

***MNEMONIC ABCDE X-RAY THORAX
SEBAGAI PREDIKTOR PENINGKATAN NT-PROBNP PADA PASIEN
CHRONIC HEART FAILURE***

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INTISARI

Latar Belakang: *Chronic Heart Failure* (CHF) merupakan sindrom klinis dengan manifestasi kongesti sistemik dan pulmoner. Pemeriksaan foto torax masih menjadi modalitas radiologi dasar dalam menilai tanda-tanda kongesti melalui pendekatan sistematis menggunakan *mnemonic* ABCDE. Di sisi lain, *N-terminal pro B-type Natriuretic Peptide* (NT-proBNP) berperan sebagai biomarker biokimia yang merefleksikan regangan dinding ventrikel. Hubungan antara temuan radiografi CHF dengan kadar NT-proBNP masih memerlukan validasi lebih lanjut.

Tujuan: Mengetahui apakah adanya temuan alveolar edema, *Kerley B lines*, hasil pengukuran *cardiothoracic ratio* > 0,5, dilatasi vaskular lobus superior, dan efusi pleura pada foto X-ray thorax, dapat memprediksi kejadian peningkatan kadar NT-proBNP > 400 pg/ mL pada pasien CHF di RS Dr. Sardjito Yogyakarta.

Metode: Penelitian dengan desain *cross-sectional retrospective study* dilakukan di RSUP Dr. Sardjito Yogyakarta pada Maret–Juli 2025. Sebanyak 36 pasien CHF yang menjalani pemeriksaan X-ray thorax posteroanterior dan pemeriksaan laboratorium NT-proBNP diikutsertakan. Analisis menggunakan uji bivariat dan multivariat untuk menilai hubungan antara temuan radiologis (alveolar edema, garis *Kerley B*, dilatasi vaskular lobus superior, efusi pleura, dan *cardiothoracic ratio* > 0,5) dengan kadar NT-proBNP.

Hasil: CTR > 0,5 ditemukan pada 81,8% pasien dengan NT-proBNP > 400 pg/mL ($p = 0,04$) dan terbukti sebagai prediktor independen peningkatan NT-proBNP pada analisis multivariat. Sementara itu, temuan radiologis lain seperti alveolar edema, *Kerley B lines*, dilatasi vaskular lobus superior, dan efusi pleura tidak menunjukkan hubungan bermakna secara statistik.

Kesimpulan: CTR > 0,5 pada foto X-ray thorax merupakan indikator radiologi yang paling konsisten dalam memprediksi peningkatan kadar NT-proBNP pada pasien CHF. Interpretasi sistematis dengan *mnemonic* ABCDE tetap penting dilakukan oleh dokter spesialis radiologi untuk mendeteksi tanda kongesti secara komprehensif.

Kata kunci: *chronic heart failure*, NT-proBNP, X-ray thorax, *cardiothoracic ratio*, *mnemonic* ABCDE

MNEMONIC ABCDE CHEST X-RAY AS A PREDICTOR OF NT-proBNP ELEVATION IN PATIENTS WITH CHRONIC HEART FAILURE

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ABSTRACT

Background: Chronic Heart Failure (CHF) is a clinical syndrome characterized by systemic and pulmonary congestion. Chest X-ray remains a fundamental radiologic modality to evaluate congestion signs through a systematic approach using the ABCDE mnemonic. Meanwhile, N-terminal pro B-type Natriuretic Peptide (NT-proBNP) serves as a biochemical biomarker reflecting ventricular wall stress. The correlation between radiographic findings of CHF and NT-proBNP levels still requires further validation.

Objective: To determine whether radiologic findings such as alveolar edema, Kerley B lines, cardiothoracic ratio (CTR) > 0.5, upper lobe vascular enlargement, and pleural effusion on chest X-ray can predict elevated NT-proBNP levels (>400 pg/mL) in CHF patients at Dr. Sardjito General Hospital, Yogyakarta.

Methods: This was a retrospective cross-sectional study conducted at Dr. Sardjito General Hospital, Yogyakarta, from March to July 2025. A total of 36 CHF patients who underwent posteroanterior chest X-ray and NT-proBNP testing were included. Bivariate and multivariate analyses were performed to assess the association between radiologic findings (alveolar edema, Kerley B lines, upper lobe vascular dilatation, pleural effusion, and CTR > 0.5) and NT-proBNP levels.

Results: A CTR > 0.5 was observed in 81.8% of patients with NT-proBNP > 400 pg/mL ($p = 0.04$) and was identified as an independent predictor of elevated NT-proBNP in multivariate analysis. Other radiologic findings such as alveolar edema, Kerley B lines, upper lobe vascular enlargement, and pleural effusion showed no statistically significant correlation.

Conclusion: A CTR > 0.5 on chest X-ray is the most consistent radiologic indicator in predicting elevated NT-proBNP levels among CHF patients. Systematic interpretation using the ABCDE mnemonic remains essential for radiologists to comprehensively detect pulmonary congestion signs in chronic heart failure.

Keywords: chronic heart failure, NT-proBNP, chest X-ray, cardiothoracic ratio, ABCDE mnemonic