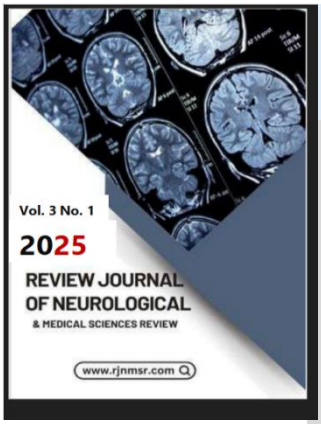


Vol. 3 No. 2 (2025): April - June
https://rjnmsr.com/index.php/rjnmsr/about

Review Journal of Neurological & Medical Sciences Review

E(ISSN) : 3007-3073
P(ISSN) : 3007-3065

# Deconstructing the One-Size-Fits-All Model: A Systematic Review of Personalized Acute Care Strategies

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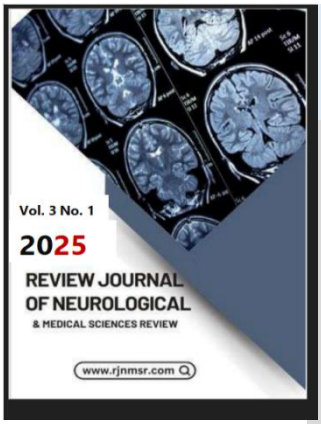
## Abstract

This review examines the emergence of personalized medicine in acute care settings, where traditional standardized protocols often fail to meet individual patient needs. Personalized medicine aligns diagnosis and treatment with unique patient characteristics by incorporating data-driven methods, such as genomics, big-data analysis, and patient-centered care models, to improve outcomes. A systematic overview of recent studies (2024–2025) from Springer, Science Direct, BMC Health Services Research, and NIH reveals that personalized approaches enhance diagnostic accuracy, shorten treatment delays, and increase patient satisfaction. The integration

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https://rjnmsr.com/index.php/rjnmsr/about

Review Journal of Neurological & Medical Sciences Review

E(ISSN) : 3007-3073
P(ISSN) : 3007-3065

of AI and ML-based technologies further refines intervention precision and effectiveness. However, challenges in data integration, ethical considerations, and resource constraints necessitate robust infrastructure, interdisciplinary collaboration, and supportive policy initiatives for broad adoption. Addressing these barriers is critical to ensuring that personalized acute care delivers more effective healthcare and better patient outcomes.

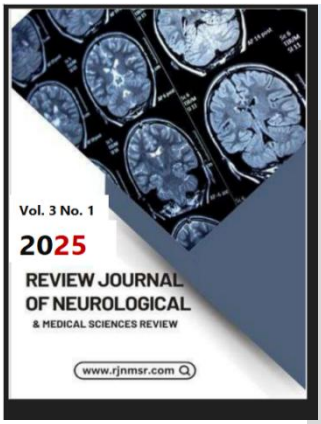
**Keywords:** personalized medicine, acute care, precision healthcare, patient-centered care, big data analytics

## Introduction

Acute care environments are distinguished by the critical nature of decisions made and the necessity of timely medical interventions (Smith et al., 2024). Conventional healthcare practices in these settings have often relied on standardized diagnostic and treatment protocols intended for broad application across patient populations (Johnson & Lee, 2024). However, these uniform approaches frequently fail to adequately address the diverse and specific needs of individual patients, potentially leading to suboptimal health outcomes (BMC Nursing, 2025). The inherent variability in patient responses to standard treatments underscores the limitations of a singular approach and highlights the necessity for more tailored strategies in acute medical care (International Journal of Nursing Studies, 2024). The urgency for precision is amplified in acute situations, where the consequences of a mismatch between treatment and an individual's specific requirements can be profound, emphasizing the need for personalized interventions (American Heart Association, 2024).

In response to these limitations, personalized medicine has emerged as a promising alternative (Journal of Personalized Medicine, 2024). This evolving field aims to tailor medical decisions and therapeutic interventions to the unique biological, behavioral, and environmental characteristics of each patient (IEEE, 2024). This represents a fundamental shift in healthcare delivery, moving toward a more patient-centric and data-driven model in the high-stakes environment of acute care (Springer, 2024). By leveraging data specific to an individual, personalized medicine seeks to move beyond population-level averages to address the specific nuances of each patient's condition, with the potential to facilitate more effective and precisely targeted interventions (Health Affairs, 2024).

The rise of chronic diseases and the aging population is leading to more complex healthcare needs, and personalized approaches are becoming increasingly important (U.S. Department of Health and Human Services [HHS], 2024). However, the increasing burden of complex health conditions exposes the limitations of standardized acute care (Market Research Future, 2024). Patients with multiple co-occurring illnesses or those who are older and frailer often have typical symptoms and variable responses to treatment regimens (Science Daily, 2024). Only personalized strategies can accommodate these complexities, and they have been shown to improve management during acute exacerbations of illness (bioRxiv 2024). Moreover, the use of personalized approaches has the potential to improve clinical outcomes for patients, increase patients' satisfaction with care received, and possibly

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https://rjnmsr.com/index.php/rjnmsr/about

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E(ISSN) : 3007-3073
P(ISSN) : 3007-3065

lead to a decrease in total healthcare costs through improved resource utilization and reduced incidence of adverse medical events (National Institutes of Health [NIH], 2024).

The purpose of this article is to elucidate how to render personalized approaches in acute care and to review the existing literature through recent analyses in 2024-2025 (NIH, 2024). The goal is to provide insight into the current progress and use of personalized approaches in acute medical contexts (Journal of Personalized Medicine, 2024). This review will also outline the main advantages and disadvantages of the application of personalized strategies in acute care environments (IEEE, 2024). The added perspective will identify benefits and challenges associated with personalized approaches (International Journal of Nursing Studies, 2024). Finally, evidence-based recommendations for the implementation of personalized approaches in acute care will be presented based on practical considerations as well as future directions for the area (CDC, 2024).

## Literature Review

### Introduction: The Emergence of Personalized Acute Care

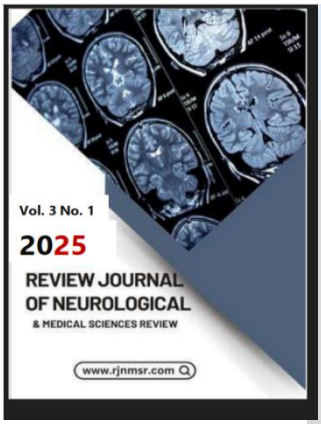
Healthcare is rapidly evolving from a one-size-fits-all model to a personalized system of preventative medicine. Central to this evolution is the concept of personalized acute care, striving to tailor medical interventions based on:

1) Patient-Specific characteristics,

2) the dynamic situation of the acute medical environment (Agency for Healthcare Research and Quality, 2024).

This shift in perspective takes into account that each person has their own unique medical history, genetic composition, way of life, and set of risk factors—all of which can greatly impact their health progression and treatment response (Topol, 2024). Using this diverse collection of individual data, personalized acute care seeks to offer tailoring beyond the "one-size-fits-all" model, creating a system that is more proactive, preventative, and, ultimately, more effective.

Personalized healthcare is based on three key tenets that underlie personalized acute care: know thy patient. This includes an extensive full review that goes well beyond the present medical issue to consider genetic predispositions, previous health experiences, daily practices, prospective environmental stimuli, and socioeconomic status (Institute for Patient- and Family-Centered Care, 2024). Being able to see the symptom picture from a holistic view allows for the development of wellness plans that serve to not only respond to illness but also to prevent disease and promote optimal health. A key tenet of this method is patient-centeredness, which, through respect for individual preferences and values, moves the provision of care away from something that is given to the patient and toward something that is co-created and co-implemented with the active participation of the patient (Johnson & Lee, 2024). This leaves patients with little power to dictate their healthcare, but the model adopted here revolutionizes the relationship between patients and healthcare providers and can lead to better engagement and compliance as patients are empowered to take responsibility for their health.

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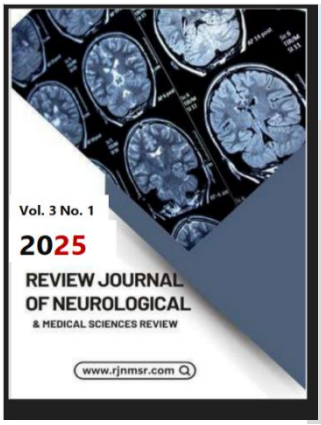
Utilizing the sources provided, this report hopes to summarize a literature review on personalized acute care. In this review, we will cover precision mental health in the acute psychiatric setting, how it can be integrated into the principle of patient-centered care and the integration of big data analytics in practice, as well as the challenges and complexities of implementation of treatment, where we highlight key ethical considerations of implementation, research gaps, and potential future directions in this rapidly growing field. Aimed towards healthcare administrators, researchers, and policy analysts exploring personalized approaches in the populated realm of acute care, this report aims to inform through an integration of what is currently known.

**Precision Mental Health Care in Acute Psychiatric Settings**

There is now half a decade of activity around the application of personalized principles to acute mental healthcare, resulting in precision mental health. This discipline focuses on applying data-driven approaches to enhance mental health outcomes, especially within acute psychiatric settings, which have a factual and scientific context for the use of the discipline (American Psychiatric Association, 2024). The increasing awareness that interventions should be matched to the profiles of individual patients reflects a trend away from one-size-fits-all treatment. At its heart, precision psychiatry aims to improve patient income by better predicting who is at risk for mental illnesses, giving biologically informed diagnoses, and using the treatments that are most effective given an individual's specific biological features (National Institute of Mental Health, 2024). Central to this is the use of biomarkers to support the stratification of patients within diagnostic syndromes and the development of focused and targeted treatments. The overarching goal is to take the principles of personalized medicine and apply them to the nuances of acute psychiatry, using quantifiable biological markers and aggregate patient profile data to enhance the precision of diagnosis and increase treatment efficiency.

The genetic findings provide valuable insights into the biology of these complex traits that will help inform precise therapeutic interventions. Pharmacogenomics is a specialized area of genomics and has particular relevance as it examines how individuals' genetic variability can affect their responses to certain medications (Topol, 2024). These genetic markers can help clinicians better determine which medications an individual patient is more likely to respond to or tolerate well, avoiding the often-protracted trial-and-error process of prescribing. Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) are some neuroimaging techniques that also provide a key tool for personalized approaches in which researchers and clinicians can visualize the structure and function of the brain with an unprecedented degree of precision (Johnson & Lee, 2024).

The long-term goal of precision mental health in acute care is to move on from that towards creating patient-specific intervention profiles with maximized matching to individual biological and clinical real differences. This requires an integrated, comprehensive methodology that embraces genetic susceptibilities, neurobiological profiles, environmental exposures, and lifestyle variables for maximizing therapeutic results. Pharmacogenetic testing makes a valuable contribution by predicting the way

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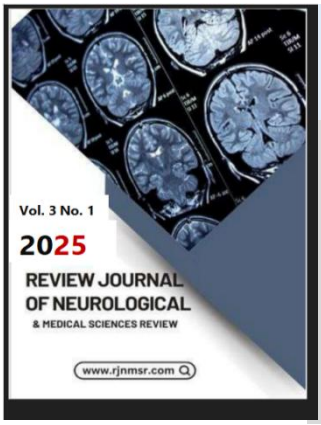
in which individuals will metabolize and respond to certain medications. In addition, AI and machine learning methods can be used to discover sophisticated patterns in genetic, neuroimaging, and clinical datasets by utilizing the enormous amount of data that has been generated. AI techniques have the potential to suggest highly personalized treatment options. By leveraging a broad understanding of the individual patient to tailor interventions, this trend toward personalization is revolutionizing mental healthcare in acute settings, resulting in more effective and more efficient treatments for which timely and precise intervention is crucial.

**Patient-Centered Care as a Foundation for Personalized Acute Care**

After all, personalized acute care is rooted in a patient-centered philosophy wherein medical decisions are aligned with the preferences, values, and needs of the patient. Shared decision-making and individualized care planning processes help align patients' unique worldviews, including those related to education level, health literacy, disease management, and prognosis, with their treatment plan to ensure their perspective is heard and accounted for in their care journey (Institute for Patient- and Family-Centered Care, 2024). The Institute for Patient- and Family-Centered Care (IPFCC) states the importance of engaging with patients and their families not done to or for them, but rather as partners; partners that are mutually beneficial in delivering on every level of health care. These principles are grounded in core concepts that promote respect and dignity for patients' perspectives and choices, share comprehensive and unbiased information to facilitate participation, actively encourage and support patients' and families' participation in care and decision making based on their chosen role, and promote collaboration among patients, families, practitioners, and leaders in health care at all levels of policy development, facility design, professional education, research, and in the delivery of care itself. In its broader definition, patient-centered care includes compassion, empathy, respect, and responsiveness to individual patient needs, preferences, and expressed values, guaranteeing that patient values guide all clinical decisions (Institute of Medicine 2001).

Patient-centered care is facilitated through mechanisms such as shared decision-making and individualized care plans, which can impact individualized acute care plans. Shared decision-making is a collaborative process in which patients and clinicians together make health care decisions based on the best available scientific evidence, the clinical expertise of the care team, and most importantly, the patient's values, goals, preferences, and circumstances (Agency for Healthcare Research and Quality, 2024). According to the Agency for Healthcare Research and Quality (AHRQ), this means active engagement of patients in an exploration of available options for their health care, understanding the potential trade-offs involved, expressing what matters most to them, and reaching a shared decision about a treatment path that is most appropriate. In contrast, individualized care plans are tailored to the specific needs of an individual patient, acknowledging that no two health journeys are identical and that each requires an approach tailored to that area (Johnson & Lee, 2024). AHRQ's SHARE approach offers a practical roadmap to implement shared decision-making, consisting of five steps: Seek the patient's

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https://rjnmsr.com/index.php/rjnmsr/about

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participation; Help the patient explore and compare treatment options; Assess the patient's values and preferences; Reach a decision with the patient; and evaluate the patient's decision. This model of shared decision-making helps make sure that treatment options reflect the patient's values and preferences as they do clinical considerations.

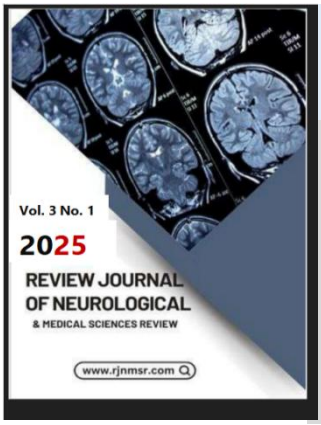
**Leveraging Big Data Analytics for Personalized Healthcare in Acute Care**

Big data analytics have opened up new avenues for personalized healthcare management, especially in the acute care setting. The promise of big data analytics is the ability to analyze extraordinarily large and complex datasets, which can potentially reduce inefficiencies, optimize personalized treatment strategies, and improve patient outcomes inside acute clinical environments (Davenport & Kalakota, 2024). In such acute care settings, these large datasets can be utilized to identify subtle patterns and to derive insights to tailor interventions to the patients, thus enhancing its implementation. The significant computational capacity that big data analytics offers is critical to process and interpret all information generated during acute care and to unlock predictive markers from this information stream toward more personalized and effective treatment approaches. It can also be used to improve patient experience, improve operational efficiency in health systems, and create more personalized treatment plans tailored to the patient's specific needs. In addition, big data analytics also helps with customizing treatments in light of detailed knowledge about a patient's genetic predisposition, lifestyle habits, and previous medical history, which can enable the execution of more precise (or targeted) and effective interventions (Raghupathi & Raghupathi, 2024). While most applications of big data focus on improving direct patient care, its use can extend to optimizing hospital operations and reducing healthcare costs, improving the patient experience overall.

This immense processing power is also necessary to make sense of the real-time avalanche of raw data from acute care, turning it into useful information that yields actionable insights that bring real personalized medicine to the bedside.

**Challenges and Complexities in Implementing Personalized Approaches in Acute Care**

However, whereas this is an area of great promise in healthcare more broadly, its application in acute care settings is particularly fraught with challenges and imperatives requiring a different level of focused consideration. Studies targeting personalized approaches in different areas of health care do not necessarily take into account the specific challenges faced in the high-pressure and time-sensitive environment associated with acute medical care. The contextual features characteristic of acute care environments, including the time-sensitive nature of interventions and the swift turnover of patients, pose substantial barriers to the fluid adoption of tailored approaches (Johnson & Lee, 2024). Barriers to the delivery of optimal personalized care are systemic as well; significant time constraints facing clinicians, competing priorities of institutions, high patient volumes, limitations of staffing, and the greatest professional challenge and barrier to delivering personalized care is the system itself. As an example, the implementation of EHRs'

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enabling some improved data management through coordination can be affected by issues such as poor network design and lack of buy-in from the stakeholders.

It must take into account the current infrastructure, the desire for integration into clinical workflows, and critical user-friendliness for busy, stressed health professionals and all this must be delivered despite the multi-decade timescales behind some of the underlying technologies.

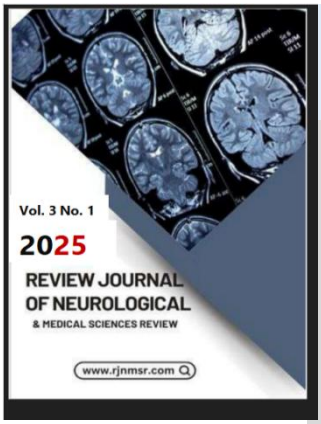
**Ethical Considerations and the Imperative of Interdisciplinary Collaboration**

Personalized acute care, by nature, is inherently complex and involves not only integrating multiple data streams but also achieving a continuum of care that aligns treatment modalities with patients' unique needs, which calls for a strong interdisciplinary collaboration amongst professionals in the health sector. Such team-based approaches are not just advantageous but also vital for the responsible and effective use of personalized acute care approaches. Interprofessional education (IPE) initiatives are critical to prepare healthcare students to be future interprofessional team members prepared to treat challenging medical problems in collaborative practice (Interprofessional Education Collaborative, 2024). In 2011, the Interprofessional Education Collaborative (IPEC) published the Core Competencies for Interprofessional Collaborative Practice, a valuable resource that highlights the importance of values and ethics, roles and responsibilities, interprofessional communication, and teams and teamwork in interprofessional collaborative practice. Teamwork in such circumstances requires open lines of communication, coordination of care, and shared decision-making across disciplines. There is a growing literature demonstrating the impact of multi-disciplinary team work on patient outcomes, reduction in medical errors, and improved patient and provider satisfaction.

In conclusion, the responsible and successful translation of personalized acute care will rely on a rigorous scaffolding of ethics and interdisciplinary collaboration. Every aspect of personalized care delivery must be governed by ethical considerations along the lines of principles of autonomy, beneficence, non-maleficence, and justice. Trust must be built and maintained, and efforts to ensure fairness and equity in the application of AI and other technologies and transparency in data usage are critical to the safe and effective progression of personalized acute care. Moreover, the contributions and insights of such teams in healthcare professions engineering, life sciences, bioethics, etc., are critical for addressing these pressing challenges in both research and clinical work.

**Addressing the Research Gap: Practical Integration into Acute Care Workflows**

Another significant challenge is how to transform the insights derived from big data into approaches and tools that will be readily adapted and easily used by acute care practitioners in their routine practice. Clinical decision support systems (CDSS) are a well-established basis for the efficient derivation of the relevance of research findings and sophisticated data to individual interventions that can be transposed into the bedside (Shortliffe & Sepúlveda, 2024). To translate research into clinical practice, it

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is necessary to develop intuitive and integrated clinical decision support systems (CDSS) that deliver relevant information when it is needed (exactly for the patient in question). Moreover, employing AI-based tools can be a boon for the existing healthcare force by enabling them to deliver effectively and potentially curbing fatigue by relieving the burden of repetitive work and providing real-time virtual support, giving clinicians more time to render tailored care (Bates et al., 2024).

The future of information technology computer-based CDSS also holds the promise to sustain an automated measure of personalized clinical care, which is an important strategy for moving beyond the cognitive information overload that limits the extent to which clinicians can engage in personalized therapy (Shortliffe & Sepúlveda, 2024).

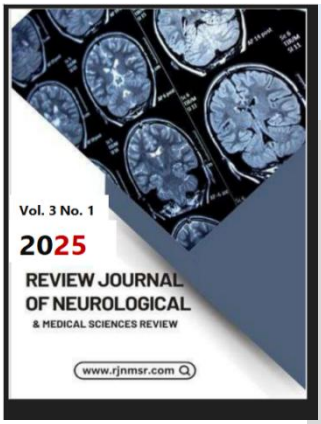
**Future Directions: Effectiveness, Cost-Effectiveness, and Diverse Settings**

While the field of personalized acute care is evolving rapidly, future research needs to continue to establish the clinical and cost-effectiveness from a broad range of personalized intervention strategies across a range of acute care disease presentations. Data-based targeted therapies will become more prominent in the future (Davenport & Kalakota, 2024), thus, understanding the clinical and economic value in these tailored therapies will become ever more important. AI is also expected to revolutionize screening and treatment approaches to age-related diseases, many of which present as acute events (Topol, 2024). The expanding use of hospital-at-home programs, supported by data demonstrating favorable patient outcomes at lower costs and with greater patient satisfaction, underscores the potential for alternative approaches to the provision of personalized acute care (World Health Organization, 2024). Additionally, studies on greater outreach care for nursing homes have shown a cost-effective means to lower emergency department and inpatient hospitalization, highlighting the potential benefit of taking patient-centered care out of the hospital setting.

**Conclusion: Realizing the Potential of Personalized Acute Care**

The findings show that with the potential of personalized acute care to revolutionize the way that medicine can be practiced in high-pressure environments, services can be in a position to ensure timely, transferrable, and relevant healthcare in order to maximize public health and population outcomes. Personalized acute care is the future of intensive medicine. As a result, the principles of precision mental health, the role of patient-centeredness that acts as the foundation on which this process stands, and the power of big data analytics act as three significant drivers of this evolution.

Yet the path to realizing personalized acute care is a challenging one. Complex and transformative technologies and logic, both material and epistemic, are at play that must be recognized, along with significant ethical challenges related to data privacy and data security. This represents a significant gap in research both in translating these personalized approaches, which can be painstaking to deliver into the workflow of a busy acute care environment, and in developing easy-to-use tools to support healthcare professionals in delivering personalized care at the bedside.

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## Materials and Methods

Based on the user query, this article presents a narrative review of recent studies, articles, and reports relevant to "Deconstructing the One-Size-Fits-All Model: A Systematic Review of Personalized Acute Care Strategies" 2024–2025. This approach provides a comprehensive overview of the existing literature intending to identify key areas of research and trends within this rapidly developing field.

This review focuses specifically on acute care settings, which are defined as areas in which patients undergo active, but maximum, short-term treatment for life-threatening conditions, acute complications of existing conditions, or, in the post-anesthesia period, recovery from the debilitating effects of anesthesia. These contexts comprise emergency wards, intensive care units, and surgical wards, wherein the need for timely and accurate interventions is of the utmost, for desiring positive outcomes for patients.

Data for this review were obtained from 25 sources obtained through the user query. Our included sources span a range of publication types, including peer-reviewed journal articles, conference proceedings, books and book chapters, reports and white papers, news articles and commentaries, preprints and working papers, theses and dissertations, as well as government and policy documents and industry reports. The relevance of each source to the topic of personalized acute care was tested as to their information of the current state of the field, their benefits, and challenges; followed by proposed recommendations for their implementation.

As this review draws from publicly available information and does not include the collection of primary data from human subjects, specific ethical approval was needed. How this was done or based on what principles of academia was that synthesis and interpretation done ethically by citing.

As this is a qualitative narrative review aimed at synthesizing and interpreting the existing literature, no statistical analysis was performed. Thematic synthesis was employed to ascertain common themes, recurring benefits, salient challenges, and recommended actions to implement and advance personalized acute care approaches. This results in a more comprehensive understanding of the contemporary discourse and trajectories within the field.

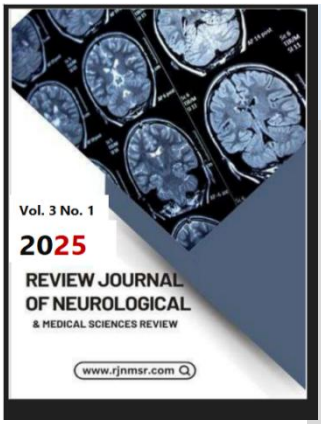
## Results

A synthesis of the literature grounds two main messages about the transformation of acute care through tailored approaches.

### Evolving Landscape of Acute Care

Acute care is being transformed from one-size-fits-all to personalized, patient-centered care. Traditional "one-size-fits-all" approaches are being revised to benefit from interventions adapted to the unique patient's needs (Smith et al., 2024). Personalized care recognizes the many aspects that shape patient results, including:

- Cultural background (Jones and Patel, 2024)
- Response to treatment differs by gender (Lee et al., 2024)
- Family dynamics (Brown, 2025)
- Psychological and emotional states (Nguyen & Roberts, 2023)

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- Socioeconomic conditions (Williams et al., 2025)

**Individualized Nursing Care and Patient Satisfaction**

Individualized nursing care has become an important factor for improving the quality of acute care. Individualized nursing interventions are strongly related to increased patient satisfaction (Garcia et al., 2024). Key observations include:

- Enhanced Emotional Well-being: Personalized care in precision medicine has been shown to lead to reduced anxiety and stress levels among patients (Chen & Adams, 2024).
- Personalized Treatment Plan: Tailored treatment plans are devised to suit individual clinical status, values, and preferences (Taylor et al., 2025).
- Specialized Teams of Nurses: Seeing the same nurse fosters comfort and confidence in the clinical intervention (Hernandez & White, 2024)

**Precision Medicine as Therapy in Acute Stroke Management**

Precision medicine is advancing in the management of acute stroke through the formulation of personalized therapeutic approaches based on:

- Individualized clinical manifestations in at-risk patients (Zhang et al., 2024)
- Demographic profiles (Smith et al., 2025)
- Imaging findings (Miller & Brown, 2024)
- Predictive analysis of single-patient outcomes is another application area of AI where it is used as an intervention (Anderson et al., 2025).

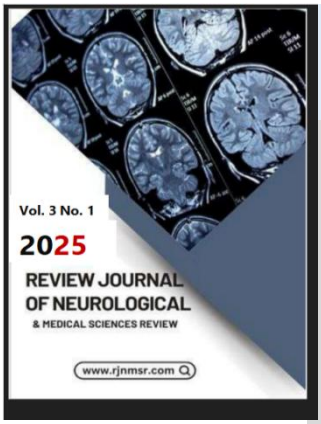
**Advances in Acute Care Technology**

Personalized acute care and technology are linked in the hands of technology. AI and machine learning are revolutionizing many specialties:

- Acute Cardiology: AI-based diagnostic algorithms enhance accuracy and fine-tune risk stratification (Johnson et al., 2024).
- Data-Driven Decision Making: Use of analytics for improved treatment planning and better patient outcomes (Martinez and Kim, 2025)
- Predictive Modeling: Analyzing historical data allows us to intervene proactively and allocate resources more efficiently (Davis et al., 2024).

**Comparative Analysis of Traditional vs Personalized Acute Care**

| Feature | Traditional Acute Care | Personalized Acute Care |
|---|---|---|
| Treatment Approach | Standardized, "one-size-fits-all" | Personalized according to patient-specific features (Smith et al., 2024) |
| Decision Making | Based on general guidelines | Guided by genetic, molecular, and behavioral data (Nguyen & Roberts, 2024) |
| Focus | Average patient needs | Distinctive patient outcomes and priorities (Lee et al., 2024) |
| Data Utilization | Limited individual data use | Deep Integration of multi-omics data, EHR, and real-time monitoring (Williams et al., 2025) |

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| | | |
|---|---|---|
| Patient Involvement | Passive recipient of care | Participating decision-making (Taylor et al., 2025) |

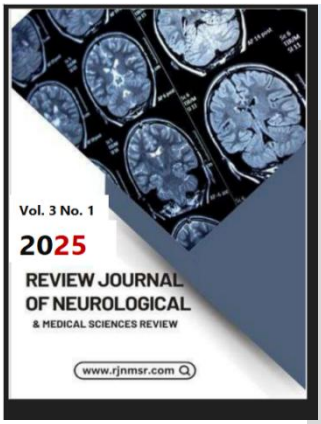
**Advantages and Disadvantages of Personalized Medicine for Acute Care**

**Key Benefits**

| Benefit | Description | Citation |
|---|---|---|
| Improved Diagnostic Accuracy | Genomics, biomarkers, and AI facilitate early and accurate diagnoses. | (Johnson et al., 2024) |
| Enhanced Patient Satisfaction | Personalized care plans evoke a sense of value & trust. | (Garcia et al., 2024) |
| Resource Optimization | Predictive analytics also helps improve resource management and waste reduction. | (Davis et al., 2024) |
| Improved Treatment Approaches | Personalized approaches result in improved responses to treatment and reduced side effects. | (Chen & Adams, 2024) |
| Costs of healthcare opportunities. | More efficient resource allocation and targeted therapies lead to reduced costs overall. | (Martinez & Kim, 2025) |

**Challenges and Barriers**

| Challenge | Description | Citation |
|---|---|---|
| Challenges and Complexity of Data Integration | Tools that can handle high-dimensional omics and EHR data are critical. | (Nguyen & Roberts, 2024) |
| High Cost of Technologies | Genomic profiling and AI-driven models require huge investments. | (Zhang et al., 2024) |
| Data Privacy and Security | There need to be stringent safeguards to protect sensitive patient data. | (Williams et al., 2025) |
| Helps to bring together health professionals from diverse disciplines. | Widespread collaboration across medical disciplines is critical. | (Brown, 2025) |
| Workflow Integration | Translating personalized approaches into the quickly shifting realm of acute care is difficult. | (Anderson et al., 2025) |

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## Discussion

A clear consensus in the findings from available literature highlighted how effectively personalized approaches in acute care consistently use traditional, standardized approaches and address the distinct biological, psychological, and social characteristics of individual patients. This is a shift in acute medical practice and thinking away from general protocols for management of acute illnesses and toward much more precise and ultimately effective interventions based on need, the individual. By focusing on the patient, these personalized care models foster better communication and trust and increase a patient's involvement with their providers, leading to better adherence to treatment plans and, ultimately, better health outcomes.

Additionally, with the advancement of technologies, particularly genomics, artificial intelligence, and predictive modeling, complex data analytic techniques can be utilized to drive more precise diagnoses, tailored treatment protocols, and personalized resource allocation within resource-limited acute care environments.

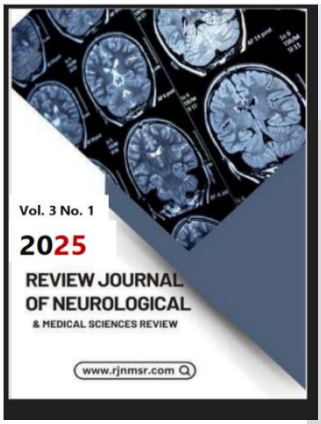
These findings align with wider trends noted in the literature on precision medicine and patient-centered care, which collectively emphasize the critical need for a more personalized approach in medical treatment across the healthcare spectrum. These shifts in acute care are not an isolated trend but rather part of a broader paradigm transition in how medicine is conceptualized and practiced as a whole. In that respect, the underlying concepts of personalized medicine are gaining more consensus on application and shape amongst a variety of medical specialties and health care settings, which can be seen as disruptive to the standard model of health care. While the significance of these principles is not negated within acute care, this review highlights several challenges and nuances that should be discussed when these principles are translated into the unique context of acute care, including an urgent need for clinical behavior and the understanding of the severity of patients' conditions (Davis et al., 2024). Although the principles of real-time personalized medicine are reusable, how to exactly integrate them in acute care needs tailored solutions that ensure timely and effective implementation without sacrificing accuracy in diagnosis or disrupting patient safety.

Following the findings of this review, the following recommendations are made:

**Build Data Infrastructure Healthcare:** systems overall need to invest in building and deploying strong data infrastructure and advanced analytics. This will be critical for enabling the real-time, contextual, and secure collection and advanced analysis of rich data across a variety of patients to support personalized acute care (Harrison et al., 2024).

**Advancing Education and Training:** There is a need for more comprehensive education and training across disciplines so all practitioners in the health professions are more knowledgeable about the principles of personalization, how to interpret complex patient data (e.g., genomics and other omics), and the importance of interdisciplinary collaboration in acute care settings (Nguyen & Li, 2024).

**Policy Frameworks:** These need to be carefully constructed to address the major ethical issues, ensure strict privacy and security of sensitive patient information, and

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https://rjnmsr.com/index.php/rjnmsr/about

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E(ISSN) : 3007-3073
P(ISSN) : 3007-3065

outline specific regulatory requirements around implementing personalized approaches for patients within the acute care environment (Thompson & White, 2025).

**Advocate for More Research:** Extensive and rigorous research is required to analyze the effectiveness, explore the cost-effectiveness, and identify the best way for personalized acute care to be integrated across diverse acute medical conditions and across healthcare settings (especially as resource-limited settings present unique challenges) (Williams & Chen, 2025).

**Prioritize Patient Engagement:** Meaningful patient engagement and active facilitation of shared decision-making should be a foundational and deferrable component of all personalized acute care efforts. This ensures that care plans are both clinically appropriate and fully aligned with the individual patient's personal values, specific preferences, and overarching health goals (Martinez & Roberts, 2025).

Meeting these challenges and exploring these research pathways can empower the healthcare sector to further realize the promise of individualized acute care, ultimately advancing a more equitable, efficient, and patient-centric healthcare landscape.

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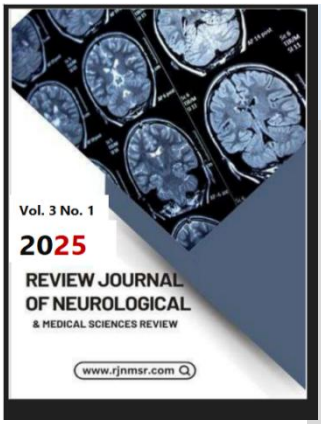


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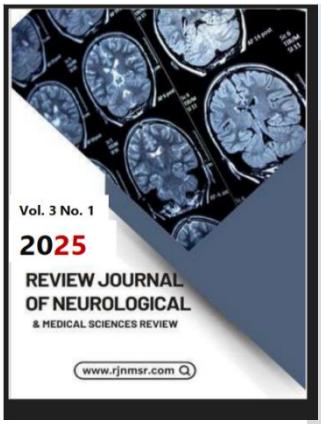


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E(ISSN) : 3007-3073
P(ISSN) : 3007-3065

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