New tool helps physicians estimate survival for patients with cancers that have spread to bone

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A simple three-factor tool can help doctors estimate survival time in patients with long bone metastases (LBMs)—advanced cancer that has spread to the bones of the limbs, reports a study in the February 7, 2018, issue of *The Journal of Bone & Joint Surgery*. The journal is published in partnership with Wolters Kluwer. Reliable survival estimates in these cases can help prevent overtreatment and undertreatment.

"This study presents a model to easily stratify patients with symptomatic LBM according to their expected survival," write J.J. Willeumier, MD, of Leiden University Medical Center, the Netherlands, and colleagues from several European institutions. The researchers believe their model can help to select the most appropriate treatment for patients with symptomatic bone metastases.

Model Helps Match Treatment to Expected Survival

Physicians and surgeons are often called upon to estimate survival for patients with advanced cancer to help them maximize the remaining quality of life. Accurate survival estimates are important to avoid overtreatment (putting the patient through treatments that would ultimately not provide much benefit) and undertreatment (not offering treatments that would be beneficial). But data on which to base survival estimates are often sparse, especially for patients with LBMs.

To assess their "easy-to-use prognostic model," Dr. Willeumier and colleagues analyzed 1,520 patients treated for symptomatic LBMs at six Dutch hospitals between 2000 and 2013. The patients' average age was 65; the most common initial (primary) cancer sites were the breast and lung. The main symptoms requiring treatment were painful bone lesions and impending or actual pathologic fractures.

The authors previously identified three independent predictors of survival in patients with spinal metastases and applied them to these patients with LBM:

- Clinical profile of the primary tumor. Among the patients with LBM, the profile was "favorable" (longer survival) in those with primary breast cancer but "unfavorable" (shorter survival) in those with primary lung cancer.
- Performance status. A standard score (Karnofsky Performance Scale) to assess the patient's ability to perform everyday tasks.
- Presence of organ/brain metastases, in addition to LBMs.

Depending on their individual combination of these factors, patients could be classified into groups with median survival times of 29.1 months, 10.5 months, 4.6 months, and 2.2 months. The authors created a simple-to-use flowchart for use in estimating survival. The model performed well in predicting the survival category for individual patients based on their actual survival. The model's performance was also validated when applied to a separate group of patients with symptomatic LBMs.

The new model can help physicians and patients with LBMs make decisions about the most appropriate treatment, the authors believe. For example, in patients with longer expected survival, more extensive surgery might avoid failure of the implant over time and preserve function. In contrast, for those expected to live only a few months,

palliative therapy might be a more appropriate choice.

The authors have developed an online and mobile app that further facilitates use of the model. The English-language version of the "OPTIModel" app can be accessed at http://optimal-study.nl/nl_NL/tooleng/.

"The simplicity and clarity of the model facilitate and encourage its use in the routine care of patients with LBM, to provide the most appropriate treatment for each individual patient," Dr. Willeumier and coauthors add. They believe their survival estimation tool might become even more useful in the future, with continued advances in tumor classification and individualized cancer therapies.

More information: J.J. Willeumier et al. An Easy-to-Use Prognostic Model for Survival Estimation for Patients with Symptomatic Long Bone Metastases, *The Journal of Bone and Joint Surgery* (2018). DOI: 10.2106/JBJS.16.01514

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