

Kangaroo Mother Care helps premature babies thrive 20 years later, study shows

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Twin infants are receiving skin-to-skin Kangaroo Mother Care contact at Gabriel Touré Hospital in Bamako, Mali. Credit: Fundación Canguro

Two decades after a group of Colombian parents were shown how to keep their perilously tiny babies warm and nourished through

breastfeeding and continuous skin-to-skin contact, a new groundbreaking study finds that as young adults their children continue to benefit from having undergone the technique known as Kangaroo Mother Care.

In young adulthood, they are less prone to aggressive, impulsive and hyperactive behaviour compared to a [control group](#) of premature and low birth weight contemporaries who received "traditional" inpatient incubator care. They are more likely to have survived into their 20s. Their families are more cohesive. They have bigger brains.

Supported by the Government of Canada through Grand Challenges Canada's "Saving Brains" program, as well as Colombia's Administrative Department of Science, Technology and Innovation (COLCIENCIAS), the study is published today in the journal *Pediatrics*.

"This study indicates that Kangaroo Mother Care has significant, long-lasting social and behavioural protective effects 20 years after the intervention," says lead researcher Dr. Nathalie Charpak, of the Kangaroo Foundation in Bogotá.

The technique's early impact was still present 20 years later for those who started life as the most fragile individuals, she says. Families trained in Kangaroo Mother Care were more likely to remain together and to be more protective and nurturing, reflected in their children's lower school absenteeism, ability to express feelings, and reduced hyperactivity, aggressiveness and antisocial conduct as young adults.

"A premature infant is born somewhere in the world every two seconds," says Dr. Peter A. Singer, Chief Executive Officer of Grand Challenges Canada. "This study shows that Kangaroo Mother Care gives premature and low birth weight babies a better chance of thriving. Kangaroo Mother Care saves brains and makes premature and low birth weight babies healthier and wealthier."

What is Kangaroo Mother Care?

About 15 million premature infants are born each year, according to the World Health Organization. Preterm birth complications are the leading cause of death among children under 5, responsible for nearly 1 million deaths in 2015; many survivors face a lifetime of disability, including learning disabilities and visual and hearing problems.

Premature and low birth weight infants generally require extra care to avoid illness and death from secondary, preventable complications such as hypothermia and infection. This is a particular problem in developing countries, where incubators and similar technologies are often scarce, over-crowded or unreliable, as well as costly.

A trained Kangaroo Mother Care parent or caregiver becomes a child's incubator and its main source of food and stimulation. The technique involves continuous skin-to-skin contact between caregiver and infant, with the baby nested in a "kangaroo" position on the caregiver's chest as soon as possible after birth. The technique is accompanied by exclusive breastfeeding.

Kangaroo Mother Care also requires and prepares the mother and child to go home as soon as possible from the hospital, after which there is rigorous monitoring of baby and mother until the infant reaches one year of corrected age (the baby's age based on due date rather than date of birth). Family solidarity around the frail child is a key element in the success of the Kangaroo Mother Care technique.



A premature infant is receiving skin-to-skin Kangaroo Mother Care contact at Gabriel Touré hospital in Bamako, Mali. Credit: Fundación Canguro

Revisiting Kangaroo Mother Care babies 20 years later

The Kangaroo Foundation research compared 18 to 20 year olds who, as premature and low birth weight infants, had been randomized at birth to receive either Kangaroo Mother Care (KMC) or traditional incubator care until they could maintain their own body temperature.

During that initial randomized control trial in 1993-96, researchers documented the short and mid-term benefits of KMC training on the infants' survival, brain development, breastfeeding and the quality of mother-infant bonding.

In 2012-2014, 264 of the original participants who weighed less than 1800 grams at birth were re-enrolled (61% of infants that qualified).

Looking at mortality, the research found that KMC offered significant protection against early death. The mortality rate in the control group (7.7 percent) was more than double that of the KMC group (3.5 percent).

Among other results of the study:

- **School:** The KMC group spent about 23 percent more time in preschool and had less than half the rate of school absenteeism compared to the control group.
- **Work:** As young workers, their average hourly wages were almost 53 percent higher.
- **Family:** A higher percentage of KMC children (almost 22 percent) grew up living with both parents. The families of KMC children were found to be more stimulating, protective, and dedicated to their children compared to the families in the control group.
- **Behaviour:** Scores for aggressiveness and hyperactivity were 16 percent lower in the KMC group, particularly among less-educated mothers. Scores for externalization (the ability to express feelings, especially negative feelings), a trait associated with risk of juvenile delinquency, academic failure, and inadequate social adjustment, were 20 percent lower in the KMC group on average. The parents of KMC children also reported that their children exhibited less antisocial behaviour compared to the reports of the parents of the counterparts in the control group.
- **Cerebral development:** Compared with those in the control group, KMC participants had larger brains - significantly larger volumes of total grey matter, cerebral cortex, and left caudate

nucleus, which plays a vital role in how the brain learns, specifically related to the storing and processing of memories.

- Overall IQ: Tests after 20 years show a small but significant (3.6 percent) advantage in overall intelligence (IQ) for the most fragile KMC babies (those with an abnormal or transient neurological exam at 6 months) compared to similar infants in the control group.

The world needs Kangaroo Mother Care

Dr. Charpak notes that as neonatal technology becomes more accessible throughout the world, more premature and low birth weight infants are saved with fewer serious consequences in later years.

"That is why the detection of 'minor' consequences becomes important," she says. "Minor effects like mild cognitive deficits, lack of fine coordination, poor hearing or eyesight and attention deficit can often go undetected but have a profound effect on the lives of families.

"The findings of our 20-year KMC study should inform the modalities of medical, psychological and social postnatal interventions such as Kangaroo Mother Care so that we can continue to reduce the disorders caused by prematurity and low birth weight."

Dr. Charpak says that this new knowledge must be used to extend KMC coverage to the 18 million premature and low [birth weight](#) infants born each year who are candidates for the technique.

"We firmly believe that this is a powerful, efficient, scientifically based health care intervention that can be used in all settings, from those with very restricted to unrestricted access to health care," she says.

"This study demonstrates that Kangaroo Mother Care can make all the

difference in the world for premature and [low birth weight](#) infants," says Dr. Karlee Silver, Vice President Programs at Grand Challenges Canada. "Kangaroo Mother Care is a cost-effective, modern method of care that can and should be applied in every country."

More information: "Twenty-year follow-up of Kangaroo Mother Care versus traditional care," [DOI: 10.1542/peds.2016-2063](https://doi.org/10.1542/peds.2016-2063)

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