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The Neonatal Piglet as a Model for Human Neonatal Carnitine Metabolism

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Abstract

Investigations concerning carnitine metabolism and possible requirements for exogenous carnitine in human preterm neonates are limited by ethical considerations. The neonatal piglet is a potential animal model for these investigations. Tissue carnitine concentrations were determined in fetuses from cross-bred domestic gilts at stages of gestation corresponding to those of neonates found in neonatal intensive care units. Fetal piglet plasma and red blood cell carnitine levels decreased from approximately 90 d to term. Skeletal muscle carnitine increased from 60 d to term. Temporal changes in fetal carnitine concentrations in plasma, red blood cells and skeletal muscle throughout gestation are similar to the pattern reported by our laboratory for the human neonate. Cardiac muscle carnitine increased earlier than skeletal muscle but also continued to increase to term. Carnitine concentrations in fetal liver, kidney and intestine were maximal at 90 d and decreased until term. Similarities in physiology, metabolism and profiles of tissue carnitine concentration between the newborn piglet and the human neonate indicate that the neonatal piglet is an appropriate animal model for investigations concerning neonatal carnitine metabolism.

Keywords: [carnitine](#), [neonate](#), [piglet](#)

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