biopsy capsule to enable it to be mounted on cardiac catheter. This allowed the operator to manipulate the capsule into the duodenum under X-ray monitoring, within 5-10 minutes.



The standard capsule had always been mounted on floppy tubing, and it could take up to 2 days for the capsule to fall through the stomach outlet into the duodenum. Using the modified capsule, I remember assisting Rudge with 5 or 6 biopsy tests in a morning in the old Ward 9 South.

Perhaps the most important outcome was the discovery of rotavirus as the most common cause of severe dehydrating gastroenteritis in children.

Rudge asked me to work with Dr Ruth Bishop to try to find the cause. The key was using Murray's modified biopsy capsule and finding severe inflammation in the duodenum.

Dr Geoff Davidson who followed me as Research Fellow in the Department, went on with Ruth to do more biopsies, which were then examined by Dr Ian Holmes at Melbourne University Department of Microbiology, using electron-microscopy, and rotavirus was discovered. RCH did not have an electron-microscope at that time.

Now every Australian child receives oral rotavirus vaccine in the National Immunisation Schedule, and rotavirus vaccination is recommended by WHO for all children worldwide.

MCRI is now testing a vaccine to be given at birth, derived from a unique strain of rotavirus found in babies at the Royal Women's Hospital in the 1970's. (Current 6 weeks of age administration is too late in some countries).

No doubt rotavirus would have eventually been found by other means, but Murray's ingenuity contributed hugely to it being found early, here in Melbourne, and so bringing forward the benefit to millions of children worldwide.

Professor Graeme Barnes AO was Director of Gastroenterology from 1975-1995 and Scientific Director of the RCH Research Institute from 1996-2000.

Medical Photography and the Educational Resource Centre at RCH – 1930 - 2002

Gigi Williams

Bronwyn Hewitt has asked me to write about the history of medical photography at the RCH for the 'Reflections' project. I worked in the Educational Resource Centre (ERC) since its inception in 1982, starting as a medical photographer and went on to become the Director for 26 years.

The following article is based on a Grand Rounds presentation by the Educational Resource Centre celebrating our 20th anniversary in September 2002.

In 2002 ERC provided photography, graphic design, video and web development services to, not only the Royal Children's Hospital, but also to the Royal Women's Hospital. In addition we delivered our services to the wider community and used this revenue to cross subsidise the work for the two hospitals. We did this by running on a partial cost recovery model and this enabled us to generate almost 40% of our budget from external sources. Through the foresight, support and encouragement of the Royal Children's Hospital this is how we managed to grow from a team of eight to a team of 24 with no increased cost to the hospitals. We were obliged to go through the formal competitive neutrality process and this demonstrated that we were 'neutral' and that the hospitals received nearly double their value for money. Our product range had increased and our turnaround times had decreased.

At this time ERC had a wealth of expertise to draw upon in its photography, graphic design, video and web teams; but it was not always this way. At its inception in 1982 there was just one graphic designer, one video producer and four photographers.

But let's look back further for a moment before ERC was established. ERC actually grew out of the original medical photography department which at the Royal Children's Hospital dates back to the 1930s.

Photography was first invented in 1839 by Daguerre in France and Fox Talbot in England, independently of each other. The first clinical photograph was thought to have been taken in Edinburgh by the Calotypists Hill and Adamson of a woman with a thyrotoxic goitre in 1847. (below, left) but it wasn't until the 1930s that we saw the first beginnings of official photography at the Royal Children's Hospital with photography services being established at both Carlton and the Orthopaedic section at Frankston. Although the official records do not mention these activities until 1934 there are photographs like these dated 1930, 1932, and 1933 taken at Frankston.

One can only assume that these were taken by Dr Keith Brown who was a pioneer of the service at Frankston.

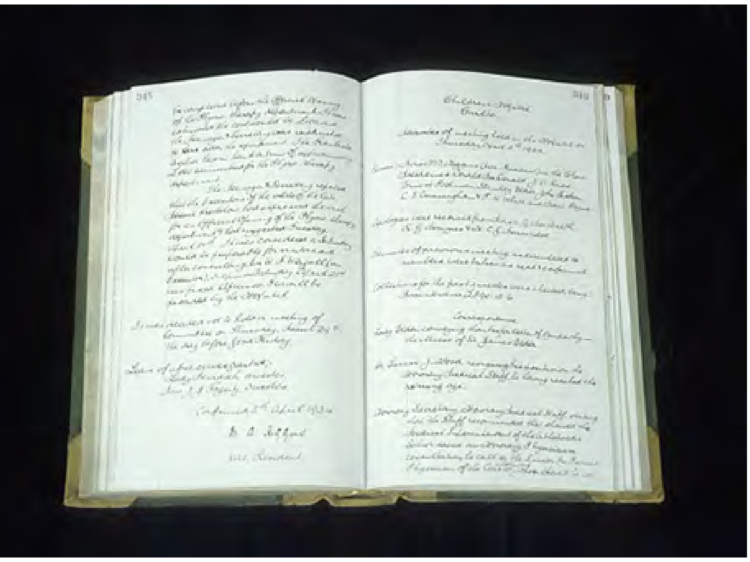
1847

1930

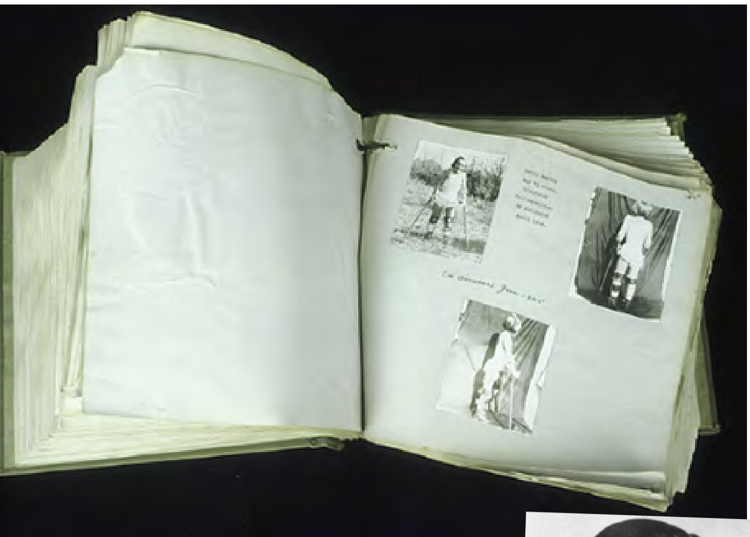
1932

1933

The official Hospital minutes of 1934 (below) described the establishment of the service in Carlton - "In order to make satisfactory provision for the taking of progress photographs of patients during treatment at the Carlton Hospital it was decided that the changing cubicles adjoining the Fluoroscopic room be converted for that purpose". In the annual report of the same year this extension of activities was reported along with the announcement of providing an assistant to carry out the clinical photography.



In the next year's annual report in 1935, the clinical photography service was proving its value and the Orthopaedic Section at Frankston, also officially established a photographic department. The records were kept in loose-leaf albums, many of which still exist to this day, although some are in extremely poor condition unfortunately due to water damage etc.



The annual report goes on to acknowledge Dr Julian Smith (right) who donated a plate camera and provided valuable assistance to Dr Brown. Dr Smith was a leading pictorial

photographer, a Fellow of the Royal Photographic Society, and a prominent Melbourne clinician. Smith found it difficult to find time from his medical practice to arrange country excursions to photograph the Australian landscape and so turned to studio portraiture where he used costumes and make-up to transform models into literary and historical characters like Mr Micawber and Captain Cook (this was very much in fashion at the time as the 'Pictorialist' movement).

We are fortunate to have a number of wonderful examples of clinical records from that era from Frankston in the RCH archives. By 1938/39 all children were photographed on admission and discharge

At Frankston, all the photography was done outdoors as they didn't have a studio and when looking through the records it is quite amazing to see all these half-naked children standing posed in the grounds! Things at Carlton however, were more professional with the establishment of a proper studio facility. So by the end of the 1930s medical photography was truly established at the Royal Children's Hospital.

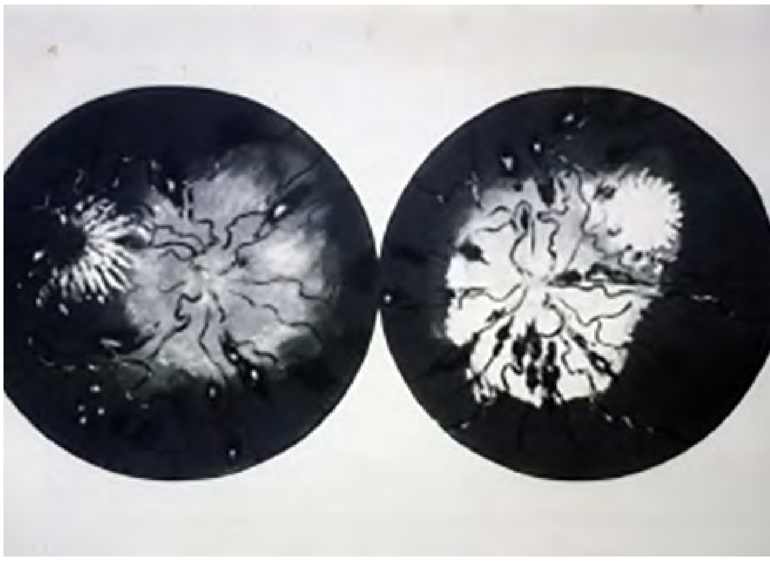
In 1948 the process of defining medical imaging truly began with the establishment of a Clinical Photography Department independent of Radiography and the appointment of Cyril Murphy as the clinical photographer (pictured below).

This probably followed advice from Britain where in 1947 along with the establishment of the National Health Service, medical photography was created as an official paramedical discipline and all district general hospitals were required to establish medical photography departments.

Here are some examples of the clinical photography taken during this period. It's interesting to note that they included a measure so that the clinician could get some indication of scale in these photos.

They also attempted to provide effective background control - one of the prerequisites for good clinical photography although the result is rather amusing – the below photo shows Subacute arthritis of the left hip 1942!

The work was varied, specimens appeared to be routinely photographed as was equipment. It even seemed that during this time somebody at least had access to, or was themselves, an artist 20 years before an artist was officially employed because this retinopathic diagram is in the records dated 1947.



The first use of colour photography was reported in the 1942/43 annual report. Unfortunately though there doesn't seem to be much evidence of these colour records. There are colour photographs in the annual reports and there is a black-and-white photograph of a colour cine film being shot, but there are no colour clinical records: in fact they seem to have gone to great lengths to hand colour some of the black-and-white photographs.

The next two decades saw the establishment of a true profession. Adrian Daniel, who took over as the head of department in 1965, worked with Eric Mackay from the Alfred Hospital to establish the Australian Institute of Medical & Biological Illustration - which to this day governs the conduct and accreditation of the medical illustration profession in Australia. In 1967 Daniel appointed the first official artist - Vivienne James - on a part-time basis. By 1971 Daniel and Mackay had worked with the Royal Melbourne Institute of Technology to establish a Bachelor of Applied Science degree specifically in the field of medical photography.

Adrian Daniel was responsible for a number of significant developments; for example, as a result of research into legibility of text slides, he introduced the famous white-on-blue diazo slide - a standard for lecture slides that was to last 20 years. During Daniel's time clinical photography improved with more emphasis on lighting, to enable the condition to be portrayed more effectively as this example below shows.

Portraiture and public relations photographs were always beautifully executed by Joe Sczepanski, who is well remembered for his craft[1].

When Adrian Daniel left in 1973 Edna Cotterell took over the management of the Department (she had originally been appointed by Cyril Murphy). Edna and Cyril fell in love and married but Cyril died quite soon afterwards and Edna then worked her way up from assistant photographer to Head of Department. In 1981 Tony Skoroplas was appointed Head for a short time and in 1982 Lynda Stephens assumed this role.

The appointment of Lynda was probably the most marked change for the department. It was moved from the fourth floor of the old hospital where Occupational Therapy used to be, to a brand new department which was opened in 1982 by the Honourable Tom Roper, the then Minister of Health (above, right).

The concept was that it should be a department servicing community health across the state. There were eight staff by this time and Lynda Stephens organised the department so that it had three distinct sections providing the basis for the department as we knew it for the next thirty years.

In 1985 I was appointed as Chief Medical Photographer. We were still producing diazo slides but then we discovered a leading edge process that meant the change from diazo slides to 'colour-on-colour', a process we thought was the 'bees knees'. We thought being able to give our doctors yellow on red slides or yellow on blue was just the best thing since sliced bread.

Then along came computers. In 1986 we won a developmental grant from the hospital to set up a routine computer graphics service. Up until then there were no computers, no email or internet and the cameras all used film and lasted 30 years! We had a dark room and chemicals to worry about.

Another highlight and certainly a life-changing event for me was being awarded a scholarship in 1987 that allowed me to benchmark our services in Europe and North America and this provided the foundation for ERC to become the world-class service it was.

Over the years 11 of our staff were privileged to do the same in their area of expertise and these study tours

1 "The Enigmatic RCH Photographer, Jozef Szczepanski" by Bronwyn Hewitt, Nov 2017 RCH Alumni Newsletter

really opened up the world to ERC. This then led to benchmarking, improving our services, staff exchanges, international conferences, research, and writing and giving papers just as any medical professionals would do. Our professional bodies were instrumental in this process and we and our clients started to win more awards and really be recognized overseas. By 2002 ERC was on the world map! But out of all these highlights the overriding thing is that we all really valued working for the Royal Children's Hospital and making a real contribution to child health.

In the research area, in 1988 we investigated photogrammetry, moiré interferometry (below) and light sectioning, working very closely with the physiotherapists and their burns patients and later investigated ultraviolet and infrared photography. We wrote in refereed journals,

won international awards for our work, appeared in the popular press, and in the process also got to meet some of the giants in the field both in the US and the UK. In 1989 I was privileged to be appointed the Department Head.

As we entered the 1990s ERC was faced with a number of major challenges. The massive growth in use of illustration within medicine was combined with the cutbacks occurring in health care budgets. This led to developing an extensive range of services and adopting a business approach to their delivery. Competitive neutrality and corporatisation of our activities had become important. In 1996 ERC merged with the Royal Women's Hospital and provided all its services to over 380 departments and 2700 individuals at Women's & Children's Health as well as to over 500 external clients.

Other highlights were the events we recorded along the way: from the Queen opening the hospital, to the Princess of Wales; and Prince Ranier of Monaco to the Pope; from Celine Dion and Michael Jackson; to Mickey Mouse and Humphrey B Bear we were there. From the Foo twins and then the Priestley twins and all the other conjoined twins that followed, to the discovery of rotavirus and the ectopic heart we've been part of the RCH team.

Recording of child abuse over the years also changed dramatically to the point of needing one photographer to be on call 24 hours a day after the implementation of mandatory reporting.

In the graphic design area computerisation brought a massive change in the way we did things. We went from no computers to just not being able to do without one! And with computerisation brought efficiency – which is just as well because the demand for our services continued to increase. Medical illustration, for example, went from producing no annual reports to eleven annual reports a year. Interior Design was probably the only thing not done on the computer: Jocelyn Bell transforming many of the areas of the old hospital.

In the video area our highlights were influenced once again by the digital age in bringing editing and recording into a much more user-friendly, efficient mode, but the development of 'Going Nuts with Macadamia' has to be a significant highlight. The concept was a magazine style format hosted by Macadamia (a friendly glove puppet) designed to inform, educate and entertain children. At the time this was a ground-breaking initiative. Macadamia started as a voluntary show until a sponsor was found. The staff of Safeway really got behind this show and together with Educational Play Therapy and Christine Unsworth, Director of the Good Friday Appeal, we nurtured our relationship with them. This resulted in an increase of their fundraising activity to over a million dollars, 90% of which was then directed to buy important pieces of equipment for the patients. Our small percentage however changed the way we did things for our clients and meant that we have been able to buy leading edge equipment which helped us produce more powerful videos for patient information and fundraising.

Probably the last area of significant innovation was in establishing the web development function. The generous support of Tattersall's to fund our webmaster was obviously a highlight as was the work we have done on the intranet, the MCRI site, for example, and our new internet site. The power of the web to really focus on the organisation and see the whole really clearly on your desktop was just brilliant and enabled us to bring better solutions to communication through this medium.

I have had the privilege of working with so many distinguished people over many years and like my staff, it seems dangerous to single any out. From Elizabeth Turner who gave the first penicillin to a child in Australia, to Howard Williams who was one of RCH's greats, to all of the alumni, it has been a real honour to make a small contribution to support you to illustrate the significant improvements you have all made to paediatric medicine and make RCH a truly great hospital. The ERC team in 2011 – the majority of whom were working here in 2002 – is pictured below.

Gigi Williams FRPS, FBCA, FAIMBI, BAppSc was on staff at RCH for 33 years from 1982 and was Director of the Educational Resource Centre from 2004-2015. View her full profile.

Sources:

1847 photo (page 13) from a collection in the National Gallery of Scotland. Ref: BMJ 1973:2:104 Wilson, G.M. "Early photography and Dr James Inglis".

Other photos from page 13–16 Collected in albums held in the RCH Archives.

Photos on page 17 & 18 ERC collection

How technology has changed the future for children born with heart defects.

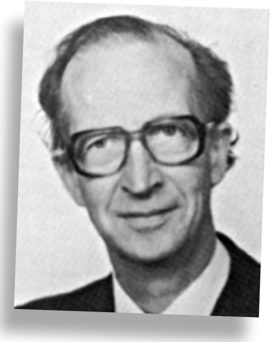
Jim Wilkinson AM

Time sequence of Technology events affecting management of children with heart defects:

- **'30s** No surgery available. Accurate diagnosis not possible in many cases.
- **'40s** Limited surgery for extracardiac procedures (PDA, Coarctation, BT shunts)
- **'50s** Cardiac catheterisation allowing diagnosis; Start of Open-Heart surgery.
- **'70s** Beginnings of 2D Echo / non-invasive diagnostic tools.
- **'80s** Catheter interventional options.
- **'90s** Computers and all that.

Until the early 1940s most children with heart defects were managed by adult physicians, as there were no paediatricians with training in the specialty of cardiology and treatment options were very limited. Dr Mostyn (Mick) Powell, a paediatrician at Melbourne Children's Hospital in Carlton, (pictured right) is quoted as saying that advice to many parents of a "blue child" was along the lines of "Your child has a heart abnormality, but there is nothing that can be done. Take him home. He will not live very long. If he is very sick you can bring him back and we will do our best for him". The only methods of investigation for such heart problems were a standard chest Xray and/or fluoroscopy and an electrocardiogram, none of which could unravel the nature of most such heart problems.

Then several changes brought hope. During the late thirties/early forties some options emerged for defects where surgery on blood vessels outside the heart itself could be employed to relieve the effects of the heart defect (Patent Ductus, Coarctation, BT shunt). Diagnostic tests involving heart catheterisation were being used, following the heroic self-catheterisation by German physician Werner Forssmann in 1929, in the hope that a more precise diagnosis of heart problems might be reached.



At Melbourne Children's Hospital Dr Mostyn Powell, along with a radiologist, Dr Harry Hiller, published some early studies with angiography in 1951 (recording Xray pictures of the chest after injection of "Xray dye" into the circulation). Dr Alexander Venables (pictured right), a young paediatrician went to England where he worked with Dr Paul Wood (a graduate of Melbourne medical school), who was exploring heart catheterisation to better understand the effects of congenital heart defects.

Dr Wood was an adult cardiologist but looked after many children at The National Heart Hospital in London and developed a major interest in the patho-physiology of congenital heart defects.

Dr Venables returned as physician to outpatients and assistant to Dr Powell in The Cardiac Investigatory Clinic. At the same time (mid-fifties) surgeons in North America and Europe were beginning to employ "heart lung bypass" machines that could maintain the circulation and add oxygen / remove carbon dioxide to / from circulating blood were being developed, and a small number of successful "bypass operations" took place during 1953 / 54.

The first effective method in 1954, used by Dr Walt Lillehei in Minneapolis, was called "Cross Circulation" in which an adult "donor" was used in a procedure, with

two adjacent operating tables, that connected a parent or other adult to the child so that the adult's heart and lungs could support the child during an open heart operation. Fortunately improvements in bypass machines rapidly led to the discontinuation of Cross Circulation (1955), when Dr Lillehei changed to using his own machine (Lillehei-De Wall "bubble oxygenator") and Dr John Kirklin at The Mayo Clinic, in Rochester, Minnesota started using the "Mayo Gibbon" thin film oxygenator.

In 1965, as a final year medical student, I went on a surgical exchange scheme to Minneapolis, where I was assigned to the service of Dr Walt Lillehei and saw many operations using his bubble oxygenator.

In Australia, in 1957 Mr Ken Morris, at the Alfred Hospital in Melbourne, carried out the first operation in Australia to close a "hole in the heart" (VSD). At the Children's Hospital initial attempts to introduce heart-lung bypass, by paediatric surgeons Russell Howard and Peter Jones, led to the appointment of Mr George Westlake in 1960, who successfully repaired a range of heart defects over the next eight years using bypass.

The use of heart catheterisation had become the main diagnostic tool by the late 1950s, but for infants this was a hazardous procedure and led to quite frequent complications and deaths. Improvements in equipment led to more reliable diagnoses and less morbidity but it was not until the 1970s that such procedures could be carried out safely and reliably. The Xray pictures were recorded on Xray film which needed to be changed rapidly to display the fast-moving circulation of Xray dye (angiography). In the early years (1950s) a manual method of changing films was employed.

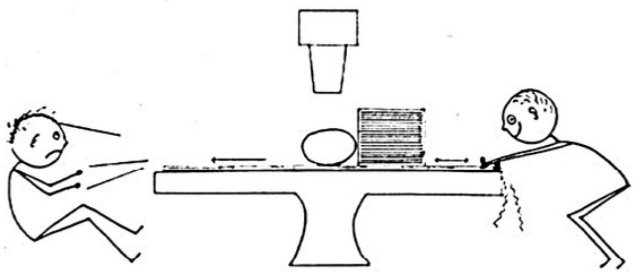


Diagram to show hand-operated film changer in use in the early 1950s (drawn by Professor John D Hay). The operator (right) needed considerable strength and fitness to move the films through, with a wooden slide, beneath the patient; with practice a rate of 2 frames per second could be achieved. The assistant (left) needed the talents of a rugby scrum half to retrieve the exposed plates as they emerged

Later, rapid film changers were developed by a Swedish Company (Elema-Schonander) and were widely installed in Xray rooms. The use of two Xray machines, working simultaneously to allow imaging from the front (or back) of the patient (AP) and, at the same time, from the side (lateral), was a major step forward but necessitated very complex machinery.

By the late sixties the use of cine cameras was being experimented with to achieve higher frame rates. This added a further level of complexity to the equipment, as I saw in 1968 when biplane cine-angiography was being introduced in the hospital in England where I was working as a resident.

Such equipment was in its infancy and required skilled technical support. In the same year, in Melbourne, the 'Royal' Children's Hospital, which had acquired its "Royal" Title (1953) and moved from Carlton to Parkville (1963), established its Cardiology Department formally with Dr Alex Venables as the director.

Its first generation of "bi-plane" Xray equipment for cardiac catheter work was purchased from a Japanese company and installed in 1974 but proved unsatisfactory and had to be replaced with equipment developed by the Philips company, from Eindhoven, Netherlands.

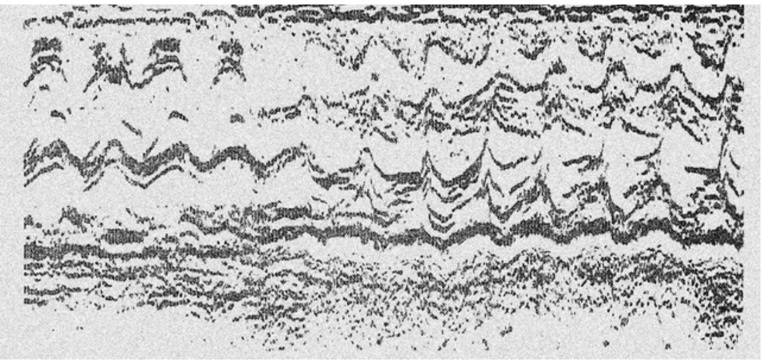
The early versions of equipment had fixed AP and Lateral Xray planes, but it became apparent that the best views for imaging heart structures needed oblique planes, which required rotating the patient and using pillows or other objects to prop the child into positions producing different degrees of obliquity and / or cranio-caudal tilt. By using a ceiling mounted lateral plane, which could itself rotate, and a floor mounted AP plane with its own rotational capacity it became feasible by the late seventies / early eighties to obtain a wide range of oblique planes without moving / propping the patient.

The change from rapid film changers or roll film to cine cameras took place in most centres during the mid to late seventies and allowed for a very useful increase in frame rates from around eight to ten frames per second up to 32 frames per second (or even 64 fps).

The films were viewed on a cine viewer / projector (e.g. Tagarno) and several such projectors became available in the Xray department, conference room and elsewhere.

At about the same time a new generation of imaging equipment was emerging using ultrasound rather than Xray. From the beginning of the 1970s ultrasound scanners were available for obtaining "single crystal" echocardiograms.

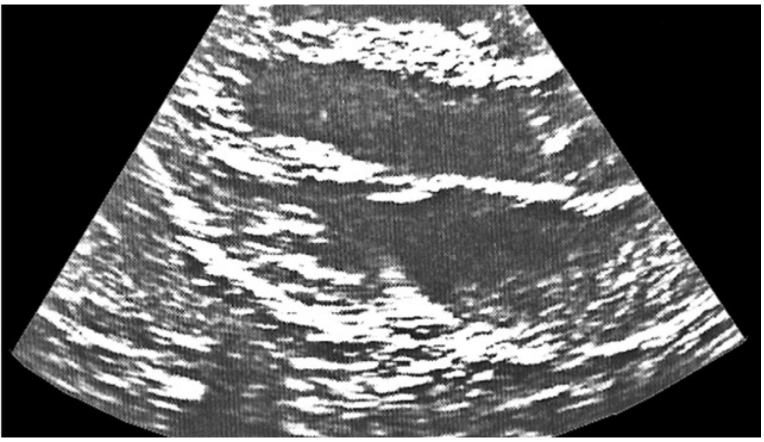
These had been developed over the preceding twenty years. Their main practical use was to record "M Mode traces" which showed the lines of movement of cardiac structures detected by a single narrow beam of reflected ultrasound (see picture, following page).



An M-Mode scan

Experimentation on animal hearts had allowed physicians to recognise the characteristic motion of the different cardiac structures. The images obtained were very useful to highly trained and experienced observers but were baffling to the untrained eye.

By the mid-seventies the use of multiple crystals or a mechanically oscillating transducer allowed the reflected ultrasound to generate a 2-dimensional image (called "cross sectional" or "real time" echocardiography). This technology developed progressively in the mid to late seventies, though the early machines could only produce crude / grainy images, which were of limited diagnostic use. I rather foolishly predicted that the pictures would never acquire the clarity needed to see details of the structures such as heart valves which we needed.



A 2D echo

As such, in 1975 one year after I started working as a consultant in Liverpool UK, I could not imagine, that echocardiography could replace the use of angiography for most purposes.

Happily, the technology advanced quite rapidly and the image quality that could be obtained improved to the point that many cardiologists were happy to rely on echocardiography as their main diagnostic tool, rather than cardiac catheterisation and angiography, within the next decade.

This non-invasive and radiation free tool proved to be a huge advance and certainly changed my life from 1977, when we obtained our first 2D Echo machine in Liverpool. It altered the practice of paediatric cardiology dramatically in most centres around the globe over the following decade.

Ultrasound machines were also being used in the neonatal units and in Melbourne during the eighties ATL and Varian machines came into use at RCH and in some of the neonatal units.

A Hewlett Packard machine was also acquired at The Royal Children's Hospital and was able to produce very good quality images.

By the mid-eighties echocardiograms were being performed routinely on most inpatients and on many of the outpatients. The portability of the machines allowed them to be operated at the patients' bedside and in Intensive Care.

Recording of the echo studies was made on VHS cassettes and VHS cassette recorders and high-quality TV monitors became a major feature of our regular clinical and teaching sessions.

Early in 1988, after I took over as department director, we expanded our echocardiography facilities with the acquisition of additional equipment from Hewlett Packard, including a smaller portable machine which we could transport in a car or plane to use at outlying clinics in country towns in Victoria, New South Wales, Tasmania, etc.

By this time most of our machines could employ Doppler and Colour Flow Mapping which were extremely valuable additions to the 2D images that had existed from the mid-seventies, allowing much better assessment of blood flow velocity, degrees of stenosis of valves, quantification of pressure gradients, etc.

All these features added to the diagnostic capabilities of Echocardiography, reducing the need for invasive cardiac catheterisation.

Pushing in the opposite direction however was the emergence of new technology which allowed therapeutic procedures to be carried out without surgery on the heart / chest.

The first such procedure had emerged in the sixties and was aimed at palliating the cyanosis and reduced oxygen levels in the blood of infants with "Transposition". In about 1966 Dr William Rashkind in Philadelphia devised a non-surgical method for enlarging the normal (small) communication that existed in newborn infants between the two Atria (upper chambers of the heart).

This allowed blood in the left side of the heart with high levels of oxygen to mix with the blood in the right side which was deficient in oxygen and improved the babies oxygen levels allowing the infant to live for many weeks or months and to grow to a size where surgery could be carried out successfully.

Prior to the introduction of this procedure most affected infants would die within a few weeks after birth unless a surgical procedure (so called Blalock-Hanlon operation) was performed to enlarge the hole surgically.

As this surgery involved high risk the non-surgical option (so called Rashkind procedure), with much less risk, offered an attractive alternative option. Dr Rashkind went on to devise and successfully perform procedures to close a PDA (Patent Ductus Arteriosus) and an Atrial Septal Defect employing a "double umbrella" device, which could be placed at the appropriate site and released, being retained as a prosthesis to seal off the defect.

The procedure to close a PDA was widely adopted in centres around the world employing the so-called Rashkind Device, though the ASD devices, as used by Dr Rashkind, were not widely employed, being replaced by a series of superior devices during the 1990s.

In Melbourne Dr TH Goh was heavily instrumental in introducing many interventional procedures. The introduction of such therapeutic options paved the way for the introduction of a range of "Interventional Catheter Procedures" during the late 1970s and 80s.

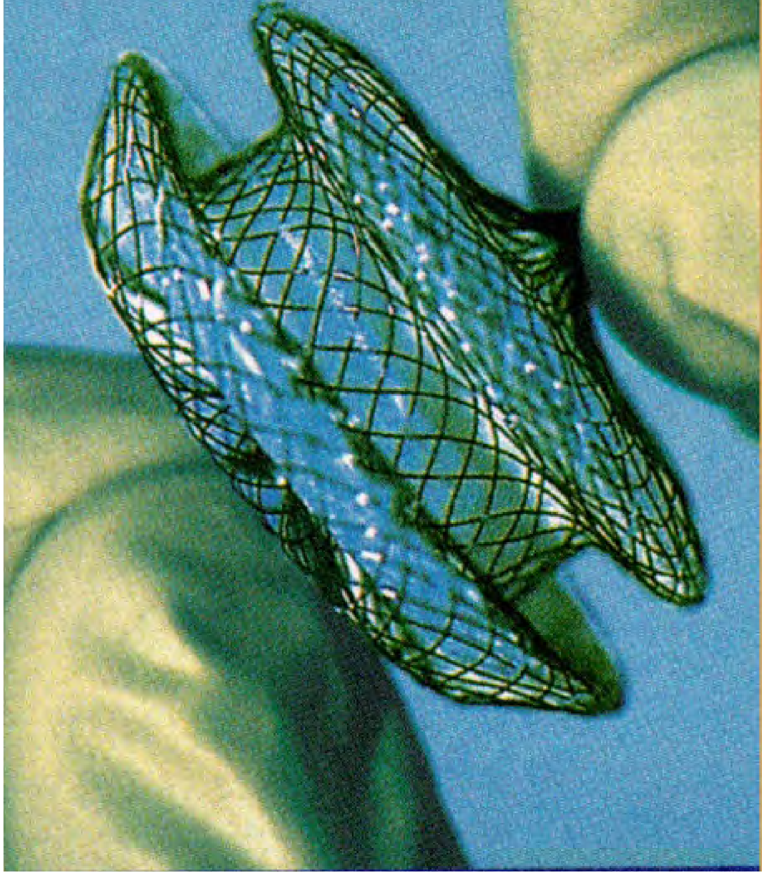
Balloon dilation, involving the passage of a catheter with an inflatable balloon through a narrowed valve or blood vessel. Once in position, inflation of the balloon could produce enlargement of the narrowed structure (Balloon angioplasty / valvuloplasty).

This became an option for treating pulmonary or aortic valve stenosis, coarctation of the aorta and a range of other defects where obstruction to blood flow could be improved by such interventions.

Many patients who had previously needed surgery to relieve such problems were able to benefit from such procedures, either as alternatives to surgery or to relieve a recurrence of the narrowing which might sometimes follow an earlier operation.

Device closure of Atrial Septal Defects in Melbourne began in 1996, using the "Amplatzer Septal Occluder" device. The Royal Children's Hospital was the first hospital in the Southern Hemisphere where this was performed, and I subsequently travelled extensively in Australia (Sydney, Brisbane, Perth, Adelaide) and to many Asian centres to mentor Adult and Paediatric cardiologists with this procedure.

Whereas the main need for heart catheter procedures in the 1960s and 70s was to make a diagnosis of the nature of the heart defect the situation changed with the arrival of echocardiography. By the 1990s and subsequently about half of all catheter procedures were performed to



The Amplatzer Septal Occluder device

carry out an interventional procedure, with many less being required for diagnostic purposes.

During much the same time period new technology was bringing personal computers into everyday use for a range of purposes.

Prior to my arrival at RCH in 1988 I had experience of using IBM compatible and Apple Macintosh computers for working with word processing, spreadsheets, databases and graphics applications.

Soon after my taking up the position of Director of Cardiology at Royal Children's Hospital we had the opportunity to join with a software developer to create a large multi-function database specifically for cardiology purposes. Called "Cardiocare" (later changed to Cardiobase) and related to an earlier pacemaker application "named Pacecare" this evolved in 1989 / 90 and was installed on a local area network (LAN) of computers within the cardiology department in December 1989. It was the first LAN within any department in the hospital and was initially independent of the hospital computer network though subsequently linked into it.

A legacy from a relative of a patient provided the necessary funds to purchase a number of computers which provided the Server and the nodes on the network. Appropriate network software was purchased and installed, and the hospital IT department assisted in planning the architecture of our LAN.

This was the era before Windows software was being used at all widely, though early versions had just emerged. The Disc Operating System (DOS) was Microsoft based and somewhat "clunky". The available applications for IBM compatible PCs worked with MS DOS.

Hospital electricians wired all the network cabling. It was a time of some eager anticipation and excitement for our team. In January 1990 we were ready to test it all, anticipating that the multiple databases of patient information, including our transplant data, test data and diagnostic information would be running smoothly on the network and available for cardiologists, secretaries and technicians to access.

When it was first turned on the disappointment was huge as we found that none of the nodes would link up to the server. A rapidly convened meeting of the IT experts, software suppliers, computer suppliers, electricians, etc. was unable to identify the cause of the problem.

I unwired one of the computer network connections and checked the connections of the multiple coloured wires. I rapidly realised that it was not wired correctly. Another connection was checked and was also wrongly wired (but with different errors). The electricians were now enjoying the long summer break and did not have enough manpower to help. We would have to wait a month or so until they were all back at work!

A small amount of experimentation rapidly demonstrated that the necessary rewiring was well within the capacity of a cardiologist with a soldering iron (myself). I recruited two assistants (my chief technologist and my 17-year-old eldest son) and we spent most of a weekend doing the necessary work. The result of our inexpert labours was spectacularly successful with the entire network running smoothly from that day onwards.

Happily, the main patient database (Cardiobase) has expanded and been upgraded many times. The same system is now in use in many hospitals in Australia, the UK and elsewhere, and is still used every day and at our weekly department meetings more than thirty years later.

Our transplant database, which I set up in 1988/89 soon after our transplant program commenced, originally programmed using an application called "dBase", is also still in regular use after several changes in the software that it works with.

There were many other changes brought by advances in technology, but they can be left for another chapter in this story.

With all the many changes that have emerged the mortality for infants born with a congenital heart defect has fallen from upwards of 30% in the 1950s to around 2 % in the current era.

Nearly all cardiac defects are amenable to repair or to effective palliation, either surgically or using catheter interventions, allowing a good quality of life for most patients for many years or decades and a near normal life span for many.

Professor Jim Wilkinson AM was Director of Cardiology at RCH from 1988-2001. He is currently Vice-President and Treasurer of the RCH Alumni. View his full profile.

The early clinical application of advances in Biomedical Engineering: Neonatal Transport Incubators

Neil Roy

Fellow Alumni, you may have noticed that I have dropped the 'RCH' from the title on which we were asked to contribute.

This is because, while I did have the pleasure of working with Glen Johnston when I was Divisional Director of Neonatal Services during the era of the Women's and Children's Healthcare Network (1995-2003), my association with Glen was purely an administrative one (Biomedical Engineering Services at both hospitals as well as both Neonatal Units were under the umbrella of the Division of Neonatal Services).

This little treatise is, however, about the role of the Engineering Services at the Royal Women's Hospital in the development of neonatal transport incubators in two separate eras, 1949 and 1976.

1949

A conference called by the Victorian Hospitals and Charities Commission (HCC) in December 1948 to discuss "The Prevention and Management of Premature Babies" determined that a standing committee should work towards producing certain items of equipment and material for pamphlets on the subject.

Three people associated with the Women's Hospital (Obstetrician Dr. Ivon Hayes, paediatrician Dr. Kate Campbell and the Medical Superintendent Dr. William Refshauge) were on this committee.

One of the items needed was a "hand ambulance" for transporting premature babies to institutions which had facilities for managing these babies.

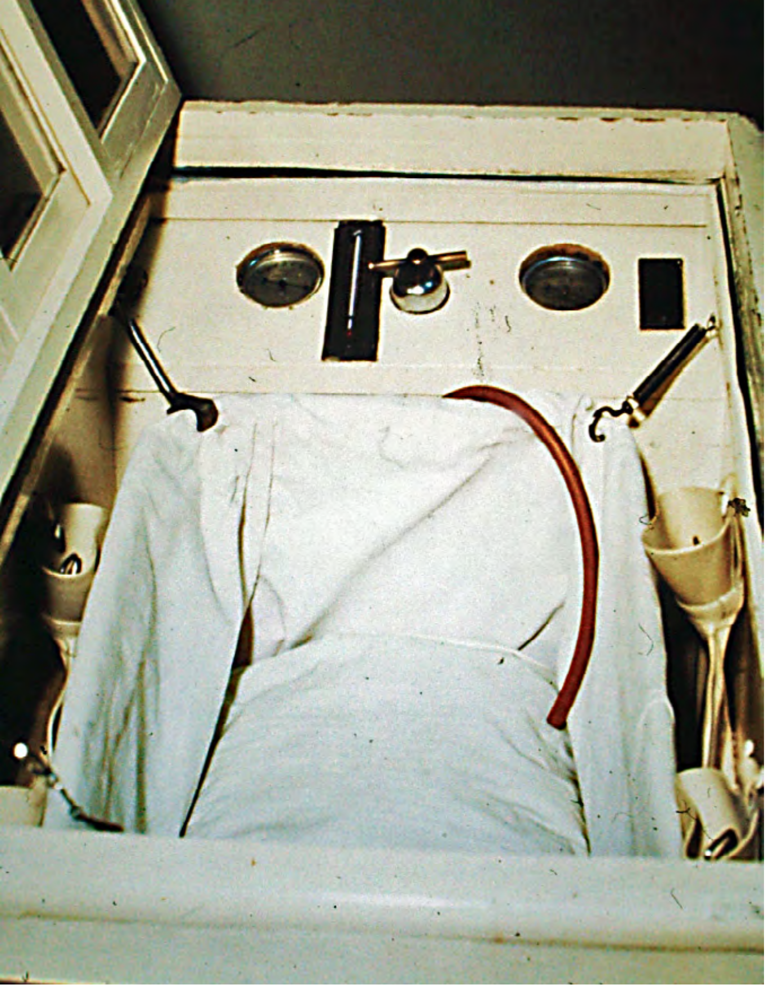
As the HCC didn't have a staff Engineer, it was suggested that the Women's Hospital's Engineer, Mr. Jack Murphy might be able to assist.

By January 1949 he had already commenced its construction – in his spare time in the evenings – under the guidance of Dr. Refshauge and Kate Campbell.

Above Top, Mr. Jack Murphy, RWH Chief Engineer

Left, Dame Kate Campbell (Australian Dictionary of Biography, ANU)

Right, Sir William Refshauge – Medical Director Women's Hospital 1948-51. Later he was Honorary Physician to Queen Elizabeth II (1955–64), Director-General of the Australian Government Department of Health (1960–73), and Secretary-General of the World Medical Association (1973–76). (Wikipedia)



Images of the Premature Baby Ambulance. Designed and built in the Women's Hospital Engineering workshops by the Chief Engineer Mr. Jack Murphy under the supervision of Drs. Campbell and Refshauge.

The sides and base are constructed of wood and the top has sliding perspex panels for access and observation. The wire cot lined with linen is suspended by springs on each corner to improve the ride.

The idea for this suspension came from Dr. Refshauge's wartime experiences noting the reduced likelihood of injured soldiers going into shock if they were carried smoothly.

Essential warmth is provided by 5 hot water bottles hanging on hooks on the inside walls, with a thermometer showing the temperature inside the cot.

The walls are lined with corrugated cardboard for additional insulation. Oxygen is provided from a cylinder placed externally in the recess at one end, there being gauges showing the capacity of the oxygen cylinder and the flow rate being used.

The oxygen is directed through a pipe that runs around the inside of the cot between the walls and the hot water bottles, thus warming the gas before it is delivered to the baby, which occurs via a rubber tubing from the end of the pipe near the head of the baby.

It has chromed steel rails along all sides and certainly would need two strong people to carry it. A subsequent improvement was the construction of a well-sprung carriage with three pneumatic tires so that it could be wheeled rather than carried.

This transport incubator is the forerunner of the modern transport incubator and incorporates the principles of warmth, oxygen delivery, a gentle ride and the ability to observe and access the baby.

The prime reason for its construction was the transfer of babies in from outlying hospitals for specialist treatment – the fore-runner of today's NETS. It was based at the Women's Hospital, picked up by the Victorian Civil Ambulance Service and taken to pick up the baby and transfer it.

The big differences from the subsequent NETS service were that there were no trained doctors or nurses to accompany the baby, and of course, no ability to use I-V therapy or respiratory support.

The Women's also saw the value of the appliance for transporting babies within the hospital, from the Labour Ward or Theatre to the Prem Nursery, which in those days could mean moving between buildings; this was in fact its most common use.

It was also used for transporting babies from the Women's to the Children's Hospital if they required surgery or specialist care.

The use of this new incubator had an immediate impact; the following year, in its first full year of use, the hospital's Annual Report in 1950 stated - "Most interesting is the great difference in the mortality rate this year of babies born outside and then admitted to our Hospital, to those rates of 1948 and 1949. In 1948 the mortality rate was 56%, 1949 was 40%, and this year is only 22%. Moreover, taking the smaller babies of this group, it is found that the mortality rates of those born under 4½ lbs. are the same whether born inside or outside this Hospital. This achievement has been made possible only by the use of the premature baby ambulance designed by this Hospital.

During the year under review the ambulance has been used over 100 times to transport babies outside this Hospital. The longest trip was to Kyabram, and the smallest baby transported weighed only 1 lb. 12 ozs.. This latter baby has grown into a bonny child."

Further to the discussion at its 1948 conference, in 1954 the Hospitals and Charities Commission, at the request of the Director of Maternal, Infant and PreSchool Welfare, Department of Health, issued information to the matrons of midwifery hospitals concerning the care of premature babies.

This ten-page document, prepared by the Women's paediatrician, Dr. Kate Campbell, included instructions for the use of the premature baby ambulance. Again this is the fore-runner of the NETS Information Booklet, first published in 1980, which over many iterations has subsequently developed into the Neonatal eHandbook widely used today.

There were 2 cots built. One still exists in the University of Melbourne Medical History Museum collection.

The units were in use until 1966. Subsequent cots in use by the ambulance services were the Acclibator (also in the UoMMHM collection) and the C.I.G. Therm-o-cot.

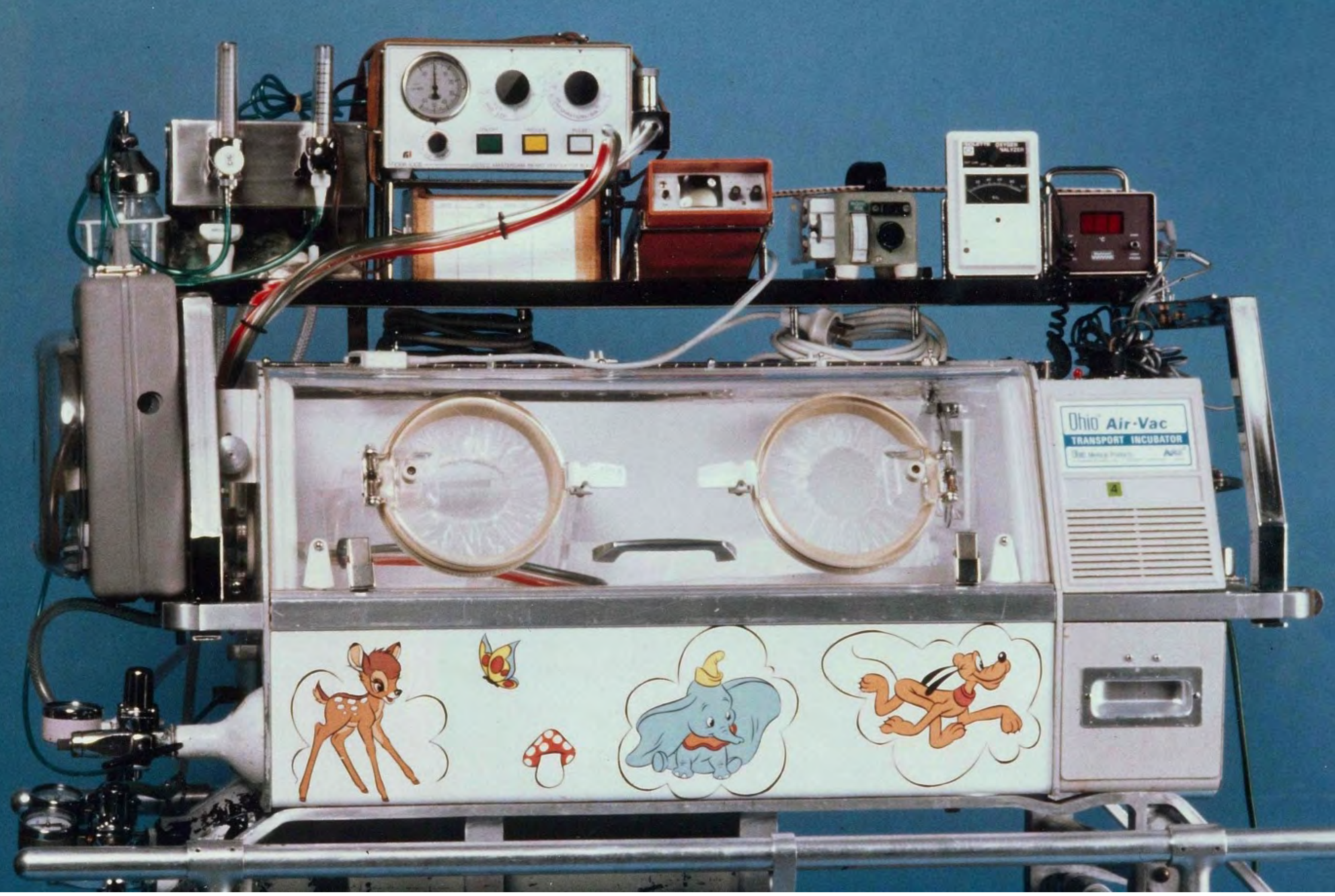
1976 – The 1st NETS Incubator

Twenty-six years after that HCC meeting that led to the first transport cot, in July 1974 Dr. Bill Kitchen with his customary foresight called a meeting of interested parties to discuss the need for a modern transport service. Other names at that meeting that will be recognised by many alumni include Dr. Neil Campbell, Prof. Arthur Clarke, Dr. John Drew, Sr. Maureen Gleeson, Dr. Tom Lambert, Mr. Bob McMahon and Dr. John McNamara. Both Bill Kitchen and Maureen Gleeson had studied neonatal transport systems overseas and gave excellent insights as to what was required. A series of meetings over the next 2 years led to the birth of NETS in 1976. I was fortunate to have returned just 9 months earlier from my 2 years' neonatal experience in Canada and was the only paediatrician in town to have had significant exposure to the latest developments in neonatal transport – a serendipidous career-defining opportunity for me!

The new service was introduced in October 1976 as the Neonatal Emergency Transport Service based at the RWH. (NETS changed its name from Neonatal to Newborn in 1980). The basic transport incubators by now were very effective incubators using the standard forced convection heating principle, with good temperature control because of relatively small size and good insulation.

The Ohio Air-Vac incubator was selected. It could be powered from a variety of sources – 240v AC, 24v DC (the standard used in aircraft) or 12v DC either from its own battery or from standard road ambulances. However, other than measuring the incubator temperature there were no other monitoring or other supporting devices.

This is where the RWH Engineering Department came to the rescue again! Jack Murphy's successor, Mr. Bruce Norton, was very innovative and constructive (literally) in producing the superstructure required to take the additional monitors and therapeutic devices and to adapt them as necessary to make them portable.



Illustrated above is the Ohio Air-Vac incubator, suitably decorated by the NETS nurses. The chrome-plated superstructure constructed by Bruce Norton's team has brackets for all pieces of equipment as well as a box at the left end to hold the oxygen and air flowmeters which are fed from cylinders below – the oxygen cylinder being stored in the incubator case and 2 air cylinders held in a cradle beneath the incubator (more air than oxygen was required because the ambulances and referring hospitals had supplies of oxygen but not air).

From left to right along the frame are –

- Laerdal battery-operated suction apparatus, hanging in its case on the left end.
- Bubble "humidifier" (part hidden behind the suction apparatus); very inefficient and superseded a few years later by the Fisher-Paykel heated humidifier.
- Oxygen and air flowmeters; inhaled oxygen concentration was adjusted by balancing the flows.
- Loosco infant ventilator, underneath which is a battery pack uniquely designed by Bruce Norton to give a 30v DC supply to the ventilator, which otherwise only ran off 240v AC.
- Cardiominiscope – battery operated heart rate monitor with miniature screen of wave form.
- Holter infusion pump – operated on the basis of persatalsis. Well before syringe pumps.
- Air-Shields oxygen concentration analyser – well before oximeters or TCP02 monitors.
- C.I.G. baby temperature monitor with either skin or rectal probe.

Two cots plus additional equipment were built. Each cot, including all equipment cost $6,500.

A further involvement of the RWH Engineering Department was the development of the self-folding undercarriage for loading the NETS cot into the ambulance, and in assisting with the interior design and fittings for the first dedicated NETS ambulance in 1980 (above).

1. The NETS incubator ready for loading.

2. Undercarriage folding beneath the frame holding the incubator.

3. The frame secured to the floor – across the ambulance - with the team facing forwards and with seatbelts. (Alumni might recognise the trainee registrar – now a Professor of Neonatology).

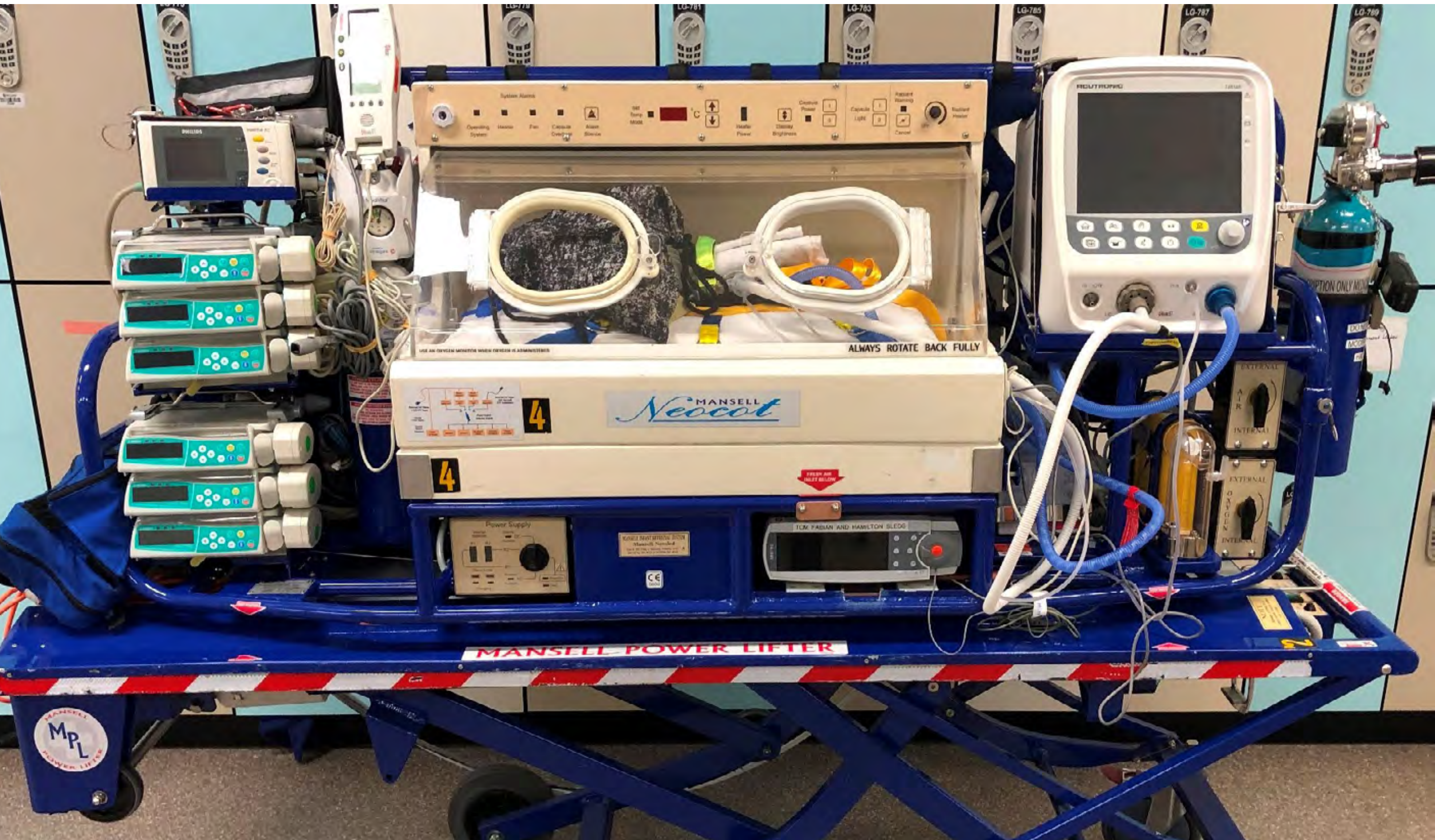
Fast Forward to 2020 - Today's transport service (curiously named PIPER – the only Piper I associate with transporting children is the one from Hamelin – and look what happened to them!) has its own ambulances fitted out especially for neonatal transport and the modern incubator is part of a module providing full life-support facilities including all modes of ventilation, including HFOV and nitric oxide as well as sophisticated monitoring and multiple syringe pumps for complex infusions. Truly a mobile intensive care unit.

This 'Neocot' was developed by the private company Mansell in consultation with my successor, Dr. Michael Stewart. However, the Biomedical Engineering Service at the Royal Children's Hospital is heavily involved in its maintenance and adaptation and integration of new equipment into the module.

The cost of each new module is approximately $200,000!

The world of neonatal transport has moved on since 1949!

Dr Neil Roy AM was Director of NETS 1976-1999



Edmund (Eddie) Keir

BA (Psych), TPTC, TTCTD, MAPS, FAudSA

12 Feb 1932 – 16 July 2020

Audiologist and Head, Department of Audiology, RCH 1960-1997

Susan Selwyn

Eddie was a gifted clinician who has left a great legacy to a generation of RCH child patients, their parents, teachers and to us, his colleagues.

Eddie was an astute observer of children and adolescents referred to RCH with developmental speech and language disorders, learning and/or behaviour difficulties. From his training and clinical experience in both psychology and audiology, Eddie's legacy is informed audiological testing providing detailed management recommendations for some children with certain previously undiagnosed problems. Eddie was a leader in his field of highly specialised audiological assessment, far beyond deafness (acuity). He provided a different understanding of the underlying basis for such difficulties.

During my own clinical work at RCH in clinical psychology and later child psychotherapy (1979 – early 1980's) I learned from and valued Eddie as a colleague. Eddie found that in children of otherwise average intelligence (within the statistically normal range), the presence of one or more audiological deficits impacted seriously on communication and learning.

Behaviour difficulties in young children are often correlated with learning problems and language disorders

Despite other cognitive skills and strengths, typically these children misunderstand others, and are gravely misunderstood – their non-compliance with requests and instructions can be mistakenly attributed to inattentiveness, disinterest, laziness, oppositional tendencies or low intelligence.

Eddie was alert to the child's experience of his cognitive difficulties - not surprisingly, the child with these weaknesses is frequently embarrassed, at being conspicuously different from his peers, is confused by his experiences in the classroom and at home, in interactions with their parents, other children and teachers. The emotional sequelae often include low self esteem, with clinical findings of anxiety, and of depression.

Eddie's expertise was in recognition of the connections within some aspects of the brain-behaviour relationship – between previously undiagnosed specific auditory deficits and associated cognitive functions.

Specialised testing at the RCH Audiology Laboratory included:

1) Auditory Processing – the meaning given by the brain to sounds heard – some children have a weakness in this area.
2) Acuity or over external impedance – or hearing against background noise as in an ordinary home environment, or in a classroom – for some children focus on a task is disrupted by simultaneous irrelevant or extraneous sounds, whether close by, or distant.

He emphasised a keen attention to medical aspects of a child's early developmental history that can have an impact on hearing – for example a history of ear infections suggests both inconsistent optimal acuity, and intermittently altered or muffled sounds; these inconsistent auditory experiences can delay speech and language development .

Early in his professional life Eddie's learning was informed by administration of comprehensive diagnostic psychological standardised tests.

These cover a range of separate cognitive abilities that are fundamental both to formal education and to informal learning during normal childhood development and socialisation.

Low scores on either the short-term auditory memory task, and / or the auditory comprehension and reasoning items (a series of spoken questions, of increasing difficulty) indicated a referral for audiological assessment.

Eddie was enthusiastic in communicating with great clarity both the findings of audiological assessments, and specific recommendations arising from them.

He was kind, patient and generous in conveying this information to others.

His skill was in the translation of complex cognitive functions into meaningful concepts that were easily understood during discussions with the child, parents, teachers and colleagues; and in reports both within and beyond RCH. Eddie was a collaborative professional.The specific individual recommendations for management, both at home and at school, and for specialised educational remediation were tailored to use each child's relative cognitive strengths, and multimodal sensory learning experiences to support their weaknesses.

For some children and their parents, the diagnosis of an auditory deficit may have been unexpected, and a great relief, with far reaching benefits.

At review it was often observed that a positive shift had developed in family interactions, with observations of a change in the child's experience of themselves, in their self-esteem and their relationships.

I feel fortunate that Eddie's legacy carried forward to my own professional work as a clinician and as a postgraduate clinical supervisor. When relevant it was helpful to convey his concepts - the implications of his knowledge, skills and understanding, to some of the next generation of keen young clinical psychologists and child and adolescent psychotherapists.

Sue Selwyn (as Sue Blashki) was a clinical psychologist (1979- 1982), and later in the mid 1980's a child psychotherapist for 2 years at RCH. Her continuing commitment and contribution to RCH since February 2013 is her membership of the Clinical Ethics Committee for the Children's Bioethics Centre.

Science as Inspiration for Art

An artist-in-residence in a research laboratory

Danny McDonald, Garry Warne and Andrew Sinclair

Our front cover this edition displays "Femto 1997" – a hybrid colour jet spray and screenprint on a polycarbonate substrate made by artist Danny McDonald when he was the inaugural artist-in-residence in Professor Andrew Sinclair's laboratory at RCH.

The full artwork is shown on the following page.

Danny explored the intrinsic beauty of images created in the course of medical science, placing them alongside forms from the natural and constructed environment.

The residency acknowledged the necessity/ importance of disciplines seeking different perspectives.

 Artwork: *Femto 1997* (Danny McDonald)

The artist: Danny McDonald

Advances in medical science have opened new worlds of enquiry, provided fresh examinations of the human condition and raised numerous ethical and moral issues. There are obvious benefits of cross-disciplinary collaborations in medical research; in partnerships between the clinician and the biochemist, the surgeon and the geneticist, the neuroscientist and the psychiatrist. Each brings complementary skills to address an issue.

What is the role of the visual artist in this arena of generally restricted access, and what collective role can scientists play in an alternative creative, aesthetic, cultural and educational expression of their research? These questions arose during my artist residency in the Department of Endocrinology and Diabetes at the Royal Children's Hospital, Melbourne in 1997 and informed my concurrent Monash University Master of Arts by Research project entitled Curio-Science.

Like my father, at a similarly young age, I had invasive heart surgery at the Alfred Hospital, Melbourne in 1995. My earlier exhibited artwork had probed the general subject of science but this exigent event helped to focus creative and theoretical concerns on advances in medical research and the associated impact on society that these developments have made.

Medical science emerged as a convenient host because I was considering issues related to health as a means of personalising and fluxing the elements of science, technology and art as a kind of aesthetic and cultural hybrid.

The RCH residency (as with the subsequent Confocal: A View Within project, 2004-2012, in the Human Neurotransmitters Laboratory at the Baker IDI, Melbourne) allowed virtually unrestricted access to the research laboratories' visual data, imaging equipment and other facilities and provided, most importantly, an opportunity for discourse with staff about their practice and findings.

Closely consulting with Garry Warne, Andrew Sinclair and Mathias Smith, there was no formal expectation by the institution of anything from me beyond a wholesome discussion of the apparent parallels between the disciplines and an eventual demonstration of the perhaps esoteric findings after I had sifted through their product – tacit diagrams, scans, digital hardcopy and transparencies of micro tissue sections, genetic mutations, molecular forms and gel sequences etc.

The resultant artworks were large-scale digital and silkscreen combination prints on transparent polycarbonate substrates outsourced to digital printers Colour Graphic and subsequently to master screen printer Larry Rawling. Arts Victoria provided funding for the printing and exhibition outcomes.

Medical research was an ideal science to investigate because so much of its activity was expressed in a variety of hard copy visual forms via digital and analogue technologies.

By reframing laboratory data in the form of a visual art statement, I interchanged their primary coding environments, outward appearances, purposes and language devices to create two synthetic series of images entitled Bastards of Perception and Curio-Science.

Through non-literal use of laboratory imagery in some works, in addition to the schematised and diagrammatic visage of others, and the deliberate obfuscation and betrayal of original source contexts, the question of how the means of our perception and interpretation of visual information are related was introduced.

The viewer was invited to speculate about the origins of the images as well as consider the unfamiliar role they had been asked to play in their new context. Proprietary scientists were also re-presented with their own material with an emphasis on its inherent beauty.

There was a presumption that scientists would be interested to see their data reconfigured in the agreeable and respected form that art making might bring to this primary interface.

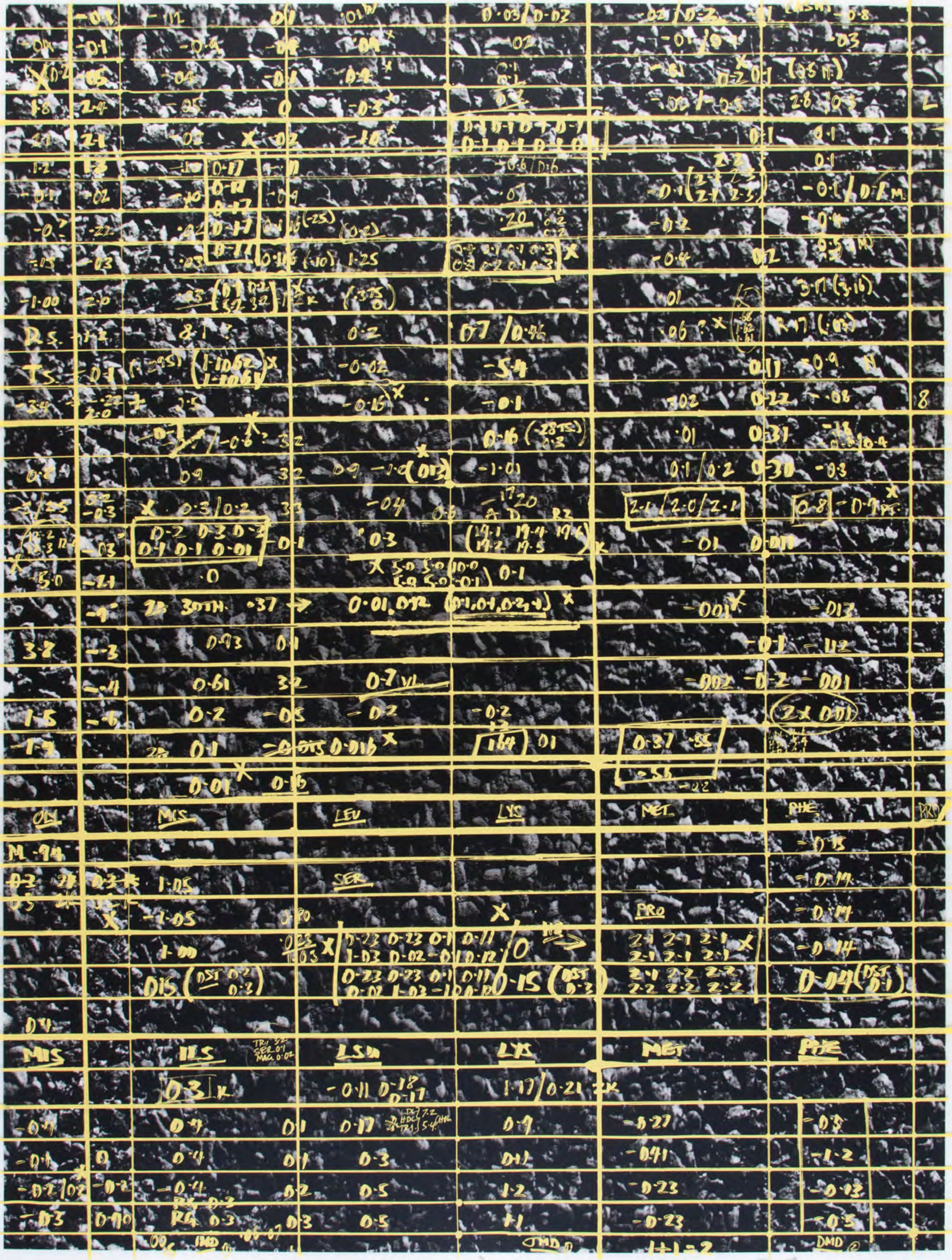
It was thought that they might be curious about a new perspective on their research and intrigued by the, perhaps minute, possibility that this apparently subjective view might just prompt a shift in the appraisal of their apparently objective science.

The attempted liaison of science, art and technology was also to provide a new perspective on an elusive but all pervasive Nature. Appropriation of this media suited my viewpoint as a printmaker who was familiar with photo transparency and visual paper print product and because this research field was, like art after all, concerned with the human condition.

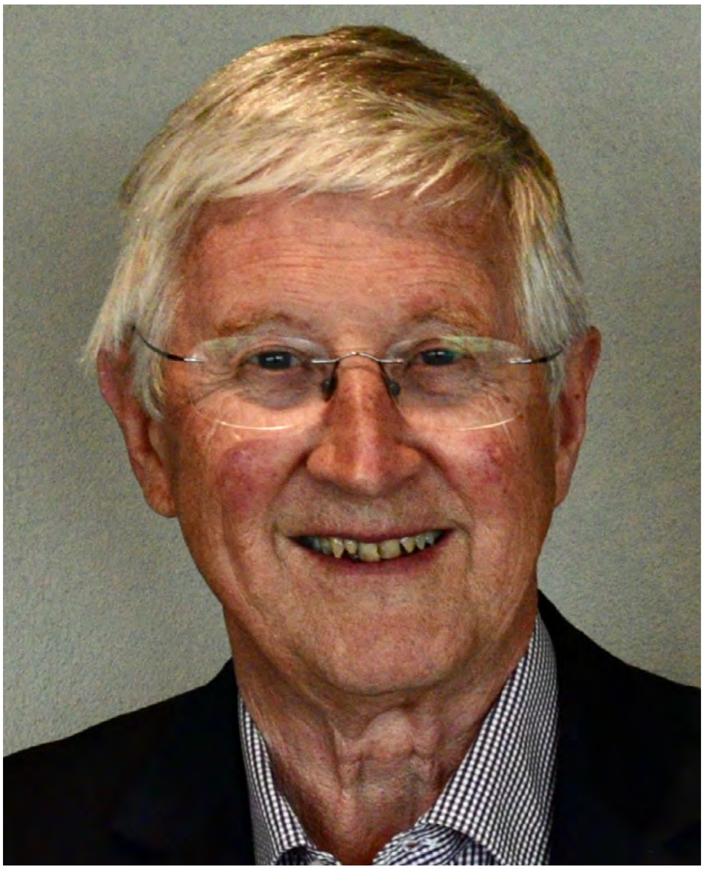
Underpinning my choice of medical science was an interest in contrasting both art and science's apparent differences with their resemblances as if they were in fact polarities of the same discipline.

Adapted extract from the chapter DEXA-Dan: Embedding the Corporeal Body by D McDonald, K McDonald and G Lambert in the book Collective Creativity. Collaborative Work in the Sciences, Literature and the Arts eds G Fischer and F Vassen, published for the University of New South Wales.

Danny McDonald (www.danny-mcdonald-artist.com) is an Australian artist working in Hamilton, Victoria.



 Artwork: *Qualities and Properties* (Danny McDonald)



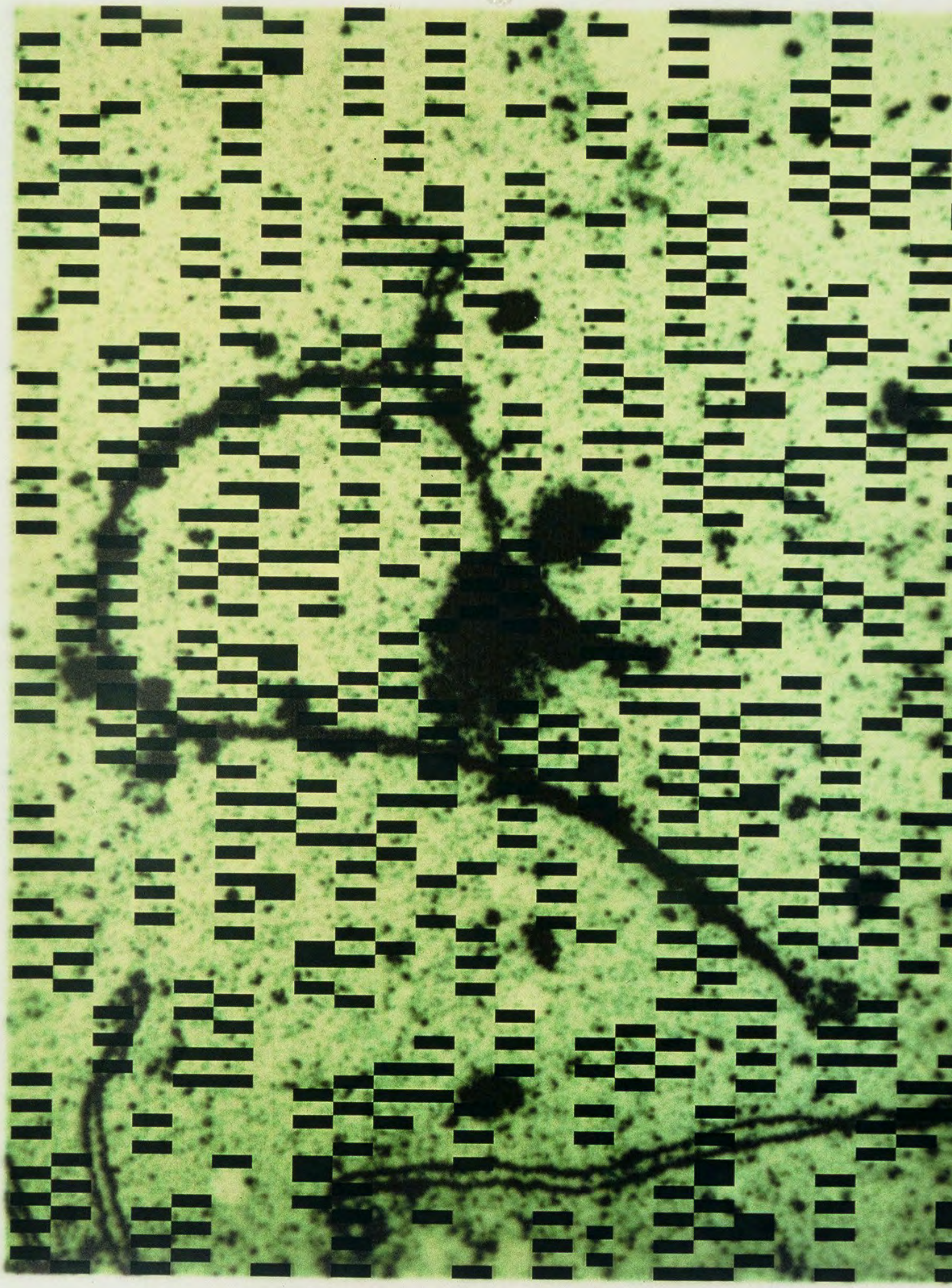
The clinician: Garry Warne

As a clinician, I was always on the lookout for ways of integrating the arts into medicine. There is nothing new about this – music therapists have been around for quite some time and psychiatrists are very familiar with ways of engaging patients and promoting emotional expression and psychological healing through the arts. As an endocrinologist treating young women with Turner syndrome, I was told by a group that had held a number of self-help meetings that "We can talk about our unhappiness with our bodies until we're black in the face, but it doesn't make any difference". Elizabeth Loughlin, our social worker, suggested that we try dance therapy. She was trained in this discipline and began holding dance therapy groups. The participants signed up for a series of six sessions. At the conclusion of the last session, one young woman said to me over a cup of coffee that she had looked at a video of herself dancing and had seen "a kind of beauty that I had never seen before".

My experiments in the arts went further. To help parents begin explaining an intersex condition to a young child, I wrote a fairy story containing the simple message that not all children are born the same and that it's OK to be different. I wrote booklets for lay people explaining intersex conditions in ways that I thought would help them to view their child's condition differently and more positively, using illustrations conveying their own positive message that were carefully and beautifully created by Jocelyn Bell in the Education Resource Centre. These were very well received internationally and have been translated into many languages.

When my artist friend Danny McDonald mentioned to me that he had a desire to make works of art that drew for inspiration on the visual outputs of scientists, I was intrigued. When you think about it, scientists seeking to gain a deeper understanding of nature's mysteries do so by producing and interpreting data that are tangible and visible – gels, data sets, graphs, and images – and which can be published as evidence of a hypothesis being proven. Why should these images and jottings in data books not be looked at as having their own intrinsic beauty? I offered Danny the opportunity of being an artist-in-residence in one of the laboratories associated with our department. He was immediately interested. I approached Professor Andrew Sinclair, with whom I was collaborating at the time, and he agreed to host Danny in his molecular genetics laboratory. Over the course of the next year, Danny visited the laboratory on a number of occasions and established a friendly working relationship with many of the researchers. The result was a series of art works which were exhibited at RCH, the Monash (now Federation) University Gallery in Gippsland, Australian Galleries, Melbourne and the Hamilton Art Gallery, Victoria. Some of the works now adorn the walls of the Murdoch Children's Research Institute and Mortal Coil is now part of the National Gallery of Victoria collection.

Dr Garry Warne AM was Director of Endocrinology & Diabetes at RCH from 1980-1999 and Director of RCH International from 1999-2012. View his full profile.



Artwork: *Mortal Coil* (Danny McDonald)

The scientist: Andrew Sinclair

In 1997 Danny McDonald was artist in residence in my research laboratory at the Murdoch Institute. This novel suggestion, which I was initially sceptical about, was put to me by Garry Warne. In reflecting on the idea, I realised that throughout history there are many examples of the convergence of art and science; think of Da Vinci's anatomical drawings or the post-impressionist pointillists such as Seurat and van Gogh who were heavily influenced by the atomic and molecular theories at the time.

As C.P. Snow's famous essay implies the two cultures of art and science rarely meet to the great cost of both. Despite popular misconceptions I believe that art and science are both highly creative endeavours that seek to reveal the nature of things. The mathematician Bronowski in The Ascent of Man argues, "the symbol and the metaphor are as necessary to science as to poetry" and a key linking feature of both disciplines. So, we would try and bridge that gap in the modern era of molecular biology and see what may come of it. However, it is all very well to have such grandiose ideas and another to have a complete stranger and non-scientist interrogate you about the intricate complexities of molecular biology.

Danny's curious and gentle nature quickly put everyone at ease. He was given free rein to talk with my staff who, as it turned out, saw it as a challenge to explain their work to a complete novice. I think Danny found the highly reductionist, precise molecular world impenetrable at first with its jargon laden terminology and intricate pieces of technology. Eventually, we found a form of language to explain the molecular world. This forced us to use common terms and metaphors to bridge the communication gulf. At the time we were using molecular biology approaches to identify genes causative for specific childhood conditions.

We started describing our work using cartographic metaphors to explain the concept of gene maps. We explained how we screened many thousands of genes to try and find that one faulty gene. Further, that we fished for genes using specific hooks with bait to capture genes. If you look at the cover image by Danny titled "Femto" (presumably referring to the prefix 10^{-15} where things are very small!) you can see how he has re-contextualised these metaphors to make a visual statement. In the background is an image of fluorescent blue human chromosomes seen down the microscope.

Overlaid are screens and combs of various types and in the top right corner a fishing line and baited hook in the sea. Also evident are set squares and measuring devices. The whole piece is printed on polycarbonate, reflective of the X-ray film we used for detecting radioactive gene sequences.

Danny has shown the metaphors as literal objects, perhaps in an effort to explain or obfuscate meaning but either way to take the science and use it as inspiration for an artistic creation. "Femto" now hangs in a Murdoch Institute corridor and see it as I walk past every day. Despite my initial hesitation I think this was a valuable learning experience for Danny and my team. We attempted something important: to use art to bridge that gap between the rarefied, restricted world of science and the everyday wider social and cultural context.

Professor Andrew Sinclair is Deputy Director of the Murdoch Children's Research Institute and Professor of Translational Genomics, Department of Paediatrics, University of Melbourne

 Artwork: Installation at the Baker Institute, *DEXA-Dan* (Danny McDonald). Photograph by Diana Snape.

RCH Alumni

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The Royal Children's Hospital Melbourne

You're invited to an **alum**inar

Should children be told the truth about their medical condition – always?

Wednesday, 28th October 2020, 12pm — via Zoom videoconference

With Professor Lynn Gillam AM

The generally accepted ethical standard is that children receiving medical treatment should be given honest information about their situation, in a developmentally appropriate way. The ethical reasons behind this are broadly two-fold – the psychological benefits to the child from knowing what is happening and why, and respect for the child's developing autonomy and capacity to be involved in decisions about their medical treatment.

However, parents may have different views about what their child should and shouldn't be told, and in some situations clinicians may hesitate about how much to tell. In this session, I will present some hypothetical but very realistic cases, derived from an interview study with clinicians, and discuss with audience the ethical nuances of telling the truth to children, with a particular focus on the primary school aged child.

Lynn Gillam is an experienced clinical ethicist, originally trained in philosophy (MA, Oxon, as a Rhodes Scholar) and bioethics (PhD). Lynn is the Academic Director of the Children's Bioethics Centre at the Royal Children's Hospital Melbourne. She is also Professor in Health Ethics at the University of Melbourne, in the Melbourne School of Population and Global Health.

Lynn provides clinical ethics case consultation, policy advice and leads research in paediatric clinical ethics. In 2018, Lynn was awarded the RCH Chairman's Medal, in recognition of this work. She also teaches ethics in the MD course, and supervises research students.

Register at tinyurl.com/LynnGillam

The Royal Children's Hospital Alumni in conjunction with Children's Rights International presents:

Indigenous child health, children's rights and the law

MEDICO-LEGAL SEMINAR AUGUST 6, 2020

Children's Rights International CRI

The Royal Children's Hospital Melbourne

Thursday, 26th November 2020, 5.30pm – 7.30pm

Co-chairs: Ruth Wraith OAM, President, RCH Alumni and The Hon Alastair Nicholson AO RFD QC, Chair of CRI

Speakers

Dr Niroshini Kennedy is a paediatrician at the Royal Children's Hospital's Wadja Clinic, and at the Victorian Aboriginal Health Service. She was awarded the 2018 Jack Brockhoff Foundation Churchill Fellowship to investigate models of Integrated Care for Aboriginal children in statutory care. Her report, "Improving the Health of Aboriginal Children in out-of-home care" has recently been published by the Churchill Trust

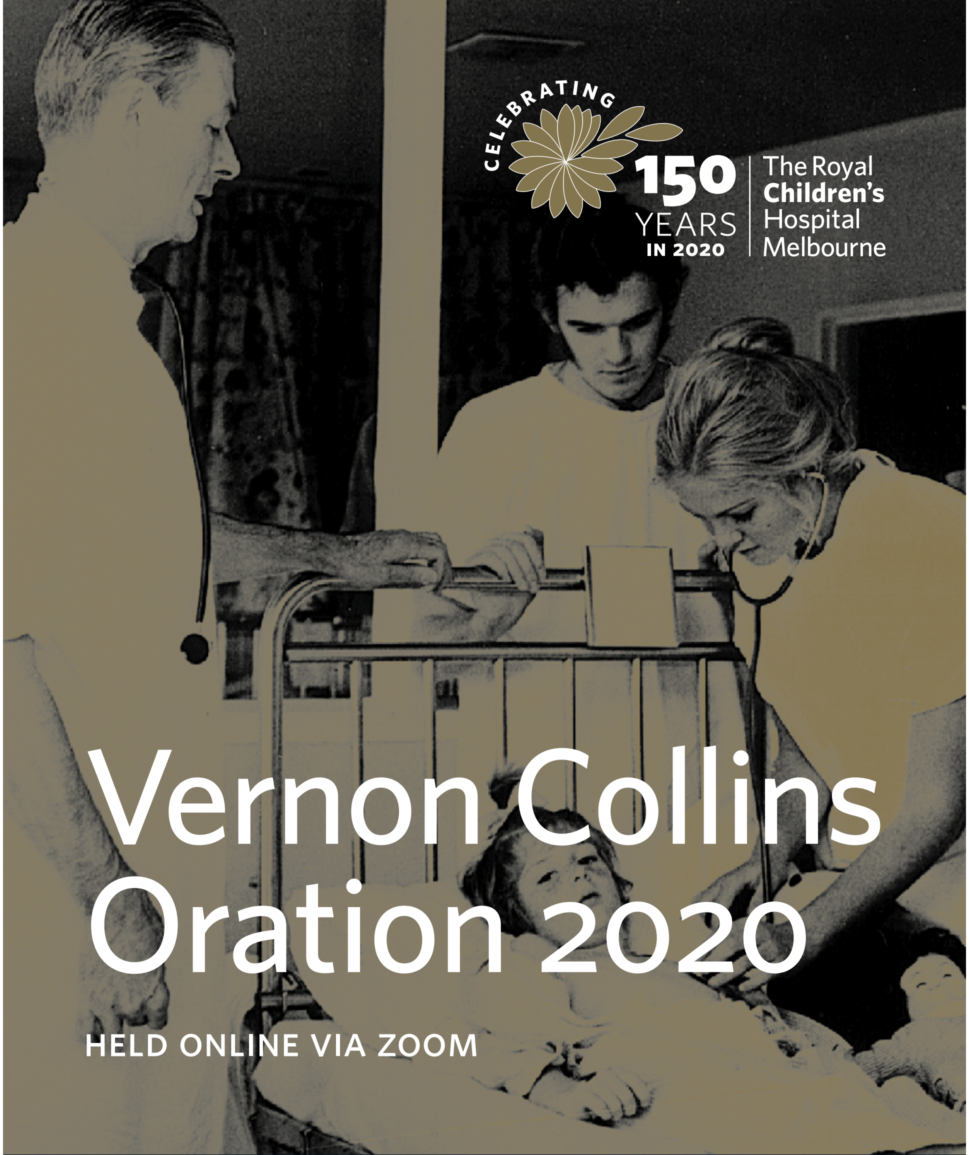
Justin Mohamed, Victorian Commissioner for Aboriginal Children and Young People Justin Mohamed is a Gooreng Gooreng man from Bundaberg in Queensland. He has worked with Victorian Aboriginal communities for 20 years before moving to Canberra to take on national positions as Chairperson of the National Aboriginal Community Controlled Health Organisation (NACCHO) and Chief Executive Officer of Reconciliation Australia. Prior to his move to Canberra, Justin held positions based in the Shepparton region as the Inaugural Director of the Academy of Sport, Health and Education (ASHE), CEO and later Chairperson of Rumbalara Aboriginal Cooperative Ltd.

Magistrate Jennifer Bowles has been a Magistrate for almost 22 years and has sat for over half that time in the Children's Court of Victoria. She is the supervising Magistrate for the Children's Koori Court and a member of the Judicial Officers Aboriginal Cultural Awareness Committee. In 2014 she was awarded a Churchill Fellowship to review options for residential therapeutic treatment for young people suffering substance abuse/mental illness. Her research was conducted in Sweden, England, Scotland and New Zealand. In 2020 she was selected to participate in the inaugural policy impact program, being a partnership between the Churchill Trust and the University of Queensland.

Register at tinyurl.com/IndigChildHealth

The number of participants is strictly limited to 100. Places allocated on a first in, first served basis.

A link to view the recording of the meeting will also be available on request for four weeks from Dr Garry Warne, Honorary Secretary, RCH Alumni – rch.alumni@rch.org.au.



CELEBRATING 150 YEARS IN 2020

The Royal Children's Hospital Melbourne

Vernon Collins Oration 2020

HELD ONLINE VIA ZOOM

Please join us on Wednesday 7 October at 12.15PM for presentation of the University of Melbourne Medical Student Prizes. Vernon Collins Oration to follow at 12.30PM

The event will be accessible via Zoom link, sent by email

SPEAKER:

Professor Elizabeth Elliott AM

Distinguished Professor in Paediatrics and Child Health, University of Sydney

Championing child rights amidst the chaos of COVID-19

Image of Professor Vernon Collins courtesy of The Royal Children's Hospital Archives and Collections

Please RVSP by Monday 28 September, 2020 to RCH Corporate Communications at rch.communications@rch.org.au

THE UNIVERSITY OF MELBOURNE