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R³: Research, Read & Review

Literature dissemination by the NIDCAP and Science Sub-Committee

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Title	**Incidence of Intermittent Hypoxemia Increases during Clinical Care and Parental Touch in Extremely Preterm Infants**
Reference	Mueller SM, Ackermann BW, Martin S, Seifert K, Mohr A, et al. Neonatology 2023; 120:102–110. DOI: 0.1159/000527725
What is known about this topic?	• Intermittent hypoxemia (IH) is common among very low birth weight (<1500 gr) preterm infants during the first few months after birth, due to immature respiratory control. • Recent studies demonstrated relationships between neonatal hypoxemia and later neurodevelopmental impairments or mortality. • Therapeutic approaches to prevent IH comprise careful oxygen supplementation, respiratory support, and Methylxanthine therapy. • It is well known that both environmental stress and medical handling can increase the frequency of IH episodes.
What does this paper add?	• The study quantifies the effect of hands-on medical and parental interventions on the incidence of IH in extremely preterm infants. • The study shows that, among the caregiving interventions tested, nursing and medical care had the highest incidence of IH episodes (both in terms of their frequency and proportion of time). • The lowest incidence of IH was during skin-to-skin care and during health care delivered by parents.
A summary	**Study Design:** An observational design with intraindividual comparisons. **Participants**: Twenty stable neonates (GA=≤28 weeks, BW<1,500g), postnatal age 0–6 weeks, receiving gavage feeding and with parental informed consent.

	Measurements: • IH were compared between 6 types of interventions: 1. Nursing and medical care by health care providers (NMC) 2. Health care provided by parents (NMC-parents). 3. Skin to Skin /kangaroo care (SSC). 4. Touch by parents while infant lays in incubator 5. Physiotherapy. 6. Rest • Neonates were monitored with a time-lapse camera at a sampling rate of one frame per second, for 6 consecutive days. Oxygen saturation and heart rate were continuously sampled with a pulse oximeter. • IH episodes were defined as oxygen saturation < 80% > 10 sec. **Results** • The highest proportion of time when infants presented IH occurred during NMC (2.49%) and incubator touch by parents (1.32%), while he lowest proportion of time occurred during SSC (0.74%) and NMC- parents (0.67%). • Significantly, more IH occurred during NMC (Median =2.95 episodes per hour) than during NMC- parents, SSC, physiotherapy, and rest. IH during touch by parents in the incubator (Median= 1.40 episodes per hour) was not significantly different from NMCs. SSC showed the lowest incidence of IH (Median= 0.88 episodes per hour). • Time to occurrence of IH episodes was shortest during NMC (Median= 3 min) and longest during SSC (Median= 37 min)
What is the relevance to NIDCAP?	• Findings of this study indirectly support two important notions of NIDCAP-based care: (a) gentler handling strategies that incorporate a co-regulatory perspective during nursing and medical care could be beneficial for the extremely premature infant; (b) parent's involvement and participation in care is beneficial to infants - as reflected in this study by the lower incidence of IH episodes when health care was provided by parents, as compared to professionals. • This is yet another study that shows the beneficial effects of SSC and further supports its implementation. • While an increase in IH during NMC and low incidence during SSC could have been expected, the relative high incidence of IH episodes while infants were touched by their parents in the incubator was

	somehow surprising, as affectionate parental touch is intended to be soothing, not stressful. However, this finding might suggest that a closer guidance and support to parents regarding the behavioral signs and language of their infants (e.g., how to interpret that language to decide about the optimality of the timing and nature of the touch) – was perhaps needed.