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# Review on Mathematical Models used to Estimate Inner Temperature Variations of Female Breast

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## Abstract

Breast cancer is a leading cause of mortality among women worldwide. Temperature-based techniques have emerged as a promising approach for breast cancer detection and prediction. This literature review aims to comprehensively analyse the existing research on mathematical models developed to predict the temperature gradient between the surface and core of the female breast. Various mathematical models, including Penne's bioheat transfer model, Wulff's model, Klinger's model, Chen and Holmes' model and the porous media model have been investigated. Strengths and limitations of each model, as well as their application in breast cancer risk prediction have been examined. Additionally, the utilization of breast models, sensors, and validation techniques has been explored. The review highlights the need for further research to address the limitations of existing models and improve their accuracy in breast cancer diagnosis. The findings provide valuable insights for advancing temperature-based approaches and enhancing early detection strategies.

**Keywords**: *Breast cancer, Temperature-based techniques, Mathematical models, Bioheat transfer, Temperature gradient, Breast models, Sensors*