

Models suggest treatments for fractures that won't heal

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New models, reinforced by in vivo experimentation, show why 5-10% of bone fractures don't heal properly, and how these cases may be treated to restart the healing process. Results of the model, published September 2 in the open-access journal *PLoS Computational Biology*, may benefit the ageing population in which the occurrence of bone fractures is expected to rise substantially in the near future.

In 5 to 10% of bone fracture cases, the [healing process](#) does not succeed in repairing the bone, which leads to the formation of delayed unions or even non-unions - fractures that fail to heal. Using a combination of an [animal model](#) mimicking a clinical non-union situation and a mathematical model developed for studying normal fracture healing, researchers at the Katholieke Universiteit Leuven (Belgium), University of Liège (Belgium), Edinburgh University (United Kingdom) and Oxford University (United Kingdom) investigated this health problem.

For example, the authors investigated the potential to treat non-unions by transplanting cells from the bone marrow to the fracture site. This was also tested in a pilot animal experiment; both the simulations and the experiments showed the formation of a bony union between the fractured bone ends. In addition, the researchers used the [mathematical model](#) to explain some unexpected experimental observations.

The study demonstrates the added value of using a combination of mathematical modelling and experimental research, as well the potential of using cell transplantation for the treatment of non-unions.

More information: Geris L, Reed AAC, Vander Sloten J, Simpson AHRW, Van Oosterwyck H (2010) Occurrence and Treatment of Bone Atrophic Non-Unions Investigated by an Integrative Approach. PLoS Comput Biol 6(9): e1000915. [doi:10.1371/journal.pcbi.1000915](https://doi.org/10.1371/journal.pcbi.1000915)

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