

More frequent exercise therapy benefits bone strength in very low weight pre-term infants

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Administering range-of-motion exercise at the ankle joint in a very low birth weight preterm infant. Credit: ©picasa

Because of their low weight and premature birth, very low birth weight (VLBW) pre-term infants have lower bone mineral mass and a greater

need for bone nutrients compared to most new-born infants. This places them at greater risk of osteopenia (low bone density) and fractures in later life.

While efforts to prevent osteopenia of prematurity have focused on nutritional therapy via intravenous or tube feeding, these, and other major advances in postnatal intensive care, have been only partially successful in improving improving the [bone](#) mineral mass of VLBW [preterm infants](#). More recently, various studies have shown that the use of physical activity interventions—comprising a daily program of passive range-of-motion-assisted exercise of the large joints—have promising protective effects for bone strength and metabolism.

In a new study published in the journal *Calcified Tissue International and Musculoskeletal Research*, researchers investigated whether increasing the frequency of physical activity intervention to twice daily has a greater effect on bone strength compared to a once daily intervention or no intervention at all.

Thirty-four VLBW preterm infants (average birth weight $127 \pm 55\text{g}$ and average gestational age 28.6 ± 1.1 weeks) were randomly assigned to one of the three study groups. The exercise intervention was initiated at around 8 days of life and continued for 4 weeks. Bone health was measured at the beginning of the study and after 2 and 4 weeks using quantitative ultrasound of tibial bone speed of sound (SOS).

Initially the average bone mass was comparable in all infants, and, as expected, it declined in all groups during the study period despite the infants' overall growth and remarkable weight gain. However, the 13 infants receiving the twice daily intervention programme had a significantly lower rate of decrease in bone mass compared to the once-daily (12 infants) group and no intervention control group (11 infants).

Lead author Dr. Ita Litmanovitz of the Meir Medical Center, Kfar Saba, and Sackler School of Medicine at Tel-Aviv University, stated, "Our study is the first to demonstrate that the [bone mass](#) response to exercise in pre-term infants is dose-related. Although more research is needed to determine the optimal duration, frequency and type of exercise intervention, we found that the twice daily [intervention](#) was safe and had a greater effect on [bone strength](#)."

More information: Ita Litmanovitz et al, The Effect of Assisted Exercise Frequency on Bone Strength in Very Low Birth Weight Preterm Infants: A Randomized Control Trial, *Calcified Tissue International* (2016). [DOI: 10.1007/s00223-016-0145-3](https://doi.org/10.1007/s00223-016-0145-3)

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