

The Role of the French Midwives in Establishing the First Special Care Units for Sick Newborns

Paul L. Toubas, MD

R. Nelson, MD

At the end of the 19th century, under Dr. Tarnier's direction, the first trials of incubators were performed at the Paris Maternity. The success led to the construction of a special pavilion for sick newborns. The midwife-in-chief, Mrs. Henry, raised the funds for the construction. The results of the initial trial are reported. In 1892, the successor of Dr. Tarnier, Dr. Budin, the Chair of Obstetrics, did not approve of the condition of the nursery. Mrs. Henry left abruptly. The unit was placed under medical direction in order to bring a scientific approach to the care of the sick newborns. Stepdown units called pouponnières were created to assure the transition of the infants to the home and decrease neonatal mortality.

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It is impossible to describe the genesis of advanced newborn care without talking about the convent of Port Royal, a maternity and midwife school. At the end of the 19th century, new concepts of maternal and neonatal care emerged from the facility. Medical knowledge spread rapidly across Europe, and allowed the diffusion of new technology. Medicine entered a scientific era, which ultimately gave new directions to perinatal health care.

The Port Royal convent, close to the Luxembourg Garden in Paris in 1625, was transformed into a prison during the French Revolution (also called Prison de La Bourbe and Port-Libre). In 1814, the prison was converted into a maternity, and was fully completed in 1818.^{1,2}

The Paris School of Midwives moved in 1794 from the Hotel Dieu, close to the church of Notre Dame where it had been located since 1610, to two different specialized locations. One taught the art of delivery and was located at the Oratoire rue d'Enfer; the other, dedicated to post-partum and breastfeeding, moved to the ex-prison of La Bourbe. From there, it moved again to the Port Royal Maternity in 1814.²

In 1802, Napoleon Bonaparte, then first consul, massively reformed and centralized the French institutions, including much-needed medical schools, to, among other tasks, keep the quantity and quality of soldiers for the numerous military campaigns necessary to establish a strong French Empire. The midwives were thought to be the source of good care for mothers and babies and thus could help to decrease the neonatal and infant mortality. The first French National School of Midwives was established by Jean Antoine Chaptal, then Minister of the Interior, to provide a model of midwife training for the entire nation. This chemist, who among other things improved the quality of gunpowder, designed the school after existing technical schools, like the weaving school and the school of pharmacy. The duration of the midwifery course was 6 months, but soon became a 1-year program. Students were taught, "The theory and practice of delivery, vaccination, blood-letting, the knowledge of usual plants used during pregnancy and post-partum".³

A Surgeon-Obstetrician was the President of the School of Midwives. The Director was the Midwife-in-Chief who had the same salary as a surgeon. She also received a stipend of 30 Francs (gold) per student. The student midwives received very comprehensive training with a discipline identical to military academics. The Midwife-in-Chief had the authority of a general. The student midwives were interns, arose at 5:30 AM, attended mass, received four lectures every day, attended physician rounds, spent 2 hours writing patient reports, and went to bed at 10 PM when they were not on call at night.³

The most important points of their education,^{3,4} framed in a quasi military-monastic discipline, included the care of the mother at all stages of pregnancy and the care of the infant.

All students attended, each in turn, the deliveries. Depending on the complexity of the case, they performed the delivery alone or with the help of the Midwife-in-Chief or the Surgeon-Obstetrician in case of major difficulties. Two students stayed with the patient at least 2 hours after delivery, and then one student accompanied the patient to the post-partum unit. Two students then took care of the mother and the newborn. The students kept a registry of all deliveries that were reviewed daily by the Surgeon-Obstetrician.

At the end of the course, the student midwife took an oral test given by four physicians. Gold and silver medals were given to the best students—soldiers—midwives. Ultimately, they received a national diploma, certifying their competency.

The midwives of this period were powerless witnesses of the high rate of death of the young mothers they attended, a tragedy

Division of Neonatology (P.L.T.), SUNY Downstate Hospital, 450 Clarkson Avenue, Box 49, Brooklyn, NY, USA; and Division of Neonatology (R.E.N.), Columbia Wesley Medical Center and University of Kansas School of Medicine, 550 North Hillside, Wichita, KS, USA.

Address correspondence and reprint requests to Paul L. Toubas, MD, Division of Neonatology, SUNY Downstate Hospital, 450 Clarkson Avenue, Box 49, Brooklyn, NY 11203, USA.

due of puerperal fever. At the end of the 19th century, maternal death after birth due to sepsis was progressively decreasing with handwashing in sterile solutions as recommended by Lister in England, and appropriate isolation of infected patients.⁴ With the decreasing maternal mortality rate,⁵ the focus of medical attention shifted progressively toward the sick newborn. It was imperative to curb the infant mortality in order to ultimately increase the work force in this new era of industrialization and colonization. The French government was attempting to decrease the infant mortality and increase the size of the French population. France, which was a demographic giant at the time of the French revolution in 1789,⁶ was a country in expansion through industrialization and colonization. Men were needed for the industry and the military, not only to defend the borders but also to expand the French Empire. The depopulation phenomenon was of extreme concern and the burden was placed on medical science to find a solution. Motivated by desire for quick results, the French government provided the means to achieve this goal through education of future mothers as early as primary schools and a structured hospital system to provide the optimal care to pregnant women. The man who ultimately orchestrated this effort toward the second half of the 19th century was Dr. Tarnier⁷ (1828 to 1897). This observant and creative obstetrician became the model of modern obstetrics and, to some extent, pediatrics.

Dr. Stephane Tarnier, the leader of French obstetrics and Chairman of Obstetrics of the University of Paris,⁷ had observed on a daily basis the tragedies of the healthy, young, pregnant mothers arriving at the Maternity and dying there of puerperal fever. He had sent Pierre Budin,⁵ his assistant, to study with Lister and learn about antisepsis and also the use of anesthesia during labor. Significant progress had been made, and because the maternal mortality rate was decreasing, it was time to attack the urgent problem of infant mortality, which was also the responsibility of the obstetricians who cared for the infants until they were 2 years of age.

The statisticians of the French government (statistics was then a new discipline) translated the tragedies of the families into numbers.⁸ The various ministries (commerce/industry and the armed forces) wanted more children to reinforce an aging and threatened nation. The mission was to increase the French population to increase the production of industry and produce more soldiers to expand the French colonial empire. Under the strong influence of Senator Bourneville, himself a physician and the discoverer of tuberous sclerosis,⁹ new maternity wards were built and physicians were specially trained to achieve this goal. The discipline of obstetrics, established on October 18, 1881,⁹ was first on the line to receive a massive boost with the creation of new positions and selecting the best physician through a system of special examinations.

Tarnier was the first obstetrician interested in understanding and helping the “weaklings.” The word meant premature, small, and/or

sick infant. Besides a few assistants and residents, midwives performed the bulk of perinatal care during this period.

According to Pinard,⁴ when “in cold weather, Tarnier arrived at the Maternity, he felt tortured, when examining the numerous unfortunate infants, he found them inactive, covered with cotton, already rigid and cold forever.” Premature infants were the first victims. Hypothermia strongly contributed, among other causes, to the infant mortality, which was the source of extreme concern for Tarnier. Tarnier was convinced of the futility of the treatment of sclerema. In 1880, convinced that the maintenance of thermal homeostasis was key to the survival of the premature infant, he introduced the first incubator for use in human babies. The concept was not new, since as early as 1857, Denuce had introduced the concept of the incubator crib. Further, Crede^{4,10} in 1864, was using a double-wall crib in which hot water circulated to warm the walls of the crib. Dr. Tarnier did not invent the incubator, but he applied it to the regular care of the premature and sick infant. He did so after a visit to the Paris fair, having observed how it was used for the incubation of chicken eggs. The primitive, bulky instrument made of wood and glass could accommodate one or two infants. The Martin couveuse with a thermosiphon heater proved too wieldy and was modified so that a warm environment was provided by heated water bottles. The instrument received national and international attention.

“Monsieur Tarnier” delegated the care of the newborn to “Madame Henry” (1858 to 1867), his newly appointed Midwife-in-Chief.¹¹ Mrs. Henry, then aged 44, found a disorganized, crowded nursery, and realized that structure was needed. She had been well educated at the Paris School of Midwives by Mrs. Alliot and her motto included leadership, discipline, authority, and order. In an article, which we recently found and translated,¹¹ she described the actions that led to the building of the pavilion of weakling newborns — a milestone in neonatal care.

During the next 12 years, following her idea that a special building was needed to treat the sick newborn, she raised money and obtained the appropriate authorizations to have a special pavilion erected. Opened in 1893, the pavilion was equipped with 12 incubators. For 2 years, Mrs. Henry supervised the treatment of 721 infants. Three hundred and sixty-four infants were discharged in good health, 357 died. Among the 357, 24 were born before viability, 15 had grave malformations, and 68 died within 24 hours after their admission. In 1895, a 51% survival rate was a success. The article of Mrs. Henry indicates that sterilization of milk took place in an American cooker. Many of our NICUs would envy today the concise manner in which nurses graphed the weight and temperature of the infants on a daily basis. Studies were made about the digestion of milk. Complications of feedings, including gastro-esophageal reflux, as well as obstructive cyanotic apneic spells, are very well described. Infection of the nasal cavity or eyes and pneumonia were some of the major preoccupations of the caretakers of these infants. In 1895, Mrs. Henry resigned “for personal reasons” when Dr. Budin, the founder of the well-baby clinics⁵ and successor of Dr. Tarnier as Chairman of Obstetrics, took over the Paris Maternity. Budin had invested much of

his time in the follow-up of infants and had developed in Paris a system of well-baby clinics to teach mothers how to feed their infants and prevent the devastating effects of gastroenteritis by boiling the milk. Infant mortality decreased rapidly, and the role of the obstetrician in infant care started to overtake the role of the omnipotent midwives. The physicians took control of an area of care that needed systematic study rather than empiric trials. The midwives, after having been at the forefront of special newborn care, had to give back the keys of the pavilion, which they had created. The personal reasons of Mrs. Henry disguised a mortal humiliation. The long-term outcome, as noted by Budin,¹² was not good. Infants discharged from the Pavilion frequently died due to the ignorance of parents. An intermediate system had to be found to raise infants in hygienic conditions.

Budin extended the care of the infants discharged from the Pavilion of weaklings through a system of Pouponnieres (stepdown nurseries). The most famous model was the Pouponniere of Porchefontaine, established near Versailles in 1896.^{13,14} This became the first modern institution dedicated to puericulture. They ultimately multiplied.

As one can see, the French government, through a combination of state money, philanthropy, and other programs, was supportive of any experimental effort to decrease infant mortality. It was a theme; it was a cause considered vital to the French nation, its industry, and its colonies. This entire process started with the midwives.

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