

Standardized protocols would greatly enhance clinical and research potential of BTMs

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An expert working group of the International Osteoporosis Foundation (IOF) and the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) has released a new position paper which reviews the evidence of bone turnover markers (BTMs) in fracture risk prediction and monitoring of osteoporosis therapy. More importantly, it identifies research priorities and recommends that specific markers be used as reference analytes for BTMs in clinical and observational studies.

BTMs have been extensively studied in relation to fracture risk assessment and have been found, in some cases, to predict fracture risk independently of [bone mineral density](#) (BMD). However, the use of different markers and a number of measurement methods, even for the same marker, has resulted in incomparable and inconsistent data and therefore currently limits the incorporation of BTMs in fracture risk prediction tools, such as FRAX®.

In clinical practice, BTMs are used to monitor osteoporosis treatment. BTMs generally show large and rapid responses to the treatments used for osteoporosis, which make them an appealing tool to inform physicians and patients on treatment efficacy. Some evidence suggests that changes in BTMs following treatment with antiresorptive agents may explain a greater percentage of the fracture risk reduction than does the change in BMD. However, further population studies, with correct

sample handling and statistical methods, are needed to confirm these findings.

In its position paper* the Joint IOF-IFCC [Bone](#) Marker Standards Working Group identified several research priorities to address the gaps in the literature. It recommends that specific markers of bone formation (s-PINP) and of bone resorption (s-CTX) be used as reference analytes for bone turnover markers in clinical and observational studies.

Professor Cyrus Cooper, Co-chair of the Joint IOF-IFCC Bone Marker Standards Working Group and Chair of the IOF Committee of Scientific Advisors, stated "Whilst no perfect 'gold standard' marker exists, these were chosen based on a number of criteria. These include adequate characterisation and clear definition of the marker; their specificity for bone and performance in clinical studies; wide availability; biological and analytical variability; sample handling; stability; ease of analysis and availability of method in routine laboratories; and the medium of measurement (urine vs. serum)."

Professor John Kanis, IOF President, urged the adoption of the reference standards by the scientific community, "Without precluding the use of other BTMs, the adoption of these reference standards would facilitate comparison between studies and allow data from different studies to be pooled in order to facilitate their incorporation into routine clinical practice." He also noted that standardised protocols would greatly increase the clinical and research potential of BTMs, with improved value in patient management and other uses, such as prediction of the rate of bone loss, identification of secondary osteoporosis, prediction of response to therapy, and in improving treatment adherence.

More information: *Markers of bone turnover for the prediction of fracture risk and monitoring of osteoporosis treatment: a need for international reference standards. Osteoporosis International S. Vasikaran, R. Eastell, O. Bruyère, A. J. Foldes and P. Garnero, et al.

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