

# NEONATAL NETWORK<sup>®</sup>

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REMINISCING

## Thirty Years of Kangaroo Care Science and Practice

IS IT 30 YEARS ALREADY SINCE I RECEIVED my first issue of *Neonatal Network: The Journal of Neonatal Nursing* (NN)? How time does fly when you are having fun! NN was a newborn 30 years ago and now it is a fully mature, highly respected peer-reviewed professional journal indexed by every relevant database and available to every health professional. Every issue, then and now, has been happily anticipated and definitively rewarding, containing so many articles of interest about innovative and established practices in caring for newborns and their families. I salute the accomplishment of 30 years of this neonatal nursing publication. To celebrate NN's achievement, I was asked to reflect on how Kangaroo Care (KC) has evolved over the last 30 years and to enumerate evidence-based effects and practice changes. I have done so, and conclude with goals for the next 30 years of KC. Please understand that KC refers to maternal–infant, paternal–infant, and surrogate–infant (meaning a surrogate for the biologic parents and includes sibling, grandparent, adoptive parent, and so forth) skin-to-skin (chest-to-chest) care, not just maternal–infant contact. In addition, KC is defined as chest-to-chest, skin-to-skin contact because this ventral contact provides pleasing tactile stimulation of the C-afferent nerves,<sup>1,2</sup> which produces release of oxytocin to modulate brain and systemic changes in both the infant and the KC provider.<sup>3,4</sup> Most of the calming, physiologic improvements, growth, and recovery-enhancing effects of KC are caused by oxytocin influences in the brain.

### EVOLUTION OF KANGAROO CARE

Having the mother and newborn experience skin-to-skin, chest-to-chest contact was first studied in 1970, making KC 41 years old in 2011. Those early KC studies tested KC with full-term infants in the first hour or two after birth and confirmed improved maternal behaviors toward the infants<sup>5,6</sup> and enhanced attachment,<sup>6</sup> but the

only change that occurred in nursing care was the adoption of rooming-in to promote attachment; the skin-to-skin contact element was disregarded. Then in 1983, the first report of skin-to-skin, chest-to-chest contact between the mother and her preterm infant originated from Colombia, South America, and KC (also called kangaroo mother care or KMC) for preterm infants was born. The first exposure of nurses to preterm infant KC in the U.S. occurred by presentation in 1988<sup>7</sup> and by publication in 1990.<sup>8</sup> In the following years, 214 reports of full-term infant KC and 345 reports of preterm infant KC have been published,<sup>9</sup> providing substantial evidence of how much better infants are when in KC than when not.

By 1993, KC had been embraced by Scandinavian and several European neonatal specialists. To facilitate KC usage in the U.S., a lay book encouraging parents to request KC for their preterm infants became available in 1993,<sup>10</sup> and by 2011, a new consumer-oriented interactive workbook<sup>11</sup> documenting each infant's and family's responses to KC became available to help mothers of preterm infants use KC to become "the real mother of the infant."<sup>12</sup> Kangaroo Care with full-term infants is not only heavily endorsed, but also recommended as a standard of care by the American Academy of Pediatrics,<sup>13,14</sup> American Heart Association,<sup>15</sup> American College of Obstetricians and Gynecologists,<sup>16</sup> Association of Women's Health, Obstetric, and Neonatal Nurses,<sup>17</sup> and the National Association of Neonatal Nurses.<sup>18</sup> The U.S. Centers for Disease Control and Prevention (CDC) are promoting KC with full-term infants,<sup>19,20</sup> beginning within a minute or so of birth and continuing until the first feeding at breast has been completed because of KC's undisputed benefits to initiation, exclusivity, and continuation of breastfeeding.<sup>21,22</sup>

Nursing adoption of KC in the U.S. is progressing slowly,<sup>23</sup> impeded by the lack of education about KC

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for the nation's 20,000 neonatal nurses and 112,000 labor/delivery/newborn nurses.<sup>23</sup> NICU nurses' insistence that KC be given only by physician order (which is not required for any other type of maternal holding of her infant and should not be for KC because physicians' knowledge about KC lags far behind that of nurses<sup>24</sup>), complaints that KC takes too much time<sup>25</sup> even though KC frees up a nurse's time because of more physiologic stability and sleep during KC than incubator care, lack of KC policies and protocols (many have been available for years<sup>26-34</sup>), and fear of infant physiologic instability related to loss of temperature (simply does not occur as shown by meta-analyses<sup>21,22,35-37</sup>) or fear of infant stress because of transfer into and out of KC (can occur but recovery is complete within 15 minutes<sup>38</sup>), are persistent but invalid barriers to routine use of KC. There are two types of transfer (standing and sitting exist and standing transfer is less stressful than sitting).<sup>38</sup> In the U.S., KC is predominantly intermittent rather than 24/7, and its duration varies widely from a few minutes to many hours, even though evidence-based guidelines recommend at least 60 minutes of continuous uninterrupted KC for any preterm infant so one cycle of sleep can be completed<sup>29</sup> and at least 60 minutes of continuous uninterrupted KC for full-term infants.<sup>20,39</sup> Kangaroo Care is seldom used for procedural pain,<sup>40</sup> despite recommendations for its use.<sup>26,41</sup> Until nursing professionals endorse and routinely practice the new paradigm of *nonseparation* of infant and mother during the neonatal period, optimal KC practice will not exist.

#### Evidence-Based Effects of Kangaroo Care for Premature and Full-Term Infants

If evidence drives practice, optimal KC practice should occur soon. Comprehensive reviews of the evidence supporting physiologic, behavioral, developmental, and social (attachment and interaction) effects of KC with preterm and full-term infants have been reported

elsewhere.<sup>42-44</sup> The overwhelming majority of effects are positive (Table 1). Physiologic and behavioral effects endure during KC, but vanish within 5-10 minutes of being separated from the mother for placement in an incubator or cot. Developmental and social effects of KC continue to be manifested 1-16 years later.<sup>45,46</sup>

#### The Next 30 Years

The practice of KC should be shaped so that nine objectives are achieved:

1. KC begins immediately after birth for healthy infants (including those born by cesarean section)<sup>47,48</sup> and as swiftly as possible thereafter for infants needing resuscitation. Kangaroo Care beginning immediately after birth programs maternal-infant interactions, brain changes, and hormonal patterns that positively influence maternal and infant interactions<sup>2,3,49</sup> and development for many years.<sup>46</sup> Kangaroo Care in the first-hour postbirth is a powerful nursing intervention.
2. All neonates experience KC, ideally 24/7 KC or as near to that as possible. There is no reason why 24/7 KC cannot be practiced for all healthy newborns over the first 2-3 days of life while infant and mother are still hospitalized together. In NICU care, many hospitals are moving to single-bedded rooms for each infant, supporting the privacy and access that permit 24/7 KC. Based on the positive outcomes of intermittent KC, imagine what might be accomplished with 24/7 KC!
3. Swaddled holding is replaced by skin-to-skin holding. Mothers must be provided with the means to contain their infants securely in KC and the rationale for doing so (Kangaroo Care promotes the best and safest sleep and physiologic condition for the infant).
4. The infant is in KC for sleep, for feedings, for periods of alertness, and for most procedural pain (i.e., shots, heel sticks, venipunctures) and recovery from painful procedures (i.e., circumcision) in which KC is not possible, whenever the mother or other family member is present.
5. Educational content on KC at birth and beyond is in every nursing, obstetric, and pediatric (especially neonatal) text so the next generation of neonatal health professionals is reared with understanding and expectation of routine KC.
6. Neonatal, newborn, and obstetric care orientation programs support, emphasize, and reinforce the fundamentals of routine KC with all neonates.

**TABLE 1 ■ Benefits of Kangaroo Care According to Gestational Age of Infant Being Studied**

Benefits	Gestational Age	Citation
Enhanced physiologic stability (infant)	Preterm	Cong et al. <sup>50</sup> Maastrup & Greisen <sup>51</sup> Marín-Gabriel et al. <sup>52</sup> Mazurek et al. <sup>53</sup> Mori et al. <sup>37</sup>
Enhanced biologic coregulation and synchrony (infant, mother)	Preterm	Ludington-Hoe et al. <sup>54</sup> Neu et al. <sup>55</sup>
Enhanced breastfeeding (more infants initiating and exclusively breastfeeding, and longer duration of breastfeeding) (infant, mother)	Preterm/full term	Conde-Agudelo et al. <sup>35</sup> Mikiel-Kostyra et al. <sup>56</sup> Moore et al. <sup>57</sup>
Enhances sense of “being the infant’s mother” and “being important” (mother)	Preterm/full term	Flacking et al. <sup>12</sup> Matos et al. <sup>58</sup>
Better quality of sleep (infant)	Preterm	Ludington-Hoe et al. <sup>59</sup> Scher et al. <sup>60</sup>
Better weight gain (infant)	Preterm	Conde-Agudelo et al. <sup>35</sup>
Better temperature control (infant)	Preterm/full term	Conde-Agudelo et al. <sup>35</sup> Marin-Gabriel et al. <sup>52</sup> Moore et al. <sup>57</sup>
Better autonomic system functioning (infant)	Preterm	Cong et al. <sup>50</sup> Martin et al. <sup>61</sup>
Better brain development (accelerated maturation and increased complexity)	Preterm	Kaffashi et al. <sup>62</sup> Scher et al. <sup>60</sup>
Better long-term motor development (infant)	Preterm	Ferber et al. <sup>63</sup> Ferber et al. <sup>64</sup>
Better long-term mental development (infant)	Preterm	Feldman <sup>46</sup> Hall et al. <sup>65</sup>
Better maternal/paternal–infant attachment (infant, mother, father)	Preterm/full term	Conde-Agudelo et al. <sup>35</sup> Fegran et al. <sup>66</sup> Gordon et al. <sup>3</sup>
Better maternal/paternal–infant interactions	Preterm/full term	Bystrova et al. <sup>49</sup> Moore et al. <sup>57</sup> Neu et al. <sup>67</sup> Velandia et al. <sup>68</sup>
Decreased stress (infant, mother)	Preterm/full term	Collados-Gomez et al. <sup>69</sup> Neu et al. <sup>55</sup> Nolan et al. <sup>48</sup> Takahashi et al. <sup>70</sup>
Decreased pain perception (infant)	Preterm/full term	Chermont et al. <sup>71</sup> Cong et al. <sup>50</sup> Cong et al. <sup>72</sup> Kashaninia et al. <sup>73</sup>

**TABLE 1 ■ Benefits of Kangaroo Care According to Gestational Age of Infant Being Studied (continued)**

Benefits	Gestational Age	Citation
Decreased crying and colic (infant)	Preterm/full term	Moore et al. <sup>57</sup> Okan et al. <sup>74</sup>
Decreased likelihood of nosocomial and other infections (infant)	Preterm/full term	Conde-Agudelo et al. <sup>35</sup> World Health Organization <sup>34</sup>
Decreased length of stay in hospital (infants)	Preterm	Conde-Agudelo et al. <sup>35</sup>
Decreased neonatal mortality	Preterm/full term	Conde-Agudelo et al. <sup>35</sup> Lawn et al. <sup>75</sup>

7. Routine KC practice is part of a nurse's performance review and a mandate for Joint Commission accreditation, because anything less than routine KC is less than the best care.
8. Position statements from neonatal and newborn nursing organizations endorsing the routine use of KC for all of its positive effects in preterm and full-term infants are published and identify KC as an essential element of newborn care. These position statements will supplement existing statements related to positive breastfeeding outcomes in full-term infants and serve as testimony that neonatal/newborn nurses provide leadership in the field.
9. Kangaroo Care continues throughout hospitalization and the first three months post-discharge.

When these practice goals have been met, maternal–newborn (including neonatal) nursing care will be truly *optimal*, and nurses will be doing their very best for all newborns and their families. The *Neonatal Network* will exist long enough to see these goals met; I hope I will, too!

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