

# Association of echocardiographic radiomics-based features with cardiotoxicity effect in breast cancer patients from the CARDIOCARE project

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- **Purpose:** Leverage radiomics analysis to explore innovative, non-invasive echocardiography biomarkers that correlate with breast cancer therapy induced cardiac toxicity.

- **Methods:**

- ✓ 28 prospective patients of the CARDIOCARE EU project undergoing cardiotoxic antineoplastic therapy.
- ✓ End diastolic (ED) and end systolic (ES) apical 2- and 4-chamber view at treatment start (T0) and 3 months after (T1).
- ✓ Pre-trained deep neural network automatically segmented the myocardium (MY) and the left ventricle (LV) from all images.
- ✓ Radiomics-based features were extracted from all areas to elicit hidden image patterns using histogram, shape and textural features.
- ✓ Delta-radiomics were calculated as the relative change in radiomics values between T0 and T1 to reveal potential changes at the MY and LV areas through treatment.

- **Results:**

- ✓ A univariate analysis identified a subset of 20 delta-radiomics and 20 radiomics features from T1 to be considered statistically significant ( $p < 0.05$ ) in correlating with cardiac toxicity response.

- **Conclusions:**

- ✓ Radiomics-based features quantifying tissue heterogeneity of the myocardium area have potential diagnostic impact in assessing cardiotoxicity response in breast cancer patients.

