

## Standard Protocol Selection for Acquisition of Breast Thermogram in Perspective of Early Breast Cancer Detection

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**Abstract :** In the last few decades, breast thermography has achieved an average sensitivity and specificity of 90% for breast tumor detection. Breast thermography is a non-invasive, cost-effective, painless and radiation-free breast imaging modality which makes a significant contribution to the evaluation and diagnosis of patients, suspected of having breast cancer. An abnormal breast thermogram may indicate significant biological risk for the existence or the development of breast tumors. Breast thermography can detect a breast tumor, when the tumor is in its early stage or when the tumor is in a dense breast. The infrared breast thermography is very sensitive to environmental changes for which acquisition of breast thermography should be performed under strictly controlled conditions by undergoing some standard protocols. Several factors like air, temperature, humidity, etc. are there to be considered for characterizing thermal images as an imperative tool for detecting breast cancer. A detailed study of various breast thermogram acquisition protocols adopted by different researchers in their research work is provided here in this paper. After going through a rigorous study of different breast thermogram acquisition protocols, a new standard breast thermography acquisition setup is proposed here in this paper for proper and accurate capturing of the breast thermograms. The proposed breast thermogram acquisition setup is being built in the Radiology Department, Agartala Government Medical College (AGMC), Govt. of Tripura, Tripura, India. The breast thermograms are captured using FLIR T650sc thermal camera with the thermal sensitivity of 20 mK at 30 degree C. The paper is an attempt to highlight the importance of different critical parameters of breast thermography like different thermography views, patient preparation protocols, acquisition room requirements, acquisition system requirements, etc. This paper makes an important contribution by providing a detailed survey and a new efficient approach on breast thermogram capturing.

**Keywords :** acquisition protocol, breast cancer, breast thermography, infrared thermography

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