



RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) FOR BONE ASSESSMENT IN GERIATRIC PATIENTS

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Introduction. Osteoporosis is a silent, multifactorial disease typically assessed through bone mineral density (BMD), expressed as a T-score (number of standard deviations from the young-adult mean). Diagnosis often occurs only after a fragility fracture, making osteoporosis largely underdiagnosed and underestimated. Early identification is therefore crucial, particularly in geriatric and bedridden populations. Standard techniques such as dual-energy X-ray absorptiometry (DXA) present limitations, including exposure to ionizing radiation and limited portability. Radiofrequency Echographic Multi Spectrometry (REMS) is a portable, operator-independent, radiation-free technology that evaluates both bone quantity and quality at reference skeletal sites (lumbar spine and proximal femur), providing a comprehensive assessment of bone health.

Objectives. To evaluate the suitability of REMS for bone assessment in geriatric populations.

Materials and Methods. A structured literature review was conducted on REMS performance in bone health and fracture risk assessment. Studies were independently reviewed by two authors and validated by a third reviewer.

Results. REMS demonstrated high sensitivity and specificity (>90%) in geriatric populations at axial sites. It also provides a BMD-independent parameter, the Fragility Score (F-S), which reflects bone quality and skeletal fragility. By integrating T-score and FS, REMS enables automatic fracture risk stratification into seven classes (R1-R7), with corresponding 5-year fracture risk probabilities. REMS has also been included in Italian Ministry of Health guidelines on fragility fractures.

Conclusions. REMS represents a valuable tool for bone monitoring in geriatric patients. Its use in clinical practice may enhance early identification and support personalized management of osteoporosis and skeletal fragility.