

DAFTAR PUSTAKA

- [1] GLOBOCAN 2020, “Cancer Today,” World Health Organization, 2020. [Online]. Available: <https://gco.iarc.fr/today/home>. [Diakses 11 Juni 2022].
- [2] Komite Penanggulangan Kanker Nasional, “kanker.kemkes.go.id,” [Online]. Available: <http://kanker.kemkes.go.id/guidelines/PPKParu.pdf>. [Diakses 11 Juni 2022].
- [3] R. M. R, “Negative pions in radiotherapy: A brief review,” *European Journal of Cancer*, vol. 10, no. 4, pp. 211-215, 1965.
- [4] S. R. Ula, “ANALISIS DOSIS RADIASI PADA TERAPI KANKER HATI BERBASIS PROTON THERAPY MENGGUNAKAN PROGRAM PHITS 3.22,” DEPARTEMEN TEKNIK NUKLIR DAN TEKNIK FISIKA FT UGM, YOGYAKARTA, 2021.
- [5] A. W. Harto, “Metode Monte Carlo dan Aplikasinya dalam Perhitungan Radiasi Nuklir pada BNCT (Boron Neutron Capture Cancer Therapy),” 1 Februari 2019. [Online]. Available: <https://repository.ugm.ac.id/id/eprint/275014>. [Diakses 14 Juni 2022].
- [6] N. Heady, “ANALISIS DOSIS PADA TERAPI KANKER PARU-PARU BERBASIS GAMMA TERAPI Co-60 DAN BORON NEUTRON CAPTURE THERAPY (BNCT) MENGGUNAKAN PROGRAM PHITS,” Departemen Teknik Nuklir dan Teknik Fisika FT UGM, Yogyakarta, 2019.
- [7] J. Robinson, “Types of Lung Cancer,” WebMD, 21 Maret 2022. [Online]. Available: <https://www.webmd.com/lung-cancer/lung-cancer-types>. [Diakses 16 September 2022].
- [8] R. Michael C, B. Jeffrey D dan R. Cliff G, “Optimizing radiation dose and fractionation for the definitive treatment of locally advanced non-small cell lung cancer,” *Journal of Thoracic Disease*, 218.



- [9] R. M. R, M. Gnanapurani, C. Richman, M. B. I. dan G. W. Barendsen, “RBE and OER of pi-minus mesons for damage to cultured T-1 cells of human kidney origin,” *The British journal of radiology*, vol. 45, no. 531, p. 178–181, 1972.
- [10] Z. e. all, “PION TREATMENT PROCEDURES AND VERIFICATION TECHNIQUES,” *Journal Radiation Oncology Biology Physics*, vol. 10, no. 5, pp. 723-735, 1984.
- [11] Stöppler dan M. C, “Lung Cancer,” MedicineNett, 13 April 2022. [Online]. Available: https://www.medicinenet.com/lung_cancer/article.htm. [Diakses 14 Juli 2022].
- [12] J. H. Schiller, K. Parles dan A. Cipau, 100 Questions & Answers about Lung Cancer Second Edition, Canada: Jones and Bartlett Publishers, 2010.
- [13] S. Tsim, O. C. A, R. Milroy dan S. Davidson, “Staging of non-small cell lung cancer (NSCLC): Tumor,” *Respiratory Medicine*, vol. 104, pp. 1767-1774, 2010.
- [14] H. Weaver dan A. S. Coonar, “Lung cancer: diagnosis, staging, and treatment,” *CARDIOTHORACIC SURGERY*, vol. 35, no. 5, pp. 247-264, 2017.
- [15] A. Al-Okour, “Radiation Physics: Radiation interaction with matter,” dalam *Materials Today: Proceedings*, Husun, 2021.
- [16] M. Rho, “PION INTERACTIONS WITHIN NUCLEI,” *Annual Reviews Nuclear Particle Science*, vol. 34, pp. 531-582, 1984.
- [17] A. Beiser, Concepts of Modern Physics, City: McGraw-Hill, 2003.
- [18] P. H. Fowler dan V. M. Mayes, “The capture of π^- mesons in oxygen and in other nuclei,” *Proc. Phys. Soc.*, vol. 92, pp. 377-389, 1967.
- [19] V. V. Sarantsev, K. N. Ermakov, L. M. Kochenda dan V. I. Medvedev, “The study of the negative pion production in neutron-proton collisions at beam momenta below 1.8 GeV/c,” *European Physical Journal A*, vol. 43, no. 1, 2009.



- [20] R. S. Darmawan dan S. Santosa, “PERANCANGAN KOMPONEN DEE SIKLOTRON PROTON 13 MEV,” *Pusat Teknologi Akselerator dan Proses Bahan*, pp. 65-71, 2011.
- [21] L. D. Hansborough, “PIGMI: A Desgn Report for a Pion Generator for Medical Irradiations,” Los Alamos National Laboratory, New Mexico, 1981.
- [22] R. Prasad, *Nuclear Physics*, New Delhi: Dorling Kindersley, 2014.
- [23] S. Santosa dan Taufik, “DESAIN KONSEPTUAL SISTEM MAGNET SIKLOTRON 30 MeV UNTUK SUMBER NEUTRON EPITHERMAL BNCT,” *Prosiding Pertemuan dan Presentasi Ilmiah Teknologi Akselerator dan Aplikasinya*, vol. 17, no. 1, pp. 1-6, 2015.
- [24] E. Mulyani, Taufik dan R. S. Darmawan, “DESAIN AWAL KOMPONEN CENTRAL REGION SIKLOTRON PROTON 13 MEV,” dalam *Prosiding Pertemuan dan Presentasi Ilmiah-Penelitian Dasar Ilmu Pengetahuan dan Teknologi Nuklir*, Yogyakarta, 2011.
- [25] Silakhuddin, “PENENTUAN KRITERIA DESAIN KOMPONEN UTAMA SIKLOTRON 13 MeV,” *Iptek Nuklir: Bunga Rampai Presentasi Ilmiah Jabatan Peneliti*, pp. 331-351.
- [26] A. W. Chao dan W. Chou, *Reviews of Accelerator Science and Technology Volume 2*, London: World Scientific Publishing, 2009.
- [27] Baartman dan dll, “THE TRIUMF 500 MeV CYCLOTRON: PRESENT OPERATION AND INTENSITY UPGRADE,” 2003.
- [28] Bylinskii dan Craddock, “The TRIUMF 500 MeV cyclotron: the driver accelerator,” *Hyperfine Interact*, vol. 225, no. 1, pp. 9-16, 2014.
- [29] L. D. Skrsgard dan dkk, “Pre-Clinieal Studies of the Negative Pi-Meson Beam at TRIUMF,” *Radiation and Environmental Biophysics*, vol. 16, no. 1, pp. 193-204, 1979.



- [30] R. W. Harrison dan D. E. Lob, "A Negative Pion Beam Transport Channel for Radiobiology and Radiation Therapy at TRIUMF," *IEEE Transactions on Nuclear Science*, vol. 20, no. 3, pp. 1029 - 1031, 1973.
- [31] Cyclotron Centre Bronowice, "For Medicine," Cyclotron Centre Bronowice, 2015. [Online]. Available: https://ccb.ifj.edu.pl/en.dla_medycyny.html. [Diakses 7 10 2022].
- [32] H. Wiedemann, Particle Accelerator Physics Fourth Edition, California: Springer, 2015.
- [33] T. Pickles dan dkk., "PION CONFORMAL RADIATION OF PROSTATE CANCER: RESULTS OF A RANDOMIZED STUDY," *Journal Radiation Oncology Biology Physics*, vol. 43, no. 1, pp. 47-55, 1999.
- [34] T. Kanai, F. Yoshiya, F. Kumiko, I. Hiromi, E.-K. Kiyomi dan O. Hiroshi, "Irradiation of Mixed Beam and Design of Spread-Out Bragg Peak for Heavy-Ion Radiotherapy," *Radiation Research*, vol. 147, no. 1, p. 78–85, 1997.
- [35] IAEA and ICRU, "RELATIVE BIOLOGICAL EFFECTIVENESS," INTERNATIONAL ATOMIC ENERGY AGENCY, Vienna, 2008.
- [36] R. Katz dan S. C. Sharma, "RBE-Dose relations for neutrons and pions (for use in treatment planning)," *PHYS. MED. BIOL*, vol. 20, no. 3, pp. 410-419, 1975.
- [37] M. R. Raju, M. Gnanapurani dan c. Richman, "RBE and OER of π^- mesons for damage to cultured T-1 cells of human kidney origin," *British Journal of Radiology*, vol. 45, no. 1, pp. 178-181, 1972.
- [38] D. Lia, A. R. Setijadi dan Hendrik, "EXTERNAL BEAM RADIATION THERAPY PADA KANKER PARU," *Berkala Ilmiah Kedokteran Duta Wacana*, vol. 2, no. 1, pp. 375-392, 2017.



- [39] The Royal College of Radiologists, “Radiotherapy dose fractionation, third edition,” Maret 2019. [Online]. Available: <https://www.rcr.ac.uk/publication/radiotherapy-dose-fractionation-third-edition>. [Diakses September 2022].
- [40] M. Y. Park dan S. E. Jung, “Patient Dose Management: Focus on Practical Actions,” *Journal of Korean Medical Science*, vol. 31, no. 1, pp. 45-54, 2016.
- [41] International Commission on Radiological Protection, “Relative Biological Effectiveness (RBE), Quality Factor (Q), and Radiation Weighting Factor (wR),” *ICRP PUBLICATION 92*, 2003.
- [42] N. Tsoulfanidis dan S. Landsberger, *Measurement & Detection of Radiation 4th Edition*, New York: Taylor & Francis Group, 2015.
- [43] International Commission on Radiological Protection, “The 2007 Recommendations of the International Commission on Radiological Protection,” *Annals of the ICRP*, 2007.
- [44] M. Ilham, Y. Sardjono dan A. W. Harto, “Analisis Dosis dan Waktu Iradiasi Terapi Proton Pada Kanker Serviks Menggunakan PHITS.,” Departemen Teknik Nuklir dan Teknik Fisika FT UGM, Yogyakarta, 2022.
- [45] L. Harkness dan Brennan, *An Introduction to the Physics of Nuclear Medicine*, San Rafael: Morgan & Claypool Publishers, 2018.
- [46] ICRP, “Radiological Protection in Ion Beam Radiotherapy,” International Commission on Radiological Protection, Vienna, 2014.
- [47] ICRU, “ICRU Report 71, Prescribing, Recording, and Reporting Electron Beam Therapy,” International Commission on Radiation Units & Measurements, 2004.
- [48] A. K. Berthelsen dan dkk, “What's new in target volume definition for radiologists in ICRU Report 71? How can the ICRU volume definitions be integrated in clinical practice?,” *Cancer Imaging*, vol. 7, no. 1, p. 104–116, 2007.



- [49] L. Beaton, S. Bandula, M. N. Gaze dan R. A. Sharma, “How rapid advances in imaging are defining the future of precision radiation oncology,” *British journal of cancer*, vol. 120, no. 1, p. 779–790, 2019.
- [50] T. d. Sato, “Overview of particle and heavy ion transport code system PHITS,” *Annals of Nuclear Energy*, pp. 110-115, 2014.
- [51] Japan Atomic Energy Agency, “Update log of PHITS,” JAEA, 31 Maret 2022. [Online]. Available: <https://phits.jaea.go.jp/rirekie.html> <https://phits.jaea.go.jp/rirekie.html>. [Diakses September 2022].
- [52] Japan Atomic Energy Agency, “PHITS,” Japan Atomic Energy Agency, 31 Maret 2022. [Online]. Available: <https://phits.jaea.go.jp/>. [Diakses 21 September 2022].
- [53] C. Kim dan dkk, “Adult mesh-type reference computational phantoms,” *ICRP Publication 145*, 2020.
- [54] A. Kusumadjati, “Summary Of Dose Constraint for 3D-CRT and IMR Summary Of Dose Constraint for 3D-CRT and IMR for Radiotherapy Dept. of RSUP dr Hasan Sadikin,” RSUP dr Hasan Sadikin, Bandung.
- [55] R. H. Greiner, H. J. Blattmann, P. Thum, A. Coray, J. F. Crawford, R. H. Kann, G. Munkel, E. Pedroni, C. F. Von Essen dan A. Zimmermann, “Dynamic pion irradiation of unresectable soft tissue sarcomas,” *International Journal of Radiation Oncology*Biography*Physics*, vol. 17, no. 5, pp. 1077-1083, 1989.
- [56] R. W. Harrison dan D. E. Lobb, “A NEGATIVE PION BEAM TRANSPORT CHANNEL FOR RADIOBIOLOGY AND RADIATION THERAPY AT TRIUMF,” 5th IEEE Particle Accelerator Conference, San Francisco, 1973.
- [57] R. J. McConn Jr, C. Gesh, R. Pagh, R. Rucker dan R. Williams III, “Compendium of Material Composition Data for Radiation Composition Data for Radiation,” Department of Homeland Security, Washington, 2011.



- [58] Greiner dan dkk, “Anaplastic astrocytoma and glioblastoma: pion irradiation with the dynamic conformation technique at the Swiss Institute for Nuclear Research (SIN),” *Radiotherapy and Oncology*, vol. 17, no. 1, pp. 37-46, 1990.
- [59] H. Nakano dan dkk, “Calculated relative biological effectiveness (RBE) for initial DNA double-strand breaks (DSB) from flattening filter and flattening filter-free 6 MV X-ray fields,” *BJR Open*, 2021.
- [60] N. e. al., “The 2021 WHO classification of lung tumors: Impact of advances since 2015,” *Journal of Thoracic Oncology*, vol. 17, no. 3, pp. 362-387, 2022.
- [61] C. Daniel, “Hadron therapy,” *Physics at the femtometer scale*, La Colle sur Loup, 2011.
- [62] N. Nakamura, G. K. Lam, K. Sakamoto dan S. Okada, “Radiobiological studies of pi-meson at TRIUMF using mouse L5178Y cells,” *International Journal of Radiation Oncology*Biophysics*, vol. 6, no. 9, pp. 1179-1185, 1980.
- [63] R. A. Powsner, M. R. Palmer dan E. R. Powsner, *Essentials of Nuclear Medicine Physics, Medicine Physics, Radiation Biology* Fourth Edition, New Jersey: John Wiley & Sons Ltd, 2022.
- [64] BATAN, “Ensiklopedi Teknologi Nuklir,” BATAN, [Online]. Available: <https://www.batan.go.id/ensiklopedi/08/01/02/03/08-01-02-03.html>. [Diakses 16 Juli 2022].
- [65] Paul Scherrer Institut, “Neutron Matter Interaction,” Paul Scherrer Institut, [Online]. Available: <https://www.psi.ch/en/niag/neutron-interaction-with-matter>. [Diakses 12 Juni 2022].
- [66] Brinannica, “Interactions of neutrons,” Brinannica, [Online]. Available: <https://www.britannica.com/technology/radiation-measurement/Interactions-of-neutrons>. [Diakses 12 Juni 2022].

