

DAFTAR PUSTAKA

- Akhter, M. W. *et al.* (2004) 'Effect of elevated admission serum creatinine and its worsening on outcome in hospitalized patients with decompensated heart failure', *The American Journal of Cardiology*, 94(7), pp. 957–960. doi: 10.1016/j.amjcard.2004.06.041.
- Akpa MR, Iheji O. Short-term rehospitalisation or death and determinants after admission for acute heart failure in a cohort of African patients in Port Harcourt, southern Nigeria. *Cardiovasc J Afr* 2018;29:46–50.
- Al-Ahmad, A. *et al.* (2001) 'Reduced kidney function and anemia as risk factors for mortality in patients with left ventricular dysfunction', *Journal of the American College of Cardiology*, 38(4), pp. 955–962. doi: 10.1016/S0735-1097(01)01470-X.
- Alahdab, M. T. *et al.* (2009) 'Six Minute Walk Test Predicts Long-Term All-Cause Mortality and Heart Failure Rehospitalization in African-American Patients Hospitalized With Acute Decompensated Heart Failure', *Journal of Cardiac Failure*, 15(2), pp. 130–135. doi: <https://doi.org/10.1016/j.cardfail.2008.10.006>.
- Alkatiri AH, Qalby N, Mappangara I, Zainal ATF, Cramer J, Doevedans P, Qanitha A. Hyperglycemia and Poor Outcomes in Patients with ST-Elevation Myocardial Infarction : a Systematic Review and Meta-analysis
- Al-Tamimi MAA, Gillani SW, Abd Alhakam ME, Sam KG. Factors Associated With Hospital Readmission of Heart Failure Patients. *Front Pharmacol* 2021;12:1–9.
- Anderson, B. (2016) *Echocardiography: The Normal Examination and Echocardiographic Measurements*. 3rd edn. Cardiotext Pub.
- Aranda, J. M., Johnson, J. W. and Conti, J. B. (2009) 'Current trends in heart failure readmission rates: Analysis of medicare data', *Clinical Cardiology*, 32(1), pp. 47–52. doi: 10.1002/clc.20453.
- Aranda Jr, J. M., Johnson, J. W. and Conti, J. B. (2009) 'Current trends in heart failure readmission rates: analysis of medicare data', *Clinical Cardiology*. John Wiley & Sons, Ltd, 32(1), pp. 47–52. doi: <https://doi.org/10.1002/clc.20453>.
- Armstrong, W. F. and Ryan, T. (2018) *Feigenbaum's Echocardiography*. 8th edn. Wolters Kluwer.
- Aronson, D., Mittleman, M. A. and Burger, A. J. (2004) 'Elevated blood urea nitrogen level as a predictor of mortality in patients admitted for decompensated heart failure', *The American Journal of Medicine*, 116(7), pp. 466–473. doi: 10.1016/j.amjmed.2003.11.014.
- Ateet Kosaraju *et al.* (2021) 'Left Ventricular Ejection Fraction - StatPearls - NCBI Bookshelf', *Treasure Island (FL): StatPearls Publishing*.
- Au, A. G. *et al.* (2012) 'Predicting the risk of unplanned readmission or death within 30 days of discharge after a heart failure hospitalization', *American Heart Journal*. Mosby, Inc., 164(3), pp. 365–372. doi: 10.1016/j.ahj.2012.06.010.
- Badan Penelitian dan Pengembangan Kementerian Kesehatan RI (2013) 'RISET KESEHATAN DASAR (RISKESDAS) 2013', 127(3309), pp. 1275–1279. doi: 10.1126/science.127.3309.1275.

- Badano, L. P. *et al.* (2018) ‘Standardization of left atrial, right ventricular, and right atrial deformation imaging using two-dimensional speckle tracking echocardiography: A consensus document of the EACVI/ASE/Industry Task Force to standardize deformation imaging’, *European Heart Journal Cardiovascular Imaging*, 19(6), pp. 591–600. doi: 10.1093/ehjci/jey042.
- Baghbani-Oskouei, A., & Gholampourdehaki, M. (2020). Anthropometric measures and the risk of coronary artery disease. *Caspian Journal of Internal Medicine*, 11(2), 183–190. <https://doi.org/10.22088/cjim.11.2.183>
- Bansal, M. and Kasliwal, R. R. (2013) ‘How do I do it? Speckle-tracking echocardiography’, *Indian Heart Journal*, 65(1), pp. 117–123. doi: <https://doi.org/10.1016/j.ihj.2012.12.004>.
- Baysan, O. *et al.* (2018) ‘Advances in echocardiography: global longitudinal strain, intra-cardiac multidirectional flow imaging and automated 3d volume analysis’, *Heart, Vessels and Transplantation*, 2(Issue 4), p. 113. doi: 10.24969/hvt.2018.83.
- Belardinelli, R. *et al.* (1999) ‘Randomized, Controlled Trial of Long-Term Moderate Exercise Training in Chronic Heart Failure Effects on Functional Capacity, Quality of Life, and Clinical Outcome’.
- British Heart Foundation (2014) *Cardiovascular Disease Statistics 2014*.
- Butler, J. *et al.* (2004) ‘Relationship between heart failure treatment and development of worsening renal function among hospitalized patients’ Guest Editor for this manuscript was Peter M. Okin, MD, New York Hospital-Cornell Medical Center, New York, NY.’, *American Heart Journal*, 147(2), pp. 331–338. doi: <https://doi.org/10.1016/j.ahj.2003.08.012>.
- Bytyçi I, Bajraktari G. Mortality in heart failure patients. *Anadolu Kardiyoloji Dergisi* 2015;15:63–68.
- Cameli, M. *et al.* (2012) ‘Right ventricular longitudinal strain correlates well with right ventricular stroke work index in patients with advanced heart failure referred for heart transplantation’, *Journal of Cardiac Failure*. Elsevier Inc, 18(3), pp. 208–215. doi: 10.1016/j.cardfail.2011.12.002.
- Carluccio, E. *et al.* (2013) ‘The “Echo Heart Failure Score”: An echocardiographic risk prediction score of mortality in systolic heart failure’, *European Journal of Heart Failure*, 15(8), pp. 868–876. doi: 10.1093/eurjhf/hft038.
- Chen, J. S. *et al.* (2020) ‘Prognostic value of heart failure echocardiography index in HF patients with preserved, mid-ranged and reduced ejection fraction’, *BMC Cardiovascular Disorders*. BMC Cardiovascular Disorders, 20(1), pp. 1–6. doi: 10.1186/s12872-020-01635-6.
- Chengode, S. (2016) ‘Left ventricular global systolic function assessment by echocardiography’, *Annals of Cardiac Anaesthesia*, 19(5), pp. S26–S34. doi: 10.4103/0971-9784.192617.
- Cho JY, Kim KH, Lee SE, Cho HJ, Lee HY, Choi JO, Jeon ES, Kim MS, Kim JJ, Hwang KK, Chae SC, Baek SH, Kang SM, Choi DJ, Yoo BS, Ahn Y, Park HY, Cho MC, Oh BH. Admission hyperglycemia as a predictor of mortality in acute heart failure: Comparison between the diabetics and non-diabetics. *J Clin Med* 2020;9:1–12.
- Chun, S. *et al.* (2012) ‘Lifetime analysis of hospitalizations and survival of patients newly admitted with heart failure’, *Circulation: Heart Failure*, 5(4), pp. 414–421. doi:

10.1161/CIRCHEARTFAILURE.111.964791.

Damman, K. et al. (2007) 'Worsening Renal Function and Prognosis in Heart Failure: Systematic Review and Meta-Analysis', *Journal of Cardiac Failure*, 13(8), pp. 599–608. doi: 10.1016/j.cardfail.2007.04.008.

Damy, T. et al. (2009) 'Comparison of four right ventricular systolic echocardiographic parameters to predict adverse outcomes in chronic heart failure', *European Journal of Heart Failure*, 11(9), pp. 818–824. doi: 10.1093/eurjhf/hfp111.

Davluros, P. A. et al. (2006) 'The right ventricle in congenital heart disease', *Heart*, 92(SUPPL. 1), pp. 27–39. doi: 10.1136/hrt.2005.077438.

Dhiman, P., Ma, J., Qi, C., Bullock, G., Sergeant, J. C., Riley, R. D., & Collins, G. S. (2023). Sample size requirements are not being considered in studies developing prediction models for binary outcomes: a systematic review. *BMC Medical Research Methodology*, 23(1), 188. <https://doi.org/10.1186/s12874-023-02008-1>

Dickstein, K. et al. (2010) '2010 Focused Update of ESC Guidelines on device therapy in heart failure', *European Heart Journal*, 31(21), pp. 2677–2687. doi: 10.1093/eurheartj/ehq337.

Dokainish, H. et al. (2005) 'Incremental predictive power of B-type natriuretic peptide and tissue Doppler echocardiography in the prognosis of patients with congestive heart failure', *Journal of the American College of Cardiology*. Elsevier, 45(8), pp. 1223–1226. doi: 10.1016/J.JACC.2005.01.025.

Dries, D. L. et al. (2000) 'The prognostic implications of renal insufficiency in asymptomatic and symptomatic patients with left ventricular systolic dysfunction', *Journal of the American College of Cardiology*, 35(3), pp. 681–689. doi: 10.1016/S0735-1097(99)00608-7.

Dunlay, S. M. et al. (2009) 'Prognostic value of biomarkers in heart failure application of novel methods in the community', *Circulation: Heart Failure*, 2(5), pp. 393–400. doi: 10.1161/CIRCHEARTFAILURE.109.849299.

Eurlings, L. W. et al. (2014) 'Risk stratification with the use of serial N-terminal Pro-B-type natriuretic peptide measurements during admission and early after discharge in heart failure patients: Post hoc analysis of the PRIMA study', *Journal of Cardiac Failure*. Elsevier Inc, 20(12), pp. 881–890. doi: 10.1016/j.cardfail.2014.08.014.

Felker, G. M. et al. (2003) 'Usefulness of anemia as a predictor of death and rehospitalization in patients with decompensated heart failure', *The American Journal of Cardiology*, 92(5), pp. 625–628. doi: 10.1016/S0002-9149(03)00740-9.

Filippatos, G. et al. (2007) 'Prognostic Value of Blood Urea Nitrogen in Patients Hospitalized With Worsening Heart Failure: Insights From the Acute and Chronic Therapeutic Impact of a Vasopressin Antagonist in Chronic Heart Failure (ACTIV in CHF) Study', *Journal of Cardiac Failure*, 13(5), pp. 360–364. doi: 10.1016/j.cardfail.2007.02.005.

Focardi, M. et al. (2015) 'Traditional and innovative echocardiographic parameters for the analysis of right ventricular performance in comparison with cardiac magnetic resonance', *European heart journal cardiovascular Imaging*, 16(1), pp. 47–52. doi: 10.1093/ehjci/jeu156.

Fonarow, G. C. (2004) 'Strategies to improve the use of evidence-based heart failure therapies: OPTIMIZE-HF', *Reviews in Cardiovascular Medicine*, 5(SUPPL. 1), pp. 45–54.

Fonarow, G. C. et al. (2007) 'Characteristics, Treatments, and Outcomes of Patients With

Preserved Systolic Function Hospitalized for Heart Failure. A Report From the OPTIMIZE-HF Registry’, *Journal of the American College of Cardiology*, 50(8), pp. 768–777. doi: 10.1016/j.jacc.2007.04.064.

Fonarow, G. C. (2008) ‘Epidemiology and risk stratification in acute heart failure’, *American Heart Journal*, 155(2), pp. 200–207. doi: 10.1016/j.ahj.2006.10.043.

Forman, D. E. et al. (2004) ‘Incidence, Predictors at Admission, and Impact of Worsening Renal Function among Patients Hospitalized with Heart Failure’, *Journal of the American College of Cardiology*. Elsevier Inc., 43(1), pp. 61–67. doi: 10.1016/j.jacc.2003.07.031.

Galderisi, M. (2005) ‘Diastolic dysfunction and diastolic heart failure: Diagnostic, prognostic and therapeutic aspects’, *Cardiovascular Ultrasound*, 3, pp. 1–14. doi: 10.1186/1476-7120-3-9.

Gheorghiade, M. et al. (2007) ‘Characterization and Prognostic Value of Persistent Hyponatremia in Patients With Severe Heart Failure in the ESCAPE Trial’, *Arch Intern Med*, 167.

Ghio, S. et al. (2000) ‘Prognostic usefulness of the tricuspid annular plane systolic excursion in patients with congestive heart failure secondary to idiopathic or ischemic dilated cardiomyopathy’, *American Journal of Cardiology*, 85(7), pp. 837–842. doi: 10.1016/S0002-9149(99)00877-2.

Ghio, S. et al. (2013) ‘Prognostic relevance of a non-invasive evaluation of right ventricular function and pulmonary artery pressure in patients with chronic heart failure.’, *European journal of heart failure*, 15(4), pp. 408–414. doi: 10.1093/eurjhf/hfs208.

Giusca, S. et al. (2010) ‘Deformation imaging describes right ventricular function better than longitudinal displacement of the tricuspid ring’, *Heart*, 96(4), pp. 281–288. doi: 10.1136/hrt.2009.171728.

Goldenberg, I. et al. (2006) ‘Causes and Consequences of Heart Failure After Prophylactic Implantation of a Defibrillator in the Multicenter Automatic Defibrillator Implantation Trial II’, *Circulation*. Lippincott Williams & Wilkins, 113(24), pp. 2810–2817. doi: 10.1161/CIRCULATIONAHA.105.577262.

Goonewardena, S. N. et al. (2008) ‘Comparison of Hand-Carried Ultrasound Assessment of the Inferior Vena Cava and N-Terminal Pro-Brain Natriuretic Peptide for Predicting Readmission After Hospitalization for Acute Decompensated Heart Failure’.

Haass, M., Kitzman, D. W., Anand, I. S., Miller, A., Zile, M. R., Massie, B. M., & Carson, P. E. (2011). Body mass index and adverse cardiovascular outcomes in heart failure patients with preserved ejection fraction: results from the Irbesartan in Heart Failure with Preserved Ejection Fraction (I-PRESERVE) trial. *Circulation. Heart Failure*, 4(3), 324–331.
<https://doi.org/10.1161/CIRCHEARTFAILURE.110.959890>

Habeeb, W. Al, Stewart, G. C. and Mudge, G. H. (2009) ‘Management of end-stage heart failure: A perspective on the Arab Gulf states’, *Annals of Saudi Medicine*, 29(6), pp. 460–466. doi: 10.4103/0256-4947.57169.

Haddad, F., Hunt, S. A., et al. (2008) ‘Right ventricular function in cardiovascular disease, part I: Anatomy, physiology, aging, and functional assessment of the right ventricle’, *Circulation*, 117(11), pp. 1436–1448. doi: 10.1161/CIRCULATIONAHA.107.653576.

Haddad, F., Doyle, R., et al. (2008) ‘Right ventricular function in cardiovascular disease, part II:

Pathophysiology, clinical importance, and management of right ventricular failure', *Circulation*, 117(13), pp. 1717–1731. doi: 10.1161/CIRCULATIONAHA.107.653584.

Hajouli, S. and Ludhwani, D. (2021) 'Heart Failure And Ejection Fraction - StatPearls - NCBI Bookshelf'.

Hamzeh N, Ghadimi F, Farzaneh R, Hosseini SK. Obesity, Heart Failure, and Obesity Paradox. J Tehran Heart Cent 2017;12:1–5.

He J, Yi S, Zhou Y, Hu X, Lun Z, Dong H, Zhang Y. B-Lines by Lung Ultrasound Can Predict Worsening Heart Failure in Acute Myocardial Infarction During Hospitalization and Short-Term Follow-Up. *Front Cardiovasc Med* 2022;9:1–8.

Hedayatnia, M., Asadi, Z., Zare-Feyzabadi, R., Yaghooti-Khorasani, M., Ghazizadeh, H., Ghaffarian-Zirak, R., Nosrati-Tirkani, A., Mohammadi-Bajgiran, M., Rohban, M., Sadabadi, F., Rahimi, H.-R., Ghalandari, M., Ghaffari, M.-S., Yousefi, A., Pouresmaeili, E., Besharatlou, M.-R., Moohebati, M., Ferns, G. A., Esmaily, H., & Ghayour-Mobarhan, M. (2020). Dyslipidemia and cardiovascular disease risk among the MASHAD study population. *Lipids in Health and Disease*, 19(1), 42. <https://doi.org/10.1186/s12944-020-01204-y>

Heidenreich PA, Bozkurt B, Aguilar D, Allen LA, Byun JJ, Colvin MM, Deswal A, Drazner MH, Dunlay SM, Evers LR, Fang JC, Fedson SE, Fonarow GC, Hayek SS, Hernandez AF, Khazanie P, Kitchens MM, Lee CS, Link MS, Milano CA, Nnacheta LC, Sandhu AT, Stevenson LW, Vardeny O, Vest AR, Yancy CW. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation* 2022;145:e895–e1032.

Horwich TB, Fonarow GC, Clark AL. Obesity and the Obesity Paradox in Heart Failure. *Prog Cardiovasc Dis* 2018;61:151–156.

Hernandez-Suarez, D. F. and López-Candales, A. (2017) 'Strain Imaging Echocardiography: What Imaging Cardiologists Should Know', *Current Cardiology Reviews*, 13, pp. 118–129. doi: 10.2174/1573403X126661610281.

Holgado, J. L., Lopez, C., Fernandez, A., Sauri, I., Uso, R., Trillo, J. L., Vela, S., Nuñez, J., Redon, J., & Ruiz, A. (2020). Acute kidney injury in heart failure: a population study. *ESC Heart Failure*, 7(2), 415–422. <https://doi.org/10.1002/eHF2.12595>

Howie-Esquivel, J. and Dracup, K. (2007) 'Effect of Gender, Ethnicity, Pulmonary Disease, and Symptom Stability on Rehospitalization in Patients With Heart Failure', *American Journal of Cardiology*, 100(7), pp. 1139–1144. doi: 10.1016/j.amjcard.2007.04.061.

Iida, M. et al. (2018) 'Association of tricuspid regurgitation within normal range on the development of left ventricular diastolic dysfunction in patients with uncomplicated hypertension', *Blood Pressure*. Informa UK Limited, trading as Taylor & Francis Group, 27(3), pp. 141–150. doi: 10.1080/08037051.2017.1417733.

Jiang, S., Wang, C., & Weiss, D. J. (2016). Sample Size Requirements for Estimation of Item Parameters in the Multidimensional Graded Response Model. *Frontiers in Psychology*, 7(February). <https://doi.org/10.3389/fpsyg.2016.00109>

Kansagara, D. et al. (2011) 'Risk prediction models for hospital readmission: A systematic review', *Jama*, 306(15), pp. 1688–1698. doi: 10.1001/jama.2011.1515.

Kasimir, M. T. *et al.* (2004) ‘Reverse cardiac remodelling in patients with primary pulmonary hypertension after isolated lung transplantation’, *European Journal of Cardio-thoracic Surgery*, 26(4), pp. 776–781. doi: 10.1016/j.ejcts.2004.05.057.

Kawata, T. *et al.* (2017) ‘Echocardiographic assessment of right ventricular function in routine practice: Which parameters are useful to predict one-year outcome in advanced heart failure patients with dilated cardiomyopathy?’, *Journal of Cardiology*. Japanese College of Cardiology, 70(4), pp. 316–322. doi: 10.1016/j.jcc.2017.02.007.

Kilgore, M. *et al.* (2017) ‘Economic burden of hospitalizations of Medicare beneficiaries with heart failure’, *Risk Management and Healthcare Policy*, 10, pp. 63–70. doi: 10.2147/RMHP.S130341.

Kirkpatrick, J. N. *et al.* (2007) ‘Echocardiography in Heart Failure: Applications, Utility, and New Horizons’, *Journal of the American College of Cardiology*, 50(5), pp. 381–392. doi: 10.1016/j.jacc.2007.03.048.

Klaeboe, L. G. and Edvardsen, T. (2019) ‘Echocardiographic assessment of left ventricular systolic function’, *Journal of Echocardiography*. Springer Japan, 17(1), pp. 10–16. doi: 10.1007/s12574-018-0405-5.

Klein, L. *et al.* (2005) ‘Lower serum sodium is associated with increased short-term mortality in hospitalized patients with worsening heart failure: Results from the outcomes of a prospective trial of intravenous milrinone for exacerbations of chronic heart failure (OPTIME-CHF) s’, *Circulation*, 111(19), pp. 2454–2460. doi: 10.1161/01.CIR.0000165065.82609.3D.

Klein, L. *et al.* (2008) ‘Admission or Changes in Renal Function During Hospitalization for Worsening Heart Failure Predict Postdischarge Survival’, *Circulation: Heart Failure*, 1(1), pp. 25–33. doi: 10.1161/CIRCHEARTFAILURE.107.746933.

Kociol, R. D. *et al.* (2011) ‘Admission, discharge, or change in B-type natriuretic peptide and long-term outcomes: Data from Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure (OPTIMIZE-HF) linked to Medicare claims’, *Circulation: Heart Failure*, 4(5), pp. 628–636. doi: 10.1161/CIRCHEARTFAILURE.111.962290.

Komukai, K. *et al.* (2008) ‘Decreased Renal Function as an Independent Predictor of Re-Hospitalization for Congestive Heart Failure’, *Circulation Journal*, 72(7), pp. 1152–1157. doi: 10.1253/circj.72.1152.

Krumholz, H. M. (1997) ‘Readmission After Hospitalization for Congestive Heart Failure Among Medicare Beneficiaries’, *Archives of Internal Medicine*, 157(1), p. 99. doi: 10.1001/archinte.1997.00440220103013.

Krumholz, H. M. *et al.* (2000) ‘Predictors of readmission among elderly survivors of admission with heart failure’, *American Heart Journal*, 139(1), pp. 72–77. doi: 10.1016/S0002-8703(00)90311-9.

Lan T, Liao Y-H, Zhang J, Yang Z-P, Xu G-S, Zhu L, Fan D-M. Mortality and Readmission Rates After Heart Failure: A Systematic Review and Meta-Analysis. Ther Clin Risk Manag 2021;17:1307–1320.

Lancellotti, P., Galderisi, M., *et al.* (2017) ‘Echo-Doppler estimation of left ventricular filling pressure: Results of themulticentre EACVI Euro-Filling study’, *European Heart Journal Cardiovascular Imaging*, 18(9), pp. 961–968. doi: 10.1093/ehjci/jex067.

- Lancellotti, P., Zamorano, J. L., et al. (2017) *The EACVI Textbook of Echocardiography*. 2nd editio. USA: Oxford University Press.
- Lang, R. M. et al. (2015) 'Recommendations for cardiac chamber quantification by echocardiography in adults: An update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging', *Journal of the American Society of Echocardiography*. Elsevier Inc, 28(1), pp. 1-39.e14. doi: 10.1016/j.echo.2014.10.003.
- Lawson, C. A., Testani, J. M., Mamas, M., Damman, K., Jones, P. W., Teece, L., & Kadam, U. T. (2018). Chronic kidney disease, worsening renal function and outcomes in a heart failure community setting: A UK national study. *International Journal of Cardiology*, 267, 120–127. <https://doi.org/10.1016/j.ijcard.2018.04.090>
- Levy, W. C. et al. (2006) 'The Seattle Heart Failure Model: Prediction of survival in heart failure', *Circulation*, 113(11), pp. 1424–1433. doi: 10.1161/CIRCULATIONAHA.105.584102.
- LeWinter, M. M. and Meyer, M. (2013) 'Mechanisms of diastolic dysfunction in heart failure with a preserved ejection fraction if it's not one thing it's another', *Circulation: Heart Failure*, 6(6), pp. 1112–1115. doi: 10.1161/CIRCHEARTFAILURE.113.000825.
- Lilly, L. S. (2016) *Pathophysiology of Heart Disease: A Collaborative Project of Medical Students and Faculty*. 6th edn. Wolters Kluwer.
- Lisi, M. et al. (2015) 'RV longitudinal deformation correlates with myocardial fibrosis in patients with end-stage heart failure', *JACC: Cardiovascular Imaging*, 8(5), pp. 514–522. doi: 10.1016/j.jcmg.2014.12.026.
- Liu, H., Huang, Y., Zhuo, W., Wan, R., & Hong, K. (2023). U-shaped association between body mass index and ejection fraction in intensive care unit patients with heart failure. *ESC Heart Failure*, 10(1), 377–384. <https://doi.org/10.1002/ehf2.14198>
- Longobardo, L. et al. (2017) 'Role of Two-Dimensional Speckle-Tracking Echocardiography Strain in the Assessment of Right Ventricular Systolic Function and Comparison with Conventional Parameters', *Journal of the American Society of Echocardiography*. Elsevier Inc, 30(10), pp. 937-946.e6. doi: 10.1016/j.echo.2017.06.016.
- Lu DY, Cheng HM, Cheng YL, Hsu PF, Huang WM, Guo CY, Yu WC, Chen CH, Sung SH. Hyponatremia and worsening sodium levels are associated with long-term outcome in patients hospitalized for acute heart failure. *J Am Heart Assoc* 2015;5:1–9.
- Mann, D. L. (2006) 'Heart Failure : Beyond Practice Guidelines', *Texas Heart Institute Journal*, pp. 201–203.
- Manzano-Fernández, S. et al. (2009) 'Complementary Prognostic Value of Cystatin C, N-Terminal Pro-B-Type Natriuretic Peptide and Cardiac Troponin T in Patients With Acute Heart Failure', *The American Journal of Cardiology*, 103(12), pp. 1753–1759. doi: 10.1016/j.amjcard.2009.02.029.
- Masson, S. et al. (2012) 'Serial measurement of cardiac troponin T using a highly sensitive assay in patients with chronic heart failure: Data from 2 large randomized clinical trials', *Circulation*, 125(2), pp. 280–288. doi: 10.1161/CIRCULATIONAHA.111.044149.
- McAlister, F. A. et al. (2004) 'Renal Insufficiency and Heart Failure', *Circulation*, 109(8), pp. 1004–1009. doi: 10.1161/01.CIR.0000116764.53225.A9.
- McDonagh, T. A. et al. (2021) '2021 ESC Guidelines for the diagnosis and treatment of acute

and chronic heart failure', *European Heart Journal*, 42(36), pp. 3599–3726. doi: 10.1093/eurheartj/ehab368.

McMurray, J. J. V. *et al.* (2012) 'ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart', *European heart journal*, 33(14), pp. 1787–1847. doi: 10.1093/eurheartj/ehs104.

Mele D, Pestelli G, Molin DD, Trevisan F, Smarrazzo V, Luisi GA, Fucili A, Ferrari R. Echocardiographic Evaluation of Left Ventricular Output in Patients with Heart Failure: A Per-Beat or Per-Minute Approach? *Journal of the American Society of Echocardiography* 2020;33:135-147.e3.

Meraviglia, V., Alcalde, M., Campuzano, O., & Bellin, M. (2021). Inflammation in the Pathogenesis of Arrhythmogenic Cardiomyopathy: Secondary Event or Active Driver? *Frontiers in Cardiovascular Medicine*, 8, 784715. <https://doi.org/10.3389/fcvm.2021.784715>

Messika-Zeitoun, D. *et al.* (2004) 'Medical and surgical outcome of tricuspid regurgitation caused by flail leaflets', *Journal of Thoracic and Cardiovascular Surgery*, 128(2), pp. 296–302. doi: 10.1016/j.jtcvs.2004.01.035.

Mishra M, Muthuramu I, Geest B De. Mice With Pressure Over-. 2019;11:3–4.

Mondillo S, Galderisi M, Mele D, Cameli M, Lomoriello VS, Zacà V, Ballo P, D'Andrea A, Muraru D, Losi M, Agricola E, D'Errico A, Buralli S, Sciomer S, Nistri S, B. L. (2011) 'Echocardiography Study Group Of The Italian Society Of Cardiology, (Rome, Italy). Speckle-tracking echocardiography: a new technique for assessing myocardial function.', (Lv), pp. 71–83.

Mora, V. *et al.* (2018) 'Comprehensive assessment of left ventricular myocardial function by two-dimensional speckle-tracking echocardiography', *Cardiovascular Ultrasound. Cardiovascular Ultrasound*, 16(1), pp. 1–8. doi: 10.1186/s12947-018-0135-x.

Morris, D. A. *et al.* (2017) 'Normal range and usefulness of right ventricular systolic strain to detect subtle right ventricular systolic abnormalities in patients with heart failure: a multicentre study', *European heart journal cardiovascular Imaging*, 18(2), pp. 212–223. doi: 10.1093/ehjci/jew011.

Muzzarelli, S. *et al.* (2010) 'Predictors of early readmission or death in elderly patients with heart failure', *American Heart Journal. Mosby*, 160(2), pp. 308–314. doi: 10.1016/J.AHJ.2010.05.007.

Nagueh, S. F. *et al.* (2016) 'Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging', *Journal of the American Society of Echocardiography*. Elsevier Inc, 29(4), pp. 277–314. doi: 10.1016/j.echo.2016.01.011.

Njoroge, J. N., & Teerlink, J. R. (2021). Pathophysiology and Therapeutic Approaches to Acute Decompensated Heart Failure. *Circulation Research*, 128(10), 1468–1486. <https://doi.org/10.1161/CIRCRESAHA.121.318186>

O'Connor, C. M. *et al.* (2005) 'Demographics, clinical characteristics, and outcomes of patients hospitalized for decompensated heart failure: Observations from the IMPACT-HF registry', *Journal of Cardiac Failure*, 11(3), pp. 200–205. doi: 10.1016/j.cardfail.2004.08.160.

O'Connor, C. M. et al. (2010) 'Causes of death and rehospitalization in patients hospitalized with worsening heart failure and reduced left ventricular ejection fraction: Results from efficacy of vasopressin antagonism in heart failure outcome study with tolvaptan (EVEREST) program', *American Heart Journal*, 159(5). doi: 10.1016/j.ahj.2010.02.023.

Oduah, M.-T., Sundaram, V., & Reddy, Y. (2023). Epicardial Fat in Heart Failure with Preserved Ejection Fraction: Bad Actor or Just Lying Around? Cardiac Failure Review 2023;9:E06. <https://doi.org/10.15420/cfr.2022.25>

Omar, A. M. S., Bansal, M. and Sengupta, P. P. (2016) 'Advances in Echocardiographic Imaging in Heart Failure with Reduced and Preserved Ejection Fraction', *Circulation Research*, 119(2), pp. 357–374. doi: 10.1161/CIRCRESAHA.116.309128.

Oren RM. Hyponatremia in congestive heart failure. *American Journal of Cardiology* 2005;95:2–7.

Palazón-Bru, A., Folgado-de la Rosa, D. M., Cortés-Castell, E., López-Cascales, M. T., & Gil-Guillén, V. F. (2017). Sample size calculation to externally validate scoring systems based on logistic regression models. *PloS One*, 12(5), e0176726. <https://doi.org/10.1371/journal.pone.0176726>

Parto P, Lavie CJ. Obesity and Cardiovascular Diseases. *Curr Probl Cardiol* 2017;42:376–394.

Perhimpunan Dokter Spesialis Kardiovaskular Indonesia. (2023). Pedoman Tatalaksana Gagal Jantung, Edisi Ketiga. In PERKI (3rd ed.). <http://www.nber.org/papers/w16019>

Piepoli, M. F. et al. (2004) 'Exercise training meta-analysis of trials in patients with chronic heart failure (ExTraMATCH)', *British Medical Journal*, 328(7433), pp. 189–192. doi: 10.1136/bmj.37938.645220.ee.

Platz E, Campbell RT, Claggett B, Lewis EF, Groarke JD, Docherty KF, Lee MMY, Merz AA, Silverman M, Swamy V, Lindner M, Rivero J, Solomon SD, McMurray JJV. Lung Ultrasound in Acute Heart Failure: Prevalence of Pulmonary Congestion and Short- and Long-Term Outcomes. *JACC Heart Fail* 2019;7:849–858.

Pol, T., Held, C., Westerbergh, J., Lindbäck, J., Alexander, J. H., Alings, M., Erol, C., Goto, S., Halvorsen, S., Huber, K., Hanna, M., Lopes, R. D., Ruzylo, W., Granger, C. B., & Hijazi, Z. (2024). Dyslipidemia and Risk of Cardiovascular Events in Patients With Atrial Fibrillation Treated With Oral Anticoagulation Therapy: Insights From the ARISTOTLE (Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation) Trial. *Journal of the American Heart Association*, 7(3), e007444. <https://doi.org/10.1161/JAHA.117.007444>

Ponikowski, P. et al. (2016) '2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure', *European Heart Journal*, 37(27), pp. 2129-2200m. doi: 10.1093/eurheartj/ehw128.

Prater, D., Scientist, C. and Vogel, J. (2017) 'Ultrasound Automated Cardiac Motion Quantification Overview Automated Cardiac Motion Quantification'.

Rangrez, A. Y., Borlepawar, A., Schmiedel, N., Deshpande, A., Remes, A., Kumari, M., Bernt, A., Christen, L., Helbig, A., Jungmann, A., Sossalla, S., Tholey, A., Müller, O. J., Frank, D., & Frey, N. (2020). The E3 ubiquitin ligase HectD3 attenuates cardiac hypertrophy and inflammation in mice. *Communications Biology*, 3(1), 562. <https://doi.org/10.1038/s42003-020-01289-2>

- Roger, V. L. (2004) ‘Trends in Heart Failure Incidence and Survival in a Community-Based Population’, *JAMA*, 292(3), p. 344. doi: 10.1001/jama.292.3.344.
- Romano, S. et al. (2018) ‘乳鼠心肌提取 HHS Public Access’, *Physiology & behavior*, 176(1), pp. 139–148. doi: 10.1161/CIRCULATIONAHA.117.027740.Association.
- Rosamond, W. et al. (2008) ‘Heart disease and stroke statistics-2008 Update: A report from the American heart association statistics committee and stroke statistics subcommittee’, *Circulation*, 117(4). doi: 10.1161/CIRCULATIONAHA.107.187998.
- Rosano GM, Vitale C, Seferovic P. Heart Failure in Patients with Diabetes Mellitus. *Card Fail Rev* 2017;03:52.
- Rudski, L. G. et al. (2010) ‘Guidelines for the Echocardiographic Assessment of the Right Heart in Adults: A Report from the American Society of Echocardiography. Endorsed by the European Association of Echocardiography, a registered branch of the European Society of Cardiology, and’, *Journal of the American Society of Echocardiography*. Elsevier Inc, 23(7), pp. 685–713. doi: 10.1016/j.echo.2010.05.010.
- Russo, M. J. et al. (2008) ‘The Cost of Medical Management in Advanced Heart Failure During the Final Two Years of Life’, *Journal of Cardiac Failure*, 14(8), pp. 651–658. doi: 10.1016/j.cardfail.2008.06.005. Sandesara PB, O’Neal WT, Kelli HM, Topel M, Samman-Tahhan A, Sperling LS. Diastolic blood pressure and adverse outcomes in the TOPCAT (Treatment of Preserved Cardiac Function Heart Failure with an Aldosterone Antagonist) trial. *J Am Heart Assoc* 2018;7:1–8.
- Sato R, Haehling S von. Revisiting the obesity paradox in heart failure: what is the best anthropometric index to gauge obesity? *Eur Heart J* 2023;44:1154–1156.
- Satpathy, C. et al. (2006) ‘Diagnosis and management of diastolic dysfunction and heart failure’, *American Family Physician*, 73(5), pp. 841–846.
- Savarese, G. and Lund, L. H. (2017) ‘Global Public Health Burden of Heart Failure’, *Cardiac Failure Review*, 03(01), p. 7. doi: 10.15420/cfr.2016:25:2.
- Schrier, R. W. (2006) ‘Role of diminished renal function in cardiovascular mortality: Marker or pathogenetic factor?’, *Journal of the American College of Cardiology*, pp. 1–8. doi: 10.1016/j.jacc.2005.07.067.
- Schrier, R. W. and Abraham, W. T. (1999) ‘Hormones and Hemodynamics in Heart Failure’, *New England Journal of Medicine*, 341(8), pp. 577–585. doi: 10.1056/NEJM199908193410806.
- Sciacca, C. et al. (2020) ‘Traditional and Novel Imaging of Right Ventricular Function in Patients with Heart Failure and Reduced Ejection Fraction’, *Current Heart Failure Reports*. Current Heart Failure Reports, 17(2), pp. 28–33. doi: 10.1007/s11897-020-00455-1.
- Setoguchi, S., Stevenson, L. W. and Schneeweiss, S. (2007) ‘Repeated hospitalizations predict mortality in the community population with heart failure’, *American Heart Journal*, 154(2), pp. 260–266. doi: <https://doi.org/10.1016/j.ahj.2007.01.041>.
- Smith, G. L. et al. (2006) ‘Renal Impairment and Outcomes in Heart Failure’, *Journal of the American College of Cardiology*, 47(10), pp. 1987–1996. doi: 10.1016/j.jacc.2005.11.084.
- Smolarek, D., Gruchała, M. and Sobiczewski, W. (2017) ‘Echocardiographic evaluation of right ventricular systolic function: The traditional and innovative approach’, *Cardiology Journal*,

- 24(5), pp. 563–572. doi: 10.5603/CJ.a2017.0051.
- Solomon, S. D. *et al.* (2007) ‘Influence of nonfatal hospitalization for heart failure on subsequent mortality in patients with chronic heart failure’, *Circulation*, 116(13), pp. 1482–1487. doi: 10.1161/CIRCULATIONAHA.107.696906.
- Srivastava, P. M., Burrell, L. M. and Calafiore, P. (2005) ‘Lateral vs medial mitral annular tissue Doppler in the echocardiographic assessment of diastolic function and filling pressures: Which should we use?’, *European Journal of Echocardiography*, 6(2), pp. 97–106. doi: 10.1016/j.euje.2004.07.005.
- Stevenson, L. W. *et al.* (2010) ‘Chronic ambulatory intracardiac pressures and future heart failure events’, *Circulation: Heart Failure*, 3(5), pp. 580–587. doi: 10.1161/CIRCHEARTFAILURE.109.923300.
- Stewart S, Playford D, Scalia GM, Currie P, Celermajer DS, Prior D, Codde J, Strange G. Ejection fraction and mortality: a nationwide register-based cohort study of 499 153 women and men. *Eur J Heart Fail* 2021;23:406–416.
- Stienen, S., Salah, K., Moons, A. H., Bakx, A. L., Van Pol, P., Kortz, R. A. M., Ferreira, J. P., Marques, I., Schroeder-Tanka, J. M., Keijer, J. T., Bayés-Genis, A., Tijssen, J. G. P., Pinto, Y. M., & Kok, W. E. (2018). NT-proBNP (N-Terminal pro-B-Type Natriuretic Peptide)-guided therapy in acute decompensated heart failure PRIMA II randomized controlled trial (Can NT-ProBNP-guided therapy during hospital admission for acute decompensated heart failure reduce mortality a. *Circulation*, 137(16), 1671–1683.
<https://doi.org/10.1161/CIRCULATIONAHA.117.029882>
- Takigiku, K. *et al.* (2012) ‘Normal Range of Left Ventricular 2-Dimensional Strain’, *Circulation Journal*, 76(11), pp. 2623–2632. doi: 10.1253/circj.CJ-12-0264.
- Timby, B. K. and Smith, N. E. (2018) *Introductory Medical-Surgical Nursing*. 12th edn. Wolters Kluwer.
- Tsimploulis A, Lam PH, Arundel C, Singh SN, Morgan CJ, Faselis C, Deedwania P, Butler J, Aronow WS, Yancy CW, Fonarow GC, Ahmed A. Systolic Blood Pressure and Outcomes in Patients With Heart Failure With Preserved Ejection Fraction. *JAMA Cardiol* 2018;3:288–297.
- Tsuchihashi, M. *et al.* (2001) ‘Medical and socioenvironmental predictors of hospital readmission in patients with congestive heart failure’, *American Heart Journal*. Mosby, 142(4), pp. 20A-26A. doi: 10.1067/MHJ.2001.117964.
- Tung Y-C, Chou S-H, Liu K-L, Hsieh I-C, Wu L-S, Lin C-P, Wen M-S, Chu P-H. Worse Prognosis in Heart Failure Patients with 30-Day Readmission. *Acta Cardiol Sin* 2016;32:698–707.
- Venner, C. *et al.* (2016) ‘Right ventricular dysfunction in patients with idiopathic dilated cardiomyopathy: Prognostic value and predictive factors’, *Archives of Cardiovascular Diseases*. Elsevier Masson SAS, 109(4), pp. 231–241. doi: 10.1016/j.acvd.2015.10.006.
- Voelkel, N. F. *et al.* (2006) ‘Right ventricular function and failure: Report of a National Heart, Lung, and Blood Institute working group on cellular and molecular mechanisms of right heart failure’, *Circulation*, 114(17), pp. 1883–1891. doi: 10.1161/CIRCULATIONAHA.106.632208.
- Voigt, J. U. *et al.* (2015) ‘Definitions for a common standard for 2D speckle tracking echocardiography: Consensus document of the EACVI/ASE/industry task force to standardize

deformation imaging', *Journal of the American Society of Echocardiography*, 28(2), pp. 183–193. doi: 10.1016/j.echo.2014.11.003.

van Walraven, C., Wong, J. and Forster, A. J. (2012) 'LACE+ index: extension of a validated index to predict early death or urgent readmission after hospital discharge using administrative data.', *Open medicine : a peer-reviewed, independent, open-access journal*, 6(3), pp. 90–100.

Wang, T.-D., Lee, C.-M., Wu, C.-C., Lee, T.-M., Chen, W.-J., Chen, M.-F., Liau, C.-S., Sung, F.-C., & Lee, Y.-T. (1999). The effects of dyslipidemia on left ventricular systolic function in patients with stable angina pectoris. *Atherosclerosis*, 146(1), 117–124.
[https://doi.org/https://doi.org/10.1016/S0021-9150\(99\)00108-2](https://doi.org/https://doi.org/10.1016/S0021-9150(99)00108-2)

Whellan, D. J. et al. (2010) 'Combined Heart Failure Device Diagnostics Identify Patients at Higher Risk of Subsequent Heart Failure Hospitalizations: Results From PARTNERS HF (Program to Access and Review Trending Information and Evaluate Correlation to Symptoms in Patients With Heart Failure) Study', *Journal of the American College of Cardiology*. Elsevier, 55(17), pp. 1803–1810. doi: 10.1016/J.JACC.2009.11.089.

Xia H, Shen H, Cha W, Lu Q. The Prognostic Significance of Anemia in Patients With Heart Failure: A Meta-Analysis of Studies From the Last Decade. *Front Cardiovasc Med* 2021;8.

Yancy, C. W. et al. (2017) *2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of Amer*, *Circulation*. doi: 10.1161/CIR.0000000000000509.

Ye XJ, Li N, Li JH, Wu WJ, Li AL, Li XL. B-lines by lung ultrasound predict heart failure in hospitalized patients with acute anterior wall STEMI. *Echocardiography* 2019;36:1253–1262.

Yingchoncharoen, T. et al. (2013) 'Normal ranges of left ventricular strain: a meta-analysis.', *Journal of the American Society of Echocardiography : official publication of the American Society of Echocardiography*, 26 2, pp. 185–191.

Zachary S. Bruss; Avais Raja (no date) 'Physiology, Stroke Volume - StatPearls - NCBI Bookshelf'.

Zaya, M. (2012) 'Predictors of re-hospitalization in patients with chronic heart failure', *World Journal of Cardiology*, 4(2), p. 23. doi: 10.4330/wjc.v4.i2.23.

Zeng S, Cai X, Zheng Y, Liu X, Ye M. Associations of body mass index with mortality in heart failure with preserved ejection fraction patients with ischemic versus non-ischemic etiology. *Front Cardiovasc Med* 2022;9:1–12.

Zornoff, L. A. M. et al. (2002) 'Right ventricular dysfunction and risk of heart failure and mortality after myocardial infarction', *Journal of the American College of Cardiology*, 39(9), pp. 1450–1455. doi: 10.1016/S0735-1097(02)01804-1.

LAMPIRAN

HARPER SCORE

<https://harperscore.com>

The screenshot shows a web-based tool titled "HARPER Score" designed for heart failure risk prediction. The title is at the top center, followed by a subtitle "HAsanuddin Risk Prediction on hEart failuRe Score". Below the subtitle, it says "Created by Akhtar Fajar Muzakkir Ali Aspar, MD". A descriptive paragraph explains the tool's purpose: "This tool is designed to help medical professionals estimate the odds ratio for adverse events or rehospitalization in short-term heart failure patients. By entering clinical parameters and echocardiography data, you can assess the risk of mortality and readmission, aiding in patient management and care planning." The form consists of ten input fields for clinical parameters, each with an up/down arrow for value adjustment. The parameters are: Gender, Age, Diastolic Blood Pressure (DBP), Body Mass Index (BMI), Hemoglobin (Hb), Admission Blood Glucose, High-Density Lipoprotein (HDL), Ejection Fraction (EF), S Lateral (S' Lat), and Left Ventricular Stroke Volume (LVSV). At the bottom is a large blue button labeled "Assess Odds".

HARPER Score

HAsanuddin Risk Prediction on hEart failuRe Score

Created by Akhtar Fajar Muzakkir Ali Aspar, MD

This tool is designed to help medical professionals estimate the odds ratio for adverse events or rehospitalization in short-term heart failure patients. By entering clinical parameters and echocardiography data, you can assess the risk of mortality and readmission, aiding in patient management and care planning.

Gender

Select Option

Age

Diastolic Blood Pressure (DBP)

Body Mass Index (BMI)

Hemoglobin (Hb)

Admission Blood Glucose

High-Density Lipoprotein (HDL)

Ejection Fraction (EF)

S Lateral (S' Lat)

Left Ventricular Stroke Volume (LVSV)

Lung Ultrasound B-lines (LUS B-line)

Assess Odds

HARPER Score

Hasanuddin Risk Prediction on hEart failuRe Score

Created by Akhtar Fajar Muzakkir Ali Aspar, MD

This tool is designed to help medical professionals estimate the odds ratio for adverse events or rehospitalization in short-term heart failure patients. By entering clinical parameters and echocardiography data, you can assess the risk of mortality and readmission, aiding in patient management and care planning.

Gender	Male
Age	66
Sexual Activity	80
Body Mass Index (kg/m²)	20
Diabetes Mellitus	8.1
Chronic Kidney Disease (eGFR < 60 mL/min)	194
Smoking Status	35
Previous Myocardial Infarction	27.1
Previous Stroke	8.06
Previous Hospitalization	49.3
Current Hospitalization	12

Assess Odds

HARPER Score

Predictive Analysis Result

Based on the calculation, the patient has an odds ratio of **5.55**

for adverse events such as death or rehospitalization within 90 days post-admission compared to other heart failure patients.

Close

iCHF SCORE

<https://ichf.harperscore.com>

iCHF Score

In-Hospital Mortality Clinical Heart Failure Score

Created by Akhtar Fajar Muzakkir Ali Aspar, MD

This tool assists medical professionals in evaluating the risk of in-hospital mortality in heart failure patients. By entering key clinical parameters, healthcare providers can categorize patients into low, moderate, or high risk groups, facilitating targeted intervention and care planning

Age Group:

65 or older
 Below 65

Diastolic Blood Pressure (DBP):

DBP < 60 mmHg
 DBP ≥ 60 mmHg

Heart Rate (HR):

HR < 60 bpm
 HR 60-110 bpm
 HR > 110 bpm

Creatinine Level:

Creatinine ≥ 1.5 mg/dL
 Creatinine < 1.5 mg/dL

Haemoglobin Level (Hb):

Hb ≤ 13 mg/dL
 Hb > 13 mg/dL

Assess Risk

iCHF Score

In-Hospital Mortality Clinical Heart Failure Score

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- Hb ≤ 13 mg/dL
- Hb > 13 mg/dL

Assess Risk

