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Early recognition of sepsis in adult emergency care.

Early recognition of sepsis in adult emergency and urgent care

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SUMMARY

To describe the approaches found in the literature regarding the early recognition of sepsis in adult emergency care. Methods: This is a review.
Integrative Literature Review conducted in the SCIELO, LILACS, MEDLINE, and BDENF databases, using the descriptors "sepsis," "clinical protocol," and "emergency nursing," combined with the Boolean operator AND. Articles published between 2019 and 2025, available in Portuguese or English, were included. Results: Initially, 11,470 articles were found. After applying the inclusion and exclusion criteria, 51 were selected, and after complete analysis, 8 studies comprised the review. The analyzed publications were distributed in the SCIELO (4 articles), LILACS (3 articles), and BDENF (1 article) databases, while the MEDLINE database did not present any articles compatible with the criteria. Conclusion: Early recognition of sepsis remains a challenge in emergency services.

Professional training, the effective implementation of clinical protocols, and the use of emerging technologies are fundamental strategies for improving care, speeding up diagnosis, and reducing mortality associated with the syndrome.
Keywords: Sepsis. Clinical protocol. Emergency nursing.

ABSTRACT

Objective: To describe the approaches found in the literature regarding the early recognition of sepsis in adult emergency and urgent care. Methods: This is an Integrative Literature Review conducted in the SCIELO, LILACS, MEDLINE, and BDENF databases, using the descriptors "sepsis," "clinical protocol," and "emergency nursing," combined with the boolean operator AND. Articles published between 2019 and 2025 in Portuguese or English were included.
Results: A total of 11,470 articles were initially identified. After applying the inclusion and exclusion criteria, 51 articles were selected, and following a complete analysis, 8 studies composed the review. The selected publications were distributed among SCIELO (4 articles), LILACS (3 articles), and BDENF (1 article); no articles from MEDLINE met the criteria.
Conclusion: Early recognition of sepsis remains a challenge in emergency and urgency services. Professional training, effective implementation of clinical protocols, and the use of emerging technologies are essential strategies to improve care, expedite diagnosis, and reduce sepsis-related mortality.

Keywords: Sepsis. Clinical protocol. Emergency nursing.

INTRODUCTION

Sepsis is a potentially fatal clinical syndrome resulting from an

A dysregulated inflammatory response to an infection, leading to organ dysfunction and, in many cases,

Sometimes, this leads to death (Westphal; Lino, 2015). This condition represents a serious problem.

of public health in Brazil and the world, being one of the main causes of

hospitalization in intensive care units and hospital mortality (Santos *et* al., 2022). The onset of the clinical picture is usually subtle, with nonspecific changes. vital signs, such as tachycardia and tachypnea, make early diagnosis difficult and compromising the patient's prognosis (Ribeiro, 2023).

Given this scenario, investing in identification and management becomes essential. Early detection of sepsis is crucial for reducing mortality, according to guidelines from the *Surviving Sepsis Campaign* and the World Health Organization indicate this. (Coelho *et* al., 2024). Early intervention strategies are based on the use of Standardized clinical protocols, such as the one-hour bundle, guide the start. Rapid antibiotic therapy and supportive measures increase the survival rate (Jaimes *et* al., 2019). However, several studies show that, even with the availability Of these protocols, there are flaws in their application, especially in emergency services and emergency (Santos *et* al., 2022).

In this scenario, the crucial role of the nursing team stands out, which operates in The nurse is often on the front line of care for septic patients. first professional to observe the initial signs of the syndrome, being responsible for Essential actions such as clinical screening, monitoring of vital signs, and implementation. immediate implementation of the conduct outlined in the protocol (Ribeiro, 2023). Qualified action and Systematized nursing care contributes to early recognition, preventing progression of sepsis to more severe conditions, such as septic shock and failure of multiple organs (Westphal; Lino, 2015).

Despite the relevance of nursing in the identification and intervention process Although it is early on, gaps in the technical and scientific knowledge of professionals are still evident. Regarding sepsis management, the literature points to limitations in training and adherence to protocols. protocols and autonomy for timely decision-making, which reinforces the There is a need to expand studies focused on nursing practice in this context. (Santos *et* al., 2022; Coelho *et* al., 2024).

Given the above, this study aims to describe the approaches present in the literature on the early recognition of sepsis in the care of Urgent and emergency care in adults.

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THEORETICAL FRAMEWORK

SEPSIS

Sepsis is a severe clinical syndrome resulting from...
A dysregulated host response to an infection, which can trigger
Organ dysfunction, septic shock, and in many cases, death. Despite
Widely studied, it remains one of the leading causes of mortality in
Intensive care units. Their complexity stems from the variability of
clinical manifestations and the need for rapid diagnosis coupled with a
Immediate therapeutic intervention. Estimates point to more than 50 million cases.
Annually worldwide, with approximately 11 million deaths, demonstrating its high lethality and
the strong impact on health systems (GYAWALI et al., 2019).

In the Brazilian context, sepsis ranks second among the main causes of death.
causes of death in hospitals, with the leading cause being in ICUs, with case fatality rates that,
Depending on the severity of the clinical condition and the hospital infrastructure, they may exceed
50%. This scenario is influenced by several factors, including the difficulty in
Early identification, underreporting of cases, and variation in adherence to guidelines.
clinical aspects. Furthermore, factors such as the presence of chronic diseases, advanced age, and the
The primary focus of infection directly interferes with the clinical outcomes of patients.
affected (SANTOS et al., 2022).

PATHOPHYSIOLOGY OF SEPSIS

The pathophysiology of sepsis begins with the recognition of pathogens by
receptors present in the defense cells of the innate immune system, promoting a
A cascade of inflammatory signaling with the release of cytokines. This process
Exacerbated symptoms lead to damage to cells and tissues, activation of the coagulation system, and
impaired tissue perfusion. The vascular endothelium plays a key role in this.
context, being one of the main targets of aggression, with an increase in its
permeability, glycocalyx degradation, microthrombus formation, and progression to
Multiple organ failure. Sepsis also induces a later phase of immunosuppression.
which reduces the body's ability to fight new infections, raising
considerably the mortality rate (GYAWALI et al., 2019).

This intense inflammatory response impacts various organ systems in a way simultaneous, primarily affecting the cardiovascular and respiratory systems, renal and neurological. Loss of endothelial barrier integrity results in the formation interstitial edema and decreased cellular oxygenation worsen hypoperfusion. tissue. Sepsis also significantly compromises the adaptive immune response. causing lymphocyte apoptosis and macrophage dysfunction, which reduces the capacity the body's ability to respond to secondary infections. These changes result in a condition The clinical picture is volatile and complex to manage, which reinforces the need for intervention. urgent and structured therapy (BERMEJO-MARTIN et al., 2019).

AGING AND VULNERABILITY

Physiological aging and the coexistence of chronic diseases, such as Systemic arterial hypertension, diabetes mellitus, renal failure, and heart disease are Factors that significantly increase the risk of developing and worsening sepsis. which can lead to death. The concept of immunosenescence refers to deterioration. The immune system progressively weakens with age, compromising innate immunity and adaptive. This decline reduces the initial inflammatory response, increasing the Susceptibility to severe infections and unfavorable clinical progression. Other Aggravating factors include intestinal dysbiosis, malnutrition, and polypharmacy resulting from pre-existing conditions (MARTÍN; PÉREZ; ALDECOA, 2017).

Studies indicate that the age group over 80 years old is the most affected in terms of... of lethality associated with sepsis, due to biological fragility, the reduction of physiological reserves and a high burden of comorbidities. The immune response in these patients It appears dysregulated, with lower production of protective cytokines and higher expression of anti-inflammatory mediators such as interleukin-10, which compromises the effectiveness of natural defenses. The treatment of sepsis in the elderly, therefore, should not be limited to resolution of the infection, but considering the broader clinical context, requires an individualized and humanized approach (MARTÍN; PÉREZ; ALDECOA, 2017).

Nursing care in sepsis

Nursing plays a fundamental role in the management of sepsis, particularly in... early identification of clinical symptoms and immediate implementation of appropriate measures

therapeutics. Constant monitoring of parameters such as blood pressure, diuresis, Respiratory rate and state of consciousness are essential for detection of hemodynamic changes. Furthermore, it is the responsibility of the nursing team to... Collection of blood cultures before administration of antimicrobials, correct dilution and application of

medications, maintenance of venous access for infection prevention and Ventilatory support when indicated. Ongoing professional training is essential. essential for adherence to institutional protocols and for reducing mortality. (SANTOS et al., 2022).

Another critical point in the care provided by nursing is the ability to clinical judgment, which allows for the rapid activation of institutional protocols, such as The three- or six-hour bundles recommended by international guidelines. The performance of The nurse is proactive, grounded in technical and scientific knowledge, promoting integration. with the multidisciplinary team to optimize interventions, including requesting Laboratory tests, fluid administration, and early detection of complications. A Systematizing record keeping and investing in ongoing training become Strategic measures to ensure quality of care and improve outcomes. caregiving (WESTPHAL; LINO, 2015).

MANAGEMENT PROTOCOLS

Sepsis management protocols, such as those recommended by the Campaign of Survival in sepsis relies on early detection of the condition and the administration of... Broad-spectrum antimicrobials in the first few hours and adequate fluid replacement. Practices such as early goal-directed therapy and the implementation of bundles Assistance programs have demonstrated a positive impact on reducing mortality. The implementation of triage systems, rapid response teams, and synergistic action among professionals in Health factors are crucial for reversing the infectious condition and stabilizing the patient's condition. patient (WESTPHAL; LINO, 2015).

Several studies show that the structured organization of protocols Sepsis care contributes to reducing intervention time and increases adherence to treatment. Timely antibiotic therapy directly impacts survival rates. However, for these protocols to be effective, it is essential to invest in training staff, improving hospital infrastructure and ensuring efficiency of

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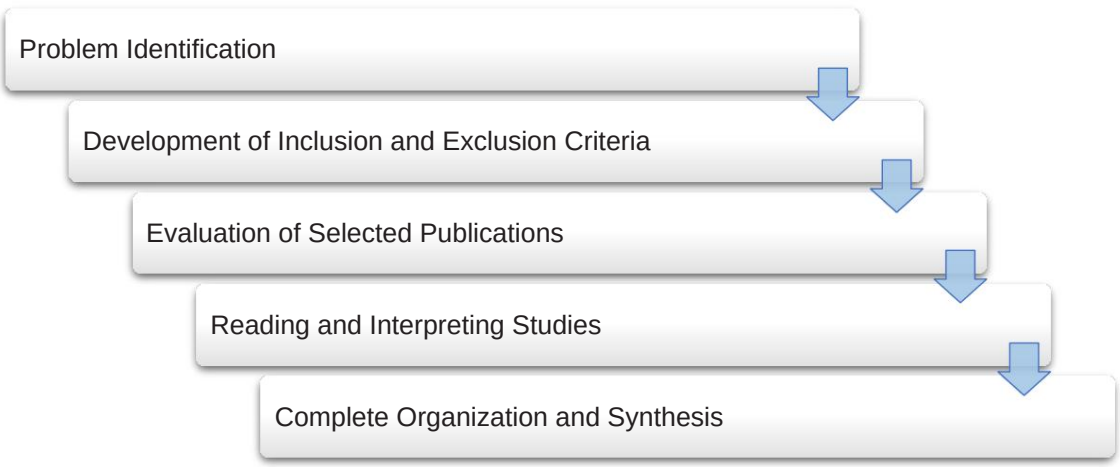
Healthcare flows. Institutional resistance to change and the overload in services of Urgent situations still represent significant challenges, reinforcing the need for policies. patient safety and the dissemination of evidence-based best practices (SANTOS et al., 2022)

MATERIALS AND METHODS

This is a descriptive study that uses the review technique. Integrative Literature (RIL), which allows one to obtain a broad body of knowledge and practical results from various publications produced over the years, incorporating concepts and scientific evidence.

Data collection was carried out using periodicals indexed in libraries. Virtual Health Libraries (VHL), including the Scientific Electronic Library Online (SCIELO), the Medical Literature Analysis and Search Online System (MEDLINE), the Literature Latin American and Caribbean Health Sciences Database (LILACS) Specialized Bibliographical References in the Nursing field (BDENF). The search was conducted using four Health Sciences Descriptors (DeCS) combined with the operator Boolean ". "AND" "sepsis" AND "clinical protocol" AND "nursing in emergency" AND.

Figure 1: Stages of research development. Author's own source.

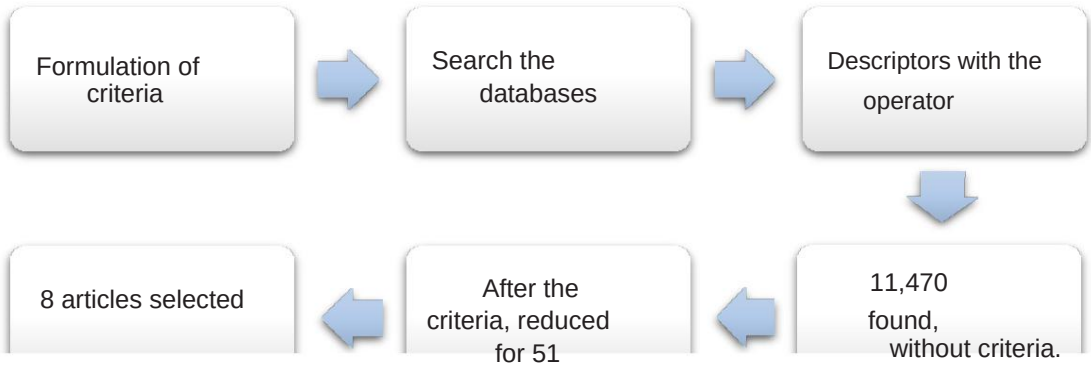


The following types of articles were chosen as inclusion criteria: Original articles, systematic reviews, integrative reviews, and case reports.

The selected articles are available for free; the articles used were in Portuguese or English, from 2019 to 2025, addressing the research topic. On the other hand, there were Excluded are documents with incomplete texts, abstracts, monographs, dissertations, and... theses, in addition to those written in languages other than English or Portuguese.

The articles were chosen according to the criteria established from the titles, and categorized into clinical guidelines (4) and protocols (4) Next, the abstracts The articles were analyzed and, finally, read in their entirety. Those that were Those aligned with the proposed theme were selected for the study.

Figure 2: Flowchart of the article selection steps for review. Source own.



RESULTS AND DISCUSSION

Using the four selected DeCS (Descriptors in Health Sciences), a total of 11,470 articles were identified. in the databases. After applying the inclusion and exclusion criteria, the number of articles The number of individuals selected for the review was reduced to 51. Subsequently, after analysis of the... From these studies, 8 publications were selected to be included in this research, as shown in Table 1.

Table 1. Results of the article search in the databases and selection of articles relevant to Study. **Own source.**

Databases	Totality	Following criteria	No.	%
SCIELO	639	13	4	50
BDENF	243	18	1	10
LILACS	4,784	17	3	40
MEDLINE	5,804	3	0	0
Total	**11,470**	**51**	**8**	**100%**

For better organization of the publications included in this RIL,
The selected articles are listed below **(Table 1).**

Table 1: Articles selected for the literature review.

No.	AUTHOR/YEAR LANGUAGE DA-BASES OF THE	TITLE	RESULTS
1	Santos *et al.* (2019) SCIELO	Clinical aspects and origin of septic patients treated at a university hospital.	Of the 225 patients analyzed, 115 (51.1%) were admitted with sepsis, with 63.5% being referred from other services. These patients presented with greater severity, with more cases of septic shock and a greater need for mechanical ventilation. The predominant infectious focus was pneumonia (77.8%). Patients referred from other services had a higher risk.
		Clinical aspects and the origin of sepsis patients treated at a university hospital.	Adherence to the 3-hour package of the SSC-2016 was higher when compared to those who developed sepsis in the hospital itself. Even so, mortality was high: 60.4% of patients died, with 63.2% coming from other services. Adherence to therapeutic approaches in the institution was higher among those admitted directly with sepsis, but this did not prevent the high mortality rate, highlighting the importance of... Early diagnosis and treatment at the point of origin.
2	Borguezam *et al.* (2020) SCIELO	Clinical protocols Managed: impact of implementation on indicators of quality of treatment of sepsis.	An observational study evaluated the impact of implementing a Managed clinical protocol for sepsis in a university hospital. A The sample included 631 patients, divided between the pre- and post-implementation phases. The protocol involved training the healthcare team, The use of checklists and the role of a nurse manager were evaluated. The results showed increased adherence to recommended procedures, a six-day reduction in the average length of stay, and a trend toward reduced mortality, especially in cases supported by the checklist and the manager. It is concluded that the implementation of the protocol improved quality indicators in sepsis treatment, favoring early diagnosis and... Therapeutic adherence and patient safety
		Managed clinical protocol: impact of implementation on sepsis treatment quality indicators.	

3	Antunes *et al.* (2021) LILACS	Early detection of sepsis in emergency departments: an interdisciplinary review. gradual. *Early detection of sepsis in urgent and emergency services: integrative review.*	The review identified ten key elements for early detection. This study examines the prevalence of sepsis in emergency services, based on nine analyzed studies. Key factors include: the use of protocols based on the Surviving Sepsis Campaign, triage performed by nurses, staff training, electronic alert systems, the use of Systemic Inflammatory Response Syndrome (SIRS) criteria, rapid response teams, and early warning scores (such as SOFA and qSOFA). Verification checklists, antibiotic lists, and multidisciplinary communication. These elements contribute to greater agility in identifying sepsis, early initiation of treatment, and improved clinical outcomes, especially in services with limited infrastructure.
4	Cesario *et al.* (2021) SCIELO	Identification Early Patients at Risk of Sepsis in Environment Hospital. *Early Identification of Patients at Risk of Sepsis in a Hospital Environment*	The study aimed to develop predictive models for the early identification of patients at risk of sepsis in a Brazilian hospital, using machine learning techniques. Two models were tested: LSTM (Long Short-Term Memory) with time series and Random Forest, based on clinical data and vital signs of 4,331 patients. patients. The LSTM model with three days' notice performed best, with an accuracy of 0.907, sensitivity of 0.912, and specificity of 0.971. Random Forest had high accuracy (0.971) and specificity (0.998), but low sensitivity (0.611), which limits its Clinical application. The most relevant variables for prediction were age, blood pressure, blood glucose, heart rate, and respiratory rate. The study concludes that, even with scarce and noisy data, it is possible... predicting sepsis with good results, but highlights the importance of to improve the quality of hospital records.
5	Mirando *et al.* (2021) LILACS	Knowledge of nurse in front to the protocol of sepsis in an emergency department public hospital large size. *The knowledge of the nurse in the sepsis protocol in an emergency service of a large public hospital.*	The study revealed that the majority of nurses interviewed (88%) demonstrated insufficient knowledge of the institutional protocol. of sepsis. Only 12% stated they were fully familiar with the protocol. Among those who were knowledgeable, the greatest expertise was in the clinical signs of sepsis and the ideal time to begin treatment. However, there were Significant gaps exist in knowledge regarding the protocol steps and the practical application of recommended procedures. The lack of regular training and the absence of institutional updates were identified as the main factors contributing to this lack of knowledge. The study highlights the need for continuous training of the nursing team to... To ensure early recognition of sepsis and effective application of the protocol, thus contributing to a reduction in mortality.
6	Lohn *et al.* (2021) SCIELO	Epidemiological and clinical profile of patients with suspected sepsis and septic shock in a hospital emergency room. *Of patients with suspected sepsis and septic shock in a hospital emergency.*	The main findings showed a predominance of females (55.1%) and a mean age of 62 years. Most patients had a previous hospitalization (63%) and the most common comorbidity was hypertension (45.7%). The predominant infectious focus was pulmonary (48%). Cases of infection with organ dysfunction accounted for 76.4% of diagnoses. The administration of all measures in the package of "Campaign "Surviving Sepsis" in the first hour.

			The suspicion was recorded in only 7.9% of the medical records. Of these Patients with septic shock all died. Most patients with sepsis were discharged from the hospital, but a significant portion died. Low adherence to recommended procedures was observed, with interventions being more frequent in cases with a confirmed diagnosis.
7	Silva *et al.* (2021) BDENF	Knowledge of emergency room nurses regarding the clinical protocol for sepsis. *Knowledge of emergency nurses about a sepsis clinical protocol.*	The study revealed that, although most of the participating emergency nurses were specialists in Urgent and Emergency Care, their knowledge of the clinical sepsis protocol was... considered unsatisfactory. Most answered questions about vasopressor use (85%) and blood culture (85%) correctly, but showed minimal knowledge about initial measures (55%), protocol application time (55%), hyperlactamemia (60%), and use of antimicrobials (65%) and laboratory tests (75%). It is concluded that there is a need for professional development and training on the sepsis protocol, aiming to guarantee timely interventions and improvement in patient prognosis.
8	Taques *et al.* (2023) LILACS	Factors associated with Sepsis and conditions that predict death in elderly people with respiratory diseases. *Factors associated with sepsis and conditions that predict death for elderly people with respiratory diseases.*	Of the 228 elderly individuals with acute respiratory illnesses unrelated to healthcare, 89.5% developed sepsis and 54.8% died. Sepsis was associated with the use of invasive devices, antibiotics, vasopressors, and chronic neurological diseases. The main predictors of death were: sepsis (RR=3.55), use of... urinary device (RR=1.75) and Covid-19 infection (RR=1.39).

Sepsis is one of the leading causes of hospital deaths in both
In Brazil, as well as internationally, it is especially prevalent in emergency services and emergency. In the study conducted by Lohn *et al.* (2021), 127 medical records were analyzed. adult patients treated in an emergency unit, where it was found that the focus
Pulmonary embolism was the most common symptom in cases of sepsis and septic shock. In this case, it was observed... although most presented with infection accompanied by organ dysfunction, only 7.9% of patients received the interventions included in the Campaign's "one-hour package". Surviving Sepsis, indicating deficiencies in the initial approach.

The findings of Taques *et al.* (2023) demonstrated that, among elderly people Of those hospitalized for acute respiratory illnesses, 89.5% developed sepsis. condition, along with COVID-19 infection and the use of invasive urinary devices, It stood out as one of the main factors associated with mortality. The results They signal a growing vulnerability of the elderly population, highlighting the urgency of... Early detection strategies and more effective therapies.

According to Santos *et al.* (2019), most patients with sepsis were transferred from other health services, arriving at the hospital in more critical condition and frequently requiring mechanical ventilation. Interestingly, these individuals They showed greater adherence to the SSC protocol when compared to those who They developed sepsis in the hospital itself. This highlights the importance of intervention. articulated between the different levels of care and professional training for to recognize the syndrome early.

The introduction of specific clinical protocols has contributed significantly contributes to improving quality indicators in sepsis management. A Research by Borguezam *et al.* (2021) showed that, after the implementation of a In a managed clinical protocol at a university hospital, there was a significant increase — 14 times greater — in the likelihood of the patient receiving appropriate treatment. In addition Furthermore, a reduction of six days in the average length of hospital stay was observed, and a decrease... relevant to the mortality rate.

In the same context, Antunes *et al.* (2021), through an integrative review, They identified key elements for the effectiveness of the protocols: initial screening by nurses, regular training, early warning systems, syndrome criteria systemic inflammatory response, rapid response teams, verification checklists and Interprofessional communication. These components are essential for timely detection. for sepsis and for the rapid administration of therapeutic interventions.

However, Silva *et al.* (2021) warn that, even among nurses Specialized in emergency medicine, knowledge about sepsis protocol remains Unsatisfactory. Only 45% were able to correctly identify the elements. essentials of the one-hour package. This indicates that the presence of protocols, by itself, does not It ensures its effective execution, requiring continuous investment in training. professional.

The advancement of technologies applied to healthcare, such as systems based on Machine learning has expanded the possibilities for early recognition of

sepsis. In this sense, they developed a predictive model using LSTM neural networks and
Random Forest algorithms, using data from Brazilian hospitals. The LSTM model.
It achieved an accuracy rate of 90.7% and a specificity of 97.1%, even in the face of low...
quality and fragmentation of information available in patient records.
Cesario *et al.* (2021).

Among the most relevant variables for predicting sepsis are age,
Blood pressure, blood glucose, respiratory rate, and length of hospital stay demonstrate that
Even with limited hospital records, artificial intelligence tools can...
To support clinical decision-making, provided there are improvements in data collection and organization.
Research recommends increasing the frequency of vital sign collection and examinations, in addition to
Combining classifiers and warning systems to anticipate diagnosis and reduce risk.
mortality. Cesario et al. (2021)

The effectiveness of clinical protocols is also directly related to
Training and performance of nursing professionals. Work conducted by Silva.
et al. (2021) reveal that the level of knowledge of nurses working in
Emergency units are limited in their ability to manage sepsis. Despite the
Despite their qualifications and experience, the healthcare team is unaware of essential measures such as...
Early administration of antibiotics, fluid resuscitation, and collection of blood cultures.

Given the challenges identified in the application of sepsis protocols, it is evident that-
I know that success in managing this condition depends not only on the existence of
guidelines, but above all, continuous training for healthcare teams. The limitation of
knowledge on the part of professionals, especially nursing professionals working in
frontline management compromises the effectiveness of interventions, such as administration.
Early administration of antibiotics, adequate fluid resuscitation, and collection of blood cultures are crucial.
These factors are crucial for reducing therapeutic response time and,
Consequently, mortality is associated with sepsis.

In this sense, continuing education emerges as an indispensable strategy.
to improve early recognition, adherence to protocols, and decision-making.
Based on evidence. Investing in the ongoing professional development of staff, combined with
incorporation of technologies such as artificial intelligence and early warning systems,
It enhances the quality of care provided and contributes to overcoming the...
Weaknesses identified in clinical practice.

FINAL CONSIDERATIONS

Early detection of sepsis in the context of urgent and emergency situations constitutes One of the main challenges in reducing hospital mortality rates. The action The efficient nursing team, combined with the implementation of clinical protocols and... The use of emerging technologies, such as artificial intelligence, is essential to improve... clinical outcomes. However, evidence suggests that the mere existence of Protocols do not guarantee their effective application, especially given the gaps in knowledge and insufficient training of professionals.

Therefore, continuing education becomes fundamental to strengthening the technical and scientific preparation of healthcare teams, ensuring a faster response and effective against the first signs of the syndrome. Combined with technological development and By integrating the different levels of care, this strategy contributes to improving the assistance, reduce the time to diagnosis and minimize the complications associated with sepsis, promoting safer and more effective care in emergency services and emergency.

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