

Kangaroo Mother Care

Physician researchers Edgar Rey Sanabria and Héctor Martínez-Gómez developed the Kangaroo Mother Program in Bogotá, Colombia, in 1979, as an alternative to conventional incubator treatment for low birth weight infants. As of 2018, low birth weight and its associated complications are the leading causes of infant death, especially in developing and underdeveloped countries where access to technology and skilled healthcare providers is limited. Kangaroo Mother Care is a simple and low cost method for treating low birth weight infants. Even though researchers developed the Kangaroo Mother Care method for infants born in hospitals with limited resources, they demonstrated that the method could be just as effective as conventional treatments. Kangaroo Mother Care changed the standard of care for low birth weight infants, making life-saving medical treatments accessible to thousands of infants in developing and undeveloped countries.

According to the World Health Organization or WHO, complications associated with low birth weight cause between 60 and 80 percent of newborn deaths around the world, making it the leading cause of infant death as of 2018. A low birth weight infant weighs less than 2500 grams or 5.5 pounds, regardless of gestational age. Although independent of gestational age, low birth weight is often associated with prematurity, or birth that occurs before thirty-seven weeks of gestation, because those infants do not spend as much time growing inside the pregnant woman's womb. Low birth weight infants can experience complications such as the inability to maintain body temperature, difficulty breathing, difficulty gaining weight, long term problems with brain function, and sometimes death as a result of those complications.

In developing and underdeveloped countries, low birth weight is a common problem. Around 15.5 percent of infants born worldwide are low birth weight, but almost all of those births occur in developing and underdeveloped countries with limited medical professionals and modern technology. According to researchers, one potential cause of the high death rate associated with low birth weight is limited access to conventional care and technology. That technology is widely available in countries such as the United States, but much less accessible in countries where low birth weight is more common. Conventional care for low birth weight typically involves placing infants in incubators to regulate their body temperature. It can also include other treatments like the use of nasogastric tubes which allow nurses to feed infants breast milk through the infants' noses directly into their stomachs. Those treatments, although effective, are not available to most infants born in developing and underdeveloped countries due to the high cost of technology and the lack of skilled healthcare providers.

During the 1970s, researchers began to study the benefits of skin-to-skin contact between the mother and her newborn, which was a simple and low cost method of newborn care. In the neonatal unit at San Juan de Dios Hospital in Bogotá, Colombia, physician researchers Rey Sanabria and Martínez-Gómez treated low birth weight infants. The researchers found it difficult to treat those low birth weight infants because they lacked technologies and resources that would keep those infants alive. The resources necessary to sustain low birth weight infants included incubators and other conventional care technologies, which were costly and difficult to obtain. In 1978, Rey Sanabria and Martínez-Gómez developed a new method for treating low birth weight infants in their hospital and called it the Kangaroo Mother Program. Their method included skin-to-skin chest contact between a mother and her infant, exclusive breastfeeding, which meant using breastfeeding as the primary method for feeding infants, and early discharge from the hospital. The method was referred to as the Kangaroo Mother Program because the constant skin-to-skin contact was inspired by the gray kangaroo, an animal that carries its baby in a pouch on the front of its body. Between 1979 and 1981, over 500 infants in Bogota received Rey Sanabria and Martínez-Gómez's

new treatment, and the researchers reported that infant survival rates tripled as a result. Later, Rey Sanabria and Martínez-Gómez's method was officially termed Kangaroo Mother Care.

In the 1980s, Rey Sanabria and Martínez-Gómez's Kangaroo Mother Method gained media attention in Europe as news networks filmed infants strapped to their mothers' chests and reported on dramatic improvements in survival rates. Rey Sanabria and Martínez-Gómez originally reported their study in 1983 in conjunction with United Nations International Children's Emergency Fund or UNICEF. In 1985, neonatal researchers Andrew Whitelaw and Katharine Sleath traveled from London, England, to Colombia to run their own analysis of the method's effectiveness. In 1985, Whitelaw and Sleath published their results in *The Lancet*, a peer-reviewed medical journal. Whitelaw and Sleath found that the kangaroo position and early discharge were effective in treating low birth weight infants at the Columbian hospital where there was little conventional equipment. They did not recommend the treatment over conventional methods used to improve the health of infants in well-funded hospitals. Whitelaw and Sleath did, however, emphasize the psychological benefits of the Kangaroo Mother Method, including improved bonding between a mother and her infant.

After the Kangaroo Mother Method became widely publicized, physicians implemented versions of the method all over the world. In October 1996, thirty-six participants from fifteen countries gathered in Trieste, Italy, for the first international Kangaroo Mother Care conference. They evaluated the effectiveness of the treatment in a range of different scenarios, such as varying infant weight categories, severity of complications, and types of hospitals at which the infants were being treated. At the meeting, multiple terms for the treatment were consolidated into the term Kangaroo Mother Care which, as of 2018, is the term researchers around the world use. The participants also agreed on the universal protocol for Kangaroo Mother Care, which the WHO published in a manual in 2003 as international guidelines.

According to the 2003 WHO guidelines, Kangaroo Mother Care has three main components. The first component is early and continuous skin-to-skin contact between the mother and her infant. Physicians typically initiate the contact immediately after birth or after any major health complications related to low birth weight have been resolved. Medical professionals teach mothers to strap their infants to the their chests using different materials. All mothers place their infants vertically between their breasts, with the infants' arms above the mothers' breasts and the infants' legs below the mothers' breasts, and the infants' heads turned to the side. The WHO states that it is imperative that the mother wraps her infant in a position where she is able to have her own arms free, so that she can continue with daily activities. The infants must be naked except for a diaper, a warm hat, and socks. If the room temperature is below 22 degrees Celsius, or 71 degrees Fahrenheit, the infant may also have an open-front shirt or vest that will still allow for skin contact with its mother on the infant's face, chest, abdomen, and extremities. Researchers have demonstrated that temperature regulation plays an important role in infant survival, so much so that decreasing environmental temperatures by five degrees Fahrenheit can decrease infant survival rates by 12 percent. Low birth weight infants are at higher risk for heat loss because they have large skin surface area and low body mass. The kangaroo position utilizes the mother's body heat to maintain the infant's body temperature.

The second component of Kangaroo Mother Care is exclusive breastfeeding. The WHO guidelines recommend that infants begin breastfeeding exclusively as soon as possible after birth. If infants are unable to breastfeed at any time, the mother should continue to express milk and medical staff should teach mothers to feed the infant with alternative methods, such as a nasogastric tube, or out of a small cup. Researchers demonstrated numerous additional health benefits associated with breastfeeding for both the infant and mother. Infants who are fed human breast milk are less likely to contract infectious diseases, which leads to lower death rates. Researchers have also shown that breastfeeding improves cognitive development in infants. According to researchers, maternal benefits may include decreased risk of breast and ovarian cancer, decreased postpartum bleeding, and quicker return to pre-pregnancy weight. The first two components of Kangaroo Mother Care, skin-to-skin contact and breastfeeding, directly affect the ability to achieve the third, which is early discharge from the hospital.

The last component of Kangaroo Mother Care is early infant discharge from the hospital. The WHO

recommends that medical staff should discharge infants from the hospital when they are able to maintain a stable body temperature, gain weight, and feed well. When treated with Kangaroo Mother Care, an infant is able to meet those milestones because the mother's body maintains the infant's body temperature as a substitute for the incubator technology, which typically requires that infants stay in the hospital longer. Most infants will still be less developed than a full-term infant at discharge, and therefore protocol recommends that staff provide continual support for mothers after discharge with frequent follow ups. The WHO recommends at least one visit by a trained healthcare professional for each week that the infant is premature.

The use of Kangaroo Mother Care continues to evolve. In general, doctors use Kangaroo Mother Care to manage complications related to low birth weight such as difficulty maintaining body temperature, slow infant growth rate, and high risk of infection. Although the WHO recommends that physicians use the treatment for infants who have no major health problems like heart defects or intestinal disorders, and for infants who are able to breathe air independently of machines, some studies have shown that Kangaroo Mother Care may have immunity and bonding benefits when used in conjunction with incubators. Research has shown that Kangaroo Mother Care has the greatest outcomes when it is initiated immediately after birth, and when it is used many hours of the day over an extended period of time. Though doctors treating low birth weight infants in developing and underdeveloped countries almost exclusively use Kangaroo Mother Care, the method has also become a frequent replacement for incubators in developed countries.

Since the development of Kangaroo Mother Care in the 1970s, many researchers have conducted studies to evaluate its effectiveness in both rural and urban communities. In 2016, a Cochrane systematic review of Kangaroo Mother Care showed a decrease in common consequences of low birth weight such as severe infection called sepsis, low body temperature called hypothermia, lower respiratory tract disease, and other illnesses. There is also evidence that Kangaroo Mother Care is equal to, if not better than, incubator care for treating all low birth weight infants. For example, Kangaroo Mother Care increases duration and prevalence of breastfeeding and infant-mother bonding, while decreasing infant and mother stress. Furthermore, Kangaroo Mother Care has been shown to empower mothers and boost maternal confidence in caring for their newborns. Researchers have not demonstrated that those additional benefits result from conventional care.

In 1991, Rey Sanabria and Martínez-Gómez received The Sasakawa Health Prize from the WHO for their Kangaroo Mother Program. Since the first Workshop and Congress of the International Network on Kangaroo Mother Care in 1996, researchers and physicians have participated in biyearly conferences focused on the uses and advantages of the technique based on updated research and professional experience. In 2003, the WHO's Department of Reproductive Health and Research published the Kangaroo Mother Care guidelines in more than a dozen languages based on that workshop and sold thousands of copies. As of 2018, Kangaroo Mother Care has become common practice around the world. The International Network on Kangaroo Mother Care continues outreach programs to implement the method in communities throughout the world. In technologically developed countries, researchers continue to explore Kangaroo Mother Care for new uses such as pain management in infants during blood draws. Researchers are also studying the role of father figures in Kangaroo Mother Care, as well as the long term outcomes of implementing the treatment method.

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