

# **IMPACTO EN LA VALORACIÓN FUNCIONAL Y CALIDAD DE VIDA EN PACIENTES CON INSUFICIENCIA CARDIACA EN UNA IPS DE BARRANQUILLA (ATL, CO) DURANTE EL 2022**

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## RESUMEN

**Introducción:** La insuficiencia cardíaca (IC) es una causa importante de morbilidad y mortalidad en todo el mundo de allí es la importancia de la implementación de programas que se enfoquen en cambiar hábitos acompañados de un equipo integral y multidisciplinar.

**Objetivo:** Evaluar el impacto en la recuperación de la valoración funcional y calidad de vida en pacientes con Insuficiencia Cardíaca adscritos a un programa de seguimiento y control de una IPS de Barranquilla (Atl, CO) durante el 2022.

**Metodología:** Se realizó un estudio analítico, recogiendo los datos de evaluación de los pacientes adscritos a un programa de seguimiento y control de IC clasificados por NYHA, la valoración funcional por Barthel y calidad de con EQ-5D. Para describir los datos se utilizaron medidas de tendencia central y dispersión para variables cuantitativas, y frecuencias para variables categóricas. Se emplearon pruebas de Wilcoxon y Fisher exact test, considerando  $p < 0.05$  como significativo. El análisis se realizó en R-CRAN versión 4.3.0.

**Resultados:** Se enrolaron 83 pacientes con IC, el 67% eran hombres, la edad media fue de 60 años. La HTA afectó al 47%, y la DM2 al 22%. La etiología dilatada fue la más común (55%). La mayoría estaba en NYHA clase II-IV y en estadio C según ACC/AHA. El BARTHEL promedió 90, indicando moderada dependencia. El EQ-5D promedió 80, denotando un estado de salud óptimo 12 posterior al inicio del programa. Hubo mejoras significativas en la FEVI y la puntuación EQ-5D a los 12 meses. No se observaron cambios en otros parámetros clínicos.

**Conclusión:** La mejora observada en la función ventricular y la calidad de vida resalta el impacto positivo que estos programas pueden tener en el manejo a largo plazo de esta condición respaldando la importancia de implementar programas de seguimiento y control para pacientes con insuficiencia cardíaca.

**Palabras clave:** Insuficiencia Cardíaca, Programa de Seguimiento, Evaluación Funcional, Calidad de Vida, Manejo de la Enfermedad, Resultado del Tratamiento.

## ABSTRACT

Heart failure (HF) is a significant cause of global morbidity and mortality, emphasizing the importance of implementing programs that focus on lifestyle modifications with the support of a comprehensive and multidisciplinary team.

**Objective:** To assess the impact on functional assessment and quality of life recovery in patients with Heart Failure enrolled in a monitoring and control program at a healthcare institution in Barranquilla (Atl, CO) during 2022.

**Methodology:** An analytical study was conducted, collecting data from the evaluation of patients enrolled in a Heart Failure monitoring and control program classified by NYHA, functional assessment using Barthel, and quality of life with EQ-5D. Descriptive statistics were used for quantitative variables, including measures of central tendency and dispersion, while frequencies were used for categorical

variables. Wilcoxon and Fisher exact tests were employed, considering  $p < 0.05$  as significant. The analysis was performed in R-CRAN version 4.3.0.

**Results:** 83 patients with HF were enrolled, 67% were male, and the mean age was 60 years. Hypertension affected 47%, and type 2 diabetes mellitus affected 22%. Dilated etiology was the most common (55%). The majority were in NYHA class II-IV and stage C according to ACC/AHA. The BARTHEL averaged 90, indicating moderate dependency. The EQ-5D averaged 80, indicating an optimal health status 12 months after program initiation. Significant improvements were observed in LVEF and EQ-5D score at 12 months. No changes were observed in other clinical parameters.

**Conclusion:** The observed improvement in ventricular function and quality of life underscores the positive impact these programs can have in the long-term management of this condition, supporting the importance of implementing monitoring and control programs for patients with heart failure.

**Keywords:** Heart Failure, Follow-up Program, Functional Assessment, Quality of Life, Disease Management, Treatment Outcome.

## REFERENCIAS BIBLIOGRÁFICAS

1. Malik A, Brito D, Vaqar S, Chhabra L. Congestive Heart Failure [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28785469>
2. Watson RD, Gibbs CR, Lip GY. ABC of heart failure. Clinical features and complications. BMJ [Internet]. 2000 Jan 22;320(7229):236–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10642237>
3. González-Juanatey JR, Alegría Ezquerro E, Bertoméu Martínez V, Conthe Gutiérrez P, de Santiago Nocito A, Zsolt Fradera I. [Heart failure in outpatients: comorbidities and management by different specialists. The EPISERVE Study]. Rev Esp Cardiol. 2008 Jun;61(6):611–9.
4. Mughal MS, Ghani AR, Kumar S, Hanif W, Ahsan I, Akbar H, et al. Heart Failure Patients and Implications of Obesity: A Single-Center Retrospective Study. Cureus [Internet]. 2021 Sep;13(9):e18140. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34703681>

5. Lee H, Oh S-H, Cho H, Cho H-J, Kang H-Y. Prevalence and socio-economic burden of heart failure in an aging society of South Korea. *BMC Cardiovasc Disord* [Internet]. 2016 Nov 10;16(1):215. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27832754>
6. De La Fuente Cid R, Hermida Ameijeiras A, Pazo Núñez M, Lado Lado F. Epidemiología de la insuficiencia cardíaca. Proporciones de epidemia. *An Med Interna*. 2007;24(10):500–4.
7. Hessel FP. Overview of the socio-economic consequences of heart failure. *Cardiovasc Diagn Ther* [Internet]. 2021 Feb;11(1):254–62. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/33708497>
8. Bosch X, Alfonso F, Bermejo J. Avances en la evaluación diagnóstica y terapéutica de la insuficiencia cardíaca. Del tratamiento tónico-deplectivo al trasplante celular y la regeneración miocárdica. *Rev Española Cardiol* [Internet]. 2004 Feb;57(2):161–2. Available from: [http://www.revespcardiol.org/cgi-bin/wdbcgi.exe/cardio/mrevista\\_cardio.fulltext?pidet=13057267](http://www.revespcardiol.org/cgi-bin/wdbcgi.exe/cardio/mrevista_cardio.fulltext?pidet=13057267)
9. Pereira-Rodríguez JE, Gina Rincón-González Lic Damaris Niño-Serrato LR, -Inglés E, Pereira-Rodríguez J. Insuficiencia cardíaca: Aspectos básicos de una epidemia en aumento. *Soc Cuba Cardiol*. 2016;8(1):58–70.
10. Vinuesa G, Chiluisa A, Aveiga C. Insuficiencia cardíaca: desafíos en la terapia farmacológica. *Rev Digit Postgrado* [Internet]. 2019;8(3):1–7. Available from: [http://saber.ucv.ve/ojs/index.php/rev\\_dp/article/view/17078](http://saber.ucv.ve/ojs/index.php/rev_dp/article/view/17078)
11. Tratamiento farmacológico de la insuficiencia cardíaca. ¿Qué hay de nuevo? *Rev Uruguaya Cardiol* [Internet]. 2017 Dec 22;32(3). Available from: [http://www.suc.org.uy/revista/V32N3/pdf/rcv32n3\\_ic-komajda.pdf](http://www.suc.org.uy/revista/V32N3/pdf/rcv32n3_ic-komajda.pdf)
12. Mercedes A, Villero U, Del K, Marín C, Andrés C, Criado R. Manejo de la falla cardíaca aguda en urgencias: enfoque terapia farmacológica. *Medicas UIS*. 2013;26(1):69–79.
13. Herreros J, Trainini JC, Bernal JM, Gutiérrez F, Cabo J, Chachques JC. Tratamiento de la insuficiencia cardíaca: nuevas estrategias terapéuticas. *Cirugía Cardiovasc* [Internet]. 2011 Apr;18(2):113–20. Available from:

<https://linkinghub.elsevier.com/retrieve/pii/S1134009611700651>

14. Plácido R, Mebazaa A. Tratamiento no farmacológico de la insuficiencia cardiaca aguda. *Rev Española Cardiol* [Internet]. 2015 Sep;68(9):794–802. Available from:  
<https://linkinghub.elsevier.com/retrieve/pii/S030089321500305X>
15. O'Connor C, Fiuzat M, Mulder H, Coles A, Ahmad T, Ezekowitz JA, et al. Clinical factors related to morbidity and mortality in high-risk heart failure patients: the GUIDE-IT predictive model and risk score. *Eur J Heart Fail* [Internet]. 2019 Jun;21(6):770–8. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/30919549>
16. Chaney E, Shaw A. Pathophysiology of Fluid Retention in Heart Failure. In 2010. p. 46–53. Available from:  
<https://www.karger.com/Article/FullText/313720>
17. Segovia Cubero J, Alonso-Pulpón Rivera L, Pereira Moral R, Silva Melchor L. Heart Failure: Etiology and Approach to Diagnosis. *Rev Española Cardiol (English Ed)* [Internet]. 2004 Mar;57(3):250–9. Available from:  
<https://linkinghub.elsevier.com/retrieve/pii/S1885585706601436>
18. Kamimura D, Cain LR, Mentz RJ, White WB, Blaha MJ, DeFilippis AP, et al. Cigarette Smoking and Incident Heart Failure. *Circulation* [Internet]. 2018 Jun 12;137(24):2572–82. Available from:  
<https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.117.031912>
19. Grubb AF, Greene SJ, Fudim M, Dewald T, Mentz RJ. Drugs of Abuse and Heart Failure. *J Card Fail* [Internet]. 2021 Nov;27(11):1260–75. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34133967>
20. Scherer PE, Hill JA. Obesity, Diabetes, and Cardiovascular Diseases: A Compendium. *Circ Res* [Internet]. 2016 May 27;118(11):1703–5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27230636>
21. Gentile F, Castiglione V, De Caterina R. Coronary Artery Anomalies. *Circulation* [Internet]. 2021 Sep 21;144(12):983–96. Available from:  
<https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.121.055347>
22. Frescura C, Basso C, Thiene G, Corrado D, Pennelli T, Angelini A, et al.

- Anomalous origin of coronary arteries and risk of sudden death: a study based on an autopsy population of congenital heart disease. *Hum Pathol* [Internet]. 1998 Jul;29(7):689–95. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/9670825>
23. Vilcant V, Hai O. Bacterial Endocarditis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30760474>
  24. Yallowitz AW, Decker LC. Infectious Endocarditis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27672723>
  25. Fahed AC, Roberts AE, Mital S, Lakdawala NK. Heart failure in congenital heart disease: a confluence of acquired and congenital. *Heart Fail Clin* [Internet]. 2014 Jan;10(1):219–27. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24275306>
  26. Bhandari B, Quintanilla Rodriguez BS, Masood W. Ischemic Cardiomyopathy. *StatPearls*. 2023.
  27. Maron BJ, Rowin EJ, Udelson JE, Maron MS. Clinical Spectrum and Management of Heart Failure in Hypertrophic Cardiomyopathy. *JACC Heart Fail* [Internet]. 2018 May;6(5):353–63. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29655822>
  28. Dattoli-García CA, Jackson-Pedroza CN, Gallardo-Grajeda AL, Gopar-Nieto R, Araiza-Garygordobil D, Arias-Mendoza A. [Infarto agudo de miocardio: revisión sobre factores de riesgo, etiología, hallazgos angiográficos y desenlaces en pacientes jóvenes]. *Arch Cardiol Mex* [Internet]. 2021 Nov 1;91(4):485–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/33471784>
  29. Jenča D, Melenovský V, Stehlik J, Staněk V, Kettner J, Kautzner J, et al. Heart failure after myocardial infarction: incidence and predictors. *ESC Hear Fail* [Internet]. 2021 Feb;8(1):222–37. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/33319509>
  30. Varricchi G, Ameri P, Cadeddu C, Ghigo A, Madonna R, Marone G, et al. Antineoplastic Drug-Induced Cardiotoxicity: A Redox Perspective. *Front Physiol* [Internet]. 2018;9:167. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/29563880>

31. Xu Z, Cang S, Yang T, Liu D. Cardiotoxicity of tyrosine kinase inhibitors in chronic myelogenous leukemia therapy. *Hematol Rep* [Internet]. 2009 Mar 13;1(1):4. Available from:  
<http://www.pagepress.org/journals/index.php/hr/article/view/hr.2009.e4>
32. Shalata W, Abu-Salman A, Steckbeck R, Mathew Jacob B, Massalha I, Yakobson A. Cardiac Toxicity Associated with Immune Checkpoint Inhibitors: A Systematic Review. *Cancers (Basel)* [Internet]. 2021 Oct 18;13(20). Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34680365>
33. Tang X-M, Chen H, Li Q, Song Y, Zhang S, Xu X-S, et al. Assessment of the cardiac safety between cetuximab and panitumumab as single therapy in Chinese chemotherapy-refractory mCRC. *Onco Targets Ther* [Internet]. 2018;11:123–9. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/29343971>
34. Nakamae H, Tsumura K, Terada Y, Nakane T, Nakamae M, Ohta K, et al. Notable effects of angiotensin II receptor blocker, valsartan, on acute cardiotoxic changes after standard chemotherapy with cyclophosphamide, doxorubicin, vincristine, and prednisolone. *Cancer* [Internet]. 2005 Dec 1;104(11):2492–8. Available from:  
<https://onlinelibrary.wiley.com/doi/10.1002/cncr.21478>
35. Spitzer E, Hahn RT, Pibarot P, de Vries T, Bax JJ, Leon MB, et al. Aortic Stenosis and Heart Failure: Disease Ascertainment and Statistical Considerations for Clinical Trials. *Card Fail Rev* [Internet]. 2019 May;5(2):99–105. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/31179020>
36. Pujari SH, Agasthi P. Aortic Stenosis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16980116>
37. Patel JB, Borgeson DD, Barnes ME, Rihal CS, Daly RC, Redfield MM. Mitral regurgitation in patients with advanced systolic heart failure. *J Card Fail* [Internet]. 2004 Aug;10(4):285–91. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/15309693>

38. Douedi S, Douedi H. Mitral Regurgitation [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30060923>
39. Mulla S, Asuka E, Bora V, Siddiqui WJ. Tricuspid Regurgitation [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/2345895>
40. Desai DS, Hajouli S. Arrhythmias. StatPearls. 2023.
41. Hafeez Y, Grossman SA. Sinus Bradycardia. StatPearls. 2023.
42. Ruddox V, Sandven I, Munkhaugen J, Skattebu J, Edvardsen T, Otterstad JE. Atrial fibrillation and the risk for myocardial infarction, all-cause mortality and heart failure: A systematic review and meta-analysis. Eur J Prev Cardiol [Internet]. 2017 Sep;24(14):1555–66. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28617620>
43. Nesheiwat Z, Goyal A, Jagtap M. Atrial Fibrillation. StatPearls. 2023.
44. Chhabra L, Goyal A, Benham MD. Wolff-Parkinson-White Syndrome [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12807866>
45. Thyagarajan B, Alagusundaramoorthy SS, Agrawal A. Atrial Fibrillation Due to Over The Counter Stimulant Drugs in A Young Adult. J Clin Diagn Res [Internet]. 2015 Aug;9(8):OD05-7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26435989>
46. Shahjehan RD, Bhutta BS. Coronary Artery Disease [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24811552>
47. Mathew P, Kaur J, Rawla P. Hyperthyroidism [Internet]. StatPearls. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27521067>
48. Smid J, Scherner M, Wolfram O, Groscheck T, Wippermann J, Braun-Dullaes RC. Cardiogenic Causes of Fever. Dtsch Arztebl Int [Internet]. 2018 Mar 23;115(12):193–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29642989>
49. Celano CM, Daunis DJ, Lokko HN, Campbell KA, Huffman JC. Anxiety Disorders and Cardiovascular Disease. Curr Psychiatry Rep [Internet]. 2016 Nov;18(11):101. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/27671918>

50. Lima G, Cardoso E, Fiscus G. Presumed Alcohol-Induced Ventricular Tachycardia Storm: A Case Report. *Cureus* [Internet]. 2020 May 13;12(5):e8097. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/32542152>
51. Guerri G, Krasi G, Precone V, Paolacci S, Chiurazzi P, Arrigoni L, et al. Cardiac conduction defects. *Acta Biomed* [Internet]. 2019 Sep 30;90(10-S):20–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/31577249>
52. Kashou AH, Goyal A, Nguyen T, Ahmed I, Chhabra L. Atrioventricular Block [Internet]. *StatPearls*. 2023. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/30817991>
53. Scherbak D, Hicks GJ. Left Bundle Branch Block [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17385703>
54. Pérez-Riera AR, Barbosa-Barros R, de Rezende Barbosa MPC, Daminello-Raimundo R, de Abreu LC, Nikus K. Left bundle branch block: Epidemiology, etiology, anatomic features, electrovectorcardiography, and classification proposal. *Ann Noninvasive Electrocardiol* [Internet]. 2019 Mar;24(2):e12572. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29932265>
55. Voigt JU, Abraham TP. Ischemic heart disease. *ASE's Comprehensive Strain Imaging*. 2021. 168–187 p.
56. Pahwa R, Jialal I. Atherosclerosis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30975520>
57. Ndrepepa G. Atherosclerosis & ischaemic heart disease: Here to stay or gone tomorrow. *Indian J Med Res* [Internet]. 2017 Sep;146(3):293–7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29355133>
58. Hermiz C, Sedhai YR. Angina [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29874661>
59. Ojha N, Dhmoon AS. Myocardial Infarction. *StatPearls*. 2023.
60. Bustamante JG, Zaidi SRH. Amyloidosis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30604309>
61. Adam RD, Coriu D, Jercan A, Bădeliță S, Popescu BA, Damy T, et al.

- Progress and challenges in the treatment of cardiac amyloidosis: a review of the literature. *ESC Hear Fail* [Internet]. 2021 Aug;8(4):2380–96. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34089308>
62. Belziti C, Bagnati R, Bianqui CT, Arbelbide J, Nucifora E, Domenech A, et al. Heart transplantation and bone marrow transplantation in a patient with AL amyloidosis and refractory heart failure . *Rev Argent Cardiol* [Internet]. 2009;77(4):309–11. Available from: <https://www.scopus.com/inward/record.uri?eid=2-s2.0-76249084622&partnerID=40&md5=23ccdc65635d7764f546ec6f965a29c3>
63. Decotto S, Villanueva E, Pérez de Arenaza D, Nucifora EM, Aguirre MA, Posadas-Martínez ML, et al. [Heart transplantation in amyloidosis. Clinical and imaging manifestations]. *Arch Cardiol Mex* [Internet]. 2022 Jul 1;92(3):320–6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34619747>
64. Frangogiannis NG. Cardiac fibrosis. *Cardiovasc Res* [Internet]. 2021 May 25;117(6):1450–88. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/33135058>
65. Morfino P, Aimo A, Castiglione V, Gálvez-Montón C, Emdin M, Bayes-Genis A. Treatment of cardiac fibrosis: from neuro-hormonal inhibitors to CAR-T cell therapy. *Heart Fail Rev* [Internet]. 2023 Mar;28(2):555–69. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/36221014>
66. Porter JL, Rawla P. Hemochromatosis [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8696333>
67. Metivier F, Marchais SJ, Guerin AP, Pannier B, London GM. Pathophysiology of anaemia: focus on the heart and blood vessels. *Nephrol Dial Transplant* [Internet]. 2000;15 Suppl 3:14–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/11032352>
68. Osuna PM, Udovcic M, Sharma MD. Hyperthyroidism and the Heart. *Methodist Debaque Cardiovasc J* [Internet]. 2017;13(2):60–3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28740583>
69. Arnalich F, Plaza I, Sobrino JA, Oliver J, Barbado J, Peña JM, et al. Cardiac

- size and function in Paget's disease of bone. *Int J Cardiol* [Internet]. 1984 Apr;5(4):491–505. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/6233229>
70. Bouchette P, Boktor SW. Paget Disease [Internet]. *StatPearls*. 2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30807433>
71. Murphy SP, Ibrahim NE, Januzzi JL. Heart Failure With Reduced Ejection Fraction: A Review. *JAMA* [Internet]. 2020 Aug 4;324(5):488–504. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/32749493>
72. Hajouli S, Ludhwani D. Heart Failure and Ejection Fraction [Internet]. *StatPearls*. 2023. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/27206819>
73. Villar R. Escala NYHA ( New York Heart Association ) Escala NYHA ( New York Heart Association ). *Med Interna (Bucur)*. 1994;
74. Albert N, Trochelman K, Li J, Lin S. Signs and symptoms of heart failure: are you asking the right questions? *Am J Crit Care* [Internet]. 2010 Sep;19(5):443–52. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/19940253>
75. Chopra S, Cherian D, Verghese PP, Jacob JJ. Physiology and clinical significance of natriuretic hormones. *Indian J Endocrinol Metab* [Internet]. 2013 Jan;17(1):83–90. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/23776857>
76. Corteville DCM, Bibbins-Domingo K, Wu AHB, Ali S, Schiller NB, Whooley MA. N-terminal pro-B-type natriuretic peptide as a diagnostic test for ventricular dysfunction in patients with coronary disease: data from the heart and soul study. *Arch Intern Med* [Internet]. 2007 Mar 12;167(5):483–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17353496>
77. Felker GM, Thompson RE, Hare JM, Hruban RH, Clemetson DE, Howard DL, et al. Underlying causes and long-term survival in patients with initially unexplained cardiomyopathy. *N Engl J Med* [Internet]. 2000 Apr 13;342(15):1077–84. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/10760308>

78. Jones NR, Hobbs FR, Taylor CJ. Prognosis following a diagnosis of heart failure and the role of primary care: a review of the literature. *BJGP open* [Internet]. 2017 Oct 4;1(3):bjgpopen17X101013. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30564675>
79. Camm AJ, Savelieva I, Lip GYH, Guideline Development Group for the NICE clinical guideline for the management of atrial fibrillation. Rate control in the medical management of atrial fibrillation. *Heart* [Internet]. 2007 Jan;93(1):35–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16952972>
80. Boldt L-H, Rolf S, Huemer M, Parwani AS, Luft FC, Dietz R, et al. Optimal heart failure therapy and successful cardioversion in heart failure patients with atrial fibrillation. *Am Heart J* [Internet]. 2008 May;155(5):890–5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18440338>
81. Faber TS, Zehender M. [Antiarrhythmic therapy in patients with heart failure]. *Ther Umsch* [Internet]. 2000 May;57(5):324–32. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10859993>
82. Ghimire R, Dhungana SP. Evaluation of drugs used in chronic heart failure at tertiary care centre: a hospital based study. *J Cardiovasc Thorac Res* [Internet]. 2019;11(2):79–84. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/31384400>
83. Rosano GM, Vitale C, Seferovic P. Heart Failure in Patients with Diabetes Mellitus. *Card Fail Rev* [Internet]. 2017 Apr;3(1):52–5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28785476>
84. Pinho-Gomes AC, Rahimi K. Management of blood pressure in heart failure. *Heart* [Internet]. 2019 Apr;105(8):589–95. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/30674544>
85. Adamson PB. Pathophysiology of the transition from chronic compensated and acute decompensated heart failure: new insights from continuous monitoring devices. *Curr Heart Fail Rep* [Internet]. 2009 Dec;6(4):287–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19948098>
86. Butler J, Talha KM, Aktas MK, Zareba W, Goldenberg I. Role of Implantable Cardioverter Defibrillator in Heart Failure With Contemporary Medical

- Therapy. Circ Hear Fail [Internet]. 2022 Aug;15(8). Available from:  
<https://www.ahajournals.org/doi/10.1161/CIRCHEARTFAILURE.122.009634>
87. Acena M, Regoli F, Auricchio A. Terapia de resincronización cardiaca. Indicaciones y contraindicaciones. Rev Española Cardiol [Internet]. 2012 Sep;65(9):843–9. Available from:  
<https://linkinghub.elsevier.com/retrieve/pii/S0300893212002527>
88. Sarsam L, Malik MB, Bashir K. Ultrafiltration in Acute Decompensated Heart Failure [Internet]. StatPearls. 2023. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/30815994>
89. Y Birati E, Jessup M. Left Ventricular Assist Devices in the Management of Heart Failure. Card Fail Rev [Internet]. 2015 Apr;1(1):25–30. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/28785427>
90. Westerdahl DE, Kobashigawa JA. Heart Transplantation for Advanced Heart Failure. In: Cardiac Intensive Care [Internet]. Elsevier; 2019. p. 504-524.e2. Available from:  
<https://linkinghub.elsevier.com/retrieve/pii/B9780323529938000485>
91. Murashita T. The role of coronary artery bypass grafting in patients with ischemic cardiomyopathy in the current era. J Thorac Dis [Internet]. 2016 Sep;8(9):E1032–3. Available from:  
<http://www.ncbi.nlm.nih.gov/pubmed/27747055>
92. Enriquez-Sarano M, Schaff H V., Orszulak TA, Bailey KR, Tajik AJ, Frye RL. Congestive Heart Failure After Surgical Correction of Mitral Regurgitation. Circulation [Internet]. 1995 Nov;92(9):2496–503. Available from:  
<https://www.ahajournals.org/doi/10.1161/01.CIR.92.9.2496>
93. Yamamoto K, Matsumura-Nakano Y, Shiomi H, Natsuaki M, Morimoto T, Kadota K, et al. Effect of Heart Failure on Long-Term Clinical Outcomes After Percutaneous Coronary Intervention Versus Coronary Artery Bypass Grafting in Patients With Severe Coronary Artery Disease. J Am Heart Assoc [Internet]. 2021 Aug 3;10(15). Available from:  
<https://www.ahajournals.org/doi/10.1161/JAHA.121.021257>
94. Mendiratta P, Schoo C, Latif R. Clinical Frailty Scale [Internet]. StatPearls.

2023. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23395245>
95. Huybrechts KF, Jaime Caro J. The Barthel Index and modified Rankin Scale as prognostic tools for long-term outcomes after stroke: a qualitative review of the literature. *Curr Med Res Opin* [Internet]. 2007 Jul 6;23(7):1627–36. Available from: <http://www.tandfonline.com/doi/full/10.1185/030079907X210444>
96. Herdman M, Badia X, Berra S. El EuroQol-5D: una alternativa sencilla para la medición de la calidad de vida relacionada con la salud en atención primaria. *Atención Primaria*. 2001;28(6):425–9.
97. Savarese G, Lund LH. Global Public Health Burden of Heart Failure. *Card Fail Rev* [Internet]. 2017 Apr;3(1):7–11. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28785469>
98. Kontogeorgos S, Thunström E, Johansson MC, Fu M. Heart failure with preserved ejection fraction has a better long-term prognosis than heart failure with reduced ejection fraction in old patients in a 5-year follow-up retrospective study. *Int J Cardiol* [Internet]. 2017 Apr 1;232:86–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28100428>
99. Sun LY, Tu J V, Bader Eddeen A, Liu PP. Prevalence and Long-Term Survival After Coronary Artery Bypass Grafting in Women and Men With Heart Failure and Preserved Versus Reduced Ejection Fraction. *J Am Heart Assoc* [Internet]. 2018 Jun 16;7(12). Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29909401>
100. Shahim B, Kapelios CJ, Savarese G, Lund LH. Global Public Health Burden of Heart Failure: An Updated Review. *Card Fail Rev* [Internet]. 2023;9:e11. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/37547123>
101. Díez-Villanueva P, Jiménez-Méndez C, Alfonso F. Heart failure in the elderly. *J Geriatr Cardiol*. 2021 Mar;18(3):219–32.
102. Gina González Robledo, , Mónica Jaramillo Jaramillo JCC. Diabetes mellitus, insuficiencia cardiaca y enfermedad renal crónica. *Rev Colomb Cardiol*. 2020;27:3–6.
103. Khan MS, Samman Tahhan A, Vaduganathan M, Greene SJ, Alrohaibani A,

- Anker SD, et al. Trends in prevalence of comorbidities in heart failure clinical trials. *Eur J Heart Fail.* 2020 Jun;22(6):1032–42.
104. Wu J-R, Lennie TA, Frazier SK, Moser DK. Health-Related Quality of Life, Functional Status, and Cardiac Event-Free Survival in Patients With Heart Failure. *J Cardiovasc Nurs.* 2016;31(3):236–44.
105. Vicent L, Álvarez-García J, Vazquez-Garcia R, González-Juanatey JR, Rivera M, Segovia J, et al. Coronary Artery Disease and Prognosis of Heart Failure with Reduced Ejection Fraction. *J Clin Med.* 2023 Apr;12(8).
106. Lawson CA, Solis-Trapala I, Dahlstrom U, Mamas M, Jaarsma T, Kadam UT, et al. Comorbidity health pathways in heart failure patients: A sequences-of-regressions analysis using cross-sectional data from 10,575 patients in the Swedish Heart Failure Registry. *PLoS Med.* 2018 Mar;15(3):e1002540.
107. Strini V, Piazzetta N, Gallo A, Schiavolin R. Barthel Index: creation and validation of two cut-offs using the BRASS Index. *Acta Biomed.* 2020 Mar;91(2-S):19–26.
108. Jonsson Å, Orwelius L, Dahlstrom U, Kristenson M. Evaluation of the usefulness of EQ-5D as a patient-reported outcome measure using the Paretian classification of health change among patients with chronic heart failure. *J patient-reported outcomes.* 2020 Jun;4(1):50.
109. Kosaraju A, Goyal A, Grigorova Y, Makaryus AN. Left Ventricular Ejection Fraction. *StatPearls.* 2023.
110. Gandara-Ricardo JA, Muñoz Ortiz E, Aguilar Molina OE, Garcia Rueda K, Giraldo Ramirez S, Salamanca JF, et al. Tratamiento actual de la falla cardiaca con fracción de expulsión reducida. *Acta Médica Colomb.* 2021 Apr;46(4).
111. Kataoka H. Clinical characteristics of lower-extremity edema in stage A cardiovascular disease status defined by the ACC/AHA 2001 Chronic Heart Failure Guidelines. *Clin Cardiol.* 2013 Sep;36(9):555–9.