

Bone metabolic markers as gauges of metastasis to bone: a review

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Currently, imaging techniques are the leading methods used to diagnose of metastasis to bone. However, these techniques are expensive, expose patients to toxic and radioactive compounds, and monitor response to treatment poorly; these drawbacks have prompted the search for alternative screening methods. Therefore, bone metabolic markers have been evaluated as possible methods to diagnose and monitor the development and progression of metastatic bone disease. Although bone metabolic markers are often grouped as either resorption or formation markers, studies have revealed that each marker has its own biologic meaning and clinical relevance. Recent milestones in the use of bone metabolic markers as screening methods for metastatic bone disease and as evaluation methods for treatment response are shown in the following lists.

1. Bone metabolic marker measurements provide insight into mechanisms of metastasis to bone.
2. Although promising data have been reported, bone metabolic markers are not yet considered to be reliable screening methods for metastasis to bone.
3. Bone metabolic markers are reliable indicators of response to both conventional and bisphosphonate therapies.
4. Preliminary results indicate bone metabolic markers might be an independent prognostic factor in patients whose tumors metastasize to bone.
5. New or refined assays for bone metabolic markers are expected to improve the sensitivity and specificity of bone metabolic marker use in diagnosing and monitoring metastasis to bone.

Key words: bone metabolic markers, metastatic bone disease, diagnosis of bone metastasis, monitoring bone response