
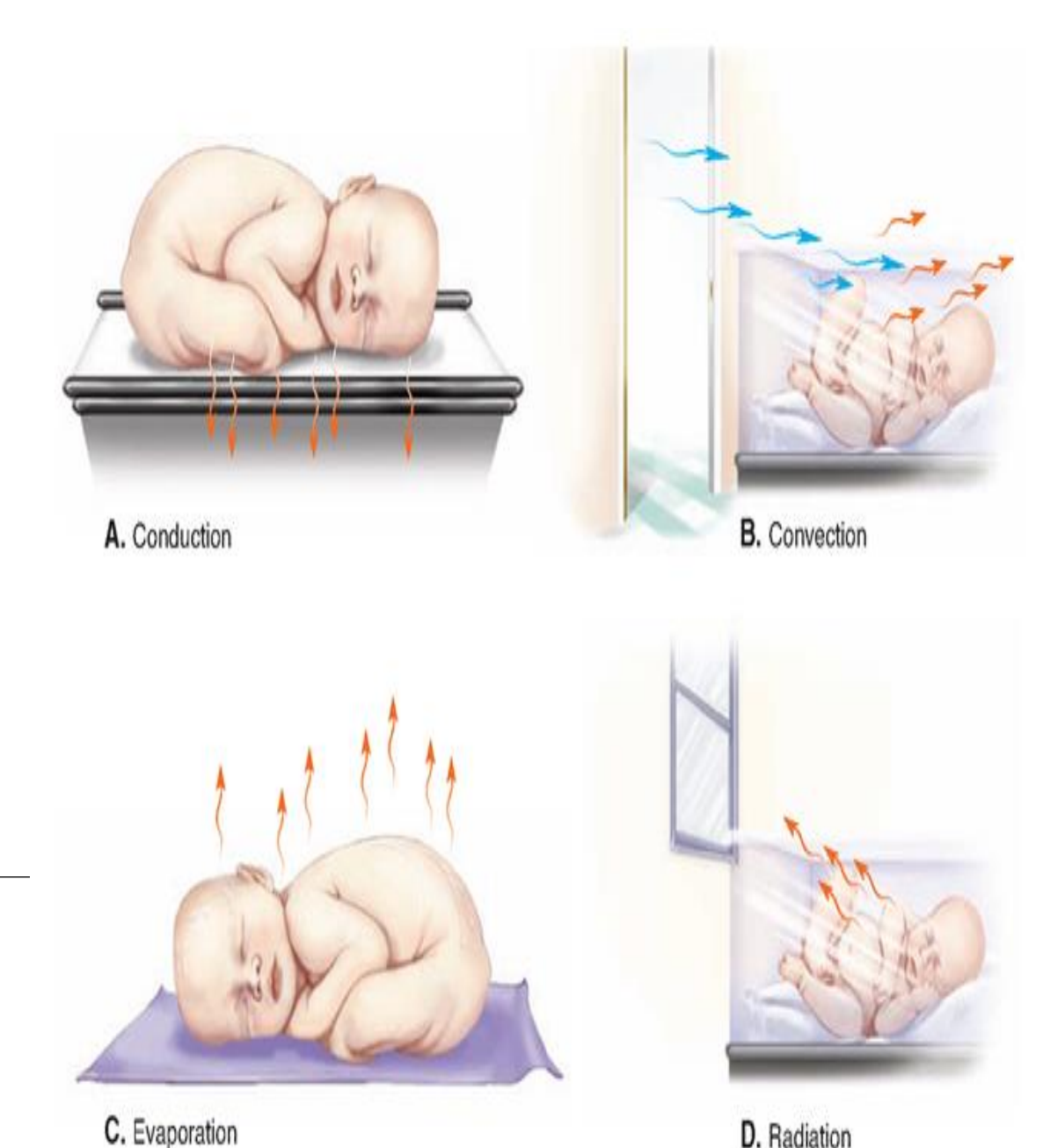


<div></div>		<div>Neonatal Thermoregulation</div> <div>Susanna Ofori</div>						
<div><div>Introduction</div><p>Tansey and Johnson (2015) define thermoregulation as the maintenance of a relatively constant core body temperature. Additionally, RCPCH (2018) disclosed the findings of the Neonatal National Audit Programme (NNAP) report, which stated that the 'normal' range must be maintained within 60 minutes, (known as, Golden Hour) between 36.5 and 37.5 degrees Celsius for the infant's survival.</p><div>Background</div><p>According to Soll (2018), a newborn's in utero heat production leads to a foetal temperature that is roughly half a degree higher than the maternal temperature. After birth, the newborn infant becomes subjected to a much different environment and is at risk of possibly fatal hypothermia, mainly to the low birth weight (LBW) and preterm infants (Sedin, 2006).</p></div>		<div><p>According to Laptook and Watkinson (2008), heat loss is controlled by the flow of heat between an infant and its surroundings and includes evaporation, convection, conduction, and thermal loss.</p><ul style="list-style-type: none">- <u>Evaporation</u>; the loss of heat from evaporation occurs when water is converted to a gas via the skin or respiratory tract.- <u>Convection</u>; occurs when heat travels from the skin to the surrounding environment via moving air or water.- <u>Conduction</u>; heat loss can occur when exposed to colder air, fluids, or solid objects.- <u>Radiation</u>; depending on the energy transferred by radiation, body temperature will decrease or increase.<div></div><div>FIGURE 67-1 Heat loss in the newborn can be caused by any one, or a combination, of the following factors: (A) Conduction: heat loss due to direct contact with a colder surface. (B) Convection: heat loss due to air movement. (C) Evaporation: heat loss due to the cooling effect of water loss on the skin. (D) Radiation: heat loss via infrared heat rays due to body metabolism.</div></div>			<div><div>Challenges</div><ul style="list-style-type: none">- A lack of resources and understanding of the cause and/or effect of heat loss, such as failing to use massage oil or failing to bathe the baby early.- Soll (2008) suggests that one of the main physiologic factors that an infant faces after birth is the inability to maintain a neutral thermal environment.</div> <div><div>Benefits</div><ul style="list-style-type: none">- Other countries recognise the significance of neonatal thermoregulation (Yip et al., (2017).- Many strategies have been implemented to prevent or reduce hypothermia, including skin-to-skin contact (SSC), in which the newborn is placed on the bare chest of the mother within the first 60 minutes of life to maintain the infant's temperature (Gupta et al., 2021).</div>		<div><div>Duty of the nurse</div><ul style="list-style-type: none">- Monitor temperature and instability.- Methods to keep infant warm; such as incubator, thermal cot, babytherm..- Maintain the neutral environment.<div>Strategies/solution</div><p>Conduction – warming towels/blankets.</p><p>Convection – room temperature above 26 degrees Celsius.</p><p>Radiation – warm incubator/radiant warmer.</p><p>Evaporator – incubator humidification</p><div>References</div><ul style="list-style-type: none">• Gupta, N., Deierl, A., Hills, E., & Banerjee, J. (2021). Systematic review confirmed the benefits of early skin-to-skin contact but highlighted lack of studies on very and extremely preterm infants. <i>Acta Paediatrica</i>, 110(8). https://doi.org/10.1111/apa.15913• Knobel, R. B. (2014). Role of effective thermoregulation in premature neonates. <i>Research and Reports in Neonatology</i>, 4, 147. https://doi.org/10.2147/rnn.s52377• Laptook, A. R., & Watkinson, M. (2008). Temperature management in the delivery room. <i>Seminars in Fetal and Neonatal Medicine</i>, 13(6), 383–391. https://doi.org/10.1016/j.siny.2008.04.003• Lunze, K., & Hamer, D. H. (2012). Thermal protection of the newborn in resource-limited environments. <i>Journal of Perinatology</i>, 32(5), 317–324. https://doi.org/10.1038/jp.2012.11• RCPCH. (2018). National neonatal audit programme (NNAP) 2018 annual report on 2017 data. https://www.rcpch.ac.uk/sites/default/files/2020-01/NNAP%202019%20annual%20report%20on%202018%20data%2009.01.20.pdf• Sedin, G. (2006). The thermal environment of the newborn infant.• Soll, R. F. (2008). Heat loss prevention in neonates. <i>Journal of Perinatology</i>, 28(S1), S57–S59. https://doi.org/10.1038/jp.2008.51• Tansey, E. A., & Johnson, C. D. (2015). Recent advances in thermoregulation. <i>Advances in Physiology Education</i>, 39(3), 139–148. https://doi.org/10.1152/advan.00126.2014• Yip, W. Y., Quek, B. H., Fong, M. C. W., Thilagamangai, Ong, S. S. G., Lim, B. L., Lo, B. C., & Agarwal, P. (2017). A quality improvement project to reduce hypothermia in preterm infants on admission to the neonatal intensive care unit. <i>International Journal for Quality in Health Care</i>, 29(7), 922–928. https://doi.org/10.1093/intqhc/mzx131</div>	