

# Shift work for mothers associated with reduced fetal growth and longer pregnancies

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New research published in *The Journal of Physiology* indicates shift work exposure in mothers can result in reduced fetal growth and longer pregnancies, even when the shift work is only carried out early in pregnancy.

Shift work interferes with normal patterns of sleep activity, eating times and exposure to light. Shift workers are at increased risk of developing type 2 diabetes and obesity, but effects on metabolism have not been studied in human [pregnancy](#). While shift work has been associated with impaired pregnancy outcomes, until now the mechanisms have not been understood. Importantly, it was not known when women should stop shift work to prevent [adverse effects](#) on their pregnancies. Researchers found that shift work could impair glucose tolerance of mothers in [early pregnancy](#), which means mothers had poorer control of their blood glucose levels. They demonstrated that shift work during pregnancy can disrupt maternal circadian rhythms, or the 24-hour body clock, and metabolism. These findings could inform [public policy](#) and workplace practices for shift work during pregnancy in women.

Previous studies have shown that disrupted sleep patterns in rodents can affect pregnancy outcomes. This study considers effects in sheep as they provide an excellent animal model for human pregnancy. The study, conducted by the University of Adelaide and South Australian Health and Medical Research Institute, involved simulating shift patterns in groups of sheep, with either light on during the day and food provided each morning, or the timing of light and feeding changed to mimic a rotation between day and [night shift](#) during each week. The researchers measured maternal circadian rhythms and glucose control in early and late pregnancy, and weighed all lambs at birth.

Exposure to a model of rotating shift work impaired glucose tolerance in sheep during early pregnancy, just as it does in non-pregnant human adults. Reduced fetal growth was seen in pregnancies with a single foetus and longer pregnancies in mothers carrying twins. Importantly, this was the case even when mothers stopped simulated shift work after the first third of pregnancy. This suggests that exposure to rotating night and day shifts, even if only in early pregnancy, may adversely affect maternal metabolic and pregnancy outcomes.

The researchers now hope to identify shift work patterns that do not adversely affect the mother's metabolism or pregnancy outcomes. The limitation of this research is that most human pregnancies are singletons, but in this study there were a similar number of twins and singletons, due to the peak fertility of sheep around equinox when they were mated. This reduced the researcher's ability to compare effects of different durations of shift work on pregnancy outcomes.

Dr. Kathy Gatford, leading author on the study, commented on the findings:

'The effects of shift work on pregnancy are not well understood. We found that exposure to rotating night and day shifts, even if only early in pregnancy, altered both maternal metabolic and pregnancy outcomes. We are now assessing whether maternal shift work affects the health of their children by looking at circadian rhythms, cardiometabolic health and body composition in the progeny in this study.'

**More information:** *Journal of Physiology* (2019).  
[physoc.onlinelibrary.wiley.com ... doi/10.1113/JP277186](https://physoc.onlinelibrary.wiley.com/doi/10.1113/JP277186)

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