## Title :Longitudinal Assessment of BMD Following Bisphosphonate Administration in Pre- and Postpubertal Children

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### Abstract

Children with cerebral palsy (CP) are at high risk for decreased bone mineral density (BMD) and fracture due to multiple medical factors. Bisphosphonates (BPs) are a common medication used in this and other populations to improve BMD and prevent fracture. However, little is known about the effects of BP on the BMD accrual of children with CP, specifically before and after puberty.

Retrospective review of BMD results by DXA and clinical information of children aged 2-18 years with CP, treated at NCHDE from 2000 to 2025. All patients were GMFCS IV or V and all received BP for at least 1 year. Patients were grouped by Tanner score during treatment: prepubescent (Tanner 1-2) and postpubescent (Tanner 3-5). Thirteen children (7 females) with a mean age of 11.6 years (range 4.3 -18.5) at time of first BP treatment were included. Total observation time was 62 years (4.8 person years). Percent change in BMD during treatment was larger in the prepubescent group, though not statistically significant.

BMD was found to increase at all DXA sites for all ages and Tanner stages in response to BP.A trend of greater BMD response to BP was noted in the prepubescent group at all DXA sites. Variability in post-treatment change in BMD was noted in both groups but varied by DXA site, and within individuals. Further study is required.

Key words: DXA, Tanner, Cerebral Palsy