

# Kangaroo Care for Fullterm Infants: State of the Science

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Human newborns, even at fullterm, are extremely immature. Thus newborns need a habitat where they can thrive and grow. Similar to the marsupials which keep their infants in a pouch for sometime after birth, the habitat for human newborns is skin-to-skin on their mother's chest. In this position newborns have easy access to food, remain warm, and the newborns' actions initiate maternal care taking responses. But the current paradigm of care separates infants and their mothers at birth and during the early postpartum period.

Evidence for skin-to-skin care, a.k.a. Kangaroo Care (KC) or Kangaroo Mother Care, dates from the mid-1970s. The evidence from 30 years of research can be categorized into three primary areas:

1. *Bonding and attachment behaviors.* Early explorations of KC focused on its effect on maternal attachment. Known as early contact, extended contact, close contact, or skin-to-skin contact, mothers were given their newborns to hold skin-to-skin immediately after delivery for 15 to 60 minutes before the infants were taken to the nursery. Mothers and infants were reunited 4 to 6 hours later. During observations of mother-infant interactions made several days to 1 week after delivery mothers demonstrated more contact behaviors, smiled and vocalized more, kissed and inspected their infant more, and attempted to elicit responses more than mothers who had held their swaddled infants for a very short period right after delivery. In long term follow-up mothers who had experienced KC after birth appeared for more follow-up appointments, continued to interact more positively with their infants, and spoke more positively about their infant. Infants who had been held in KC fretted and cried less frequently and for shorter periods at 3 and 36 months, smiled more often at 3 months, and at 1 year were ahead in social, linguistic, and fine/gross motor indices. Differences between KC groups and no-KC groups were noted even 3years after birth. The determinant of increased maternal affectionate behavior was KC contact and the timing of KC contact (immediate vs 12 hrs after delivery or none).

2. *Infant physiology.* Newborn thermoregulation has been a primary research concern and many studies have compared thermoregulation during KC to thermoregulation during routine care. Routine care consists of removal of infant from delivery area to warming unit for initial assessments and treatments (eyes & thighs, measurements), then infant is swaddled in multiple blankets and given to mom for 5-10 minutes of holding, and finally, infants then taken to nursery for remainder of newborn period. KC, as an intervention to warm the newborn, has been compared to routine care for varying lengths of time, 5 to 90 minutes, and in a variety of conditions: in warmer, swaddled in cot, swaddled in mothers' arms, when infant had mustard seed oil applied. In all situations the temperature of the infant in KC remained in the neutral thermal zone, sometimes warming faster in KC or having less of a temperature drop than routine

care, but all results for infants in KC were the same as if not better than routine care. One study even documented that peripheral circulation was established in 90 minutes for infants in KC where as it took several days for infants who were swaddled and placed in a cot. In KC infants remained uniformly warm throughout their body as demonstrated with a thermogram. In summary Kennell & McGrath (2003) stated “Swaddling was more stressful and potentially harmful than allowing the infant to remain skin-to-skin with his mother.”

Results from studies exploring of other physiological parameters, such as heart and respiratory rates, oxygen saturation, and blood gas levels, have indicated that these parameters are similar and within the safe range regardless of whether the infant was in KC or in the control group. Blood glucose was higher and within normal limits for infants receiving KC. There were no differences in weight loss between infants receiving KC or swaddled infants. Additionally, KC infants did not experience diarrhea or ketonuria. Physiological outcomes may be due in part to minimal crying, fewer episodes and shorter in duration, by infants while in KC.

More recent studies have begun to look at the newborns experience of pain while in KC. Infants in KC had significantly shorter duration of crying and significantly less grimacing. KC also appears to prevent the rise in heart rate seen in control infants that accompanies painful procedures (heel lancing or shots). KC appears to fostered physiologic stability during painful procedures in healthy fullterm infants.

Exploration of the impact of KC on neurobehavioral stabilization and development in full term infants has just begun. Initial results suggest that KC positively influences state organization and motor system modulation shortly after birth thereby positively impacting the initial adaptation and physiological stability of neonates.

3. *Breastfeeding initiation, duration, exclusivity.* Numerous descriptive and randomized control trials have documented the positive impact of KC on breastfeeding. If infants were placed in KC immediately after delivery and remained there for at least 50 minutes they spontaneously crawled to the breast and start feeding 50 to 90 minutes after birth. Additionally, mothers who KCed and breastfed in the immediate post-delivery period were more likely to breastfeeding exclusively and for a longer time than mothers who receive “routine care.” KC was a significant and independent predictor of exclusive breastfeeding continuation. Additionally, infants who received KC had fewer infections at 6 and 9 months. Mothers who KCed had less anxiety, less breast engorgement, and greater maternal self-confidence than control mothers. KC was also beneficial in helping mothers with breastfeeding difficulties develop the breastfeeding relationship. The overwhelming evidence that KC positively influences breastfeeding initiation, exclusivity and duration has lead multiple international, national and healthcare organizations to recommend placing newborns in KC immediately after delivery and leaving them there until the first breastfeeding is accomplished, delaying all assessments and preventive treatments for the first hour.

*Practice recommendations for healthy, fullterm infants.*

- 1) Begin Kangaroo Care as soon as possible after birth,
- 2) let the mother help stabilize her infant,
- 3) provide a comfortable milieu for the new family,
- 4) KC as long and as often as possible,
- 5) KC before, during, and after feedings,
- 6) let mother and infant sleep together, and
- 7) let others KC if mother agrees.

## Kangaroo Care with Full Term Infants

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