TITLE	AUTHORS	Journal	YEAR	RESULTS	SUBJECTS #
The application of the cell method in a clinical assessment of bone fracture risk	F.Cosmi, D.Dreossi	Acta of Bioengineering and Biomechanics	2007	Introduces a new technique for in vivo quantification of bone structure fracture risk	17
Evaluation of the structural quality of bone in a case of progressive osteoporosis complicating a Complex Regional Pain Syndrome (CRPS) of the upper limb	F.Cosmi, G. Mazzoleni	ELSEVIER- JMBBM	2014	The results derived from the analysis of a particular case of rapidly progressing, severe osteoporosis of the upper limb, associated with a Complex Regional Pain Syndrome (CRPS) type II, and obtained by applying a new computational method, developed in order to permit to "classify" bone's quality in osteoporotic syndromes are discussed	1
Osteoporosis risk factors and bone microstructure evaluation: a population breakdown	F.Cosmi, A.Nicolosi, G.Zatta	ELSEVIER-Materials Today: Proceedings	2017	The distributions of BSI and of fragility fracture risk factors recognized by the scientific community is identified	351
Bone Structure Evaluation : Perspectives In Oncology	F.Cosmi, S.Saracchini	ELSEVIER - Materials Today: Proceedings	2018	The preliminary results obtained in the evaluation of the BSI in female patients undergoing breast cancer treatment are presented	100
Morphological and structural bone alterations in a rare disease	F.Cosmi. M.Maximova	ELSEVIER- Materials Today: Proceedings	2019	An extended description, including morphology and elasticity, of the abnormalities found in the bone structure of an ARO patient 25 yrs after transplantation, is presented for the first time in literature.	1
BES TEST analysis in patients with normal or ostepoenic DEXA. A case-control study	G.Saviola et al.	MINERVA MEDICA	2019	BESTEST in association with DEXA is shown to be useful in completing the fracture risk map. A larger sample of patients is needed in order to draw definitive conclusions.	24
BESTEST®: a new diagnostic opportunity for bone structure evaluation in oncology	S. Saracchini, A. Del Conte, L. Foltran, S. Corsetti, F. Cosmi.	THE BREAST	2019	We assessed the bone alterations induced by oncological treatment by BESTEST® and DXA. Statistical analyses show that BESTEST® can help assessing bone alterations due to oncological treatment, especially,when associated with fractures.	Oncological : 100 women Control : 200 women, BESTEST® in screening.
BONE FRACTURE RISK: DENSITY AND MICROARCHITECTURE QUALIFICATION	F. Cosmi, A. Nicolosi, G. Saviola	ELSEVIER- Materials Today: Proceedings	2020	TComparison of DEXA and BES TEST ability as 3-year risk estimators in a clinical application. In the CONTROL group, the BSI T-score is signifincantly different from the femoral DEXA T-score. (p = 0.0005). In the FRACTURED group, the BSI T-score is significantly different from both the femoral (p = 0.0005). In the FRACTURED group, the BSI T-score is signifincantly different from both the femoral DEXA T-score (p = 0.0266) and the lumbar DEXA T-score (p = 0.0051). Inter-group t-test statistical analysis groups are not significantly different (p = 0.1478), while the BSI T-score of the CONTROL and the FRACTURED groups highlights a significant difference (p = 0.0001).	FRACTURED population =12 women with a recent atraumatic fragility fracture. CONTROL population =15 women who had not suffered any fragility fractures before BSI evaluation nor in the following 3 years.
EVALUATION OF THE BONE ELASTIC STRUCTURE IN PERSONS WITH AND WITHOUT CRONIC KIDNEY DISEASE ON DYALISIS	Pietro Manuel Ferraro, Alessandra Nicolosi, Alessandro Naticchia, Nicola Panocchia, Giuseppe Grandaliano, Francesca Cosmi	Nefrology Dyalisis and Transplantation - Oxford University Press	2021	Average (SD) age was 64 (17) years in the HD group and 60 (12) years in the non-HD group, with a prevalence of males of 49% and 16%, respectively. After adjustment for age and sex, the BSI in the HD group was significantly lower compared with the non-HD group (HD 145, 95% CI 140, 154; non-HD 179, 95% CI 177, 181; absolute difference −32, 95% CI −40, −25; p-value < 0.001). There was no significant interaction between age, sex and kidney status on BSI values (all p-values > 0.05). The output of BES TEST, a non-invasive tool to determine the bone elastic structure, appeared to be strongly associated with kidney function after control for differences in age and sex.	Chronic hemodialysis population (HD), 41 patients the Control population (No HD), 374 persons with normal renal function
3D-printing for the repeatability assessment of the Bone Elastic Structure Test, BES TEST™	Francesca COSMI, Alberto DAL MASO, Giorgio ZATTA	Proc IMechE Part C: J Mechanical Engineering Science	2021	Repeatability of BES TEST. The tests were carried out on a 3D-printed phantom hand, in which different mimicked trabecular structures (chips) were inserted. Each mimicked bone had a unique internal structure and density and was 3D-printed using radiopaque composite materials. 15 different chips were manufactured, 20 measurements were performed on each chip. BSI and T-score values were analysed according to ISO 5725 and ISCD standards.	3D printed phantom study
A 3-year follow-up study on bone structure elastic quality	Francesca Cosmi *, Simona Gentile and Sergio Carrato	Materials Forum Proceedings	2023	In this study, the incidence of fragility fractures was assessed after a 3-year follow-up period in the women enrolled for a population study in 2015. The BES TEST® resulted an effective estimator of bone health (AUC ROC =0.78), and can improve the assessment of the patient's fracture risk map.	351 Caucasian women
BES TEST accuracy evaluation by means of 3D-printed phantoms	Francesca COSMI, Alberto DAL MASO	Proc IMechE Part C: J Mechanical Engineering Science	2022	The aim of this study is to evaluate the precision of the BES TEST™ process analysis under reproducibility conditions. The results obtained in this study are comparable to the precision required from Dual Energy X-Ray Absorptiometry (DEXA), which is considered the gold-standard technology for the evaluation of Bone Mineral Density (BMD).	3D printed phantom study
POSTER PRESENTATI A CONVEGNi					
Associazione di metodi classici e innovativi per la valutazione del rischio di fratture da fragilità.	Silvana SARACCHINI, Alessandra NICOLOSI, Francesca COSMI	POSTER SIOMMMS	2019	Le prestazioni BSI nella popolazione generale non sono inferiori a quelle del DEXA, attuale gold standard. Il BSI sembra ottenere prestazioni migliori in situazioni, come il trattamento del cancro al seno, che notoriamente compromettono la struttura trabecolare.	237 in trattamento per carcinoma mammario, 15 fratturate.Controllo:Gruppo A: 243 donne, 45 fratturate.
Valutazione delle alterazioni della struttura ossea in una malattia rara	F. Cosmi , N. Maximova	POSTER SIOMMMS, PREMIO migliore contributo scientifico	2020	Questo lavoro offre una descrizione originale delle anomalie ancora presenti nella struttura ossea ARO (osteopetrosi autosomica recessiva) diversi anni dopo il trapianto di cellule staminali ematopoietiche (HSCT). Le valutazioni morfologiche e strutturali, compreso BES TEST®, mostrano che anomalie sono ancora presenti nella struttura ossea ARO.	1 soggetto ARO, 1 controllo stesso sesso ed età
Valutazione della precisione di un nuovo dispositivo medico mediante stampa 3d	F. Cosmi, A. Dal Maso	POSTER SIOMMMS	2021	La stampa 3D ha svolto un ruolo chiave durante la pandemia nello studio della precisione del BESTEST.Al fine di poter effettuare un gran numero di misure nonostante le restrizioni imposte, i test di valutazione della precisione sono stati eseguiti su una mano stampata in 3D, in cui sono stati inseriti phantom che mimano diverse strutture trabecolari (chip) stampati in 3D utilizzando materiali compositi radiopachi. I valori di ripetibilità e riproducibilità sono in linea con i requisiti per i gold standard diagnostici dell'osteoporosi.	studio phantom
BES TEST® A NEW MEDICAL DEVICE TO EVALUATE TRABECULAR STRUCTURE ELASTICITY (BONE QUALITY)	F. Cosmi, A. Dal Maso	POSTER V CONGRESSO OSTEOPOROSI E ALTERAZIONI DEL METABOLISMO MINERALE OSSEO NELLA MALATTIA RENALE CRONICA	2022	BESTEST monitors trabecular bone, which changes earlier than cortical bone and BMD in response to physio-pathological alterations. The 95% confidence intervals are small and the repeatability, reproducibility and LSC values are in line with the requirements for the diagnostic gold standard of osteoporosis..	
La valutazione della bone elastic structure (Bestest™) in segmenti scheletrici sottoposti a diverso carico	Francesco Bertoldo, Luca Ballini, Eugenia Bertoldo, Alessandra Nicolosi, Francesca Cosmi	COMUNICAZIONE ORALE CONVEGNO SIOMMMS	2022	Lo scopo dello studio è quello di valutare se i valori di BSI ottenuti in un segmento non sottoposto a carico (mano) siano diversi da quelli ottenuti in segmenti analoghi sottoposti a carico (piede, analisi nel metacarpo). Questo studio è preliminare ad un studio per predire il rischio di stress fracture al piede degli atleti. I risultati confermano che il BSI è indipendente dalla BMD e come, al contrario di questa, sia indipendente dal carico.	10 runners (9 maschi/1 femmina, età 25.8+3.04,BMI 21.9+2.11)
BES TEST™ EVALUATION IN FEMALES AND MALES	ı. Dal Maso, A. Nic0losi,	POSTER V CONGRESSO OSTEOPOROSI E ALTERAZIONI DEL METABOLISMO MINERALE OSSEO NELLA MALATTIA RENALE CRONICA	2022	For both females and males, the BSI tends to decrease with age; however, the rate of change with age is influenced by sex. In females, the rate of BSI loss seems to be biphasic (around 60 years of age and beyond 70). In males, the BSI decreases only slightly with age, with an increase rate of loss around 75-80 years. The Poisson regression analysis showed that, for both males and females, BSI is not influenced by height.	1130 females and 191 males (age 20-90)