DAFTAR PUSTAKA

Addetia, K. Harb, S. C. , Hahn, R. T. , Kapadia, S. , & Lang, R. M. (2019). Cardiac implantable electronic device Lead-induced trikuspid regurgitation. *JACC: Cardiovascular Imaging*, 12(4), 622–636. 10.1016/j.jcmg.2018.09.028

Akerström, F., Arias, M. A., Pachón, M., Jiménez-López, J., Puchol, A., & Juliá-Calvo, J. (2013). The importance of avoiding unnecessary right ventricular pacing in clinical practice. World Journal of Cardiology, 5(11), 410.

Ali, N., Keene, D., Arnold, A., Shun-Shin, M., Whinnett, Z. I., & Sohaib, S. A. (2018). His bundle pacing: a new frontier in the treatment of heart failure. Arrhythmia & electrophysiology review, 7(2), 103.

Al-Mohaissen, M. A., & Chan, K. L. (2012). Prevalence and mechanism of trikuspid regurgitation following implantation of endocardial leads for pacemaker or cardioverter-defibrillator. Journal of the American Society of Echocardiography, 25(3), 245-252.

Arora, V., & Suri, P. (2021). Physiological pacing: a new road to future. Indian Journal of Clinical Cardiology, 2(1), 32-43.

Bank AJ, et al. (2012)Right ventricular pacing, mechanical dyssynchrony, and heart failure.*Journal of cardiovascular translational research* vol. 5,2: 219-31. doi:10.1007/s12265-011-9341-8

Barba-Pichardo, R., Moriña-Vázquez, P., Fernández-Gómez, J. M., Venegas-Gamero, J., & Herrera-Carranza, M. (2010). Permanent His-bundle pacing: seeking physiological ventricular pacing. Europace, 12(4), 527-533.

Bender, A. B., & Ajijola, O. A. (2019). Stylet-directed His bundle lead placement: Early days of an emerging contender. Heart Rhythm, 16(12), 1832-1833.

Bradshaw, P. J., Stobie, P., Knuiman, M. W., Briffa, T. G., & Hobbs, M. S. (2014). Trends in the incidence and prevalence of cardiac pacemaker insertions in an ageing population. *Open heart*, *1*(1), e000177.

Britannica, T. Editors of Encyclopaedia (2022, December 25). Wilhelm His. Encyclopedia Britannica. https://www.britannica.com/biography/Wilhelm-His-Swiss-cardiologist

Burri, H., Jastrzebski, M., & Vijayaraman, P. (2020). Electrocardiographic analysis for His bundle pacing at implantation and follow-up. *Clinical Electrophysiology*, *6*(7), 883-900.

Cai, B., Huang, X., Li, L., Guo, J., Chen, S., Meng, F., ... & Su, M. (2020). Evaluation of cardiac synchrony in left bundle branch pacing: insights from echocardiographic research. Journal of cardiovascular electrophysiology, 31(2), 560-569.

Cazeau, S., Bordachar, P., Jauvert, G., Lazarus, A., Alonso, C., Vandrell, M. C., ... & Ritter, P. (2003). Echocardiographic modeling of cardiac dyssynchrony before and during multisite stimulation: a prospective study. *Pacing and Clinical*

Electrophysiology, *26*(1p2), 137-143.

Chen, T. E. , Wang, C. C. , Chern, M. S. , Chu, J. J. (2007). Entrapment of permanent pacemaker lead as the cause of trikuspid regurgitation. *Circulation Journal*, 71(7), 1169–1171. 10.1253/circj.71.116

Chen, K., Li, Y., Dai, Y., Sun, Q. I., Luo, B., Li, C., & Zhang, S. (2019). Comparison of electrocardiogram characteristics and pacing parameters between left bundle branch pacing and right ventricular pacing in patients receiving pacemaker therapy. *EP Europace*, *21*(4), 673-680.

Cicchitti, V., Radico, F., Bianco, F., Gallina, S., Tonti, G., & De Caterina, R. (2016). Heart failure due to right ventricular apical pacing: the importance of flow patterns. *Ep Europace*, *18*(11), 1679-1688.

Costello L. (2020). Expert Review. https://commons.wikimedia.org/wiki/File: ICD_System.png.

Daniëls, F., Adiyaman, A., Aarnink, K. M., Oosterwerff, F. J., Verbakel, J. R. A., Ghani, A., ... & Elvan, A. (2022). The Zwolle experience with left bundle branch area pacing using stylet-driven active fixation leads. *Clinical Research in Cardiology*, 1-10.

De Pooter, J., Calle, S., Timmermans, F., & Van Heuverswyn, F. (2021). Left bundle branch area pacing using stylet-driven pacing leads with a new delivery sheath: a comparison with lumen-less leads. *Journal of Cardiovascular Electrophysiology*, *32*(2), 439-448.

De Pooter, J., Wauters, A., Van Heuverswyn, F., & Le polain de Waroux, J. B. (2022). A guide to left bundle branch area pacing using stylet-driven pacing leads. *Frontiers*

in Cardiovascular Medicine, 241.

Deshmukh, P., Casavant, D. A., Romanyshyn, M., & Anderson, K. (2000). Permanent, direct His-bundle pacing: a novel approach to cardiac pacing in patients with normal His-Purkinje activation. *Circulation*, *101*(8), 869-877.

Ellenbogen, K. A., & Kaszala, K. (Eds.). (2014). *Cardiac pacing and ICDs*. John Wiley & Sons.

Epstein, A. E., DiMarco, J. P., Ellenbogen, K. A., Estes III, N. M., Freedman, R. A., Gettes, L. S., ... & Sweeney, M. O. (2008). ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities: executive summary. *Circulation*.

Fan, D., Takawale, A., Lee, J., & Kassiri, Z. (2012). Cardiac fibroblasts, fibrosis and extracellular matrix remodeling in heart disease. *Fibrogenesis & tissue repair*, *5*, 1-13.

Fang, F., Zhang, Q., Chan, J. Y. S., Razali, O., Azlan, H., Chan, H. C. K., ... & Yu, C. M. (2013). Early pacing-induced systolic dyssynchrony is a strong predictor of left ventricular adverse remodeling: analysis from the Pacing to Avoid Cardiac Enlargement (PACE) trial. *International journal of cardiology*, *168*(2), 723-728.

Gao, J., Zhang, B. H., Zhang, N., Sun, M., & Wang, R. (2022). The electrocardiogram characteristics and pacing parameters of permanent left bundle branch pacing: a systematic review and meta-analysis. *Journal of Interventional Cardiac Electrophysiology*, *63*(1), 215-224.

Glikson, M., Nielsen, J. C., Kronborg, M. B., Michowitz, Y., Auricchio, A., Barbash, I. M., ... & Witte, K. K. (2022). 2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy: Developed by the Task Force on cardiac pacing and

cardiac resynchronization therapy of the European Society of Cardiology (ESC) With the special contribution of the European Heart Rhythm Association (EHRA). *EP Europace*, *24*(1), 71-164.

Hanafy, D. A., Yuniadi, Y., Raharjo, S. B., Tondas, A. E., Rahadian, A., Yamin, M., ... & Munawar, M. (2014). Pedoman Terapi Memakai Alat Elektronik Kardiovaskular Implan (Aleka) Perhimpunan Dokter Spesialis Kardiovaskular Indonesia 2014. *Indonesian Journal of Cardiology*, 171-245.

Hasumi E., Fujiu K. Kawata T, Komuro I. (2018). The Influence of His Bundle Pacing on Trikuspid Valve Functioning Using Three-Dimensional Echocardiography. Heart Rhythm Case Reports, 4(9), 437-438.

Hayes, D. L., Asirvatham, S. J., & Friedman, P. A. (Eds.). (2021). *Cardiac pacing, defibrillation and resynchronization: a clinical approach*. John Wiley & Sons.

Honarbakhsh, S et al. (2018). Bradyarrhythmias and pacemakers. *BMJ (Clinical research ed.)* vol. 360 k642, doi:10.1136/bmj.k642

Hua J, Wang C, Kong Q.(2020) Comparative effects of left bundle branch area pacing, His bundle pacing, biventricular pacing in patients requiring cardiac resynchronization therapy: A network meta-analysis. Clin Cardiol 45(2): 214-223.

Huang, W., Su, L., Wu, S., Xu, L., Xiao, F., Zhou, X., & Ellenbogen, K. A. (2017). A novel pacing strategy with low and stable output: pacing the left bundle branch immediately beyond the conduction block. *Canadian Journal of Cardiology*, *33*(12), 1736-e1.

Huang, W., Chen, X., Su, L., Wu, S., Xia, X., Vijayaraman, P. A. (2019). Beginner's guide

to permanent left bundle branch pacing. *Heart Rhythm*, *16*, 1791–1796.

Issa, Z. F., Miller, J. M., & Zipes, D. P. (2009). *Clinical arrhythmology and electrophysiology: a companion to Braunwald's heart disease*. Elsevier Health Sciences.

Jastrzębski, M., Burri, H., Kiełbasa, G., Curila, K., Moskal, P., Bednarek, A., ... & Vijayaraman, P. (2022). The V6-V1 interpeak interval: a novel criterion for the diagnosis of left bundle branch capture. *EP Europace*, *24*(1), 40-47.

Jastrzębski, M., Kiełbasa, G., Cano, O., Curila, K., Heckman, L., De Pooter, J., ... & Vernooy, K. (2022). Left bundle branch area pacing outcomes: the multicentre European MELOS study. *European heart journal*, *43*(40), 4161-4173.

Jastrzębski, M., Kiełbasa, G., Curila, K., Moskal, P., Bednarek, A., Rajzer, M., & Vijayaraman, P. (2021). Physiology-based electrocardiographic criteria for left bundle branch capture. *Heart Rhythm*, *18*(6), 935-943.

Jastrzębski, M., Moskal, P., Bednarek, A., Kiełbasa, G., Kusiak, A., Sondej, T., ... & Czarnecka, D. (2020). Programmed deep septal stimulation: a novel maneuver for the diagnosis of left bundle branch capture during permanent pacing. *Journal of Cardiovascular Electrophysiology*, *31*(2), 485-493.

Jastrzębski, M., Moskal, P., Curila, K., Fijorek, K., Kukla, P., Bednarek, A., ... & Czarnecka, D. (2019). Electrocardiographic characterization of non-selective His-bundle pacing: validation of novel diagnostic criteria. *EP Europace*, *21*(12), 1857-1864.

Jensen, Paul N et al. (2014): Incidence of and risk factors for sick sinus syndrome in the

general population.” *Journal of the American College of Cardiology* vol. 64,6 531-8. doi:10.1016/j.jacc.2014.03.056

John, R. M., & Kumar, S. (2016). Sinus node and atrial arrhythmias. *Circulation*, *133*(19), 1892-1900.

Kawashima, T., & Sasaki, H. (2005). A macroscopic anatomical investigation of atrioventricular bundle locational variation relative to the membranous part of the ventricular septum in elderly human hearts. *Surgical and Radiologic Anatomy*, *27*, 206-213.

Kenny, T. (2014). *The Nuts and Bolts of Implantable Device Therapy: Pacemakers*. John Wiley & Sons.

Khoshbin, E., Abdelbar, A., Allen, S., & Hasan, R. (2013). The mechanism of endocardial lead-induced trikuspid regurgitation. *Case Reports*, *2013*, bcr2012008191.

Kim, J. B., Spevack, D.M., Tunick, P.A., et al. (2008). The effect of transvenous pacemaker implantable cardioverter defibrillator lead placement on trikuspid valve function: an observational study.*Journal of the American Society of Ekokardiografi : official publication of the American Society of Ekokardiografi*, *21*(3)

Kotsakou M., Kioumis I., Lazaridis G., et al. (2015). Pacemaker Insertion: Pneumothorax. Annals of Translational Medicine; 3(3)

Kusumoto, F. M., Schoenfeld, M. H., Barrett, C., Edgerton, J. R., Ellenbogen, K. A., Gold, M. R., Goldschlager, N. F., Hamilton, R. M., Joglar, J. A., Kim, R. J., Lee, R., Marine, J. E., McLeod, C. J., Oken, K. R., Patton, K. K., Pellegrini, C. N.,

Selzman, K. A., Thompson, A., & Varosy, P. D. (2019). 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Circulation*, *140*(8), e382–e482. **https://doi.org/10.1161/CIR.0000000000000628**.

Lamas, G. A., Ellenbogen, K. A., & With the Assistance of Charles H. Hennekens, MD, DrPH, and Alicia Montanez, MD. (2004). Evidence base for pacemaker mode selection: from physiology to randomized trials. *Circulation*, *109*(4), 443-451.

Lamas, G. A., Orav, E. J., Stambler, B. S., Ellenbogen, K. A., Sgarbossa, E. B., Huang, S. K. S., ... & Wilkoff, B. L. (1998). Quality of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing. *New England Journal of Medicine*, *338*(16), 1097-1104.

Lewis, A. J., Foley, P., Whinnett, Z., Keene, D., & Chandrasekaran, B. (2019). His bundle pacing: a new strategy for physiological ventricular activation. *Journal of the American Heart Association*, *8*(6), e010972.

Liu, P., Wang, Q., Sun, H., Qin, X., & Zheng, Q. (2021). Left bundle branch pacing: current knowledge and future prospects. *Frontiers in Cardiovascular Medicine*, *8*, 630399.

Marcus, G. M., Rose, E., Viloria, E. M., Schafer, J., De Marco, T., Saxon, L. A., ... & VENTAK CHF/CONTAK-CD Biventricular Pacing Study Investigators. (2005). Septal to posterior wall motion delay fails to predict reverse remodeling or clinical improvement in patients undergoing cardiac resynchronization

therapy. *Journal of the American College of Cardiology*, *46*(12), 2208-2214.

Marinaccio, L., Giacopelli, D., Romanato, G., Borgato, M., Resta, M., & Marchese, D. (2019). Is dedicated implantation tool set really needed for permanent His bundle pacing?. *Cardiovascular Diagnosis and Therapy*, *9*(1), 78.

Marinaccio, L., Vetta, F., Rocchetto, E., Napoli, P., & Marchese, D. (2021). 204 Permanent his bundle pacing using stylet-driven lead in patients with right atriomegaly: a single-centre experience. *European Heart Journal Supplements*, *23*(Supplement_G), suab127-018.

Mendoza, I. J., Sung, R. J., Mallon, S. M., Castellanos, A., & Myerburg, R. J. (1978). Multiple intracardiac recordings in evaluation of patterns occurring during attempted His bundle pacing in man. *The American journal of cardiology*, *41*(6), 1068-1074.

Mulpuru, S. K., Madhavan, M., McLeod, C. J., Cha, Y. M., & Friedman, P. A. (2017). Cardiac pacemakers: function, troubleshooting, and management: part 1 of a 2-part series. *Journal of the American College of Cardiology*, *69*(2), 189-210.

Muraru, D., Hahn, R. T., Soliman, O. I., Faletra, F. F., Basso, C., & Badano, L. P. (2019). 3-Dimensional echocardiography in imaging the trikuspid valve. *JACC: Cardiovascular Imaging*, *12*(3), 500-515.

Osório, A. P. S., Warpechowski, S., Ley, A. L. G., Miglioranza, M. H., Ley, L. L. G., Almeida, E. D., ... & Leiria, T. L. L. (2017). Analysis of Dyssynchrony and ventricular function in right univentricular stimulation at different positions. *Brazilian Journal of Cardiovascular Surgery*, *32*, 492-497.

Pada S.K., Ellenbogen K.A. (2020). Left bundle branch pacing is the best approach to physiologicl pacing. Heart Rhythm, 1(1), p59-67

Panicker, G. K., Desai, B., & Lokhandwala, Y. (2009). Choosing pacemakers appropriately. *Heart Asia*, *1*(1), 26-30.

Patra, C., Zhang, X., & Brady, M. F. (2022). Physiology, Bundle of His. In *StatPearls [Internet]*. StatPearls Publishing.

Patton, K. T., & Thibodeau, G. A. (2013). *Mosby's handbook of anatomy & physiology*. Elsevier Health Sciences.

Penicka, M., Bartunek, J., De Bruyne, B., Vanderheyden, M., Goethals, M., De Zutter, M., ... & Geelen, P. (2004). Improvement of left ventricular function after cardiac resynchronization therapy is predicted by tissue Doppler imaging echocardiography. *Circulation*, *109*(8), 978-983.

Prihadi EA, van der Bijl P, Gursoy E. (2018). Development of significant trikuspid regurgitation over time and prognostic implications: new insight into natural history. Eur Heart J 14: 39 (39): 3574-3581.

Prinzen F, Spinelli JC, Auricchio A. (2011). Basic physiology and hemodynamics of cardiac inpacing. In *Clinical Cardiac Pacing, Defibrillation and Resynchronization Therapy E-Book*. Elsevier Health Sciences. p. 291–335.

Karam, E. H., Tashan, T., & Mohsin, E. F. (2019). Design of Model Free Sliding Mode Controller based on BBO Algorithm for Heart Rate Pacemaker. *International Journal of Modern Education & Computer Science*, *11*(3).

Kistler PM, Sanders P, Fynn SP, et al. (2004). Electrophysiologic and electroanatomic

changes in the human atrium associated with age. *J Am Coll Cardiol,* 44:109–16.

Raatikainen, M. P., Arnar, D. O., Merkely, B., Nielsen, J. C., Hindricks, G., Heidbuchel, H., & Camm, J. (2017). A decade of information on the use of cardiac implantable electronic devices and interventional electrophysiological procedures in the European Society of Cardiology Countries: 2017 report from the European Heart Rhythm Association. *Ep Europace*, *19*(suppl_2), ii1-ii90.

Saito, M., Iannaccone, A., Kaye, G., Negishi, K., Kosmala, W., & Marwick, T. H. (2015). Effect of right ventricular pacing on right ventricular mechanics and trikuspid regurgitation in patients with high-grade atrioventricular block and sinus rhythm (from the protection of left ventricular function during right ventricular pacing study). *The American Journal of Cardiology*, *116*(12), 1875-1882.

Sanders P, Morton JB, Davidson NC, et al.(2003). Electrical remodeling of the atria in congestive heart failure: electrophysiological and electroanatomic mapping in humans. *Circulation,* 108:1461–8.

Scherlag, B. J., Kosowsky, B. D., & Damato, A. N. (1967). A technique for ventricular pacing from the His bundle of the intact heart. *Journal of applied physiology*, *22*(3), 584-587.

Sharma, P. S., Ellenbogen, K. A., & Trohman, R. G. (2017). Permanent His bundle pacing: the past, present, and future. *Journal of Cardiovascular Electrophysiology*, *28*(4), 458-465.

Sharma, P. S., Vijayaraman, P., & Ellenbogen, K. A. (2020). Permanent His bundle pacing: shaping the future of physiological ventricular pacing. *Nature Reviews*

Cardiology, *17*(1), 22-36.

Sherwood, L. (2015). *Human physiology: from cells to systems*. Engage learning.

Shimony, A., Eisenberg, M. J., Filion, K. B., & Amit, G. (2012). Beneficial effects of right ventricular non-apical vs. apical pacing: a systematic review and meta-analysis of randomized-controlled trials. *Europace*, *14*(1), 81-91.

Sizarov A. (2013). Development and functional maturation of cardiac conduction system.http://www.researchgate.net/publication.

Tashan T, Karam E, Mohsin E. (2019). Design of Model Free Sliding Mode Controller based on BBO Algorithm for Heart Rate Pacemaker. International Journal of Modern Education and Computer Science. 2019 Mar 1;11:31–7.

Tatum, R. , Maynes, E. J. , Wood, C. T. , Deb, A. K. , Austin, M. A. , O'Malley, T. J. , Choi, J. H. , et al. (2021). Trikuspid regurgitation associated with implantable electrical device insertion: A systematic review and meta-analysis. *Pacing and Clinical Electrophysiology*, 44(8), 1297–1302. 10.1111/pace.14287

Trancle CR, Gertz ZM, Koneru JN. (2018). Severe trikuspid regurgitation due to interaction with right ventricular permanent pacemaker or defibrillator leads. Pacing Clin Electrophysiol, 41 (7): 845-853

Vijayaraman, P., Dandamudi, G., Worsnick, S., & Ellenbogen, K. A. (2015). Acute His-bundle injury current during permanent His-bundle pacing predicts excellent pacing outcomes. *Pacing and Clinical Electrophysiology*, *38*(5), 540-546.

Vijayaraman, P., & Dandamudi, G. (2016). How to perform permanent His bundle pacing: tips and tricks. *Pacing and Clinical Electrophysiology*, *39*(12), 1298-1304.

Vijayaraman P, Bordachar P, Ellenbogen KA. (2017) The continued search for physiological pacing: where are we now? J Am Coll Cardiol. American College of Cardiology; 69 (25) :3099–114

Vijayaraman, P., Chung, M. K., Dandamudi, G., Upadhyay, G. A., Krishnan, K., Crossley, G., ... & ACC's Electrophysiology Council. (2018). His bundle pacing. *Journal of the American College of Cardiology*, *72*(8), 927-947.

Vijayaraman P., Naperkowski, A., Subsposh, F. A., Abdelrahman M., Sharma P.S., Oren J.W., et al. (2018). Peremanent His-bundle pacing: long term lead performance and clinical outcomes. Heart Rhythm, 15: 686-702.

Vijayaraman, P., Subzposh, F. A., Naperkowski, A., Panikkath, R., John, K., Mascarenhas, V., ... & Huang, W. (2019). Prospective evaluation of feasibility and electrophysiologic and echocardiographic characteristics of left bundle branch area pacing. *Heart rhythm*, *16*(12), 1774-1782.

Vijayaraman, P., Ponnusamy, S., Cano, Ó., Sharma, P. S., Naperkowski, A., Subsposh, F. A., ... & Jastrzebski, M. (2021). Left bundle branch area pacing for cardiac resynchronization therapy: results from the International LBBAP Collaborative Study Group. *Clinical Electrophysiology*, *7*(2), 135-147.

Wang, S., Lan, R., Zhang, N., Zheng, J., Gao, Y., Bai, J., ... & Xu, W. (2021). LBBAP in patients with normal intrinsic QRS duration: Electrical and mechanical characteristics. *Pacing and Clinical Electrophysiology*, *44*(1), 82-92.

Wiegand, U. K. H., Potratz, J., Bode, F., Schreiber, R., Bonnemeier, H., Peters, W., & Katus, H. A. (2001). Cost-effectiveness of dual-chamber pacemaker therapy:

does single lead VDD pacing reduce treatment costs of atrioventricular block?. *European heart journal*, *22*(2), 174-180.

Wu, S., Chen, X., Wang, S., Xu, L., Xiao, F., Huang, Z., ... & Huang, W. (2021). Evaluation of the criteria to distinguish left bundle branch pacing from left ventricular septal pacing. *Clinical Electrophysiology*, *7*(9), 1166-1177.

Zaidi, S. M. J., Sohail, H., Satti, D. I., Sami, A., Anwar, M., Malik, J., ... & Mehmoodi, A. (2022). Trikuspid regurgitation in His bundle pacing: A systematic review. *Annals of Noninvasive Electrocardiology*, *27*(6), e12986.

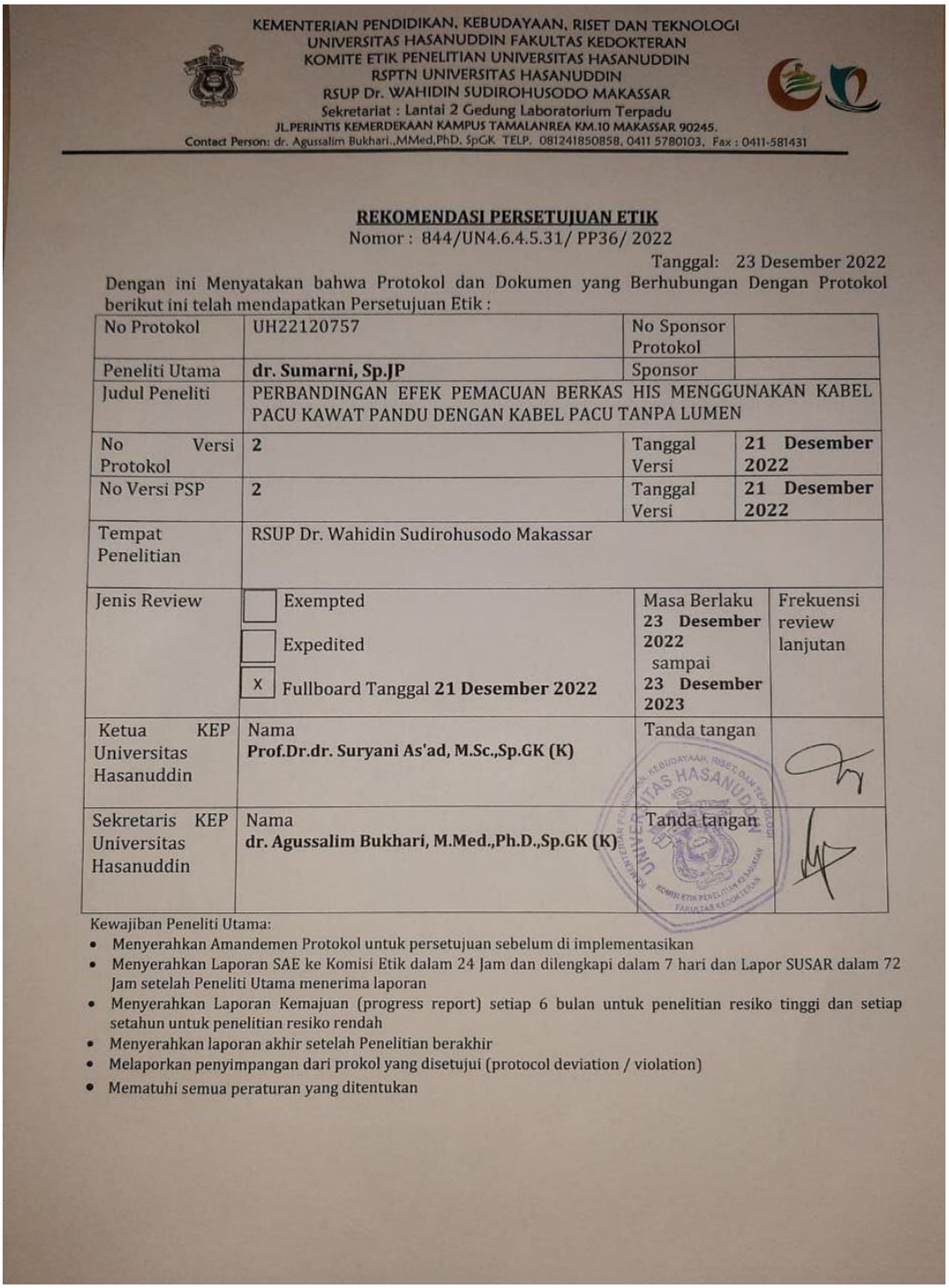
Zhang, S., Zhou, X., & Gold, M. R. (2019). Left bundle branch pacing: JACC review topic of the week. *Journal of the American College of Cardiology*, *74*(24), 3039-3049.

Zhu, Haojie et al. (2021). Medium- and Long-Term Lead Stability and Echocardiographic Outcomes of Left Bundle Branch Area Pacing Compared to Right Ventricular Pacing. *Journal of cardiovascular development and disease* vol. 8,12 168. 30 Nov. 2021, doi:10.3390/jcdd8120168

Zoghbi, W. A., Adams, D., Bonow, R. O., Enriquez-Sarano, M., Foster, E., Grayburn, P. A., ... & Weissman, N. J. (2017). Recommendations for noninvasive evaluation of native valvular regurgitation: a report from the American Society of Echocardiography developed in collaboration with the Society for Cardiovascular Magnetic Resonance. *Journal of the American Society of Echocardiography*, *30*(4), 303-371.

Lampiran-lampiran :

Lampiran 1. Izin Etik Penelitian



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN
KOMITE ETIK PENELITIAN UNIVERSITAS HASANUDDIN
RSPTN UNIVERSITAS HASANUDDIN
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu
JL.PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM.10 MAKASSAR 90245.
Contact Person: dr. Agussalim Bukhari.,MMed.PhD. SpGK. TELP. 081241850858, 0411 5780103, Fax : 0411-581431

REKOMENDASI PERSETUJUAN ETIK
Nomor : 844/UN4.6.4.5.31/ PP36/ 2022

Tanggal: 23 Desember 2022

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH22120757	No Sponsor Protokol	
Peneliti Utama	**dr. Sumarni, Sp.JP**	Sponsor	
Judul Peneliti	PERBANDINGAN EFEK PEMACUAN BERKAS HIS MENGGUNAKAN KABEL PACU KAWAT PANDU DENGAN KABEL PACU TANPA LUMEN		
No Versi Protokol	**2**	Tanggal Versi	**21 Desember 2022**
No Versi PSP	**2**	Tanggal Versi	**21 Desember 2022**
Tempat Penelitian	RSUP Dr. Wahidin Sudirohusodo Makassar		
Jenis Review	☐ Exempted ☐ Expedited ☒ Fullboard Tanggal **21 Desember 2022**	Masa Berlaku **23 Desember 2022** sampai **23 Desember 2023**	Frekuensi review lanjutan
Ketua KEP Universitas Hasanuddin	Nama **Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)**	Tanda tangan	
Sekretaris KEP Universitas Hasanuddin	Nama **dr. Agussalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)**	Tanda tangan	

Kewajiban Peneliti Utama:

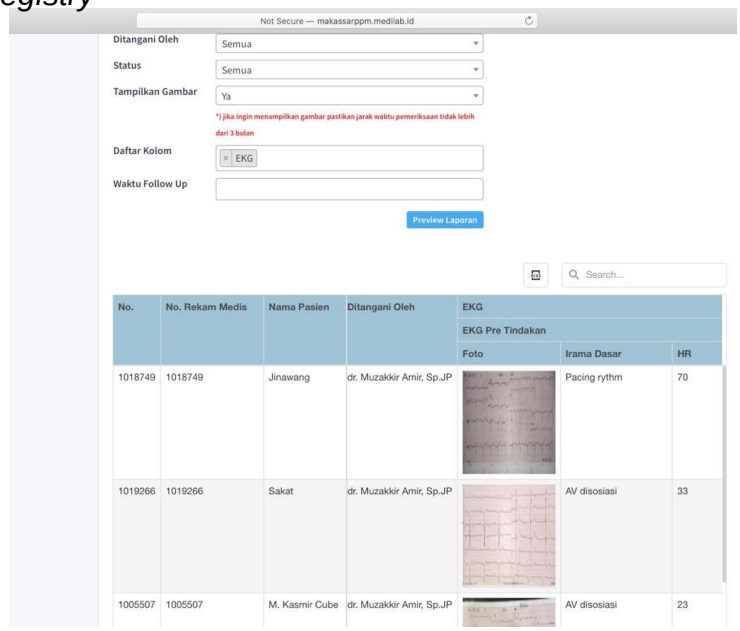
- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Lapor SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari prokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan

Lampiran 2. Prosedur pemasangan APJP pemacuan sistim konduksi

A. membentuk curva pada kawat pandu kabel pacu

B. insersi kawat pandu ke dalam

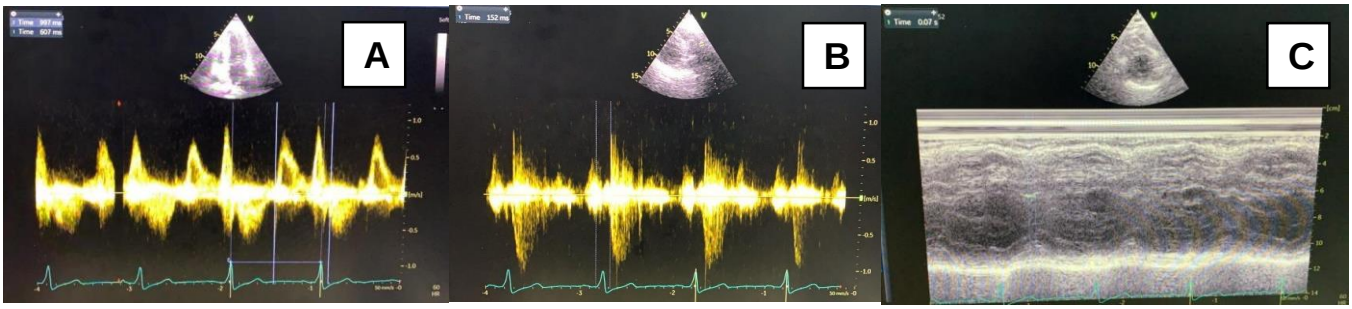
Lampiran 3. Pengambilan data sekunder pada *Makassar Permanent Pacemaker Registry*



Lampiran 4. Pengambilan data primer parameter elektrik kabel pacu 6 bulan setelah implantasi

Proses Interogasi APJP setelah 6 bulan post implantasi

Lampiran 5. Pengambilan data primer disinkroni ventrikel

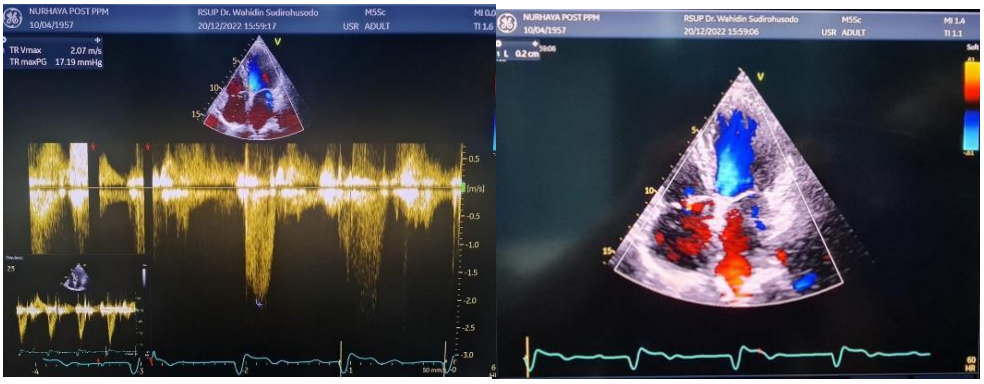


A. Pengukuran Ekhokardiografi PW Doppler yang mengukur LVFT/RR

B. Pengukuran Ekhokardiografi PW Doppler yang mengukur *LV pre-ejection time- RV pre-ejection time*

C. Pengukuran Ekhokardiografi *M- Mode* pada *short axis view* setinggi muskulus papillaris yang mengukur pergeseran maksimal posterior septum dan pergeseran maksimal dinding posterior kiri

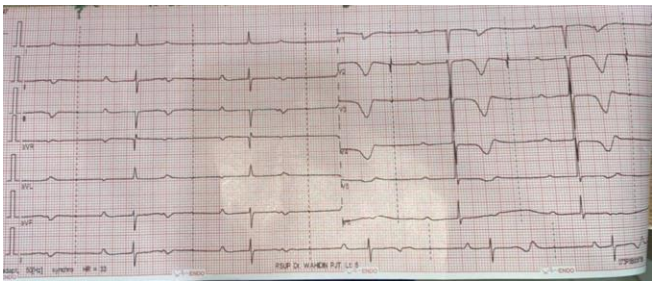
Lampiran 6. Pengambilan data primer regurgitasi trikuspid



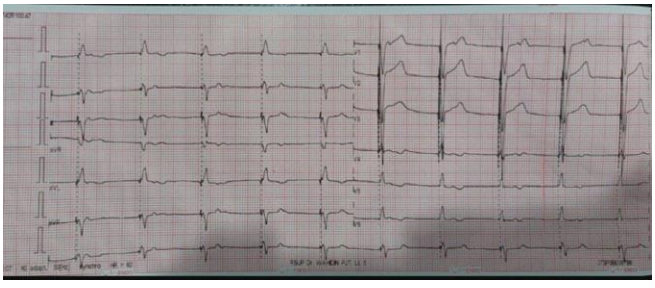
Pengukuran ekhokardiografi menggunakan *continuous wave doppler* menunjukkan adanya jet regurgitan kemudian dinilai keparahannya berdasarkan pengukuran VC berupa leher tersempit aliran

Lampiran 7. Pemilihan sampel penelitian berdasarkan konfigurasi EKG

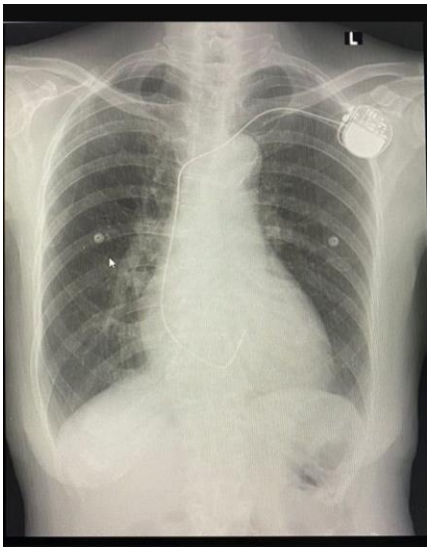
A. Contoh gambaran EKG sampel penelitian sesuai dengan pemacuan berkas His



Konfigurasi EKG Pre Implantasi (AV Blok Total)

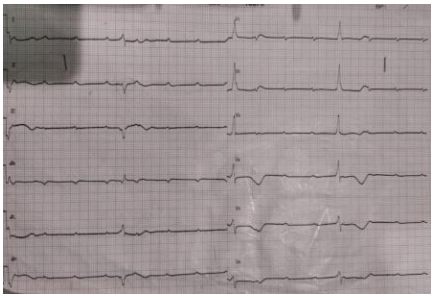


Konfigurasi EKG Post Implantasi (Menunjukkan HBP Non Selektif : Konfigurasi EKG : Pemacuan identik dengan intrinsik, tidak ada struktur flat di puncak R pada lead I, tidak ada notch di lead V1, RWPT < 90 ms di V6, durasi QRS <130 ms)

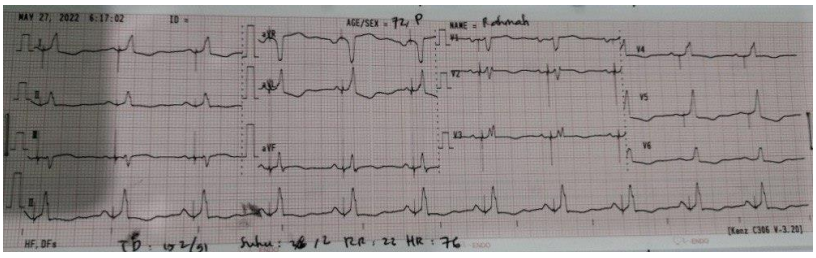


Gambaran Foto Thorax Post Implantasi

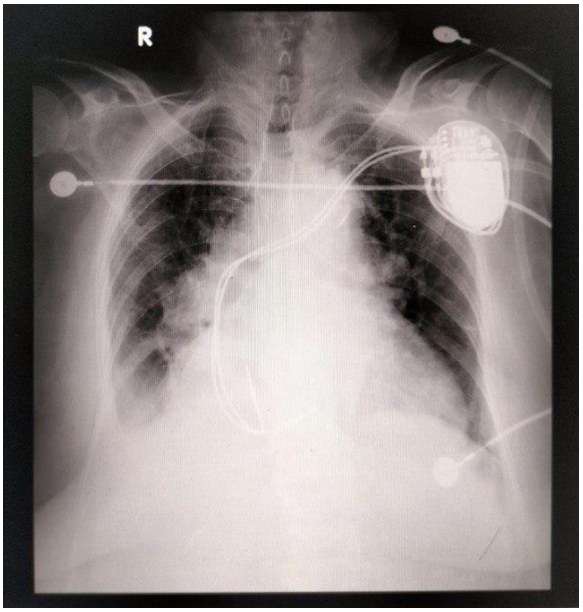
B. Contoh gambaran EKG sampel penelitian sesuai dengan pemacuan cabang berkas kiri



Konfigurasi EKG Pre Implantasi (AV Blok Total)

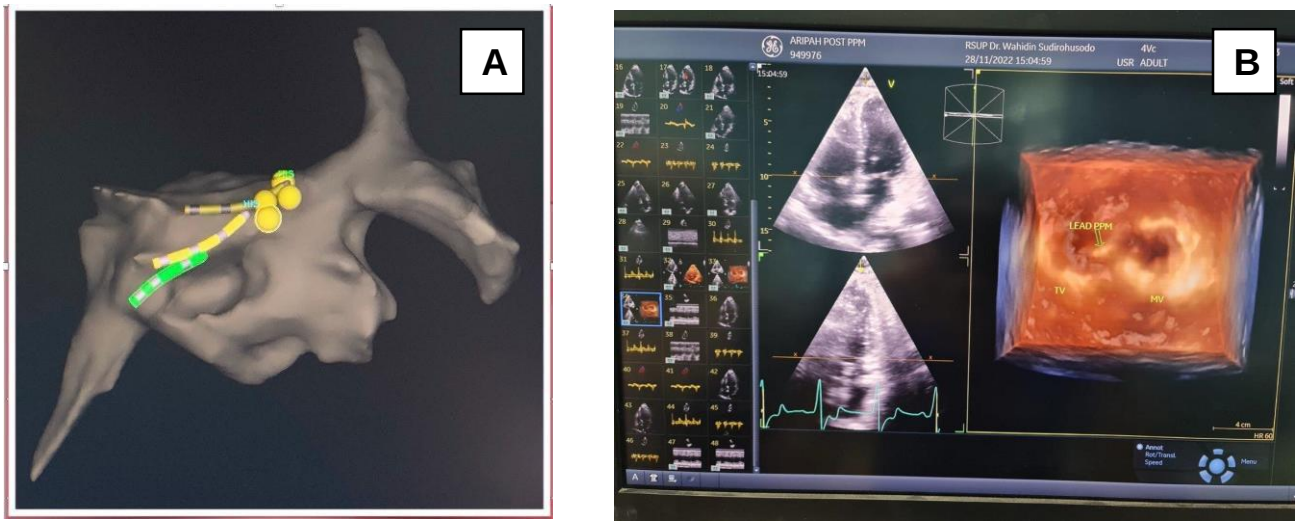


Konfigurasi EKG Post Implantasi (Menunjukkan LBBAP : Konfigurasi EKG : Terminal R/r di V1, aksis QRS inferior atau intermediate (LBB *capture*)



Gambaran Foto Thorax Post Implantasi

Lampiran 8. Konfirmasi kabel pacu berada di sistim konduksi (cabang berkas kiri)



A. Berdasarkan *electroanatomy mapping 3D*

B. Berdasarkan gambaran ekhokardiografi

Lampiran 9. Tabel Hasil Normalitas dan Homogenitas

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
efhbppre	,187	17	,118	,851	17	,011
efhbppost	,168	17	,200*	,881	17	,033
tapsehbppre	,220	17	,029	,938	17	,300
tapsehbppost	,232	17	,016	,919	17	,143
davhbppre	,189	17	,107	,943	17	,350
davhbppost	,141	17	,200*	,934	17	,254
diterhbppre	,194	17	,087	,890	17	,047
diterhbppost	,172	17	,191	,887	17	,041
dintrahbppre	,214	17	,037	,934	17	,252
dintragbppost	,213	17	,038	,898	17	,064
TRhbppre	,349	17	,000	,642	17	,000
TRhbppost	,349	17	,000	,642	17	,000
rwavehbppre	,210	17	,044	,868	17	,021
rwavehbppost	,443	17	,000	,561	17	,000
tresholdhbppre	,198	17	,076	,890	17	,046
tresholdhbppost	,175	17	,173	,948	17	,420
inpedancehbppre	,352	17	,000	,585	17	,000
inpedancehbppost	,236	17	,013	,885	17	,039
eflbbapre	,215	17	,036	,767	17	,001
eflbbapost	,248	17	,007	,752	17	,000
tapselbbapre	,123	17	,200*	,955	17	,532
tapselbbapst	,193	17	,092	,924	17	,170
davlbbapre	,144	17	,200*	,934	17	,258
davlbbapost	,136	17	,200*	,954	17	,528
diterlbbapre	,128	17	,200*	,946	17	,394
diterlbbapost	,218	17	,031	,864	17	,017
dintralbbapre	,240	17	,010	,929	17	,208
dintralbbapost	,154	17	,200*	,960	17	,640
TRlbbapre	,349	17	,000	,642	17	,000
TRlbbapost	,349	17	,000	,642	17	,000
rwavelbbapre	,225	17	,023	,856	17	,013
rwavelbbapost	,426	17	,000	,632	17	,000

tresholdlbbapre	,182	17	,136	,908	17	,092
tersholdlbbapost	,210	17	,044	,886	17	,040
inpedancelbbapre	,282	17	,001	,874	17	,025
inpedancelbbapost	,175	17	,177	,934	17	,255

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
trpre	Based on Mean	,787	1	42	,380
	Based on Median	,244	1	42	,624
	Based on Median and with adjusted df	,244	1	41,958	,624
	Based on trimmed mean	,787	1	42	,380
trpost	Based on Mean	,787	1	42	,380
	Based on Median	,244	1	42	,624
	Based on Median and with adjusted df	,244	1	41,958	,624
	Based on trimmed mean	,787	1	42	,380
rwavepre	Based on Mean	2,654	1	42	,111
	Based on Median	,946	1	42	,336
	Based on Median and with adjusted df	,946	1	38,877	,337
	Based on trimmed mean	2,268	1	42	,140
rwavepost	Based on Mean	4,147	1	42	,048
	Based on Median	2,405	1	42	,128
	Based on Median and with adjusted df	2,405	1	24,113	,134
	Based on trimmed mean	2,243	1	42	,142
tresholdpre	Based on Mean	4,707	1	42	,036
	Based on Median	2,549	1	42	,118
	Based on Median and with adjusted df	2,549	1	26,055	,122
	Based on trimmed mean	3,426	1	42	,071
tresholdpost	Based on Mean	,759	1	42	,388
	Based on Median	,178	1	42	,675
	Based on Median and with adjusted df	,178	1	41,046	,676

	Based on trimmed mean	,527	1	42	,472
inpedancepre	Based on Mean	1,661	1	42	,205
	Based on Median	,412	1	42	,524
	Based on Median and with adjusted df	,412	1	37,201	,525
	Based on trimmed mean	1,621	1	42	,210
inpedancepost	Based on Mean	,514	1	42	,477
	Based on Median	,212	1	42	,647
	Based on Median and with adjusted df	,212	1	32,478	,648
	Based on trimmed mean	,304	1	42	,584

Lampiran 13. Tabel Hasil Validalitas dan Relibilitas

Hasil SPSS Validitas

		EF HBP Pre	EF HBP Post	EF HBP total	Total
EF HBP Pre	Pearson Correlation	1	,972**	1,000**	Valid
	Sig. (2-tailed)		,000	,000	
	N	20	18	20	
EF HBP post	Pearson Correlation	,972**	1	,972**	Valid
	Sig. (2-tailed)	,000		,000	
	N	18	18	18	
Total	Pearson Correlation	1,000**	,972**	1	Valid
	Sig. (2-tailed)	,000	,000		
	N	20	18	20	

		Tapse HBP pre	Tapse HBP post	Total	Ket
Tapse HBP pre	Pearson Correlation	1	,909**	1,000**	Valid
	Sig. (2-tailed)		,000	,000	
	N	20	18	20	
Tapse HBP post	Pearson Correlation	,909**	1	,909**	Valid
	Sig. (2-tailed)	,000		,000	
	N	18	18	18	

Total	Pearson Correlation	1,000**	,909**	1	Valid
	Sig. (2-tailed)	,000	,000		
	N	20	18	20	

		VAR00007	VAR00008	VAR00009	ket
EF LBBA pre	Pearson Correlation	1	,972**	1,000**	valid
	Sig. (2-tailed)		,000	,000	
	N	24	24	24	
EF LBBA post	Pearson Correlation	,972**	1	,972**	valid
	Sig. (2-tailed)	,000		,000	
	N	24	24	24	
total	Pearson Correlation	1,000**	,972**	1	valid
	Sig. (2-tailed)	,000	,000		
	N	24	24	24	

Tapse LBBA

		TAPSE LBBA pre	TAPSE LBBA post	Total	ket
TAPSE LBBA PRE	Pearson Correlation	1	,912**	1,000**	valid
	Sig. (2-tailed)		,000	,000	
	N	24	24	24	
TAPSE LBBA Post	Pearson Correlation	,912**	1	,912**	valid
	Sig. (2-tailed)	,000		,000	
	N	24	24	24	
Total	Pearson Correlation	1,000**	,912**	1	valid
	Sig. (2-tailed)	,000	,000		
	N	24	24	24	

AV HBP

		AV HBP pre	AV HBP post	total	ket
AV HBP pre	Pearson Correlation	1	,334	1,000**	valid
	Sig. (2-tailed)		,176	,000	
	N	20	18	20	
AV HBP post	Pearson Correlation	,334	1	,334	valid
	Sig. (2-tailed)	,176		,176	

	N	18	18	18	
Total	Pearson Correlation	1,000**	,334	1	valid
	Sig. (2-tailed)	,000	,176		
	N	20	18	20	

Interventriculer HBP

		Interventriculer HBP pre	Interventriculer HBP post	total	Ket
Interventriculer HBP pre	Pearson Correlation	1	,701**	1,000**	valid
	Sig. (2-tailed)		,001	,000	
	N	20	18	20	
Interventriculer HBP post	Pearson Correlation	,701**	1	,701**	
	Sig. (2-tailed)	,001		,001	
	N	18	18	18	
total	Pearson Correlation	1,000**	,701**	1	
	Sig. (2-tailed)	,000	,001		
	N	20	18	20	

Intraventriculer HBP

		Intraventriculer HBP pre	Intraventriculer HBP post	total	ket
Intraventriculer HBP pre	Pearson Correlation	1	,505*	1,000**	valid
	Sig. (2-tailed)		,032	,000	
	N	20	18	20	
Intraventriculer HBP post	Pearson Correlation	,505*	1	,505*	valid
	Sig. (2-tailed)	,032		,032	
	N	18	18	18	
Total	Pearson Correlation	1,000**	,505*	1	valid
	Sig. (2-tailed)	,000	,032		
	N	20	18	20	

AV LBBA

		AV LBBA pre	AV LBBA post	Total	ket
AV LBBA pre	Pearson Correlation	1	,252	1,000**	valid
	Sig. (2-tailed)		,235	,000	
	N	24	24	24	
AV LBBA	Pearson Correlation	,252	1	,252	valid

post	Sig. (2-tailed)	,235		,235	
	N	24	24	24	
total	Pearson Correlation	1,000**	,252	1	valid
	Sig. (2-tailed)	,000	,235		
	N	24	24	24	

Interventriculer LBBA

		Interventriculer LBBA pre	Interventriculer LBBA post	total	ket
Interventriculer LBBA	Pearson Correlation	1	,671**	1,000**	Valid
	Sig. (2-tailed)		,000	,000	
	N	24	24	24	
Interventriculer LBBA	Pearson Correlation	,671**	1	,671**	valid
	Sig. (2-tailed)	,000		,000	
	N	24	24	24	
Total	Pearson Correlation	1,000**	,671**	1	Valid
	Sig. (2-tailed)	,000	,000		
	N	24	24	24	

Intraventriculer LBBA

		Intraventriculer LBBA pre	Intraventriculer LBBA post	total	ket
Intraventriculer LBBA pre	Pearson Correlation	1	,509*	1,000**	valid
	Sig. (2-tailed)		,011	,000	
	N	24	24	24	
Intraventriculer LBBA post	Pearson Correlation	,509*	1	,509*	valid
	Sig. (2-tailed)	,011		,011	
	N	24	24	24	
total	Pearson Correlation	1,000**	,509*	1	valid
	Sig. (2-tailed)	,000	,011		
	N	24	24	24	

Listrik HBP pre

		rwave	treshold	impedance	total	ket
Rwave	Pearson Correlation	1	-,021	-,030	1,000	valid

	Sig. (2-tailed)		,931	,900	,994	
	N	20	20	20	20	
treshold	Pearson Correlation	-,021	1	,248	,248	valid
	Sig. (2-tailed)	,931		,292	,291	
	N	20	20	20	20	
impedanc	Pearson Correlation	-,030	,248	1	1,000**	valid
e	Sig. (2-tailed)	,900	,292		,000	
	N	20	20	20	20	
total	Pearson Correlation	-,002	,248	1,000**	1	valid
	Sig. (2-tailed)	,994	,291	,000		
	N	20	20	20	20	

Listrik HBP post

		rwave	treshold	impedanc e	total	ket
rwave	Pearson Correlation	1	,505*	,382	,398	valid
	Sig. (2-tailed)		,023	,097	,082	
	N	20	20	20	20	
treshold	Pearson Correlation	,505*	1	,795**	,800**	valid
	Sig. (2-tailed)	,023		,000	,000	
	N	20	20	20	20	
impedanc	Pearson Correlation	,382	,795**	1	1,000**	valid
e	Sig. (2-tailed)	,097	,000		,000	
	N	20	20	20	20	
total	Pearson Correlation	,398	,800**	1,000**	1	valid
	Sig. (2-tailed)	,082	,000	,000		
	N	20	20	20	20	

Listrik LBBA pre

		rwave	treshold	impedanc e	total	ket
rwave	Pearson Correlation	1	-,328	,580**	.b	
	Sig. (2-tailed)		,117	,003	.	
	N	24	24	24	0	
treshold	Pearson Correlation	-,328	1	-,330	.b	
	Sig. (2-tailed)	,117		,116	.	

	N	24	24	24	0	
impedance	Pearson Correlation	,580**	-,330	1	.b	
	Sig. (2-tailed)	,003	,116		.	
	N	24	24	24	0	
total	Pearson Correlation	.b	.b	.b	.b	
	Sig. (2-tailed)	.	.	.		
	N	0	0	0	0	

LBBA listrik post		Rwave	Treshold	Impedance	Total	ket
Rwave	Pearson Correlation	1	-,328	,580**	,589**	valid
	Sig. (2-tailed)		,117	,003	,002	
	N	24	24	24	24	
Treshold	Pearson Correlation	-,328	1	-,330	-,331	valid
	Sig. (2-tailed)	,117		,116	,114	
	N	24	24	24	24	
Impedance	Pearson Correlation	,580**	-,330	1	1,000**	valid
	Sig. (2-tailed)	,003	,116		,000	
	N	24	24	24	24	
Total	Pearson Correlation	,589**	-,331	1,000**	1	valid
	Sig. (2-tailed)	,002	,114	,000		
	N	24	24	24	24	

Reliabilitas data

Reliability Statistics

Cronbach's Alpha	N of Items
,467	36

P<0.05 berarti data reliable
p>0.05 tidak reliable

EF HBP

Correlations

		EF HBP Pre	EF HBP Post	EF HBP total
EF HBP Pre	Pearson Correlation	1	,972**	1,000**
	Sig. (2-tailed)		,000	,000

	N	20	18	20
EF HBP post	Pearson Correlation	,972**	1	,972**
	Sig. (2-tailed)	,000		,000
	N	18	18	18
Total	Pearson Correlation	1,000**	,972**	1
	Sig. (2-tailed)	,000	,000	
	N	20	18	20

**. Correlation is significant at the 0.01 level (2-tailed).

TAPSE HBP

Correlations

		Tapse HBP pre	Tapse HBP post	Total
Tapse HBP pre	Pearson Correlation	1	,909**	1,000**
	Sig. (2-tailed)		,000	,000
	N	20	18	20
Tapse HBP post	Pearson Correlation	,909**	1	,909**
	Sig. (2-tailed)	,000		,000
	N	18	18	18
Total	Pearson Correlation	1,000**	,909**	1
	Sig. (2-tailed)	,000	,000	
	N	20	18	20

**. Correlation is significant at the 0.01 level (2-tailed).

EF LBBA

Correlations

		VAR00007	VAR00008	VAR00009
EF LBBA Pre	Pearson Correlation	1	,972**	1,000**
	Sig. (2-tailed)		,000	,000
	N	24	24	24
EF LBBA Post	Pearson Correlation	,972**	1	,972**
	Sig. (2-tailed)	,000		,000
	N	24	24	24
Total	Pearson Correlation	1,000**	,972**	1
	Sig. (2-tailed)	,000	,000	
	N	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

Tapse LBBA

Correlations

		TAPSE LBBA pre	TAPSE LBBA post	Total
TAPSE LBBA PRE	Pearson Correlation	1	,912**	1,000**
	Sig. (2-tailed)		,000	,000
	N	24	24	24
TAPSE LBBA Post	Pearson Correlation	,912**	1	,912**
	Sig. (2-tailed)	,000		,000
	N	24	24	24
Total	Pearson Correlation	1,000**	,912**	1
	Sig. (2-tailed)	,000	,000	
	N	24	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

Analisis Disinkronisasi Atrioventrikel

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
predav	HBP	20	55,5000	10,29819	2,30274
	LBBA	24	53,5833	12,91079	2,63540

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
predav	Equal variances assumed	,381	,541	,536	42	,594	1,91667	3,57286	-5,29365	9,12699
	Equal variances not assumed			,548	41,936	,587	1,91667	3,49971	-5,14636	8,97969

Disinkronisasi Interventrikel

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
prediter	HBP	20	15,2500	12,27267	2,74425
	LBBA	24	20,5417	14,09280	2,87668

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
prediter	Equal variances assumed	,389	,536	-1,314	42	,196	-5,29167	4,02686	-13,44181	2,83487
	Equal variances not assumed			-1,331	41,902	,190	-5,29167	3,97570	-13,31551	2,73218

Disinkronisasi Intraventrikel

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
predintra	HBP	20	78,3500	28,46471	6,36490
	LBBA	24	23,8333	16,68550	3,40591

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
prediantra	Equal variances assumed	4,308	,044	7,904	42	,000	54,51667	6,89744	40,59706	68,43627
	Equal variances not assumed			7,552	29,444	,000	54,51667	7,21888	39,76208	69,27126

Disinikronisasi Atrioventrikel

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DAVpost	1,00	18	60,6667	12,38120	2,91828
	2,00	24	60,6667	11,60085	2,36801

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DAVpost	Equal variances assumed	,215	,645	,000	40	1,000	,00000	3,72255	-7,52356	7,52356
	Equal variances not assumed			,000	35,410	1,000	,00000	3,75817	-7,62633	7,62633

Disinkronisasi Interventrikel

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DITERpost	1,00	18	15,3333	10,85736	2,55911
	2,00	24	15,2917	11,24617	2,29562

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DITERpost	Equal variances assumed	,280	,599	,012	40	,990	,04167	3,45561	-6,94238	7,02571
	Equal variances not assumed			,012	37,446	,990	,04167	3,43786	-6,92130	7,00463

Disinkronisasi Intraventrikel

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DINTRApost	1,00	18	67,7778	22,37529	5,27391
	2,00	24	72,5000	25,58022	5,22154

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DINTRApost	Equal variances assumed	1,443	,237	-,624	40	,536	-4,72222	7,56747	-20,01665	10,57220

	Equal variances not assumed			-,636	38,979	,528	-4,72222	7,42149	-19,73387	10,28942

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	davprehbp	56,9444	18	9,69822	2,28589
	davposthbp	60,6667	18	12,38120	2,91828
Pair 2	diterprehbp	14,5000	18	10,95042	2,58104
	diterposthp	15,3333	18	10,85736	2,55911
Pair 3	dintraprehbp	75,3889	18	25,85739	6,09465
	dintraposthbp	67,7778	18	22,37529	5,27391

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	davprehbp - davposthbp	-3,72222	12,67144	2,98669	-10,02358	2,57914	-1,246	17	,230
Pair 2	diterprehbp - diterposthp	-,83333	6,85351	1,61539	-4,24150	2,57484	-,516	17	,613
Pair 3	dintraprehbp - dintraposthbp	7,61111	22,42147	5,28479	-3,53882	18,76104	1,440	17	,168

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	davprelbba	53,5833	24	12,91079	2,63540
	davpostlbba	60,6667	24	11,60085	2,36801
Pair 2	diterprelbba	20,5417	24	14,09280	2,87668
	diterpostlbba	15,2917	24	11,24617	2,29562
Pair 3	dintraprelbba	90,0000	24	25,02173	5,10754

	dintrapostlbba	72,5000	24	25,58022	5,22154

Paired Samples Test

		Paired Differences					t	df	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	davprelbba - davpostlbba	-7,08333	15,02727	3,06743	-13,42879	-,73787	-2,309	23	,030
Pair 2	diterprelbba - diterpostlbba	5,25000	10,60865	2,16548	,77036	9,72964	2,424	23	,024
Pair 3	dintraprelbba - dintrapostlbba	17,50000	25,06513	5,11640	6,91592	28,08408	3,420	23	,002

Analisis Listrik

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
rwavepre	HBP	20	6,1050	3,54304	,79225
	LBBAP	24	7,3458	4,88894	,99795

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
rwavepre	Equal variances assumed	2,654	,111	-,946	42	,350	-1,24083	1,31163	-3,88782	1,40615
	Equal variances not assumed			-,974	41,279	,336	-1,24083	1,27419	-3,81359	1,33192

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
tresholdpre	HBP	20	1,0450	,16051	,03589
	LBBAP	24	,8208	,27816	,05678

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
tresholdpre	Equal variances assumed	8,467	,006	3,185	42	,003	,22417	,07037	,08215	,36619
	Equal variances not assumed			3,337	37,755	,002	,22417	,06717	,08816	,36018

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
impedance	HBP	20	542,8500	126,35800	28,25451
	LBBAP	24	661,9583	333,67720	68,11157

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
impedance	Equal variances assumed	4,707	,036	-1,506	42	,139	-119,10833	79,06460	-278,66716	40,45050
	Equal variances not assumed			-1,615	30,503	,117	-119,10833	73,73943	-269,60020	31,38353

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
rwavepost	HBP	20	6,0600	3,89323	,87055
	LBBAP	24	7,3250	4,36411	,89082

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
rwave post	Equal variances assumed	,759	,388	-1,005	42	,321	-1,26500	1,25881	-3,80538	1,27538
	Equal variances not assumed			-1,016	41,780	,316	-1,26500	1,24556	-3,77904	1,24904

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
tresholdpost	HBP	20	,8375	,30645	,06853
	LBBAP	24	,7871	,23877	,04874

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
treshold post	Equal variances assumed	1,661	,205	,613	42	,543	,05042	,08220	-,11546	,21630
	Equal variances not assumed			,600	35,567	,553	,05042	,08409	-,12020	,22103

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
inpedancepost	HBP	20	492,8500	207,97552	46,50474
	LBBAP	24	620,1667	312,76393	63,84267

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
inpedancepost	Equal variances assumed	,514	,477	-1,555	42	,127	-127,31667	81,87877	-292,55472	37,92138
	Equal variances not assumed			-1,612	40,187	,115	-127,31667	78,98467	-286,92749	32,29416

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	HBPprerwave	6,1050	20	3,54304	,79225
	HBPpostrwave	6,0600	20	3,89323	,87055
Pair 2	HBPpretreshod	1,0450	20	,16051	,03589
	HBPosttreshold	,8375	20	,30645	,06853
Pair 3	HBPpreinpedance	542,8500	20	126,35800	28,25451
	HBPinpedancepost	492,8500	20	207,97552	46,50474

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	HBPprerwave - HBPpostrwave	,04500	1,38049	,30869	-,60109	,69109	,146	19	,886
Pair 2	HBPpretreshod - HBPosttreshold	,20750	,31467	,07036	,06023	,35477	2,949	19	,008
Pair 3	HBPpreinpedance - HBPinpedancepost	50,00000	172,36681	38,54239	-30,67015	130,67015	1,297	19	,210

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	lbbaprerwave	7,3458	24	4,88894	,99795
	lbbapostrwave	7,3250	24	4,36411	,89082
Pair 2	lbbainpedancepre	661,9583	24	333,67720	68,11157
	lbbapostinpedance	620,1667	24	312,76393	63,84267

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	lbbaprerwave - lbbapostrwave	,02083	1,58470	,32348	-,64833	,69000	,064	23	,949
Pair 2	lbbainpedancepre - lbbapostinpedance	41,79167	62,98929	12,85763	15,19362	68,38971	3,250	23	,004

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 3	Tresholdprelbbap	,8208	24	,27816	,05678
	Tresholdpostlbbap	,7512	24	,16987	,03467

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 3	Tresholdprelbbap - Tresholdpostlbbap	,06958	,29031	,05926	-,05301	,19217	1,174	23	,252

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
predav	HBP	20	55,5000	10,29819	2,30274
	LBBA	24	53,5833	12,91079	2,63540

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
predav	Equal variances assumed	,381	,541	,536	42	,594	1,91667	3,57286	-5,29365	9,12699
	Equal variances not assumed			,548	41,936	,587	1,91667	3,49971	-5,14636	8,97969

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
prediter	HBP	20	15,2500	12,27267	2,74425
	LBBA	24	20,5417	14,09280	2,87668

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
predi ter	Equal variances assumed	,389	,536	-1,314	42	,196	-5,29167	4,02686	-13,41821	2,83487
	Equal variances not assumed			-1,331	41,902	,190	-5,29167	3,97570	-13,31551	2,73218

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
predintra	HBP	20	78,3500	28,46471	6,36490
	LBBA	24	23,8333	16,68550	3,40591

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
predin tra	Equal variances assumed	4,308	,044	7,904	42	,000	54,51667	6,89744	40,59706	68,43627
	Equal variances not assumed			7,552	29,444	,000	54,51667	7,21888	39,76208	69,27126

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DAVpost	1,00	18	60,6667	12,38120	2,91828
	2,00	24	60,6667	11,60085	2,36801

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DAVpost	Equal variances assumed	,215	,645	,000	40	1,000	,00000	3,72255	-7,52356	7,52356
	Equal variances not assumed			,000	35,410	1,000	,00000	3,75817	-7,62633	7,62633

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DITERpost	1,00	18	15,3333	10,85736	2,55911
	2,00	24	15,2917	11,24617	2,29562

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DITERpost	Equal variances assumed	,280	,599	,012	40	,990	,04167	3,45561	-6,94238	7,02571
	Equal variances not assumed			,012	37,446	,990	,04167	3,43786	-6,92130	7,00463

Group Statistics

	k1	N	Mean	Std. Deviation	Std. Error Mean
DINTRApost	1,00	18	67,7778	22,37529	5,27391
	2,00	24	72,5000	25,58022	5,22154

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DINTRApost	Equal variances assumed	1,443	,237	-,624	40	,536	-4,72222	7,56747	-20,01665	10,57220
	Equal variances not assumed			-,636	38,979	,528	-4,72222	7,42149	-19,73387	10,28942

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	davprehbp	56,9444	18	9,69822	2,28589
	davposthbp	60,6667	18	12,38120	2,91828
Pair 2	diterprehbp	14,5000	18	10,95042	2,58104
	diterposthp	15,3333	18	10,85736	2,55911
Pair 3	dintraprehbp	75,3889	18	25,85739	6,09465
	dintraposthbp	67,7778	18	22,37529	5,27391

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	davprehbp - davposthbp	-3,72222	12,67144	2,98669	-10,02358	2,57914	-1,246	17	,230
Pair 2	diterprehbp - diterposthp	-,83333	6,85351	1,61539	-4,24150	2,57484	-,516	17	,613
Pair 3	dintraprehbp - dintraposthbp	7,61111	22,42147	5,28479	-3,53882	18,76104	1,440	17	,168

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	davprelbba	53,5833	24	12,91079	2,63540
	davpostlbba	60,6667	24	11,60085	2,36801
Pair 2	diterprelbba	20,5417	24	14,09280	2,87668
	diterpostlbba	15,2917	24	11,24617	2,29562
Pair 3	dintraprelbba	90,0000	24	25,02173	5,10754
	dintrapostlbba	72,5000	24	25,58022	5,22154

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	davprelbba - davpostlbba	-7,08333	15,02727	3,06743	-13,42879	-,73787	-2,309	23	,030
Pair 2	diterprelbba - diterpostlbba	5,25000	10,60865	2,16548	,77036	9,72964	2,424	23	,024
Pair 3	dintraprelbba - dintrapostlbba	17,50000	25,06513	5,11640	6,91592	28,08408	3,420	23	,002

Analisis TR

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PREHBP * POSTHBP	20	45,5%	24	54,5%	44	100,0%

PREHBP * POSTHBP Crosstabulation

Count

		POSTHBP		
		YA	TIDAK	Total
PREHBP	YA	9	0	9
	TIDAK	0	11	11
Total		9	11	20

Chi-Square Tests

	Value	Exact Sig. (2-sided)
McNemar Test		1,000[a]
N of Valid Cases	20	

a. Binomial distribution used.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
PRELBBAP * POSTLBBAP	24	54,5%	20	45,5%	44	100,0%

PRELBBAP * POSTLBBAP Crosstabulation

Count

		POSTLBBAP		
		YA	TIDAK	Total
PRELBBAP	YA	9	0	9
	TIDAK	0	15	15
Total		9	15	24

DAVHBPpost * DAVLBBAPpost Crosstabulation

Count

		DAVLBBAPpost		
		1,00	2,00	Total
DAVHBPpost	2,00	1	17	18
Total		1	17	18

DITERHBPpost * DITERLBBAPpost Crosstabulation

Count

		DITERLBBAPpost	
		2,00	Total
DITERHBPpost	2,00	18	18
Total		18	18

DINTRAHBPpost * DINTRALBBAPpost Crosstabulation

Count

		DINTRALBBAPpost	
		2,00	Total
DINTRAHBPpost	2,00	18	18
Total		18	18

Group Statistics

	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
DAVpost	HBP	18	60,6667	12,38120	2,91828
	LBBAP	24	60,6667	11,60085	2,36801

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DAVpost	Equal variances assumed	,215	,645	,000	40	1,000	,00000	3,72255	-7,52356	7,52356
	Equal variances not assumed			,000	35,410	1,000	,00000	3,75817	-7,62633	7,62633

Group Statistics

	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
diterpost	HBP	18	15,3333	10,85736	2,55911
	LBBAP	24	15,2917	11,24617	2,29562

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
diterpost	Equal variances assumed	,280	,599	,012	40	,990	,04167	3,45561	-6,94238	7,02571

	Equal variances not assumed			,012	37,446	,990	,04167	3,43786	-6,92130	7,00463

Group Statistics

	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
dintrapost	HBP	18	67,7778	22,37529	5,27391
	LBBAP	24	72,5000	25,58022	5,22154

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
dintrapost	Equal variances assumed	1,443	,237	-,624	40	,536	-4,72222	7,56747	-20,01665	10,57220
	Equal variances not assumed			-,636	38,979	,528	-4,72222	7,42149	-19,73387	10,28942

TRpostHBP * TRpostlbbap Crosstabulation

Count

		TRpostlbbap		
		ya	tidak	Total
TRpostHBP	ya	4	5	9
	tidak	5	6	11
Total		9	11	20

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,002[a]	1	,964		
Continuity Correction[b]	,000	1	1,000		

Likelihood Ratio	,002	1	,964		
Fisher's Exact Test				1,000	,658
Linear-by-Linear Association	,002	1	,965		
McNemar Test				1,000[c]	
N of Valid Cases	20				

a. 3 cells (75,0%) have expected count less than 5. The minimum expected count is 4,05.

b. Computed only for a 2x2 table

c. Binomial distribution used.

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
postvc	HBP	20	,1300	,14903	,03332
	LBBAP	24	,1208	,16676	,03404

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
postvc	Equal variances assumed	,282	,598	,190	42	,850	,00917	,04813	-,08797	,10631
	Equal variances not assumed			,192	41,769	,848	,00917	,04764	-,08698	,10532

Group Statistics

	kelompok	N	Mean	Std. Deviation	Std. Error Mean
posttr	HBP	20	13,7000	16,19649	3,62165
	LBBAP	24	12,1667	16,77386	3,42395

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
posttr	Equal variances assumed	,006	,936	,307	42	,761	1,53333	5,00022	-8,55751	11,62418
	Equal variances not assumed			,308	41,051	,760	1,53333	4,98395	-8,53157	11,59824

TRVCPostHBP * TRVCpostLBBAP Crosstabulation

Count

		TRVCpostLBBAP		
		1,00	2,00	Total
TRVCPostHBP	ya	4	5	9
	tidak	5	4	9
Total		9	9	18

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,222[a]	1	,637		
Continuity Correction[b]	,000	1	1,000		
Likelihood Ratio	,223	1	,637		
Fisher's Exact Test				1,000	,500
Linear-by-Linear Association	,210	1	,647		
McNemar Test				1,000[c]	
N of Valid Cases	18				

a. 4 cells (100,0%) have expected count less than 5. The minimum expected count is 4,50.

b. Computed only for a 2x2 table

c. Binomial distribution used.

TRMAXpostHBP * TRMAXpostLBBAP Crosstabulation

Count

		TRMAXpostLBBAP		
		1,00	2,00	Total
TRMAXpostHBP	ya	4	7	11
	tidak	5	8	13
Total		9	15	24

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,011[a]	1	,916		
Continuity Correction[b]	,000	1	1,000		
Likelihood Ratio	,011	1	,916		
Fisher's Exact Test				1,000	,625
Linear-by-Linear Association	,011	1	,918		
McNemar Test				,774[c]	
N of Valid Cases	24				

a. 2 cells (50,0%) have expected count less than 5. The minimum expected count is 4,13.

b. Computed only for a 2x2 table

c. Binomial distribution used.