

Pacemaker Implantation in Elderly Patients: Post-hospital Ischarge Care

Implante de Marcapasso em Pacientes Idosos: Cuidados Pós Alta Hospitalar

Implantación de Marcapasos en Pacientes de Edad Avanzada: Cuidados Post-Alta Hospitalaria

RESUMO

Objetivo: verificar na literatura nacional e internacional, os cuidados necessários para alta hospitalar de pacientes idosos após implante de marcapasso cardíaco. **Método:** revisão integrativa, realizada nas bases de dados: Embase, Medline/Pubmed, Cinahl, Cochrane, Web of Science, e Portal BVS. A busca foi conduzida em outubro de 2024. **Resultados:** A amostra foi composta por 8 artigos, categorizados em: Complicações Operatórias; Cuidados Gerais com Marcapasso; e Monitoramento Pós-Alta. **Conclusão:** As complicações operatórias, foram divididas em intra-procedimento e pós-procedimento, os cuidados gerais versaram sobre orientações com a interferência eletromagnética, direção veicular, exercício físico. No monitoramento após alta hospitalar, destaca-se a tele saúde como intervenção terapêutica ao cuidado. Evidencia-se, nesse contexto, o papel essencial da enfermagem na sistematização da assistência, na educação em saúde e no acompanhamento contínuo do paciente, promovendo segurança, autonomia e qualidade de vida após o implante do marcapasso.

DESCRIPTORES: Alta do paciente; Cuidados pós-operatórios; Idoso; Marca-passo artificial; Período pós-operatório.

ABSTRACT

Objective: to review the national and international literature on the care required for the discharge of elderly patients after cardiac pacemaker implantation. **Method:** integrative review conducted in the following databases: Embase, Medline/PubMed, Cinahl, Cochrane, Web of Science, and Portal BVS. The search was conducted in October 2024. **Results:** The sample consisted of eight articles, categorized as: Surgical Complications; General Pacemaker Care; and Post-Discharge Monitoring. **Conclusion:** Surgical complications were divided into intra-procedural and post-procedural complications, while general care focused on guidelines regarding electromagnetic interference, driving, and physical exercise. In monitoring after hospital discharge, telehealth stands out as a therapeutic intervention for care. In this context, the essential role of nursing in the systematization of care, health education, and continuous patient follow-up is evident, promoting safety, autonomy, and quality of life after pacemaker implantation.

DESCRIPTORS: Patient discharge; Postoperative care; Elderly; Artificial pacemaker; Postoperative period.

RESUMEN

Objetivo: verificar en la literatura nacional e internacional los cuidados necesarios para el alta hospitalaria de pacientes ancianos tras la implantación de un marcapasos cardíaco. **Método:** revisión integradora, realizada en las bases de datos: Embase, Medline/Pubmed, Cinahl, Cochrane, Web of Science y Portal BVS. La búsqueda se llevó a cabo en octubre de 2024. **Resultados:** La muestra estuvo compuesta por 8 artículos, categorizados en: Complicaciones quirúrgicas; Cuidados generales con marcapasos; y Monitorización tras el alta. **Conclusión:** Las complicaciones quirúrgicas se dividieron en intraoperatorias y posoperatorias, los cuidados generales versaron sobre orientaciones con la interferencia electromagnética, la conducción de vehículos y el ejercicio físico. En la monitorización tras el alta hospitalaria, destaca la telesalud como intervención terapéutica para el cuidado. En este contexto, se evidencia el papel esencial de la enfermería en la sistematización de la asistencia, la educación en salud y el seguimiento continuo del paciente, promoviendo la seguridad, la autonomía y la calidad de vida tras la implantación del marcapasos.

DESCRIPTORES: Alta del paciente; Cuidados posoperatorios; Ancianos; Marcapasos artificial; Periodo posoperatorio.

Regiani Bernardino da Silva

Nurse, Master's student in the Graduate Program in Health Care Practice at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0009-0000-6957-0210>

Tatiane Prette Kuznier

Nurse, PhD in Nursing. Professor in the Department of Nursing at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0000-0001-9665-3134>

Karina Silveira de Almeida Hammerschmidt

Nurse, PhD in Nursing. Professor in the Nursing Department at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0000-0002-7140-3427>

Susanne Elero Betioli

Nurse, PhD in Nursing. Professor in the Nursing Department at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0000-0003-4469-4473>

Jane Francisco da Costa Testoni

Nurse, Master's student in the Graduate Program in Health Care Practice at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0009-0004-0827-8581>

Fernando Chiquito Costa

Nurse, Master's student in the Graduate Program in Health Care Practice at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0009-0004-2269-9569>

Claudia Fernanda Toporoski Sereneski Zoschke

Nurse, Master's Degree in Health Care Practice from the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0009-0003-8897-2102>

Caroline Quinsler

Nurse, Master's student in the Graduate Program in Health Care Practice at the Federal University of Paraná. Curitiba, PR.

ORCID: <https://orcid.org/0009-0006-9908-6933>

Received 10/22/2025

Approved: 11/03/2025

INTRODUCTION

The heart is a fundamental organ, its functioning is conditioned by the electrical system, which is responsible for controlling heart rate and rhythm¹. Arrhythmias are disorders that alter the heart rhythm, either pathologically or even as a natural condition of life, such as aging².

Cardiac arrhythmias are recurrent complications and are the main reason why elderly people seek urgent and emergency care, leading to hospitalizations and a higher incidence of implantable electronic cardiac devices³.

Pacemakers, resynchronization devices, and cardioverter-defibrillators are known as implantable electronic cardiac devices (IECDs)⁴. They emit an electrical pulse that stimulates the heart if adequate electrical activity does not occur. Implanted in the subcutaneous tissue of the chest, it is a process susceptible to risks and complications⁵. It is essential that nurses understand the impact of complications on the elderly population, given their vulnerability⁵.

Caring for elderly patients with pacemakers requires comprehensive knowledge and specific skills that support the systematization of hospital discharge, so that the transition of care is effective and safe³. It is essential to plan care and prepare for safe self-care at home in order to reduce hospital readmission rates². Hospital discharge requires health education for patients and their families, especially elderly people, who have persistent and continuous health needs. The objective of this study was to re-

view the national and international literature on the care required for the hospital discharge of elderly patients after cardiac pacemaker implantation.

METHOD

An integrative literature review was conducted in six stages⁶, as follows:

Step 1- Definition of the research question. Guided by the PICO acronym, where: P- Population (elderly patients); I - Intervention (Guidelines on post-pacemaker implantation care); Co - Context (preparation for hospital discharge), the research question was defined as: What guidelines should elderly patients receive on post-pacemaker implantation care for hospital discharge?

Step 2- Search and selection of primary studies. The descriptors and Boolean operators for the search were selected: "Elderly"; "Artificial pacemaker"; "Postoperative period AND Postoperative care" OR "Patient discharge." Adaptations were made for six databases: EMBASE, Web of Science, CINAHL, Cochrane, Virtual Health Library Portal, PubMed/Medline. The searches were conducted in October 2024. Rayyan[®] was used to manage and evaluate the articles.⁷ The inclusion criteria were: studies that were available, free of charge, and complete, published in the last 5 years, in Portuguese, English, or Spanish. The following were defined for exclusion: duplicate articles in the databases, theses, monographs, studies that diverged from the theme or were not related to the guiding question.

Step 3—Extraction of data from

primary studies. A file was created with a description of the studies, including title, authors, year of publication, and journal.

Step 4 - Careful evaluation of primary studies. After analysis by Rayyan[®], a table was created to compile the information, namely: country where the study was conducted, level of evidence, name of the journal, year of publication, title of the article, and objective of the study. The studies were categorized by level of evidence⁸. **Steps 5 and 6, consisting of the synthesis and presentation of results,** are described in the results section. In this context, the integrative review was conducted with data in the public domain; therefore, ethical review is not required.

RESULTS

The search resulted in 523 articles. After applying the temporality filter, 82 studies were selected for analysis. Of these, 4 articles were removed due to duplication and 1 because it was not available in its entirety. Reading the title and abstract allowed the exclusion of 30 studies. For the full reading, 47 articles remained, of which 29 were discarded because they did not address the research question and 10 presented divergences regarding the theme. Thus, the final sample consisted of 8 articles. To ensure methodological rigor, the review followed the PRISMA recommendations⁹ as can be seen in Figure 1.

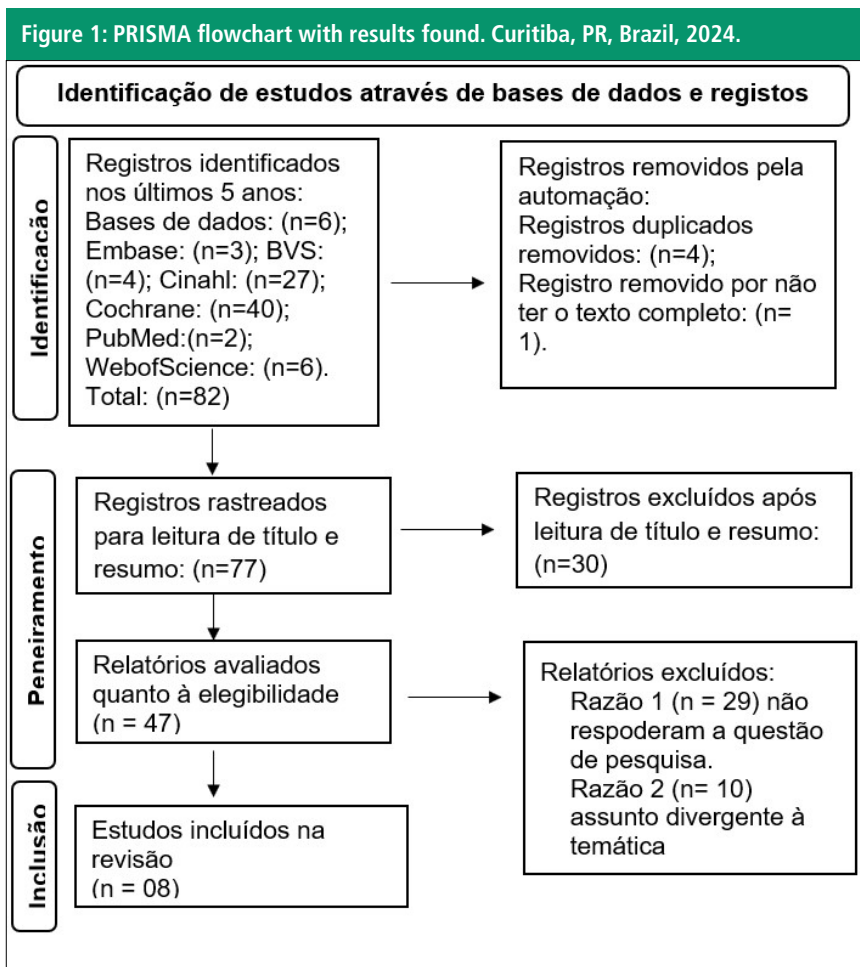


Table 1 was created to present the selected studies, including the article identification (ID), a sequential alphanumeric code (A1, A2...), and other variables necessary for analysis. Based on this information, three empirical categories were organized: **I- Surgical complications, II- General pacemaker care, and III- Post-discharge monitoring.**

Source: The authors (2024)

Table 1: Characterization of the studies analyzed. Curitiba, PR, Brazil, 2024.

ID	Country/ NE	Journal/ Year	Study objective
A01 ¹⁰	Italy/1B	International Journal of Cardiology /2019	To investigate the feasibility and clinical implications of early mobilization after pacemaker implantation
A02 ¹	Brazil/ 2C	Text and Context/ 2020	Assessing the health-related quality of life of patients with permanent cardiac pacemakers
A03 ¹¹	Norway/ 1B	International Journal of Environmental Research and Public Health /2019	Analyzing the health-related quality of life of patients monitored through a remote device monitoring system compared to patients monitored through standard outpatient consultations.
A04 ¹²	Iran / 1B	Pacing and Clinical Electrophysiology (PACE) /2019	Determine whether post-procedure antibiotics reduce the risk of infection related to implantable cardiac electronic device (ICED) implantation.
A05 ²	Brazil/ 2C	Reben/ 2021	Understand how nurses provide transitional care to elderly patients with artificial pacemakers.
A06 ¹³	Poland /2C	Poliheart Journal /2023	Assess the occurrence of early complications after electronic cardiac device implants and determine the management after the procedure and the ideal discharge time.
A07 ¹⁴	China/ 1B	Nursing Health & Sciences /2019	Examine the effect of a nurse-led telephone support program on health outcomes in patients after cardiac pacemaker implantation.
A08 ¹⁵	Japan/ 2C	Pacing and Clinical Electrophysiology (PACE)/ 2020	Evaluate the safety and efficacy of wireless pacemakers in the very elderly.

Legend: ID= Identification, E.L.= Level of evidence.

Source: The authors (2024)

DISCUSSION

I- Surgical Complications

A pacemaker is a treatment for cardiac arrhythmias¹⁴. The surgical procedure presents risks and complications, requiring specific care. Although the complication rate after pacemaker implantation is low, it is not negligible, being more frequent on the first day after the procedure¹³.

Some complications that may occur during the procedure include hemothorax, pneumothorax, cardiac perforation, cardiac tamponade, transient ischemic attack (TIA), stroke, peripheral embolism, and valve damage¹⁰.

The most common postoperative complications are displacement, electrode fracture, and pocket hematoma¹⁰. Among postoperative complications, infectious diseases have a significant economic impact on health services due to the cost of therapy to remove the pacing system¹¹.

II- General pacemaker care

General care is essential for patients' quality of life. After implantation, patients experience a lack of knowledge, concerns, lack of skills, and develop emotional limitations, such as anxiety and depression¹⁶. Reinforcing routine care, such as surgical wound care, medication use, functional exercises of the upper limb on the side of the operation, self-monitoring methods, and outpatient follow-up time, are necessary in health education¹⁴.

Due to the device's internal circuit's ability to capture the individual's cardiac sensitivity, the device becomes sensitive to other sources of electricity, which can compromise its performance and reduce its functional capacity. Therefore, guidance on electromagnetic interference is indispensable⁵.

The devices have specific charac-

teristics, so medical examinations and surgical procedures can be performed as long as they are preceded by a medical evaluation. As for sexual activity, it can be resumed after complying with the initial post-implantation restrictions⁵. Another important precaution is the restriction on driving, and in this context, each category of cardiac device has specific rules and guidelines¹⁷.

Regarding physical exercise, care must be taken to ensure the integrity of the device and the mobilization of the limb in order to avoid joint complications⁵. In the first few weeks after surgery, activities and movements that cause impact on the implant region should be avoided, including lifting weights over 5 kg, performing wide limb movements, and practicing activities that may cause displacement of the electrodes⁵.

III- Post-Discharge Monitoring

Telehealth uses information and communication technologies to exchange information valid for diagnosis, treatment, and prevention of diseases, and is performed by all health professionals¹⁸.

As a technological modality of care, telemonitoring offers continuous follow-up of patients, in addition to reducing costs and outpatient visits¹⁹. As a nursing intervention, telemonitoring supports the work of professionals in the remote monitoring of patients, allowing for the surveillance of health problems, the management of clinical situations, and rapid decision-making¹⁹. In addition, monitoring promotes self-care awareness, assists in general care, and enables the prevention of complications, especially signs of infection².

Post-discharge follow-up is beneficial in reducing anxiety and depression, improving understanding of the disease and the recovery process, promoting adaptation to the device,

and reducing complication and hospitalization rates¹⁴. In this context, telehealth assists in the early detection of complications, promotes adherence to therapy, and improves health awareness²⁰.

CONCLUSION

The pacemaker is an essential treatment for cardiac arrhythmias, making it indispensable to systematize care during the transition process. Care related to the device, the surgical wound, the use of medications, electromagnetic interference, sexual activity, and driving are fundamental to ensuring the patient's safety and well-being after hospital discharge. In this scenario, the nurse's role transcends the technical dimension: they educate, guide, welcome, and accompany each patient, promoting confidence, autonomy, and quality of life, in addition to preventing complications and strengthening self-care. Although the studies analyzed were not exclusive to the elderly population, which is a limitation, the relevance of the topic becomes even greater, encouraging new contributions that value and recognize the transformative role of nursing in the lives and recovery of patients.

References

- Gonçalo SS, Grotti EMO, Furuia RK, Dantas RAS, Rossi LA, Dessotte CAM. Health-related quality of life of patients with permanente cardiac pacing. *Texto Contexto Enferm* [Internet]. 2020 [cited 15 Nov 24]; 29: 1-12. Available from: <https://doi.org/10.1590/1980-265X-TCE-2018-0486>
- Oliveira ES, Menezes TMO, Gomes NP, Oliveira LMS, Batista VM, Oliveira MCM, Chaves AN. Transitional care of nurses to older adults with artificial pacemaker. *Rev Bras Enferm* [Internet]. 2022 [cited 18 Nov 24]; 75(4): 1-8. Available from: <https://doi.org/10.1590/0034-7167-2021-0192>
- Sociedade Brasileira de Cardiologia. Atualização das diretrizes em cardiogeriatría da Sociedade Brasileira de Cardiologia. *Arq Bras Cardiol* [Internet]. 2019 [citado 2025 Apr 05]; 112(5):649-705. Disponível em: [10.5935/abc.20190075](https://doi.org/10.5935/abc.20190075)
- Silva LDC, Caminha ELC, Ferreira NS. Qualidade de vida de indivíduos portadores de dispositivo cardíaco eletrônico implantável. *Rev Enferm UERJ* [Internet]. 2019 [citado 2025 Apr 05]; 27:1-6. Disponível em: <https://www.e-publicacoes.uerj.br/index.php/enfermagemuerj/article/view/45014>
- Ordem dos Enfermeiros. Guia orientador de boa prática em enfermagem de reabilitação: reabilitação cardíaca. *Ordem dos Enfermeiros* [Internet]. 2020 [cited 2025 Apr 08]; 1-376. Available from: <https://www.flipsnack.com/ordenfermeiros/gobper/full-view.html>
- Mendes KDS, Silveira RC, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. *Texto Contexto Enferm* [Internet]. 2008 [citado 03 Feb 25]; 17(4): 758-64. Disponível em: <https://doi.org/10.1590/S0104-07072008000400018>
- Rayyan. Rayyan – intelligent systematic review [Internet]. 2022 [cited 2024 Oct 5]; Available from: <https://www.rayyan.ai/>
- Oxford Centre for Evidence-Based Medicine. Levels of evidence [Internet]. Oxford: University of Oxford; 2011 [cited 2024 Nov 10]; Available from: <https://www.cebm.ox.ac.uk/resources/levels-of-evidence>
- PRISMA. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA 2020 flow diagram [Internet]. 2020 [cited 2025 Apr 10]; Available from: <https://www.prisma-statement.org/prisma-2020-flow-diagram>
- Budano C, Garrone P, Castagno D, Bissolino A, Andreis A, Bertolo L, Mazzini D, Bergasmaco L, et al. Same-day CIED implantation and discharge: Is it possible? The E-MOTION trial (Early MOBilization after pacemaker implantaTION). *International Journal of Cardiology* [Internet]. 2019 [cited 10 Oct 24]; 288: 82-6. Available from: <https://dx.doi.org/10.1016/j.ijcard.2019.04.020>
- López-Liria R, López-Villegas A, Enebakk T, Thunhaug H, Lappegård KT, Catalán-Matamoros D. Telemonitoring and Quality of Life in Patients after 12 Months Following a Pacemaker Implant: the Nordland Study, a Randomised Trial. *International Journal of Environmental Research and Public Health* [Internet]. 2019 [cited 02 Nov 24]; 16(11): 1-13. Available from: <https://pubmed.ncbi.nlm.nih.gov/31195650/>
- Madadi S, Kafi M, Kheirkhah J, Azhari A, Kiarsi M, Mehryar A, Fazelifar A, Alizadehdiz A, et al. Postoperative antibiotic prophylaxis in the prevention of cardiac implantable electronic device infection. *Pacing and Clinical Electrophysiology* [Internet]. 2019 [cited 08 Nov 24]; 42(2):161–5. Available from: <https://pubmed.ncbi.nlm.nih.gov/30575054/>
- Ślawiński G, Zieleniewicz P, Młyński M, Budrejko S, Królak T, Szymanowicz LD, Kempa M. Optimal hospital discharge time after cardiac implantable electronic device implantation: A retrospective study from a tertiary electrotherapy center. *Polish Heart Journal* [Internet]. 2024 [cited 15 Nov 24]; 82(2): 206–9. Available from: <https://pubmed.ncbi.nlm.nih.gov/37718580/>
- Shen Z, Zheng F, Zhong Z, Ding S, Wang L. Effect of peer support on health outcomes in patients with cardiac pacemaker implantation: A randomized, controlled trial. *Nursing & Health Sciences* [Internet]. 2019 [cited 20 Nov 24]; 21(2):269–77. Available from: <https://pubmed.ncbi.nlm.nih.gov/30677198/15>
- Tachibana M, Banba K, Matsumoto K, Ohara M. The feasibility of leadless pacemaker implantation for superelderly patients. *Pacing and Clinical Electrophysiology* [Internet]. 2020 [cited 20 Nov 24]; 43(4): 374–81. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/pace.13894?msocid=02727c7e-0cdd6dbb109968a80da46c5a>
- Ignácio IB, Fernandes PA, Maier SRO, Dessotte CAM. Anxiety, depression and cardiac anxiety in patients with implantable cardioverter defibrillator according to gender and age. *Rev Rene* [Internet]. 2021[citado 02 Dec 24]; 22:e61117. Available from: https://www.revenf.bvs.br/scielo.php?script=sci_arttext&pid=S1517-38522021000100317
- Fenelon G, Nishioka SAD, Lorga FA, Teno LAC., Pachon EI., Adura FE, et al. Sociedade Brasileira de Cardiologia e Associação Brasileira de Medicina de Tráfego. Recomendações Brasileiras para direção veicular em portadores de dispositivos cardíacos eletrônicos implantáveis (DCEI) e arritmias cardíacas. *Arq Bras Cardiol* [Internet]. 2012 [citado 2025 Apr 20]; 99 (5):1-10. Available from: <https://sobrac.org/wp-content/uploads/2023/10/diretriz-direcao-veicular-2012.pdf>
- Ministério da Saúde. Portaria GM/MS nº 1.348, de 2 de junho de 2022 (BR): dispõe sobre as ações e serviços de Telessaúde no âmbito do Sistema Único de Saúde (SUS). Brasília [Internet]. 2022 Jun 2 [citado 2025 Apr 10]; Disponível em: https://bvsm.sau.gov.br/bvsm/saudelegis/gm/2022/prt1348_03_06_2022.html
- Santos JV, Flores PVP, Ferreira MV da C, Pinto VVG, Sá LV de, Silva JS da. Surgical site infection and nurse telemonitoring in the postoperative period: a scoping review. *Online Braz J Nurs* [Internet]. 2024 [cited 10 Jan 25]; 23. 1-14. Disponível em: <https://doi.org/10.17665/1676-4285.20246673>
- Costa ICP, Costa AS, Garbuio DC, Zamarioli CM, Eduardo AHA, Carvalho EC, Chaves ECL. Telessaúde na assistência ao paciente por enfermeiros de prática avançada: revisão sistemática. *Acta Paul Enferm* [Internet]. 2025 [citado 20 Jan 25]; 38: 1-13. Disponível em: <http://dx.doi.org/10.37689/acta-ape/2025AR0003141>

The study was extracted from the master's thesis entitled: "Educational technology for hospital discharge of elderly patients in the postoperative period of electronic cardiac device implantation ." Thesis qualification in 07/2025. The program in question is linked to CAPES according to Notice No. 01/2024.

Funding: The research did not receive financial assistance, nor does it have scholarships or agreements.