

## From respiratory support to critical care: my early days in intensive care medicine

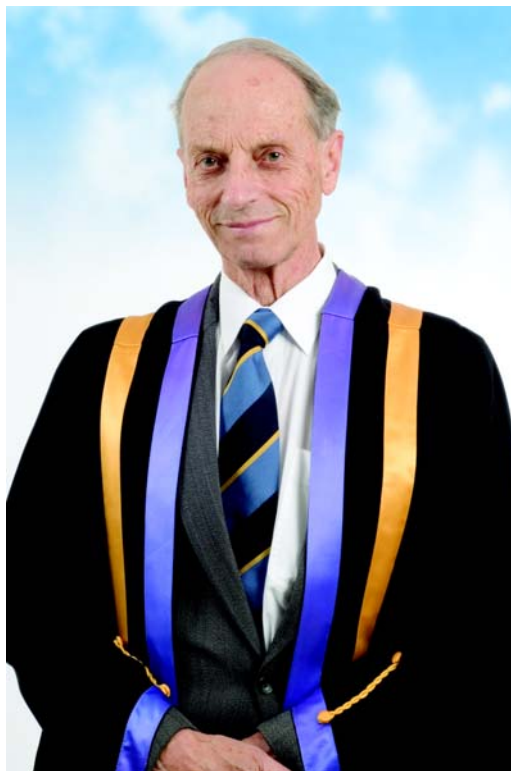
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*The oration given by Dr Trubuhovich on the occasion of receiving the Medal of the Joint Faculty of Intensive Care Medicine at the Faculty's annual scientific meeting in Sydney, June 2007*

Our beloved Dean suggested that I might say a few words about earlier days in intensive care medicine. So I thought I could tell you how it was for me, when I started clinical work in the Acute Respiratory Unit, the ARU, at Auckland Hospital, in February 1968.

Our JFICM Fellows here tonight have completed 6 years, with rigorous training and searching examinations, and to all of them I offer my congratulations; their success has been well earned. In my training time — the 1960s — there was no Joint Faculty to certify one for a “ticket”; but to get an appointment to an ICU, or to start up a unit, yes, you did need a postgraduate qualification, and it was usually in anaesthesia, sometimes in medicine. There was the occasional thing easier though. In 1960, my final undergraduate year at Christchurch Hospital, two medical registrars, both very bright, after completing only the required three postgraduate years, were able to sit and gain their MRACP [Member of the Royal Australasian College of Physicians] exam. It took at least a year longer in anaesthesia.

Although I was appointed to start in 1966, my future chief, Dr Matthew Spence, Matt, agreed to let me complete my research degree at Oxford. It was only when I returned to New Zealand in February 1968 that I realised how difficult was the year to which I had subjected him and his only registrar. I have been truly grateful for that generosity. Further, I immediately saw what an organised ICU he ran, well established, with the major battles for its survival fought and mostly won, though some of the victories were Pyrrhic (mainly in the field of public relations). He refused to call his unit an ICU, insisting intensive



care was what nurses did, doctors applied intensive therapy.

Once started, I rejoiced in the new work, though I recognised the cost to my wife and children. From my 6 months at an obstetrics factory, I knew what working more than a hundred hours a week was like — not much time left after necessary sleep. But not till 1974, when my chief was on sick leave for 6 months, did I understand what he himself had put up with in the year awaiting my return. And I had two registrars.

What were they doing in the ARU at Auckland? First, let us look back a little further.

Following Copenhagen's polio successes 1952–53, and the establishment of the first multidisciplinary ICU there in 1953,<sup>1</sup> anaesthetists elsewhere were now being asked about certain patients, “Is there anything useful

*you can do?”* This was for acute, life-threatening breathing problems, whether from ventilatory failure and/or hypoxia: at first due to acute polio (hitherto treated with cabinet or cuirass negative pressure ventilation [NPV] “respirators”), then for patients with polyneuritis, opiate or barbiturate poisoning, and, of course, tetanus. (Actually, IPPV [intermittent positive pressure ventilation] with full curarisation had been tried for tetanus in 1950.<sup>2</sup>) Units were quickly established in Scandinavia from 1953, while in many places, including England and Australasia (Auckland, Adelaide, Melbourne and Sydney), they usually started under primitive conditions in ward side-rooms or recovery rooms. Leeds had a dedicated tetanus unit in 1954; but, without such a unit, Adelaide treated nine tetanus patients, properly, in just 4 months during 1957. In Toronto that year, a neurologist asked his friend Barrie

Fairley to start a ventilatory ward;<sup>3</sup> and a year later Peter Safar's multidisciplinary unit was started at Baltimore;<sup>4</sup> and so on. One of Auckland's early big successes came from rescuing a moribund acute asthmatic in a matter of hours; but Matt said of their 1959, notable, first-IPPV tetanus patient, "It took us 3 months to get him better and it nearly killed us".

(By the way, the word "intensivist" appeared later in print, possibly first from Peter Safar in 1965.<sup>4</sup> At least by 1960, there is mention of "intensive care".<sup>5</sup>)

When formal units were being established, intensivists started exploring limits, by taking whatever patients they were allowed. We had to find our way by trial and error, learning what was useful, what was hopeless, and widening the range of conditions treated. I can remember multiple occasions in my first year being called to the "Head Injury Unit" because someone with traumatic brain injury had "coned", with pupils fixed and dilated, and was meantime being optimistically bagged for apnoea. A neurosurgeon would ask could I see what we could do for him *now*. On being told that the age of miracles was over, he would suggest that I just take the patient away and see what cooling and ventilating him for 24 hours would do. Nothing useful could follow of course, except a few precious kidney donations.

Often what was written then about new treatments in ICUs seemed just cookbook-type, how-to-do-it descriptions for treating critical conditions, lacking data. But when I arrived at our unit, Matt Spence's massive accumulation of "gestetnered" dissertations, and sheets about treatments and equipment, for detailed education, would have filled a textbook.

The first annual report from Auckland's ARU, issued for 1960, defined its pioneering achievements. The 1968–69 annual report, covering approximately my first year there, makes interesting reading to me now. Perhaps today, a year's total of 283 patients — a third paediatric — seems modest, but the wide range covered is well illustrated from a detailed list of "conditions treated" (Figure 1):

- 25 with trauma, including four with severe cerebral trauma and, this may surprise you, two diagnoses of fat embolism.
- 24 with airway disease; over the previous 8 years tracheotomy had been replaced by short-term endotracheal intubation for children's severe airway problems, such as croup and epiglottitis.
- 70 with pulmonary diseases, including 12 with status asthmaticus: for years we had a succession of asthmatics in absolutely horror status, virtually unventilatable — as others had elsewhere in the world.<sup>6</sup> When I reached Auckland, the concept of "forget about the pCO<sub>2</sub>, just keep the pH up to 7.2"(!) was well established. And

scary, full bronchopulmonary lavages were being performed for asthmatics.

- 19 with postoperative problems (my chief had earned the undying gratitude of some surgeons in private practice).
- 59 with overdoses, and three with carbon monoxide poisoning (no hyperbaric chamber until 1971).
- 15 tetanus patients but two deaths (though, by the time I wrote a paper in 1989, no more tetanus deaths among the next 62); and three with polyneuritis.
- 12 post-cardiac arrest, and 33 with cerebral disorders, including 13 with meningitis, five with convulsive status, and eight with cerebral oedema.
- Six with septicaemia. But when I visited Marina Rosanda in Milan in 1974 — and was given our first ampoule of dopamine, as well as being taken to see The Last Supper fresco — I heard about the sudden sepsis, obviously nosocomial, which we just did not get until the thiopentone 1980s, but which was frequent among their crowded-together, ventilated patients.
- Three of the 283 were coded as "irreversible cerebral lesions".

Mortality rate was 65/283 (23%), though some of the post-meningitis recoveries were bad outcomes, because the "boss" would just not give up on them. For instance, the brain with pneumococcal meningitis was often found at autopsy to have gross surface destruction from pneumococcal cerebritis as well. We did insist on autopsy wherever possible.

Well, what we had was a fantastic nursing service inspired to great performances by the "boss" and the nursing "sisters". Nurses had close medical supervision, including instantly available medical response at junior and senior levels at all times. Great emphasis was placed on clinical observation. When hypothermia to 32°C was prescribed, completion was expected within 30 minutes. The unit's own physiotherapists were dedicated and superb. Radiography was on-site, and the radiologist visited to read each morning's films. We had none of today's fancy monitoring with continual read-out, just one new Tektronix oscilloscope; and *no* alarms; while all drips were superbly controlled — manually. This is starting to sound too good to be true, but it was a unified, compact unit, whose staff were inspired to better results already splendid from dedicated effort and leadership. We did have femoral intra-arterial cannulae, metal, for a while (until I came back from one annual leave and was told we did not need them any more); and blood gas and pH electrodes in our own laboratory. Intravascular monitoring was solely central venous pressure, but in 1968 central lines became radiopaque so we could now see where the ends were sitting. Plasma was freely used, metaraminol was the only inotrope, and isoprenaline rarely employed.

EDITORIALS

Figure 1. Conditions treated at the Acute Respiratory Unit, Auckland Hospital, 1968-69

<u>ADMISSIONS TO RESPIRATORY UNIT 1/4/68 - 31/3/69</u>					
Admissions	: 283	Outpatients	: 80		
Mortality	: 23%	Examinations under anaesthesia	: 700		
Consultations	: 100				
<u>EXTRA TECHNICAL PROCEDURES</u>					
Hypothermia	: 45				
Bronchopulmonary lavage	: 12				
Continuous epidural	: 21				
Peritoneal dialysis	: 8				
Haemodialysis	: 1				
<u>Disease &amp; Condition</u>	<u>No</u>	<u>Age Group</u>	<u>Children up to 14</u>	<u>Time in Unit</u>	<u>Died</u>
<b>"ACCIDENTS"</b>					
Chest & Multiple injuries	15	18 - 62 years	-	1 - 47 days	4
Head & Chest injuries	3	2 - 57 "	1	34 - 52 "	-
Head injuries	4	11 - 80 "	1	1 - 8 "	4
Fat embolism	2	7 - 26 "	1	1 - 39 "	2
Fractured spine	1	54 "	-	3 "	1
<b>SEPTICAEMIA OR INFECTIONS</b>					
Endotoxin shock	2	4 - 21 "	1	1 - 36 "	1
Meningococcal septicaemia	1	11 "	1	3 "	1
"Cardiogenic Shock"	3	2 - 51 "	1	3 - 6 "	3
<b>PULMONARY DISTURBANCES.</b>					
Status asthmaticus	12	4 - 72 "	3	1 - 14 "	2
Acute obstructive bronchiolitis	9	6 wks - 1 "	9	1 - 12 "	1
Status asthmaticus with P.I.E.	15	7 wks - 50 "	7	2 - 25 "	1
Pulmonary oedema	16	2 mths - 68 yrs.	3	1 - 31 "	4
Drowning	3	4 - 50 years	1	1 - 3 "	-
Obstructive lung disease	1	57 "	-	9 "	-
Emphysema & bronchopneumonia	4	47 - 69 "	-	5 - 37 "	-
Pneumonia (Staph. or Viral)	8	3 wks - 20 yrs.	7	1 - 10 "	5
Pulmonary embolism	1	82 years	-	10 "	-
Pneumothorax	1	7 "	1	3 "	-
<b>AIRWAY OBSTRUCTION</b>					
Supraglottic airway obstruction	12	1 day - 6 "	12	1 - 11 "	-
Tracheal obstruction	7	1 - 55 "	2	1 - 365 "	-
Laryngo-tracheobronchitis	5	1 - 42 "	4	1 - 14 "	-
<b>POST OPERATIVE RESPIRATORY FAILURE</b>					
	19	7 wks - 82 "	2	1 - 60 "	3
<b>DRUG REACTIONS &amp; ANAPHYLAXIS</b>					
	2	17 - 46 "	-	1 - 5 "	2
<b>DRUG INTOXICATIONS</b>					
Overdoses	59	1 - 83 "	3	1 - 40 "	2
Carbon monoxide poisoning	3	37 - 86 "	-	4 - 66 "	1
<b>TETANUS</b>	15	8 - 81 "	3	8 - 240 "	2
<b>NEUROMUSCULAR DISORDERS</b>					
Polyneuritis	3	17 - 71 "	-	1 - 40 "	-
<b>CEREBRAL DISORDERS</b>					
Encephalitis	1	1 "	1	16 "	-
Meningitis	13	3 mths - 49 yrs.	11	2 - 23 "	2
Coma & Convulsion	5	2 mths - 16 "	4	5 - 16 "	1
Thrombosis	1	4 mths "	1	3 "	1
Cerebral haemorrhage	5	2 mths - 58 "	3	1 "	5
Cerebral oedema	8	3 mths - 35 "	7	1 - 8 "	4
<b>CARDIOVASCULAR DISORDERS</b>					
Congenital abnormalities	2	2 mths - 1 "	2	4 - 5 "	2
Cardiac Arrest	12	11 days - 78 "	2	1 - 44 "	7
<b>FLUID &amp; ACID BASE DISORDERS</b>					
Metabolic acidosis	3	4 mths - 44 "	2	1 - 18 "	1
Endocrine disturbances	1	70 years	-	8 "	-
<b>IRREVERSIBLE CEREBRAL LESIONS</b>					
	3	1 - 21 "	2	1 - 62 "	3
<b>NEUROSES</b>					
	2	26 - 53 "	-	1 "	-
	<b>283</b>		<b>98</b>		<b>65</b>

The page from the original annual report for April 1968-March 1969, with Matt Spence's idiosyncratic classification of "conditions treated". □

We had bicarbonate but also THAM [tris-hydroxy methyl-aminomethane]. And employed indwelling epidural catheters.

We offered a back-up to "A & E" for the critically ill. There were no paramedics, the ARU provided the respiratory flying squad to call-out by St John's officers, before Ron Stewart's paramedic principles came to Australia and New Zealand. And we led the hospital's cardiac arrest team.

Were there problems? Of course! Funding, staffing, equipment, etc, but curiously, some of the hardest to endure lay with other doctors. We had many loyal supporters who could see the good results and our capabilities, supported our efforts, sought help at an appropriate stage, and were grateful to have patients they thought they would never see again returned after the acute phase. But there were some who were dismissive: "How can a pair of jumped-up anaesthetists know anything about these conditions, let alone treat them!"

Typical criticism included:

- "What's this 'internal pneumatic stabilisation' business for crushed chests? All that chap needs is a couple of wires to bring the rib ends together again."
- "Now look at the x-ray, you've flooded his lungs with all that fluid you've given him, he's got pulmonary oedema and respirator lung!"<sup>7</sup> Yet the previous year, 1967, ARDS [acute respiratory distress syndrome] had been described, while a decade earlier Francis Moore, then Peter Safar, had been writing about "shock lung". My chief's emphasis was well in advance of many others, "You've got to get the perfusion up", not just the blood pressure.
- Another complaint: "You've gone and paralysed and sedated a patient with a head injury! However can I tell anything about his neurological state now?" At that time, with no CTs [computed tomograms], the only cerebral investigations were angiography, EEGs [electroencephalograms], and air (then echo-) encephalograms.
- Or: "How do you think *you* can look after paediatric patients? Children are so different." Would it have been preferred that they die in the wards from intractable convulsions, or meningitis coma, or total airway obstruction? But, our greatest supporters were other paediatricians.

- Or about one woman with trauma: "You mean to say she's had 100% O<sub>2</sub> for 14 days? That's poisonous!" But her po<sub>2</sub> was kept up to 50 torr, and she recovered.<sup>8</sup>
- Or the ultimate judgement from the pathologist: "This man's died from 'respirator brain', it's all just pea soup". Or else "bronchopneumonia" was offered, when obviously we were aware of plenty of other factors before the terminal changes.

Coming up against such attitudes did not make our working life easy. I felt the title of a once famous New Zealand poem epitomised many of our situations: Thomas Bracken's *Not understood*. But we coped.

Mr Dean, thank you.

### Author details

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