

Preemies' separation from mom + physical stress may increase health risks in adulthood

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A new study suggests that physiological stress in premature infants combined with separation from their mothers may have lasting effects into adulthood. In clinical studies, these factors have been found to

increase the risk of obesity and insulin resistance, leading to metabolic disorders such as metabolic syndrome and type 2 diabetes mellitus. The study is published ahead of print in the *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology*.

Researchers from Aurora St. Luke's Medical Center/Aurora Research Institute in Milwaukee and the Medical College of Wisconsin studied groups of newborn rats in varying situations that simulated the experience of [premature infants](#) separated from their mothers for the purposes of clinical care:

- Low oxygen levels that spontaneously led to low body temperature;
- Normal oxygen levels and induced low body temperature;
- Low oxygen levels and steady (normal) body temperature (to mimic incubator care); and
- Normal oxygen and temperature levels ([control group](#)).

The control group with normal oxygen and temperature levels was compared to a group of neonatal rat pups staying with their mother (unseparated).

When the rat pups reached adulthood, the research team measured levels of insulin, glucose and hormones in the blood that are associated with appetite, body weight and [insulin resistance](#).

Male and female adult rats that were separated from their mothers as newborns weighed more than the control group. Male rats separated from their mothers had higher levels of leptin, a hormone linked to increased appetite and obesity. This may contribute to the development of [metabolic syndrome](#) and type 2 [diabetes mellitus](#). Adult male rats that had been exposed to low oxygen with steady (normal) body temperature as neonates also had lower testosterone levels.

The researchers wrote that because touch between the caregiver and the separated newborn can weaken some of these effects, "we feel that continued mechanistic studies in our rat model will prove useful to develop new approaches to the management of the premature human infant to mitigate the long-term effects."

The article, "Insulin sensitivity, leptin, adiponectin, resistin, and testosterone in adult male and female [rats](#) after maternal-neonatal separation and environmental stress," was published ahead of print in the *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology*.

More information: Hershel Raff et al. Insulin Sensitivity, Leptin, Adiponectin, Resistin, and Testosterone in Adult Male and Female Rats After Maternal-Neonatal Separation and Environmental Stress, *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology* (2017). [DOI: 10.1152/ajpregu.00271.2017](https://doi.org/10.1152/ajpregu.00271.2017)

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