PERINATAL LESSONS FROM THE PAST

Dr Mary Crosse, OBE, MD (1900–1972) and the premature baby

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On behalf of Birmingham's Department of Public Health, Dr Crosse developed the Sorrento Premature Baby Unit in 1931 and pioneered the modern care of these small newborn infants in Britain.

Victoria Mary Crosse, known as Vickie to her friends, was born on 17 May 1900 in Rye where her father was the vicar. She was educated at Carlisle and Oxford High School, and in 1918 entered the Royal Free Medical School, London. There she became senior student of her college hall and won the Rosa Morison medal. Graduating in medicine in 1925, she held resident posts at the Royal Free Hospital, Windsor Hospital, and the Mother's Hospital, Clapton, before moving to Birmingham in 1929 to become house physician to the Canwell Babies' Hospital. Proceeding to the MD in midwifery in 1930, she also took the DPH and the following year was appointed by Dr Jean Mackintosh of the Birmingham City's Public Health Department to be obstetrician to the Sorrento Maternity Home. This small maternity hospital of 21 beds had opened in 1929 to cater for social problems such as destitute or unmarried women. The same year, on the initiative of Dr Ethel Cassie, the Senior Assistant Medical Officer of Health for Maternity and Child Welfare in Birmingham, a unit for the care of premature babies (defined as birth weight <2500 g) was built and equipped at the Sorrento to take 10 infants and six mothers. Dr Crosse was appointed Senior Medical Officer in charge (fig 1). Thus was the to be famous Sorrento Premature Baby Unit founded. This unit, the first of its kind in this country, was the forerunner of our present special and intensive care baby units.¹

In 1938 Dr Crosse took the DOBstet RCOG. That year too she was joined in the Sorrento by her friend and colleague, Dr Jean Hallum. Together they dealt with both the obstetric problems and the care of the babies, a perinatal approach. Indeed they also did their own postmortem examinations, biochemistry, and whatever else needed doing. Dame Hilda Lloyd was consultant obstetrician to the unit, and Sir Leonard Parsons the consultant paediatrician. The hospital thrived and grew. Between 1931 and 1946, 3215 premature babies were treated in the unit, 17.4% being born in the hospital, while 82.6% had been admitted after birth from their own homes. By 1950 the number of maternity beds had increased to 94, and the Premature Baby Unit had grown to provide accommodation for 26 babies and eight mothers.²

Mary Crosse's practice, which was based in part on that of earlier paediatricians such as Pierre Budin and Julius Hess, relied on simple equipment and nursing techniques. Her teaching emphasised the need for the most detailed personal care of the babies by the nursing and medical staff. "The essence of her work was meticulous clinical observation and attention to basic needs of the babies—to keep them warm, to feed them correctly, and to nurse them aseptically but with tender loving care".³ Each infant was nursed individually with special attention to hand washing, gowning, and the wearing of masks. Dr Crosse also firmly believed that "human milk was the best food for preterm infants, especially those with the lowest gestational age."³

The equipment available for neonatal care used by Dr Crosse in the 1940s was very simple. The deep open Sorrento cot, which cost £10 in 1946, could be tipped either way on its stand. It had a tray and cupboard for equipment and the nurse's gown. The cot's canvas lining contained pockets for four hotwater bottles, one of which was changed each hour. The nurseries were heated by radiators and a gas fire, while humidity was provided by a fish kettle on a gas burner. Among

Figure 1 Dr Victoria Mary Crosse (1900–1972).

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the more sophisticated apparatus and techniques were simple thermometers and provision for face mask oxygen and tube feeding. The gavage tubes were made of rubber and therefore had to be removed and boiled between four hourly feeds.⁴ All the rules for the nursing care of tiny babies were laid down in her book, along with detailed instructions for feeding, including vitamin supplementation, for the avoidance of infections, the management of common neonatal problems, and the importance of good record keeping. Another important aspect of Sorrento management involved the transport of premature babies both from and to their homes, the forerunner of the modern neonatal flying squad.²

Sir Leonard Parsons, along with Charles McNeill in Edinburgh and Norman Capon in Liverpool, was one of the few paediatricians at that time with the vision to perceive the importance of newborn care.⁵ It was Parsons who coaxed and bullied Vickie into describing her methods in a book *The premature baby*, first published in 1945. In the foreword Parsons wrote: "... deaths in the (first) month are higher than those in the remaining part of the first year; moreover, more than one-half of these children are born prematurely ... Fourteen years ago Dr. Mary Crosse commenced an attack on ... the reduction of mortality amongst premature babies ... (she) has not only had an almost unrivalled experience in this country in the care of the premature children, but her results have also so far been unrivalled in this country ... (Her) book, which is unique in British literature will prove invaluable ... (in) the long overdue reduction in neonatal mortality."²

The premature baby contained many statistical tables. The neonatal mortality for all premature infants admitted to the unit, 1931–1946 was 32.9% (fig 2). However, for those babies actually delivered in the Sorrento Maternity Home, it was much lower at 13.4%. The causes of death were listed as: "prematurity" 66.5%; intracranial haemorrhage 13.0%; fetal deformity 4.7%; infection 9.7%; other causes 6.1%. Some 54.2% of deaths occurred on day 1, 10.7% on day 2, 10.7% on days 3–7, 12.8% in the 2nd week, 7.6% in the 3rd week, and 4.0% in the 4th week.²

In 1947 Mary Crosse visited the Institute of Human Relations in New Haven, Connecticut, and observed the pioneering work of Arnold Gesell and Edith Jackson on infant bonding, breast feeding, and the development of babies and young children. As a result, in the 3rd edition of her book (1952), she was able to state that "All premature infants born in the City of Birmingham have been followed up for one year and that 1.8% were found to have defects, mental, physical or both". A control series of babies born in 1948–49 who weighed more than 5½ lbs were shown to have an incidence of defects of 0.85%, about half the number of those in the low birthweight group.^{2 5}

NEO-NATAL MORTALITY ACCORDING TO BIRTH-WEIGHT (GRAMMES)				
Birth-weight (in Grammes)	Premature Baby Unit, 1931–46		Premature Babies Born Alive in Sorrento Maternity Home, 1931–46	
	Cases	Mortality per Cent.	Cases	Mortality per Cent.
Up to 1,000 g. (2 lbs. 3 oz.)	141	95.0	21	96.6
1,000–1,500 g. (3 lbs. 4 ozs.)	677	61.2	94	62.7
1,500–2,000 g. (4 lbs. 6 ozs.)	1,465	26.7	238	20.1
2,000–2,500 g. (5 lbs. 8 ozs.)	932	16.7	788	3.8
All weights	3,215	32.9	1,141	13.4

Figure 2 Neonatal mortality for the Sorrento Premature Baby Unit, 1931–1946.

Dr Crosse's initiative was soon followed by others. Dr Beryl Corner visited the Sorrento soon after the book's publication in 1945, and, with the encouragement and support of Professor R H Parry, Medical Officer for Health for Bristol, then set up a similar premature baby unit at Southmead Hospital in 1946. She was the first paediatrician to do so. In addition, in Bristol she introduced two further important new developments, a breast milk bank and an outreach team of health visitors based on the premature baby unit to follow up these small patients after their discharge home. Like Dr Crosse, she too eventually published her experience with premature babies.⁶

Dr Corner became a great friend of Vickie's and later wrote: "It was a matter of pride with Mary Crosse that she remained in the vanguard of all new developments and indeed she had the first modern incubator to be used in this country, acquired from the United States after World War II, and she was the first to observe that the sudden epidemic of blindness in surviving premature infants was linked to incubator care."³ Dr Crosse mentioned her suspicions to Dr Kate Campbell of Melbourne at an international paediatric meeting in Zurich in 1950. The following year Dr Campbell published her own experiences,⁷ and received the credit for warning the profession of this new iatrogenic disease, already widely encountered for more than a decade in the United States. Dr Crosse's own experience had been as follows: before 1949 little oxygen had been used in the Sorrento, and in the period 1931–1947 there had been no recorded case of retrolental fibroplasia. During 1948, Sorrento was presented with two modern American incubators capable of sustaining a high ambient level of oxygen. Between January 1949 and June 1950, there was free and generous use of oxygen in these incubators, and 10.2% of all the surviving premature babies in the unit were found to be severely affected with retrolental fibroplasia. As a result, during the next 18 months, the use of oxygen was restricted to a maximum of 30%. There were no further cases of retrolental fibroplasia during this period. Moreover the survival rate rose from 37.7% in the first 18 month period to 44.5% in the second. Crosse felt able to write in 1952: "It is important to realise that a restricted use of oxygen has reduced the incidence of RLF without reducing the survival rates".⁸ This experience preceded the 1954 randomised control trial of the use of oxygen in premature baby care in the United States.

Although *The premature baby*² reads today more like a nursing manual than a medical text, this small book contains all the basic instructions required for the care of small infants. It was translated into several languages and proved to be a best seller. Passing through seven editions during her lifetime over the next 25 years, it brought its author international recognition and fame. In 1946 Dr Crosse was appointed lecturer in the University of Birmingham Department of Paediatrics and Child Health. Besides holding many other appointments in the city, she became lecturer and examiner for the Central Midwives Board, secretary to the Joint Committee of the BPA/RCOG, president of the Medical Women's Association, and honorary treasurer of the International Medical Women's Association. She also became consultant advisor on prematurity to the World Health Organisation, and the now world famous Sorrento became recognised as a WHO postgraduate hospital for the training of doctors and nurses in the care of premature babies.¹

In 1961 Dr Crosse took early retirement in order to travel and advise other countries on the care of premature babies, in particular Turkey, the Philippines, Kuwait, and Australia.⁹ Full of life and energy, she learnt several languages and was a stimulating and amusing lecturer. Her country honoured her for her achievements with the award of the OBE.

In 1967 Vickie was diagnosed as having cancer of the rectum. During her last illness she exhibited tremendous courage,

eventually dying at the age of 72 on 21 March 1972. After her death a series of six annual lectures was instituted in Birmingham in her memory. The first was given by Beryl Corner,³ with subsequent lectures by Brian Wharton, David Baum, Peter Dunn,⁹ Jon Scopes, and Graham Chance. In addition, a number of research fellowships founded in her name led to many publications, mainly on perinatal nutrition and growth.

In conclusion, Mary Crosse deserves to be remembered as a pioneer of premature baby care in the United Kingdom. When she first began her sterling work, even full term newborn babies received little attention from the medical profession, and premature infants were in the realm of "survival of the fittest". Her courage and achievements on behalf of these tiny patients both at home and abroad are all the more remarkable for her being a woman in a man's world. In addition, she did not hold the membership of a Royal College, and for many years was graded as a senior medical officer of the Department of Public

Health rather than, as later, a clinical paediatric consultant. She deserves to be remembered as a truly great woman doctor.

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IMAGES IN NEONATAL MEDICINE.....

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Facial submandibular cellulitis-adenitis in a preterm infant

This little girl was born at 32 weeks' gestation by emergency caesarean section for pregnancy-induced hypertension and fetal distress. Initial course of penicillin and gentamicin were discontinued at 36 h, when her blood culture done at birth was found to be negative.

On day 20 she deteriorated with bradycardias and desaturations, and she was noticed to have an erythematous, warm, firm swelling in the right submandibular region, extending from her right ear to the upper neck. (fig 1). The rest of her clinical examination was unremarkable. She was ventilated for apnoea. Her blood culture grew group B streptococcus (GBS) after 12 h. An ultrasound examination revealed multiple right submandibular lymphnodes with subcutaneous tissue thickening. She made an uneventful recovery after treatment with broad spectrum antibiotics. Her surface swabs were negative and maternal group B status was unknown.

Cellulitis-adenitis is a rare presentation of GBS infection in neonates. The clinical features include a mean age at onset of 5 weeks, male predominance (75%), and rapid resolution with appropriate antimicrobial therapy. It is usually GBS type III and the pathogenesis is postulated to be lymphatic spread from ipsilateral otitis media or mucus membrane colonization with subsequent bacteremia and seeding of the soft tissues.^{1,2}

Figure 1 Erythema and swelling with central clearing in the right submandibular region. Informed parental consent was obtained for publication of this figure.

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