

# Therapeutic touch affects DNA synthesis and mineralization of human osteoblasts in culture.

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Complementary and alternative medicine (CAM) techniques are commonly used in hospitals and private medical facilities; however, the effectiveness of many of these practices has not been thoroughly studied in a scientific manner. Developed by Dr. Dolores Krieger and Dora Kunz, Therapeutic Touch is one of these CAM practices and is a highly disciplined five-step process by which a practitioner can generate energy through their hands to promote healing. There are numerous clinical studies on the effects of TT but few in vitro studies. Our purpose was to determine if Therapeutic Touch had any effect on osteoblast proliferation, differentiation, and mineralization in vitro. TT was performed twice a week for 10 min each on human osteoblasts (HOBs) and on an osteosarcoma-derived cell line, SaOs-2. No significant differences were found in DNA synthesis, assayed by [(3)H]-thymidine incorporation at 1 or 2 weeks for SaOs-2 or 1 week for HOBs. However, after four TT treatments in 2 weeks, TT significantly ( $p = 0.03$ ) increased HOB DNA synthesis compared to controls.

Immunocytochemistry for Proliferating Cell Nuclear Antigen (PCNA) confirmed these data. At 2 weeks in differentiation medium, TT significantly increased mineralization in HOBs ( $p = 0.016$ ) and decreased mineralization in SaOs-2 ( $p = 0.0007$ ), compared to controls. Additionally, Northern blot analysis indicated a TT-induced increase in mRNA expression for Type I collagen, bone sialoprotein, and alkaline phosphatase in HOBs and a decrease of these bone markers in SaOs-2 cells. In conclusion, Therapeutic Touch appears to increase human osteoblast DNA synthesis, differentiation and mineralization, and decrease differentiation and mineralization in a human osteosarcoma-derived cell line. (c) 2008 Orthopaedic Research Society. Published by Wiley Periodicals, Inc.

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