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# SPECIALIZED NURSING INTERVENTION FOR THE POTENTIAL ORGAN DONOR IN BRAIN DEATH AND THE FAMILY
SCOPING REVIEW

# INTERVENÇÃO DE ENFERMAGEM ESPECIALIZADA AO POTENCIAL DADOR DE ÓRGÃOS EM MORTE CEREBRAL E À FAMÍLIA
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# INTERVENCIÓN ESPECIALIZADA DE ENFERMERÍA PARA POSIBLES DONANTES DE ÓRGANOS CON MUERTE CEREBRAL Y FAMILIA
SCOPING REVIEW

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# Abstract

**Introduction:** The organ donation process is an area of high relevance in clinical practice and health management, requiring highly specialised nursing interventions that integrate advanced technical skills and differentiated emotional support, both in identifying and maintaining potential brain-dead donors and in accompanying the families involved. **Objective:** To map the available scientific evidence on a specialized nursing intervention targeted at the potential organ donor in brain death and their family in intensive care and emergency settings. **Methodology:** This scoping review was conducted according to the methodology of the Joanna Briggs Institute, with research carried out in the EBSCO content aggregator, covering the period between 2019 and 2024. Full articles published in Portuguese and English and subject to peer review were included. After applying the eligibility criteria, eight scientific articles and one master's thesis were selected. **Results:** Critical analysis of the studies revealed fundamental dimensions of nursing intervention in organ donation, namely: the implementation of standardised protocols that favour early detection and clinical maintenance of potential donors; the establishment of empathetic communication and continuous emotional support for families; and the adoption of ethical and humanised practices in the provision of care. Nevertheless, relevant gaps were identified, among which the absence of universal guidelines, the insufficiency of structured psychological support programmes, and the shortage of professionals with specialised training in the area stand out. **Conclusion:** In view of these results, it is proposed to strengthen professional training strategies, create educational initiatives, and strengthen multidisciplinary teams. These measures are essential to consolidate a more efficient and humanised organ donation process based on robust scientific evidence.


**Keywords:** Brain Death; Critical Care; Family; Nursing; Organ Donation.


# Resumo

**Introdução:** O processo de doação de órgãos constitui uma área de elevada relevância na prática clínica e na gestão em saúde, exigindo intervenções de enfermagem altamente especializadas que integrem competências técnicas avançadas e apoio emocional diferenciado, tanto na identificação e manutenção do potencial dador em morte cerebral como no acompanhamento das famílias envolvidas. **Objetivo:** Mapear as evidências científicas disponíveis sobre uma intervenção de enfermagem especializada dirigida ao potencial dador de órgãos em morte cerebral e à sua família, em contextos de cuidados intensivos e de urgência. **Metodologia:** A presente *scoping review* foi conduzida segundo a metodologia do Joanna Briggs Institute, tendo a pesquisa sido realizada no agregador de conteúdos EBSCO, abrangendo o período compreendido entre 2019 e 2024. Incluíram-se artigos completos, publicados em português e inglês, sujeitos a revisão por pares. Após a aplicação dos critérios de elegibilidade, foram selecionados oito artigos científicos e uma dissertação de mestrado. **Resultados:** A análise crítica dos estudos revelou dimensões fundamentais da intervenção de enfermagem na doação de órgãos, nomeadamente: a implementação de protocolos padronizados que favorecem a deteção precoce e a manutenção clínica do potencial dador em morte cerebral; o estabelecimento de uma comunicação empática e de suporte emocional contínuo às famílias; e a adoção de práticas éticas e humanizadas na prestação de cuidados. Não obstante, foram identificadas lacunas relevantes, entre as quais se destacam a ausência de diretrizes universais, a insuficiência de programas de apoio psicológico estruturados e a deficiência de profissionais com formação especializada na área. **Conclusão:** Face a estes resultados, propõe-se o reforço de estratégias de capacitação profissional, a criação de iniciativas educativas e o fortalecimento de equipas multidisciplinares. Estas medidas são essenciais para consolidar um processo de doação de órgãos mais eficiente, humanizado e sustentado em evidência científica robusta.


**Palavras-chave:** Cuidados Críticos; Doação de Órgãos; Enfermagem; Família; Morte Cerebral.


# Resumen

**Introducción:** El proceso de donación de órganos constituye un ámbito de gran relevancia en la práctica clínica y en la gestión sanitaria, y requiere intervenciones de enfermería altamente especializadas que integren competencias técnicas avanzadas y un apoyo emocional específico, tanto en la identificación y el mantenimiento del donante potencial en caso de muerte cerebral como en el acompañamiento de las familias implicadas. **Objetivo:** Mapear la evidencia científica disponible sobre una intervención especializada en enfermería dirigida a posibles donantes de órganos con muerte cerebral y sus familias, en entornos de cuidados intensivos y de urgencias. **Metodología:** La presente revisión exploratoria se llevó a cabo siguiendo la metodología del Joanna Briggs Institute, y la búsqueda se realizó en el agregador de contenidos EBSCO, abarcando el periodo comprendido entre 2019 y 2024. Se incluyeron artículos completos, publicados en portugués e inglés, sometidos a revisión por pares. Tras la aplicación de los criterios de elegibilidad, se seleccionaron ocho artículos científicos y una tesis de máster. **Resultados:** El análisis crítico de los estudios reveló dimensiones fundamentales de la intervención de enfermería en la donación de órganos, a saber: la implementación de protocolos estandarizados que favorecen la detección precoz y el mantenimiento clínico del donante potencial en muerte cerebral; el establecimiento de una comunicación empática y de apoyo emocional continuo a las familias; y la adopción de prácticas éticas y humanizadas en la prestación de cuidados. No obstante, se identificaron lagunas relevantes, entre las que destacan la ausencia de directrices universales, la insuficiencia de programas estructurados de apoyo psicológico y la escasez de profesionales con formación especializada en el área. **Conclusión:** Ante estos resultados, se propone reforzar las estrategias de capacitación profesional, crear iniciativas educativas y fortalecer los equipos multidisciplinares. Estas medidas son esenciales para consolidar un proceso de donación de órganos más eficiente, humanizado y sustentado en evidencia científica sólida.


**Descriptores:** Cuidados Críticos; Donación de Órganos; Enfermería; Familia; Muerte Cerebral.

# Introduction

In 2022, according to the Global Observatory on Donation and Transplantation (GODT), approximately 157,494 solid organ transplants were performed, representing a 9.1% increase compared to 2021. However, this growth remains insufficient, covering less than 10% of global needs. Among the most transplanted organs, the kidney leads with 102,090 procedures, followed by the liver (37,436), heart (8,988), lung (6,784), pancreas (2,026), and small intestine (170). Additionally, it is noteworthy that 39% of kidney transplants and 24% of liver transplants originated from living donors. Regarding deceased donors, there were 41,792 cases, with 32,248 after brain death (BD) and 9,544 due to circulatory arrest (CA). These data, collected from 91 countries and representing 75% of the world's population, demonstrate that despite the increase in transplants, organ shortage continues to be a significant challenge[1].

Considering the international context, it becomes essential to adopt strategies to strengthen donation, as long waiting periods can result in adverse outcomes, such as deterioration of health status and, in many cases, death before transplantation. In this sense, the increasing demand for organs, coupled with limitations in their availability, further exacerbates this issue. Therefore, it is highlighted as a priority to implement effective policies that not only increase the supply of organs but also optimize allocation processes, reducing waiting time and maximizing benefits for patients[2].

In response to this need, the Madrid Resolution (2010), a result of the 3rd Global Consultation of the World Health Organization (WHO) on Organ Donation and Transplantation, encouraged governments to seek self-sufficiency in this sector. To achieve this, it is recommended to reduce the incidence of diseases treatable by transplants and to prioritize organ donation from deceased donors. In this sense, countries with greater access to transplants have developed robust organ donation programs, primarily after death by neurological criteria (brain death), which remains the main source of organs from deceased donors[2].

Faced with this scenario, Portugal emerges as a global success case in organ donation and transplantation, standing out as one of the world leaders even while facing financial and structural challenges. This success is largely due to the combination of effective policies, the adaptation of international models, and strong institutional and social commitment. Over the past two decades, the country has recorded remarkable growth in donation and transplantation rates, reaching, in 2018, 33.7 deceased donations per million inhabitants (pmp). This performance placed Portugal in second place in Europe and third globally in organ donations from deceased individuals[3].

In addition to success in donation rates, Portugal stands out for having managed to overcome economic and structural constraints. For example, despite spending less on health per capita than the European average and having only 4.2 intensive care beds per 100,000 inhabitants before the pandemic, the country adopted an innovative approach that allowed it to overcome these limitations[3]. Among the factors explaining this performance, the *opting-out* system stands out, in which all citizens, stateless persons, and resident foreigners are considered potential *post mortem* donors, unless they express opposition in the National Register of Non-Donors (RENNDA)[3].

In addition to the legislative framework, the organizational structure of transplantation in Portugal has been crucial to the good results. The adopted model is based on the Spanish experience but was adjusted to national specificities since 1993. One of the most relevant milestones in this process was the creation of the Portuguese Institute of Blood and Transplantation (IPST), which ensures the supervision and coordination of donation and transplantation at the national level. Another significant advancement was the introduction of hospital donation coordinators in 2007, highly qualified professionals who work in identifying potential donors, in dialogue with families, and in the logistics of organ procurement[3].

The failure to identify and refer potential donors is one of the main obstacles to organ donation after death. To avoid missed opportunities, several countries have implemented “mandatory notification” of patients in imminent death. This procedure applies

to patients in a deep coma, ventilated in intensive care units, and with irreversible brain injuries of known cause[2].

Nursing plays a central role in the entire organ donation process, from the identification and maintenance of the potential donor to the emotional and informational support provided to grieving families. Organ donation thus emerges as a process that goes beyond additional technical aspects, requiring healthcare professionals to possess advanced competencies in communication, empathy, and relationship management, which are crucial for the familial and social flexibility of the procedure. In this context, the specialized nursing intervention aimed at critically ill individuals, potential brain-dead donors, and their families in intensive care units and emergency departments gains particular prominence.

Given the complexity of this process and the need for evidence-based practices, this study aims to map the available scientific evidence on a specialized nursing intervention targeted at the potential organ donor (POD) in brain death and their family in intensive care and emergency settings. To guide this scoping review, the following research question was formulated according to the Population–Concept–Context (PCC) framework: What is the specialized nursing intervention directed at the POD in brain death and their family in the context of intensive care units and emergency services? In addition to identifying specialized nursing interventions, this scoping review seeks to map the main associated outcomes described in the literature, namely clinical indicators of the potential donor (hemodynamic stability, physiological stability, organ suitability for transplantation), family-level outcomes (understanding of brain death, grief experience, consent rate for donation), and process outcomes (adherence to maintenance protocols and time intervals between confirmation of brain death and organ procurement).

In the context of this study, specialized nursing intervention is understood as the set of care provided by specialist nurses in medical-surgical nursing, particularly in intensive care units and emergency departments, which ensure the hemodynamic, respiratory, metabolic, and infectious monitoring and stabilization of the potential brain-dead donor, as well as emotional support and structured communication with the family. This definition encompasses both direct care to the critically ill person and the coordination activities of the donation process organized by transplant coordinating nurses, including collaboration with the multidisciplinary team, logistical management of organ procurement, and ethical and communicative mediation with the family.

In this context, the specialist nurse in medical-surgical nursing, in the area of Nursing for the Person in Critical Situations, possesses specific competencies that qualify them to care for the person and family experiencing complex processes of critical illness and organic deficiency, ensuring the differentiated management of complex therapeutic protocols, including the hemodynamic maintenance of the potential donor in brain death[4]. These encompass, among others, the ability to early identify foci of instability, perform high-complexity technical care, conduct therapeutic communication with the family, supporting emotional experiences and grieving processes, which is particularly relevant in the context of organ donation[4].

# Materials and Methods

The present scoping review aims to answer the previously defined research question, which was formulated according to the Population–Concept–Context (PCC) methodology, as presented in Table 1.

The search strategy was implemented in three sequential stages, aiming to identify published and unpublished studies relevant to the review. In the first stage, an exploratory search was conducted in the databases Complementary Index, MEDLINE Ultimate, CINAHL Ultimateand Academic Search Complete (via the EBSCOhost platform), with the objective of identifying the DeCS/MeSHdescriptors, keywords, and most frequent indexing terms in the titles and abstracts of articles related to brain death, organ donation, and nursing interventions in critical care contexts. In the second stage, a Boolean search strategy was designed, combining descriptors and free terms with Boolean operators (AND, OR, NOT) to

| Table 1: PCC Methodology for Formulating the Research Question. | | |
|---|---|---|
| P | Participants | Brain-dead organ donor and family |
| C | Concept | Specialized Nursing Intervention |
| C | Context | Intensive and Emergency Care Unit |

refine the search and maximize the precision and comprehensiveness of the results. The complete search-strings, organized by resource and search field, are presented in Appendix 1. The search plan was designed to identify relevant studies on brain death, organ donation, and nursing care in the aforementioned databases. The search included combinations of DeCS/MeSHdescriptors such as “brain death” AND (“organ donor*” OR “tissue donor*”) AND (family OR families), associating terms in the abstract (AB) field such as “nursing care” OR “nursing interventions” OR “nursing assessment” AND (“critical care” OR “intensive care” OR “emergency care”), refining the results with the NOT operator to exclude children and adolescents (e.g., “children” OR “adolescent” OR “youth” OR “teenager”). In addition to the mentioned databases, the Scientific Repository of Open Access of Portugal (RCAAP) was consulted to include relevant gray literature. Finally, a bibliographic reference analysis of the selected studies was conducted to identify potential additional studies meeting the eligibility criteria. Studies published in English and Portuguese between 2019 and 2024, subjected to peer review, were included.

The definition of eligibility criteria was based on the Population, Concept, and Context framework, including adults ($\geq$ 18 years) in critical condition, potential brain-dead donors, and family. The review focused on specialized nursing interventions, professional competencies, and communication strategies, with emphasis on specific practices applied in intensive care units and emergency departments. Primary studies with qualitative, quantitative, and mixed approaches, systematic reviews, and gray literature, such as doctoral theses or master's dissertations, were included as long as they were directly related to the topic. To ensure timeliness and scientific relevance, only studies published in the last five years, in English and Portuguese languages, in full text, will be considered.

Excluded from this scoping review were studies addressing living donors or donation after cardiac death, investigations involving participants under 18 years of age, and research not focused on nursing care for critically ill patients, potential organ donors with brain death, or family support and communication strategies in critical contexts. Additionally, studies conducted outside intensive care units or emergency departments, publications in languages other than Portuguese and English, works published more than five years ago, and articles presenting only abstracts will be disregarded.

Initially, the research results will be transferred to the reference manager Mendeley Desktop (version 1.19.3), where duplicate articles will be located and removed. Subsequently, a screening by title and abstract was conducted, applying the predefined eligibility criteria, with potentially relevant studies undergoing full-text reading. For each included study, data related to participants, concept, context, methodological design, and main results relevant to the review question were extracted. Later, the included studies were mapped and synthetically represented in a radial diagram, organized by process phases and respective intervention domains.

This strategy resulted in the identification of studies focused on the fundamental aspects of organ donation, brain death, nursing interventions, communication strategies, and family impact.

Initially, 241 records were identified in the consulted databases. After removing duplicates and applying limits related to full-text access, publication period (2019–2024), and languages (Portuguese and English), we found 43 articles for title and abstract screening. Of these 43 records, 15 were obtained from CINAHL, 17 from Complementary Index, 6 from MEDLINE Ultimate, and 5 from Academic Search Complete.

After screening the titles and abstracts, 22 studies were selected for full-text reading. Of these, 8 scientific articles and 1 master's thesis, sourced from the gray literature, fully met the eligibility criteria, totaling 9 studies included in the present scoping review.

The remaining studies were excluded because they focused predominantly on the challenges or experiences of nurses, or on the psychometric validation of attitude scales regarding brain death and donation/transplantation, without providing sufficient description of specific nursing interventions or clinical or family outcomes. The search was conducted on December 28, 2024.

The research strategy was outlined in accordance with the JBI Manual for Evidence Synthesis and the extension PRISMA-ScR, designed to be as comprehensive as possible within available resources and utilizing exclusively the EBSCO platform, which integrates central databases for nursing and health sciences.

The protocol of this scoping review is registered on the Open Science Framework (OSF) platform under DOI 10.17605/OSF.IO/2X5MU.

In accordance with the recommendations of the Joanna Briggs Institute for scoping reviews, no critical assessment of the methodological quality of the included studies was conducted, as the main objective of this review was to map the extent and nature of the available evidence.

### Study/Selection of Evidence Sources

Figure 1 presents the PRISMA diagram with the data selection process.

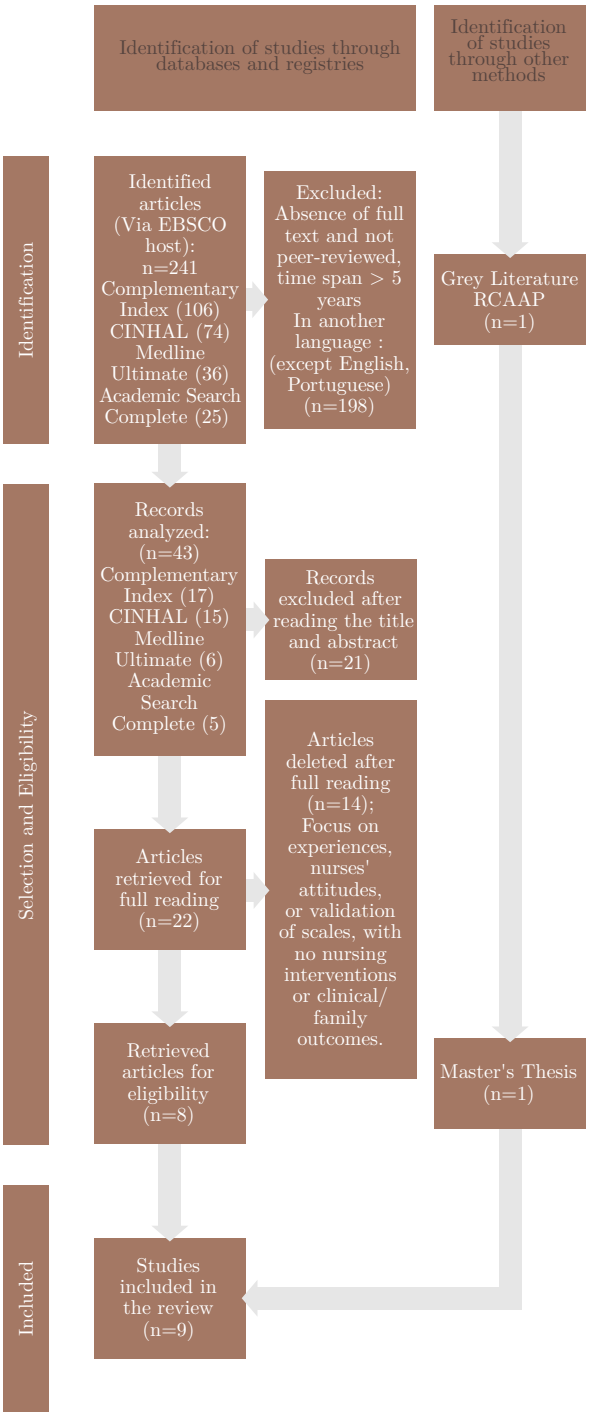


Figure 1: PRISMA diagram.

# Results

This literature review integrated a total of nine studies, corresponding to eight scientific articles and one master's thesis. To systematize and analyze the extracted data, a synthesis matrix was developed. Table 2 presents the characterization of the included studies, considering the author, year of publication, country, study design, sample and context, as well as the described interventions, clinical and family outcomes, and key messages for practice.

**Table 2: Characterization of the nine included studies, integrating author/year/country, design, sample/context, nursing interventions, clinical/family outcomes, and key message-for practice.**

| Author/Year/Country | Study | Context | Nursing interventions | Clinical/family outcomes | Key message |
|---|---|---|---|---|---|
| Yoshikawa *et al*, 2021, Brazil. | Narrative Review. | Studies on brain-dead patients; ICU/ Transplant. | Hemodynamic/respiratory monitoring; maintenance of ventilation and perfusion; metabolic and hormonal control; use of maintenance protocols. | Donor stabilization and organ preservation, with fewer hemodynamic complications. | Standardized protocols for maintaining potential donors improve the donation process and organ quality. |
| Tavares & Cunha, 2023, Portugal. | Integrative review. | Brain-dead patient; ICU. | Identification and maintenance of donor potential; hemodynamic stabilization; infection prevention; empathetic communication and family support. | Improved organ quality and more effective donation process; structured communication reduces family suffering. | The role of the nurse, reinforced with specific training and stabilization protocols, is crucial to preserve organs and support the family. |
| Ribeiro *et al*, 2022, Brazil. | Integrative review. | Families of patients with brain death; unspecified context. | Clear and structured communication; creating spaces for questions; continuous emotional support. | Intense suffering, difficulty accepting brain death, and high stress when there is a lack of information. | The quality of communication and emotional support is important to reduce suffering and promote informed decisions about donation. |
| Sindeuax *et al*, 2021, Brazil. | Integrative review. | Nurses in ICUs with potential brain-dead donors. | Hemodynamic and physiological monitoring; hemodynamic stabilization; infection prevention and control; humanized and ethical care. | Greater clinical stability and functional preservation of organs; safer and more structured donation process. | Systematized care focused on hemodynamics, infection, thermoregulation, and humanized communication are essential for the quality and efficacy of donation. |
| Bezerra *et al*, 2022, Brazil. | Integrative review. | Studies on potential donors in brain death; multiple contexts. | Identification and management of prevalent nursing diagnoses, with continuous training of nurses on brain death and hemodynamic changes. | Greater hemodynamic stability and organ preservation; fewer failures associated with knowledge gaps. | The systematic use of nursing diagnoses, combined with continuous training, is crucial to maintain the stability of the given potential and enable donation. |
| Barros & Sousa, 2021, Portugal. | Systematic literature review. | Families of potential donors; donation process in a hospital setting. | Empathic communication; emotional support; assurance of privacy and welcoming environment; clarification of doubts. | Reduction of emotional suffering, anxiety, and family ambivalence, with better understanding of brain death and greater openness to consider donation as a gesture of comfort in grief. | Family-centered nursing interventions, with empathetic communication and psychological support, are essential in managing grief in the face of brain death and can facilitate organ donation. |
| Tolfo *et al*, 2021, Brazil. | Descriptive, exploratory study, mixed method. | 125 nurses from hospital donation committees. | Educational actions by the commissions to train professionals in donor maintenance and family support; the role of nurses dedicated to donation, coordinating care for potential donors and awareness-raising actions. | Higher likelihood of successful implementation and increased donation rates; better family experience when there is support and information. | Family-centered actions, specialized training, and valuing nurses, along with awareness campaigns, enhance the increase in organ donation and technologies. |
| Fernández-Alonso *et al*, 2020, Spain. | Exploratory, descriptive qualitative study. | 16 nursing coordinators from 6 public hospitals in Madrid. | Fulfillment of the donor's wishes; preservation of bodily and organ integrity; continuous support to the family; honest communication; rigorous coordination of the process; respect for anonymity. | Improvement of quality throughout the course of action, with better preservation of organs and enhanced safety; more positive family experience and greater willingness to consent to donation. | The coordinator nurse is a key element in maintaining the predictability of organs and in supporting the family, coordinating technical care, empathetic communication, and ethical management of the entire donation process. |
| Teixeira, M., 2021, Portugal. | Master's thesis in nursing (practice/ reflection). | Nurses in emergency services and ICU involved in organ and tissue donation | Identification of the patient in brain death; hemodynamic maintenance of the potential donor; application of protocols; empathic and clarifying communication with the family; informed action on ethical-legal aspects. | Improvement of hemodynamic stability and preservation of organs; greater understanding and ease of the donation process by families. | Nurses play a central role in identifying and maintaining the potential donor and supporting the family, requiring clear protocols and ongoing technical and relational training. |

The diagram presented in Figure 2 systematically and sequentially describes the process of maintaining the donor potential in brain death, integrating the interventions of Clinical Nursing, Hospital Donation Coordination, and Family Communication and Support, as well as the corresponding clinical and procedural indicators and goals.

**Figure 2: Process flow diagram for maintaining donor potential in brain death, integrating Clinical Nursing interventions, Hospital Donation Coordination, and Family Communication/Support, with associated indicators/results.**

| Phase | Clinical Nursing (ICU/ER) | Hospital Donation Coordination (HDC) | Communication & Family Support | Indicators/Results |
|---|---|---|---|---|
| 1. **Identification of PDO and confirmation of (BD)** | ABC Mnemonic: *Etiology of brain damage; Brain death alerts; Contraindications to organ donation.*<br>Use of checklists and standardized protocols.<br>Activation of the MC protocol. | Process initiation: Eligibility assessment (history, examination, serologies, cultures).<br>Consultation of RENNDA. | Clear and empathetic information about the diagnosis of MC and the possibility of donation; time for questions and emotional expression. | Early identification of PDO, fewer potential donors lost due to notification failure.<br>Respect for the donor's expressed wishes. |
| 2. **Hemodynamic stabilization** | VIPPS (ventilation, infusion, pressure, pharmacological support, specific instructions).<br>Keep MAP 65–70 mmHg (acceptable 60–80) or SBP $\geq$ 100 mmHg;<br>Monitoring for signs of hypoperfusion and arrhythmias.<br>Record of urinary output (0.5–2.5 mL/kg/h). | Stabilization protocols;<br>Multidisciplinary coordination. | Structured updates on clinical status and stabilization goals, explaining the need to maintain support. | PAM 60–80 mmHg;<br>Débito urinário 0,5–2,5 mL/kg/;<br>Reduction of pre-harvest CPR episodes.<br>MAP/UO on target; Organ preservation. |
| 3. **Ventilation and oxygenation** | Protective ventilation: VT 6–8 mL/kg, adequate PEEP;<br>Avoid volutrauma/barotrauma.<br>Serial gasometric monitoring. | Planning of respiratory/imaging exams for assessment of pulmonary probabilities;<br>Coordination with recipients. | Clarify the role of the ventilator and technological support, humanizing the environment (explanation of alarms, noises, tubes). | $PaO_2/FiO_2 \geq 300$, lower incidence of atelectasis and hypoxemia without potential for harm. |
| 4. **Thermoregulation, metabolism, and infection prevention** | Temperature 36–37 °C, active warming strategies to prevent hypothermia.<br>Glicemia 120–180 mg/dL (ideal $\approx$ 150);<br>$Na^+$ 135–155 mEq/L; $K^+$ 4–5 mEq/L;<br>pH 7,35–7,45; PVC 6–8 mmHg;<br>Lactate monitoring;<br>Implementation of the PPCIRA bundle. | Checklists of serial exams (biochemistry, blood count, coagulation), serologies, cultures; documents for organ authorization decision. | Prepare for waiting times and reassessments; continuous presence, support in managing anxiety and uncertainty. | Target metabolic parameters, reduced infections, and improved organ quality. |
| 5. **Ethics, Humanization, and Documentation Closure of the Process** | Complete records;<br>Respect for the dignity of the body. | Ethical conduct of the process, document management, respect for the donor's will and anonymity | Interview for donation consent, empathetic communication, support at the onset of grief. | Family consent/collaboration, less traumatic grieving experience, process aligned with best practices. |

Legend: MAP – mean arterial pressure; SBP – systolic blood pressure; UO – Urinary output; $Na^+$ – serum sodium concentration; $K^+$ – serum potassium concentration; pH – blood hydrogen potential; CVP – central venous pressure; PDO – potential organ donor; BD – brain death; HCD – Hospital Donation Coordination; IPCIRA – Infection Prevention and Control and Antimicrobial Resistance Program; RENNDA- National Non-Donor Registry

Source: Prepared by the authors based on the submitted manuscript "Specialized Nursing Intervention for the Potential Brain-Dead Donor and Family" and the evidence mapped in the review.

# Discussion

This review covers nine selected studies, which include different research methodologies: four integrative literature reviews, one systematic review, one narrative review, one descriptive and exploratory cross-sectional study, one qualitative exploratory study, and one master's thesis. This methodological diversity allowed for a comprehensive and multifaceted analysis of the phenomenon under study.

From the analysis of the extracted data, several key thematic categories emerged that are fundamental to understanding the organ donation process and the role of nurses in this complex context. Among these, nursing interventions in the identification, monitoring, and maintenance of potential brain-dead donors stand out; the experiences, needs, and challenges faced by families; and the competencies and training needs of nursing professionals. Simultaneously, the ethical and legal aspects inherent to organ donation become evident, as well as the importance of communication quality and emotional support provided to families throughout the process. Finally, the efficient coordination and management of the donation process, through coordinated multidisciplinary teams and standardized protocols, also prove crucial to the system's effectiveness and the realization of the potential for organ donation.

The six literature reviews included (four integrative, one systematic, and one narrative) revealed a convergent set of nursing interventions aimed at the potential donor in brain death and the family. At the clinical level, these reviews describe as core interventions hemodynamic monitoring and stabilization, optimization of ventilation and oxygenation, thermoregulation, metabolic control, and infection prevention. Across the board, they emphasize the adoption of standardized protocols, checklists and care bundles, which are recommended to achieve target physiological parameters and preserve organ viability.

In the communication plan, the reviews addressing the family dimension demonstrate that strategies of structured communication, continuous emotional support, and safe spaces for clarifying doubts improve the understanding of the brain death diagnosis, supervising the suffering in grief and supporting more informed decisions regarding donation. The authors also emphasize the need for continuous training of professionals and effective multidisciplinary coordination, which are presented as crucial for the overall quality of the process.

Two primary studies, a mixed-method study with nurses from the Intra-Hospital Organ and Tissue Donation for Transplant Commissions and an exploratory qualitative study with transplant coordinator nurses, explore the concrete implementation of nursing interventions for potential donors and their families. Tolfo *et al* analyze educational actions, awareness campaigns, and professional training strategies, as well as measures to welcome and support families, showing that these initiatives have the potential to increase organ and tissue donation rates. Fernández-Alonso *et al* describe the central role of the coordinator nurse in fulfilling the donor's wishes, in caring for the family as an extension of the donor, and in the specificity of the donation process, emphasizing that nursing care based on continuous, honest, and humanized communication aimed at better organ preservation and greater family willingness to consent to donation.

Teixeira's master's thesis, presented as a specialized practice report, analyzes the role of emergency and ICU nurses in the donation process, from the identification of the patient in brain death to the hemodynamic and physiological maintenance of the potential donor and the structured approach to the family. The study highlights the central role of the specialist nurse in critical care in applying the Nursing Process, using specific diagnoses and instructions, and conducting family interviews in a welcoming environment, integrating technical and communication skills, as well as the ethical-legal framework of donation.

### Nursing interventions for potential organ donors

In the review conducted by Yoshikawa *et al* on-organ donor management, two main mechanisms leading to brain death (BD) are described. The first involves increased intracranial pressure (ICP), resulting in the interruption of cerebral blood flow, tissue necrosis, and failure of blood absorption by brain tissue. The second, as described by Palmer and Bader, occurs through the collapse of the nervous system at the capillary and cellular levels, where, despite maintained blood flow, tissue oxygenation drops to zero. Both processes lead to the irreversible cessation of brain function, characterizing BD[5].

According to Yoshikawa *et al*, the ischemia resulting from MC triggers a cascade of hormonal, metabolic, and hemodynamic changes, resulting in vagal and sympathetic stimulation. This process clinically manifests as Cushing's triad—bradycardia, hypertension, and irregular breathing pattern—and progresses to apnea. Subsequently, multisystem dysfunctions develop, including cardiovascular changes (hypertension, arrhythmias), pulmonary (pulmonary edema, ventilator-induced lung injury), thermoregulatory (hypothermia), endocrine (diabetes *insipidus*, hypoglycemia), renal (acute kidney injury), and hematological (disseminated intravascular coagulation). Additionally, the activation of pro-inflammatory mediators promotes a significant systemic inflammatory response, which can compromise graft viability post-transplantation[5].

The analysis conducted by Tavares & Cunha aimed to identify the essential nursing interventions to ensure the viability of organs from a brain-dead donor. According to the authors, this process is orga-

nized into four key points: the identification and assessment of the potential donor, using checklists that enhance the effectiveness and safety of healthcare professionals; clinical stabilization, based on continuous monitoring and reducing the number of cardiorespiratory arrests; the crucial role of the intensivist physician in the context of donation; and finally, the importance of scientific research on the pathophysiological mechanisms of brain death and reversible organ damage[6].

Studies suggest that the adoption of structured tools, such as checklists and standardized protocols, can be an effective strategy to optimize the PDO maintenance process[6,7,8,13].

The creation of mnemonics, such as the ABC approach (Etiology of Brain Damage, Brain Death Alerts, and Contraindications to Organ Donation), facilitates the early identification of PDO and standardizes the actions of professionals in critical situations. The ABC mnemonic clearly organizes the key aspects for the assessment of a PDO, with A dedicated to "Etiology of brain damage" (etiology of brain damage), which helps identify the cause of the brain death condition; B, "Brain death alerts" (brain death alerts), which involves the clinical signs and confirmatory tests of brain death; and C, "Contraindications to organ donation" (contraindications to organ donation), which considers factors that prevent donation, such as active infections or other clinical conditions. Additionally, as noted by the authors Martin-Loches *et al*, the mnemonic VIPPS (Ventilation, Infusion, Pumping/Pressure, Pharmacological support and Specific interventions) goes beyond ventilation, perfusion, and pumping/pressure, including pharmacological support and specific interventions for more effective stabilization of PDO[6]. This adapted approach aims for more efficient management of critical patients, involving a combination of invasive mechanical ventilation, volume replacement, use of inotropes or vasopressors, and specific interventions, thereby providing continuous and controlled stabilization of the patient's condition[6].

At the level of hemodynamic support, the "sympathetic storm" in MC is characterized by two distinct phases, as described by Yoshikawa. The initial phase of adrenergic hyperactivity, manifested by tachycardia and hypertension, lasts approximately 30 minutes and is followed by hypotension. Although there is no consensus on the treatment of the initial hypertensive crisis, systolic levels $\geq$ 160 mmHg for more than 30 minutes may result in organ damage due to hypoperfusion of intra-abdominal organs. If temporary blood pressure control is necessary, the use of esmolol or nitroprusside is recommended[5].

According to the mentioned study, the recommended hemodynamic parameters include maintaining the mean arterial pressure (MAP) between 60 and 80 mmHg, or alternatively, a minimum systolic blood pressure (SBP) of 100 mmHg[5].

A comparative analysis between the physiological targets proposed by Hunt & Murphy, as synthesized by Tavares & Cunha[6], and the recommendations of Yoshikawa *et al*[5] allows for a comprehensive mapping of the framework of clinical parameters target and donor maintenance protocols, integrating specific objectives for mean arterial pressure, temperature, diuresis, electrolytes (sodium and potassium), acid-base balance (pH), $PaO_2/FiO_2$ ratio, central venous pressure, and transfusion strategies.

For a more robust understanding of the available evidence, a comparative table of the main parameters for maintaining donor potential in brain death is presented below, relating the physiological goals proposed by Hunt & Murphy, mentioned by Tavares & Cunha[6], with the recommendations described by Yoshikawa *et al*[5].

The analysis of the comparative table shows that the clinical parameters defined for the management of the potential donor in brain death are, in general, aligned with the recommendations of the EDQM Guide for Organ Transplantation, which reinforces their coherence with the current European guidelines. In this sense, the convergence observed between the values presented in the detailed articles and the guidelines of the EDQM Guide for Organ Transplantation (2022), suggests the existence of a core of international consensus regarding the hemodynamic, respiratory, metabolic, and transfusion goals to be prioritized in this context, supporting the external validity of the parameters synthesized from Hunt & Murphy, cited by Tavares & Cunha[6], and Yoshikawa *et al*[5].

**Table 3: Maintenance parameters of the donor potential in brain death: comparison between Hunt & Murphy (cited by Tavares & Cunha) and Yoshikawa *et al.***

| Parameter | Hunt & Murphy 2020 (Tavares & Cunha) | Yoshikawa *et al* |
|---|---|---|
| General objective. | Specific physiological goals to ensure organ perfusion and viability. | Detailed management of hemodynamics, ventilation, and pathophysiology of BD. |
| MAP/BP Hemodynamics. | PAM ≥ 65–70 mmHg. | Maintain MAP 60–80 mmHg or SBP ≥ 100 mmHg. Vasopressin in bolus, followed by 0.5–2.4 U/h; Bradyarrhythmias and tachyarrhythmias treated according to AHA protocols, avoiding atropine in bradycardia. |
| Body temperature. | 36–37 ºC; eactive warming strategies; prevent hypothermia. | 36–37.5°C; central monitoring (nasopharynx/esophagus); active warming strategies. |
| Ventilation and oxygenation. | $PaO_2/FiO_2$= 300 mmHg. Emphasize alveolar recruitment. | Protective ventilation: VC 6–8 mL/kg, PEEP 8–10, plateau pressure < 30 $cmH_2O$; $PaO_2$ ≥ 90 mmHg; prevention of ALI/ARDS. |
| Urine output. | 0,5–2,5 mL/kg/h. | 0.5–4 mL/kg/h, with correction of DI. |
| Blood glucose. | 120–180 mg/dL, ideal around 150 mg/dL. | Control capillary blood glucose every 6 h; treat persistent values > 180 mg/dL. |
| Serum sodium. | 135–155 mEq/L. | 130–150 mEq/L; corrijir hipernatremia com NaCl 0,45% ou SG 5%. |
| Serum potassium. | 4–5 mEq/L. | Does not define a numerical range; recommends monitoring of K, Ca, Mg, and P every 6 h. |
| Arterial pH. | 7,35–7,45. | 7,35–7,45 (aceita até 7,20 em situações específicas). |
| CVP. | 6–8 mmHg. | PVC < 4 mmHg indicates the need for volume regulation; values of 8–12 mmHg do not, by themselves, predict a response to fluids. |
| Nutrition. | No detailed information. | Caloric intake 70–85% of basal energy expenditure; contraindicated in severe instability. |
| Transfusion/coagulation. | Does not specify formal criteria for Hb, fibrinogen, or platelets. | Transfuse if Hb < 7 g/dL (or 7–10 g/dL if target MAP is not achieved); maintain Hct > 30%; cryoprecipitate if fibrinogen < 100 mg/dL; platelets if < 80,000/$mm^3$. |

Note: MAP – mean arterial pressure; BP – blood pressure; SBP – systolic blood pressure; $PaO_2$ – arterial oxygen pressure; $FiO_2$ – inspired oxygen fraction; CVP – central venous pressure; Na – sodium; K – potassium; Ca – calcium; Mg – magnesium; P – phosphorus; DI – diabetes insipidus; Hb – hemoglobin; Ht – hematocrit; DIC – disseminated intravascular coagulation; AHA – American Heart Association.

Despite the overall consistency observed, the small numerical discrepancies identified between the articles and the European guideline do not seem to reflect a conceptual divergence, but rather the need to preserve a margin of clinical adaptation to the particularities of critical illness. This finding reinforces the importance of a critical and contextualized reading of the guidelines and highlights the need for additional research to clarify whether more conservative or more permissive targets (for example, in mean arterial pressure, serum electrolyte levels, or the $PaO_2/FiO_2$ ratio) are associated with the best clinical outcomes. Such contributions may, in the medium term, promote greater harmonization between empirical evidence and normative recommendations applicable to the management of the potential brain-dead donor, strengthening quality and safety standards aligned with the guidelines of the European Council.

The integrative review by Sindeuaux *et al* (2021) on nursing care for brain-dead organ donors (PDO) equally emphasizes the primacy of hemodynamic monitoring. This includes maintaining blood pressure at adequate levels, preferably via invasive methods, infusion of warmed crystalloids, monitoring for signs of hypoperfusion, and measuring central venous pressure. The study further highlights the importance of controlling arrhythmias and early recognition of hemodynamic changes and organic complications to ensure organ viability for transplantation[8].

The main nursing diagnoses applicable to the potential PDO were systematized by Bezerra *et al* (2022), based on the Classification of the North American Nursing Diagnosis Association (NANDA). The synthesis presented below integrates the diagnoses most frequently identified by the authors, organized according to the respective related factors and clinical implications, with the aim of highlighting the critical areas of nursing intervention in the context of intensive care[9].

**Table 4: Nursing diagnoses in the NCP, adapted from Bezerra *et al* (2022), formulated according to the NANDA International taxonomy (2021–2023), including the associated factors and clinical implications described by the authors based on the mapped evidence.**

| Diagnosis (NANDA-I) | Associated Factors | Clinical Implications |
|---|---|---|
| Risk of infection. | Loss of central thermoregulation. | Reduces hemodynamic stability and may compromise organ goals. |
| Risk of hemorrhage. | Vasodilation, hypotension, autonomic dysfunction. | Requires hemodynamic monitoring, pressure, and vasopressor titration. |
| Risk of unstable blood glucose. | Hypovolemia, hemorrhage, renal losses. | Impairs tissue perfusion and the quality of organs for transplantation. |
| Impaired gas exchange. | Ventilation-perfusion imbalance, pulmonary edema. | Decrease tissue oxygenation and may limit organ utilization. |
| Risk of compromised fluid volume. | Endocrine dysfunction, therapy, fasting. | Disrupts energy metabolism and contributes to clinical instability. |
| Risk of decreased cardiac output. | Coagulopathy, liver dysfunction, procedures. | Worsens hemodynamic instability and may compromise harvesting. |
| Hypothermia. | Invasive devices, adaptive deficit. | Increases the risk of infections and may contraindicate the use of organs. |

The identified nursing diagnoses highlight that maintaining donor potential requires a systematic and protocol-driven approach, focused on preventing hemodynamic, respiratory, metabolic, and infectious complications, in order to preserve the viability of organs for transplantation.

The evaluation for organ and tissue transplantation must ensure the absence of risk of transmission of infectious or neoplastic diseases, as well as determine the functionality of the organs to be transplanted[5,6,8,9]. In the patient with brain death, this evaluation includes clinical history, physical examination, complementary diagnostic tests, and intraoperative report. The clinical history is obtained through analysis of medical records and interviews with family members. The physical examination, including anthropometric measurements, is essential to ensure compatibility between donor and recipient and to identify possible contraindications. The tests include blood cultures and urine cultures, biochemical tests performed every 24 hours, and serological tests[5].

The studies included in this scoping review converge on the importance of continuous laboratory monitoring of the donor's potential, but tend to describe it in a generic manner, without systematically specifying the panel of blood cultures, urine cultures, serial biochemical tests, and serologies to be performed. In contrast, international normative guidelines, particularly in the Guide to the quality and safety of organs for transplantation (2022), explicitly establish these tests as a mandatory component of donor evaluation, highlighting a discrepancy between the level of laboratory detail advocated by technical-regulatory frameworks and how the practice is described in the nursing literature.

The results of the study conducted in Spain by Fernández-Alonso *et al* highlight the crucial role of transplant coordinating nurses (CNT), emphasizing the ethical perspective and humanization of the organ donation process. The central aspect is respect for the donor's autonomy, even after brain death. Nurses ensure that the donor's wishes are honored, treating them as a patient with rights. This includes maintaining dignity through aesthetic care of the body, preserving respect for the donor and their family. Furthermore, the decision to donate is seen as an act of generosity that requires adequate ethical and technical support. This approach reflects a strong commitment to ethical principles and the humanization of the organ donation process in the Spanish system[13].

### Care for the family

According to the integrative review conducted by Ribeiro *et al* (2022), families experience significant emotional distress at the time of communicating the diagnosis of brain death, with frequent manifestations of sadness, anguish, grief, and denial. The organ donation process is marked by a set of distinct phases, each associated with specific emotional and behavioral reactions from the family members of the potential donor. In the initial phase, family members experience intense concern and fear about the prognosis, often accompanied by denial of the severity of the clinical condition. As the process progresses, there is a significant difficulty in understanding brain death. Many still hold hopes for a reversible diagnosis, believing in the possibility of recovery[7].

After confirming the diagnosis, a particularly delicate period begins. This phase is marked by a sense of double loss: the farewell to the loved one and the acceptance of donation, which may be perceived as a second farewell. At this critical moment, the approach of the medical and nursing team becomes essential to support the family and facilitate decision-making[6,8,12,13,14]. After confirming the diagnosis, it becomes necessary to inform the family and conduct an explanatory interview about the organ and tissue donation process[8,14].

Barros and Sousa also dedicated themselves to exploring the experiences of the PDO family, highlighting the intense emotional burden and conflicting feelings that arise during this process. The lack of understanding about the concept of MC and the lack of clarity in medical explanations hinder the comprehension of the diagnosis, increasing suffering and, at times, generating resistance to donation[11]. Many families experience the moment of decision as a significant moral responsibility, considering the impact of their choice on the lives of the recipients.

Although this intensifies the emotional weight, for some families, the possibility of transforming loss into an altruistic gesture brings comfort and meaning, especially when they receive adequate support[12,13].

Families who refuse donation face similar emotional challenges, often exacerbated by doubts and regrets. In both cases, the experience is described as difficult and filled with tension, regardless of the decision made. This study reveals two crucial challenges that significantly affect families' experience in the organ donation process: time pressure, characterized by the short interval between the notification of death and the request for consent for donation, and the lack of adequate emotional support, both during the deliberative process and in the subsequent period, regardless of the decision made. These combined factors intensify the stress and anguish of families during an already emotionally fragile time[12].

It is imperative to respect family autonomy, providing all members with the opportunity to express their perspective. The primary purpose of the interview is to clarify the process, refraining from exerting pressure to obtain agreement. Authorization for donation can provide comfort and support in the grieving process; however, the lack of information about the recipient may lead to frustration[7,8,12].

Another factor that may influence the family's resistance to organ donation, described by Sindeuaux *et al* (2021), is the lack of technical knowledge among healthcare professionals about brain death and its indicators, which can compromise effective communication with family members and a patient-centered approach. The trust and security conveyed by professionals prove crucial for the acceptance or refusal of organ donation, profoundly influencing the outcome of the process[8].

From the perspective of Transplant Coordination Nurses, the family is considered an extension of the donor, playing a fundamental role in the continuity of the donation process. Support for the family is guided by constant, organized, and respectful communication, prioritizing privacy and respect for mourning. Additionally, Transplant Coordination Nurses often accompany families during more delicate moments, such as going to the operating room or the release of the body, reinforcing emotional support during the most critical stages of the process[13].

The quantitative results of the study by Tolfo *et al* (2020), which involved 125 nurses from the Intra-Hospital Commissions for Organ and Tissue Donation for Transplants (CIHDOTT), highlight the importance of the guidance and support actions carried out by nurses in the context of organ donation. It was found that a significant percentage of professionals, specifically 64.8%, stated that they “always” promote and organize family support before, during, and after the donation process, thus demonstrating the importance of continuous support to family members. Additionally, 53.6% of nurses reported “always” maintaining telephone contact with family members, with the aim of providing essential information and clarifying doubts throughout the process. Regarding respect for the wishes of the potential donor and their family, 61.6% of nurses stated that they “always” act in accordance with these wishes, even when they personally disagree with the decisions made. Family support emerged as an essential pillar, emphasizing the importance of humanized reception, continuous communication, and comprehensive support to families during the donation process[11].

### Skills and training of nurses

As evidenced by Ribeiro *et al*, significant challenges were identified in the organ donation process, namely: the lack of technical skills among healthcare professionals responsible for conducting family interviews; the inadequacy of environments intended for these interactions; and the pressing need to foster opportunities for learning and exchange of experiences among professionals involved in this sensitive context[7,14].

Tavares & Cunha identified significant gaps in nurses' technical knowledge regarding the brain death protocol and the maintenance of the potential organ donor. The study revealed that 50% of the evaluated professionals were unaware of the appropriate time to initiate the MC protocol or the ideal physiological parameters for maintaining the PDO, also highlighting weaknesses in the early identification of hemo-

dynamic changes. Another gap identified by these authors was the scarcity of specific equipment for the diagnosis and maintenance of the PDO as well as the lack of trained professionals[6].

The results of the analyzed studies show that nursing professionals face significant obstacles in mastering the criteria and clinical manifestations associated with brain death, as well as in preserving the organ donor potential. The identified vulnerabilities include weaknesses in the early detection of indicators of physiological compromise, namely hypothermia, hemodynamic instability, and hydroelectrolytic disorders associated with polyuria/diabetes *insipidus*.

Gaps are also observed in the implementation of preventive criteria for complications and in adherence to standardized protocols for maintaining the hemodynamic and metabolic functions of the patient[5,6,8,9].

In the dimension of professional training, the results of the investigation by Tolfo *et al* were particularly revealing only 15.2% of professionals regularly engage in training activities, and 55% rarely participate in educational activities external to the hospital. Professional training was highlighted in the aforementioned study as a challenge to overcome the lack of technical knowledge, skill gaps, and professional insecurities, which can compromise the organ donation process[11].

The results highlight the complexity and multidimensionality of the organ donation process, reinforcing the crucial role of nurses in maintaining PDO, supporting families, and coordinating the entire process. The analyzed studies emphasize nursing interventions as fundamental pillars for the clinical stabilization of PDO and the realization of transplantation, underlining the need for structured tools, such as checklists and mnemonics (ABC and VIPPS), which optimize early identification, continuous monitoring, and reduction of risks associated with poor management of physiological parameters.

In the context of supporting the families of potential donors, the research results highlight the intense emotional impact caused by the diagnosis of brain death. Feelings of grief, anguish, denial, and difficulty in understanding the concept of brain death are common among family members, creating barriers that may hinder the acceptance of organ donation. The studies reinforce the importance of empathetic and effective communication, aimed at clarifying doubts and reducing family anxiety. Support strategies and emotional support, such as organizing farewell moments, and continuous support, which respects the values and emotional needs of families, prove to be essential to alleviate suffering[7,12,13,14].

Despite the efforts of nursing teams, challenges such as time pressure to make decisions and the lack of emotional support during and after the process remain significant limitations. These conditions can increase family suffering and negatively influence decisions regarding donation, highlighting the importance of more humanized and personalized strategies. In this context, the role of the nurse as an intermediary between the family, the medical team, and the transplant process is central to ensuring that decisions are made in an informed and respectful manner[12].

Time is a critical factor in this process, as prolonged periods between diagnosis and organ removal are associated with a more intense inflammatory response and less favorable outcomes in transplants. Therefore, it is recommended that the interval between the diagnosis of brain death and organ procurement be limited to 12-24 hours[5]. A study on the impact of donor brain death duration on post-transplant outcomes evaluated the influence of the interval between brain death diagnosis and organ procurement on graft function and recipient survival in kidney, liver, heart, and lung transplants. The results challenge the notion that extending this interval beyond 12–24 hours is inherently harmful, suggesting that the optimal duration varies depending on the organ and depends predominantly on the quality of hemodynamic and metabolic stabilization of the donor, rather than a rigid time limit, highlighting the relevance of individualized donor management strategies to optimize graft viability[15].

These results suggest that an "ideal window" varies depending on the organ and that post-transplant outcomes depend more on the quality of monitoring and correction of pathophysiological changes than

on an absolute temporal cutoff. For this review, these findings reinforce two central aspects for specialized nursing. First, we demonstrate that effective interven-tions in hemodynamic stabilization, thermoregulation, metabolic control, and infection prevention can redu-ce the impact of longer waiting times until harvest. Second, we support an individualized approach, where the optimal timing for harvest results from the com-bination of the time elapsed since the diagnosis of MC and sensitive indicators of clinical stability, aligning graft safety and donation logistics.

The study results emphasize the ethical and humanized role in PDO care. Respect for donor autonomy and dignity emerges as a central principle, reflected both in maintaining bodily integrity and in providing emotional support to the family. This ethical approach, aligned with the commitment of transplant coordinator nurses to efficiently coordinate the various stages of the process, demonstrates how humanization is essential to the success of organ donation[13,14]. However, the research also points to the need for greater institutional support, which includes exclusive dedication to this type of work, adequate remuneration, and specialized training for the professionals involved[13].

Finally, the role of awareness campaigns and educational initiatives is emphasized as crucial to demystify social prejudices about organ donation and promote greater acceptance by society[11]. However, there is low adherence from professionals to regular training and a lack of continuing education initiatives, which represents an obstacle to the improvement of practices[8,9,11,14].

The reading of the Spectral Diagram of the maintenance process of the donor potential in brain death shows that the interventions of Clinical Nursing, the Hospital Donation Coordination, and Communication/Family Support are distributed interdependently throughout all phases of the maintenance process of the donor potential in brain death, demonstrating that clinical stabilization is only effective when supported by rigorous logistical complexity (e.g., eligibility assessment, coordination with recipients, temporal management of harvesting) and by structured communication with the family, aimed at understanding brain death and supporting donation decisions. This pattern reinforces the need for integrated protocols that align physiological goals, organizational procedures, and relational strategies, as well as specific training programs for multiprofessional teams, to ensure consistency in practice, reduce variability between services, and promote a donation process that is simultaneously safe, efficient, and humanized.

The included studies consistently demonstrated the centrality of clinical, relational, and organizational interventions in the process of maintaining the potential donor in brain death.

In the clinical setting, the need for continuous hemodynamic monitoring, adjustment of vasopressors to meet MAP targets between 65–70 mmHg, use of protective mechanical ventilation, and strict control of temperature, blood glucose, and electrolytes stands out, aligned with structured protocols for infection prevention and control. The improvement of these care practices is associated with greater physiological stability of the potential donor, reduced episodes of hemodynamic collapse prior to organ retrieval, and better functional preservation of organs, although such effects predominantly emerge in safety narratives, with scarce systematic quantification of outcomes.

In the domain of family, nursing interventions focused on communication and emotional support are described, including gradual explanation and understanding of the brain death diagnosis, creation of private contexts for clarifying doubts, continuous presence with family members, validation of emotional reactions, respect for decision-making time, and conducting donation interviews in welcoming environments. These practices are associated with greater understanding of the concept of brain death, alleviation of suffering and ambivalence towards loss, and greater willingness to consider donation as an act of care and meaning in mourning, although the benefits are reported mainly in qualitative terms, without systematic use of standardized assessment instruments.

At the organizational level, studies addressing the hospital dynamics of donation describe processes such as the systematic notification of potential

donors, verification of clinical and legal eligibility, integration between ICU/emergency departments, operating rooms, and recipient teams, management of intervals between confirmation of brain death and organ retrieval, as well as the standardization of records throughout the entire pathway. In various contexts, internal awareness and training programs for care teams are also reported, aimed at reinforcing early identification of potential donors and adherence to institutional protocols. These strategies appear to be associated with reducing the time between confirmation of brain death and organ retrieval, decreasing losses of potential donors due to organizational failures, and increasing the effectiveness of actions, particularly in institutions with dedicated coordinators and well-defined procedures; however, the evidence remains largely descriptive, limiting the robustness of causal inferences regarding the impact of hospital structure.

In summary, the success of the organ donation process is intrinsically linked to the implementation of well-structured technical practices, empathetic communication, and emotional support for families, combined with an ethical and humanized approach. Investments in training, protocol development, and strengthening multidisciplinary teams are essential to overcome the identified challenges and improve outcomes in organ donation and transplantation.

# Conclusion

A scoping review allowed mapping three central domains of specialized nursing intervention for the potential brain-dead donor and the family: differentiated clinical care, communicational and emotional support, and organizational coordination of the donation process. Collectively, these domains translate into interventions that are specific to the hemodynamic and physiological stabilization of the potential donor, to a clearer understanding of brain death by the family, and to more structured and efficient donation processes, although, in most studies, the effects are described in a predominantly narrative and poorly quantified manner.

In the family context, studies converge on the relevance of structured, gradual, and empathetic communication, the creation of protected spaces for clarifying doubts and emotional expression, and the continuous presence of professionals as mediators between the family and the multidisciplinary team. These interventions are associated with a better understanding of brain death, reduced suffering and ambivalence, and greater willingness to consider donation as an act of care and meaning in the grieving process, although the evaluation of these outcomes is predominantly qualitative and lacks support from standardized instruments.

Temporal pressure and the lack of formal psychological support programs before and after the decision remain critical challenges, with potential impact on registration rates and the quality of the family experience.

At the organizational level, the review shows that the existence of dedicated coordinators, systematic notification of potential donors, coordination between ICU/emergency departments, operating rooms, and recipient teams, as well as the standardization of records and workflows, are associated with the reduction of losses due to logistical failures and increased effectiveness of donation. However, the evidence remains essentially descriptive, with limited measurement of the impact of these structures on objective indicators, such as the time between brain death diagnosis and organ retrieval, incidence of pre-retrieval hemodynamic collapse, or exercise outcomes and recipient survival.

A scoping review highlighted significant gaps in the nursing literature, among which the absence of robust trials and observational studies that allow quantifying the effect of nursing interventions on clinical outcomes of the donor and recipient, as well as the scarce use of validated instruments to assess distress, understanding of brain death, and the quality of family decision-making stand out. These weaknesses add to the insufficiency of continuous training, the low participation of nurses in educational activities, and the non-systematic implementation of structured training programs in brain death, end-of-life communication, and coordination of the entire dona-

tion process.

These gaps have direct implications for practice, management, and health policy, making it mandatory to develop and implement integrated protocols that align physiological goals, organizational procedures, and family communication strategies, supported by specific training programs for intensive care, emergency, operating room, and transplant teams. It is also recommended to establish models of continuous psychological support for families, from the diagnosis of brain death through the post-decision period, as well as to define and systematically monitor indicators sensitive to nursing interventions of a clinical, familial, and organizational nature.

Finally, it is important to highlight the need to strengthen awareness-raising and professional training strategies, as well as the development of educational campaigns to demystify prejudices and increase social acceptance of organ donation. Investments in continuous training, the creation of standardized protocols, and the strengthening of multidisciplinary teams are essential to ensure a more efficient, humanized donation process aligned with the best evidence-based practices.

The evidence presents methodological and geographical limitations, with a predominance of studies from Brazil, Portugal, and Spain and reliance on consolidated databases, which restricts the generalization of the results and reinforces the need for future reviews with greater diversity of sources and registered protocols. This geographical concentration of studies limits the generalization of the results to realities outside the Ibero-American context, requiring caution in extrapolating the findings to other health systems.

For future investigation, it becomes a priority to: (1) develop multicenter studies that evaluate the impact of nursing intervention bundles on donor, family, and recipient outcomes; (2) validate and apply standardized instruments to assess family experience and communication quality; and (3) explore the relationship between donor stabilization quality, brain death duration, and transplant outcomes, in order to refine time windows and decision criteria centered on graft safety. By strengthening specialized training, applied research, and institutional support for nursing and organ donation coordination teams, it becomes possible to consolidate a more equitable and deeply humanized organ donation process, aligned with international best practices and the real needs of critically ill individuals and their families.

# Appendix I

## Search Strategy

Boolean search was implemented to identify relevant studies on the topic in four databases (via the EBSCOhost platform): Complementary Index, Medline Ultimate, Academic Search Complete, CINAHL Ultimate, and using Boolean operators (AND, OR, NOT), the search strategy was refined to optimize the precision and comprehensiveness of the results.

**Appendix I: Bibliographic search strategy in the EBSCOhost databases.**

| Boolean Conjugation | Retrieved records |
|---|---|
| DeCS/MeSH *AND* "brain death" | 117233 |
| DeCS/MeSH *AND* "organ donor*" *OR* "tissue donor*" | 22497 |
| DeCS/MeSH *AND* "family" OR "families" | 9273 |
| DeCS/MeSH *AND* "nursing care" *OR* "nursing interventions" *Or* "nursing assessment" | 568 |
| DeCS/MeSH *AND* "critical care" *OR* "intensive care" *OR* "emergency care" | 496 |
| DeCS/MeSH *NOT* "children" *OR* "adolescent" *OR* "Youth" *OR* "child" *OR* "teenager" | 241 |

Initially, 241 records were identified in the consulted databases. After removing duplicates and applying limits regarding access to full text, publication period (2019–2024), and languages (Portuguese and English), 43 articles remained for title and abstract screening. Of these 43 records, 15 came from CINAHL, 17 from Complementary Index, 6 from MEDLINE Ultimate, and 5 from Academic Search Complete. After title and abstract screening, 22 studies were selected for full-text reading, of which 8 articles and 1 master's thesis met the eligibility criteria and were included in this scoping review.

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AA: Study coordination, study design, data collection, storage and analysis, review and discussion of results.
AP: Data analysis, review and discussion of results.
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