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## Pulsed electromagnetic fields for the treatment of bone fractures

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### Abstract

The effectiveness of electrical stimulation and Pulsed Electro Magnetic Field (PEMF) stimulation for enhancement of bone healing has been reported by many workers. The mechanism of osteogenesis is not clear, therefore, studies look for empirical evidence. The present study involved a clinical trial using low amplitude PEMF on 19 patients with non-union or delayed union of the long bones. The pulse system used was similar in shape to Bassett's single pulse system where the electric voltage pulse was 0.3 mSec wide repeating every 12 mSec making a frequency of about 80 Hz. The peak magnetic fields were of the order of 0.01 to 0.1 m Tesla, hundred to thousand times smaller than that of Bassett. Among the 13 who completed this treatment schedule the history of non-union was an average of 41.3 weeks. Within an average treatment period of 14 weeks, 11 of the 13 patients had successful bone healing. The two unsuccessful cases had bone gaps greater than 1 cm following removal of dead bone after infection. However, use of such a low field negates Bassett's claim for a narrow window for shape and amplitude of wave form, and justifies further experimental study and an attempt to understand the underlying mechanism.

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