



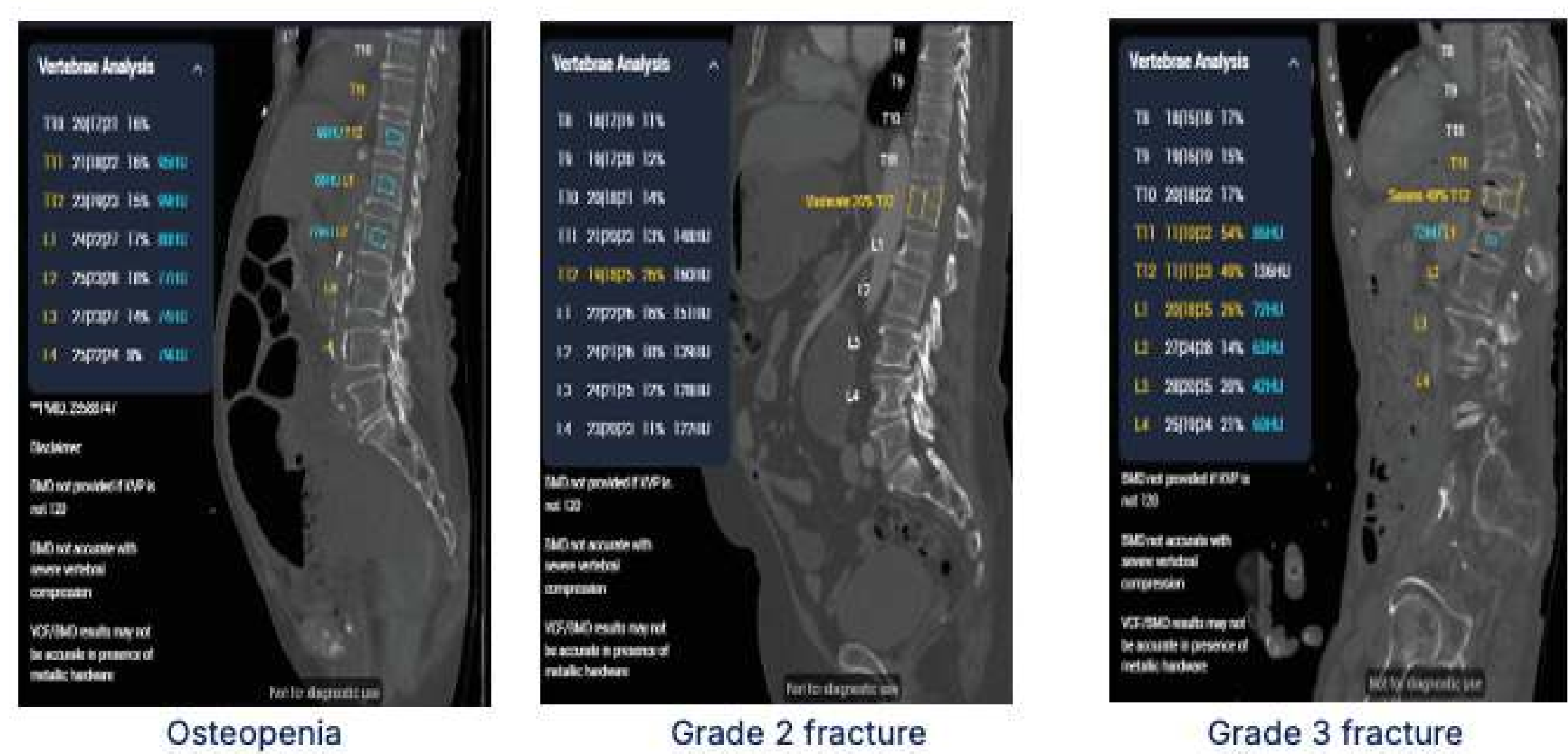
# Artificial Intelligence Vs Human Interpretation For Opportunistic Detection Of Vertebral Fractures In Routine Ct Imaging: Results Of A 2-Months Pilot Study

Authors: Polyzois Makras<sup>12</sup>, Eleftherios Chatzellis<sup>1</sup>, Christos Gravvanis<sup>1</sup>, Georgia Kanti<sup>1</sup>, Maria P. Yavropoulou<sup>23</sup>, Konstantinos Papadimitropoulos<sup>4</sup>, Nikolaos Kyriakopoulos<sup>5</sup> and the Radiology Department reporting group

## OBJECTIVE:

To evaluate the diagnostic performance of an artificial intelligence (AI) system for detecting vertebral fractures (VFs) opportunistically in routine chest and abdominal CT scans compared with human readers in a real-world hospital setting during a single-center pilot study.

### AI Findings in the Evaluation of CT Scans



## MATERIAL AND METHODS:

All thoracic and abdominal CT scans performed over two months in patients aged  $\geq 50$  years at a tertiary hospital were prospectively analyzed using the HealthOST AI platform (Nanox AI Ltd.).

Routine radiology reports and targeted endocrinologist reviews were compared to AI findings. A gold-standard adjudication panel confirmed VF presence or absence.

### Statistical comparisons of:

- Sensitivity
- Predictive Values
- Specificity
- Odds Ratios (Or) Were Performed Using  $\chi^2$  Tests ( $P < 0.05$ ).

## RESULTS:

Among 427 scans, AI achieved a sensitivity of 86.3% in the discrimination of CT scans with or without VFs, outperforming radiologists (50.0%) and endocrinologists (68.8%) ( $p \leq 0.01$ ). In addition, AI demonstrated significantly higher odds of correctly flagging VFs leading to case finding: OR=14.23 (95% CI 4.7–43.1,  $p < 0.000001$ ) compared to radiologists, and OR=4.77 (95% CI 1.6–13.6,  $p = 0.001$ ) compared to endocrinologists. Extrapolated annually, the integration of this system in the hospital's radiology setting could identify approximately 150 otherwise undiagnosed patients needing osteoporosis therapy.

## CONCLUSION:

AI-driven VF detection in routine CT scans offers significantly higher diagnostic accuracy than human interpretation. Its integration into clinical workflows can enhance early osteoporosis diagnosis and optimize treatment strategies without added imaging or cost.

### Disclosures:

No conflicts of interest to declare.

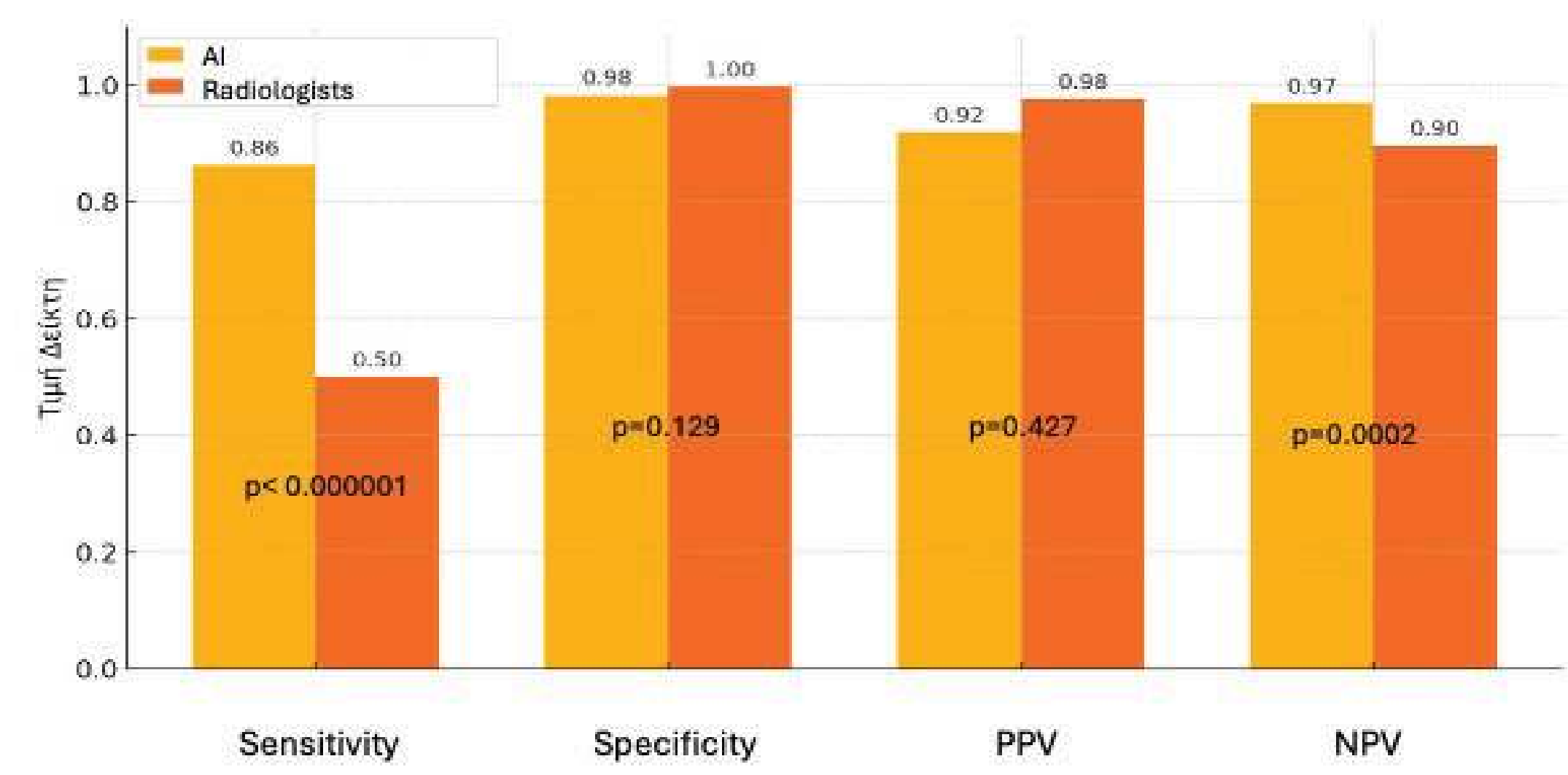
#### Affiliations:

- Department of Endocrinology and Diabetes, 251 Hellenic Air Force & VA General Hospital, Athens, Greece
- Department of Medical Research, 251 Hellenic Air Force & VA General Hospital, Athens, Greece
- Endocrinology Unit, First Department of Propaedeutic and Internal Medicine, Medical School, National and Kapodistrian University of Athens, Greece
- Hospital Command, 251 Hellenic Air Force & VA General Hospital, Athens, Greece
- Department of Radiology, MRI Section, 251 Hellenic Air Force & VA General Hospital, Athens, Greece

#### Group contributors (Radiology Department reporting group):

Christos Tekedis, Vasiliki Mpamparousi, Ioannis Liakopoulos, Dimitrios Matsaridis, Emmanouil Skoularikis, Maria Varela, Harikleia Athanasiou, Stella Koropouli, Nikolaos Gidarakos

Comparison of diagnostic performance: AI Vs Radiologists



Comparison of diagnostic performance: AI Vs Endocrinologists

