

## **METASTRA: Transforming Fracture Risk Assessment for Cancer Patients with Vertebral Metastases**

*Cutting-edge EU-funded project METASTRA unites an interdisciplinary team of experts to spearhead a transformative approach to revolutionize fracture risk assessment and personalized treatment for cancer patients with vertebral metastases.*

[Bologna, 17 July 2023] — A groundbreaking initiative, METASTRA, is set to transform the way clinicians assess fracture risk in cancer patients with vertebral metastases. The ambitious project funded by the EU's Horizon Europe "Tools and technologies for a healthy society," Calls promises to provide personalised treatment recommendations based on robust computational models and improved patient stratification techniques. Coordinated by the University of Bologna, METASTRA brings together 15 partners from different European Member States, receiving a total funding of 6.7 Mil EUR over the next five years. With an avid and visionary work plan, the international, multidisciplinary research team is poised to make a substantial impact on the lives of cancer patients and the healthcare system as a whole.

As early diagnosis and improved care are improving life expectancy of cancer patients across Europe, approximately 2.7 million individuals, face an alarmingly high incidence of secondary tumors, affecting nearly 1 million people. Among these cases, bone metastases spread to the spine in 30-70% of instances, causing a significant reduction in the vertebrae's load-bearing capacity and leading to fractures in approximately 30% of patients. Currently, clinicians are left with two subjective options: either performing surgery to stabilize the spine or leaving the patient vulnerable to a high risk of fractures. Such decisions often result in either unnecessary surgeries or fractures that severely impact both the quality of life and ongoing cancer treatment.

The existing standard-of-care relies on scoring systems based solely on radiographic images, with limited consideration for local biomechanics. As a consequence, these systems fail to provide accurate indications for surgery in around 60% of cases, leaving a critical need for improved risk quantification and patient stratification methods.

### [Innovative Computational Models for Personalised Cancer Therapies](#)

METASTRA will address this unmet need by developing innovative Artificial Intelligence (AI) and Physiology-based (VPH) mechanical computational models. These models will accurately stratify patients with spine metastasis who are at high risk of fractures and identify personalised surgical treatments. The project will extensively train the models using a comprehensive dataset comprising clinical data from 2000 retrospective cases and biomechanical data from 120 ex vivo specimens. Subsequently, the efficacy of the new approach will be evaluated through a multicentric prospective observational study involving 200 patients.

To facilitate clinical decision-making, the project will integrate the computational models into a user-friendly Decision Support System (DSS) tailored to meet regulatory requirements and future commercialization opportunities. METASTRA's innovative guidelines for patient stratification and



management are expected to significantly reduce uncertain diagnoses from the current 60% to a mere 20% of cases. This breakthrough will alleviate patient suffering and potentially save up to 2.4 billion euros annually in healthcare expenditures.

Professor Luca Cristofolini (from University of Bologna, Italy), the coordinator of the METASTRA project, expressed his enthusiasm for this groundbreaking endeavor: *“We stand on the cusp of a groundbreaking revolution in fracture risk stratification for cancer patients with vertebral metastases. METASTRA is poised to transcend the limitations of current subjective approaches by harnessing the power of advanced computational models and clinical validation. This project holds the potential to reshape the landscape of patient care, sparing individuals from unnecessary surgeries and fractures that impact their well-being and treatment outcomes. With METASTRA, we strive to empower clinicians with precise, personalized strategies, ultimately elevating the quality of life for countless patients and transforming the future of cancer management.*

*We are thrilled to be part of this exceptional collaboration, bringing together leading institutions and experts from across Europe. Our collective efforts and expertise will drive transformative advancements in personalized medicine, revolutionizing the way we treat cancer patients with vertebral metastases. We look forward to working collaboratively to achieve our shared goals and make a significant impact on patient care.”*

For more information about the METASTRA project, please visit [metastraproject.eu](https://metastraproject.eu) or follow us on Twitter ([@MetastraProject](https://twitter.com/MetastraProject)) and LinkedIn ([Metastra-eu](https://www.linkedin.com/company/Metastra-eu)).

## Key facts

### Full name

METASTRA: COMPUTER-AIDED EFFECTIVE FRACTURE RISK STRATIFICATION OF PATIENTS WITH VERTEBRAL METASTASES FOR PERSONALISED TREATMENT THROUGH ROBUST COMPUTATIONAL MODELS VALIDATED IN CLINICAL SETTINGS

### Start date

1 July 2023

### Duration

60 months (1 July 2023 – 30 June 2028)

### Budget

6,750,817.50 €

### Coordinator

University of Bologna, Italy



# PRESS RELEASE



## Social media

LinkedIn: [Metastra-eu](#)

Twitter: [@MetastraProject](#)

## Website

[Metastraproject.eu](http://Metastraproject.eu)

## Project Partners

- UNIVERSITA DI BOLOGNA
- THE UNIVERSITY OF SHEFFIELD
- SZEGEDI TUDOMANYEGYETEM
- UNIVERSIDAD DE ZARAGOZA
- EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH
- ISTITUTO ORTOPEDICO RIZZOLI
- BUDAI EGESZSEGKOZPONT ZRT
- UNIVERSITAIR MEDISCH CENTRUM UTRECHT
- CHARITE - UNIVERSITAETSMEDIZIN BERLIN
- AO FOUNDATION
- PHILIPS GMBH
- FRONTENDART SZOFTVER KFT
- INSILICOTRIALS TECHNOLOGIES S.P.A.
- VOISIN CONSULTING LIFE SCIENCES
- EURICE EUROPEAN RESEARCH AND PROJECT OFFICE GMBH

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Funded by  
the European Union