

Deep-radiomics models can diagnose osteoporosis

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A deep-radiomics approach can be used to diagnose osteoporosis from

hip radiographs, according to a study published online May 25 in *Radiology: Artificial Intelligence*.

Sangwook Kim, M.D., from Seoul National University Hospital in South Korea, and colleagues developed and validated deep-radiomics models for diagnosis of [osteoporosis](#) using 4,924 hip radiographs of 4,308 patients. The model was trained using 10 deep features, 16 texture features, and three clinical features. Seven deep-radiomics models were developed by combining different types of features: clinical (Model-C), texture (Model-T), deep (Model-D), texture and clinical (Model-TC), deep and clinical (Model-DC), deep and texture (Model-DT), and deep, texture, and clinical features (Model-DTC). Four hundred forty-four hip radiographs from a different institution were used as an external test set. An observer performance test was performed by six radiologists.

The researchers found that Model-D demonstrated higher diagnostic performance than Model-T for the external test set (area under the receiver operating characteristic curve [AUC], 0.92 versus 0.77). Compared with Model-D, Model-DC and Model-DTC showed improved diagnostic performance (AUCs, 0.95 and 0.95, respectively). Prediction improved from an average AUC of 0.77 to 0.87 when comparing observer performance without and with the assistance of the Model-DTC prediction.

"Our study shows that opportunistic detection of osteoporosis using these X-ray images is advantageous, and our model can serve as a triage tool recommending dual-energy X-ray absorptiometry in patients with highly suspected osteoporosis," a coauthor said in a statement.

More information: Sangwook Kim et al, Deep-Radiomics-Based Approach to the Diagnosis of Osteoporosis Using Hip Radiographs, *Radiology: Artificial Intelligence* (2022). [DOI: 10.1148/ryai.210212](https://doi.org/10.1148/ryai.210212)

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