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The enterostomal therapy nurse and artificial intelligence: ethics, clinical judgment and decision-making**

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ABSTRACT

Objective: To analyze how the incorporation of artificial intelligence into enterostomal therapy influences clinical judgment, decision-making, and the ethical foundations of specialized care. **Method:** A theoretical essay based on a critical analysis of recent scientific literature on artificial intelligence in healthcare, with an emphasis on generative models, computer vision systems, bioethics, and data protection. **Results:** Artificial intelligence enhances analytical capacity and assessment accuracy but introduces risks related to uncritical reliance on automated recommendations, reduced patient autonomy, and the inappropriate handling of sensitive data, particularly clinical images. **Conclusion:** Artificial intelligence can contribute to safer, higher-quality decisions when used as a support tool under human supervision, clinical discernment, and ethical responsibility, reaffirming the role of the enterostomal therapy nurse as a critical interpreter of technology and a guardian of autonomy, privacy, and humanized care.

KEYWORDS: Artificial intelligence. Enterostomal therapy. Nursing. Decision making. Nursing ethics.

O enfermeiro estomaterapeuta e a inteligência artificial: ética, julgamento clínico e tomada de decisão

RESUMO

Objetivo: Analisar de que forma a incorporação da inteligência artificial na estomaterapia influencia o julgamento clínico, a tomada de decisão e os fundamentos éticos do cuidado especializado. **Método:** Ensaio teórico baseado em análise crítica da literatura científica recente sobre inteligência artificial em saúde, com ênfase em modelos generativos, sistemas de visão computacional, bioética e proteção de dados. **Resultados:** A inteligência artificial amplia a capacidade analítica e a precisão avaliativa, mas introduz riscos relacionados à confiança acrítica em recomendações automatizadas, à redução da autonomia do paciente e ao manejo inadequado de dados sensíveis, especialmente imagens clínicas. **Conclusão:** A inteligência artificial pode favorecer decisões mais seguras e qualificadas quando utilizada como ferramenta de apoio, sob supervisão humana, discernimento clínico e responsabilidade ética, reafirmando o papel do enfermeiro estomaterapeuta como intérprete crítico da tecnologia e guardião da autonomia, da privacidade e do cuidado humanizado.

DESCRITORES: Inteligência artificial. Estomaterapia. Enfermagem. Tomada de decisão. Ética em enfermagem.

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El enfermero estomaterapeuta y la inteligencia artificial: ética, juicio clínico y toma de decisiones

RESUMEN

Objetivo: Analizar de qué manera la incorporación de la inteligencia artificial en la estomaterapia influye en el juicio clínico, la toma de decisiones y los fundamentos éticos de la atención especializada. **Método:** Ensayo teórico basado en un análisis crítico de la literatura científica reciente sobre inteligencia artificial en salud, con énfasis en modelos generativos, sistemas de visión computacional, bioética y protección de datos. **Resultados:** La inteligencia artificial amplía la capacidad analítica y la precisión de la evaluación, pero introduce riesgos relacionados con la confianza acrítica en las recomendaciones automatizadas, la reducción de la autonomía del paciente y el manejo inadecuado de datos sensibles, especialmente imágenes clínicas. **Conclusión:** La inteligencia artificial puede favorecer decisiones más seguras y fundamentadas cuando se utiliza como herramienta de apoyo, bajo supervisión humana, discernimiento clínico y responsabilidad ética, reafirmando el papel del enfermero estomaterapeuta como intérprete crítico de la tecnología y garante de la autonomía, la privacidad y la ate nción humanizada.

DESCRIPTORES: Inteligencia artificial. Estomaterapia. Enfermería. Toma de decisiones. Ética en enfermería.

INTRODUCTION

The advancement of artificial intelligence (AI) in recent decades has profoundly transformed healthcare practice[1–3]. From systems capable of recognizing images and predicting clinical complications to generative models that produce reports and automated guidance, AI now occupies a space once reserved exclusively for human reasoning[1,2]. In enterostomal therapy, where clinical observation, judgment, and professional presence are diagnostic tools, this transformation creates a conflict involving technical and ethical knowledge.

The care of complex wounds, stoma management, and the prevention of complications require a combination of observation, experience, and professional intuition that, until recently, could not be transferred. The emergence of AI systems capable of measuring lesions, comparing serial images, and proposing clinical management strategies places nurses in a new scenario: cognitive collaboration between humans and algorithms[4–6].

However, the use of these technologies requires more than technical curiosity. It prompts reflection on autonomy, responsibility, and ethical boundaries[7–9]. The Brazilian General Data Protection Law (LGPD) establishes principles for the processing of sensitive data, including clinical records and images[10]. Thus, the contemporary challenge in the field is not merely to incorporate AI, but to do so with critical awareness and moral responsibility while maintaining professionals' clinical autonomy[7–9].

Accordingly, this theoretical reflection proposes an analysis of the role of the enterostomal therapy nurse in the era of AI, exploring the ethical[7–9], cognitive, and legal[10] dimensions involved and discussing how technology can enhance human clinical judgment without replacing it[7,9].

OBJECTIVES

To critically analyze the ethical, legal, and clinical implications of artificial intelligence in enterostomal therapy practice, focusing on its impact on nurses' clinical judgment and decision-making.

METHODS

This is a theoretical essay developed with the aim of critically analyzing the use of artificial intelligence in the practice of enterostomal therapy nurses, with emphasis on the ethical, legal, and clinical aspects involved in decision-making. The text was developed

based on an analytical reading and argumentative interpretation of recent scientific publications on AI in healthcare, complemented by national regulatory documents, including the LGPD[10] and the Code of Ethics for Nursing Professionals (CEPE)[11].

The literature search was conducted in PubMed, SciELO, Lilacs, and Google Scholar, using the descriptors "Artificial Intelligence," "Nursing," "Enterostomal therapy," "Nursing Ethics," "Decision-Making," and related terms. Publications from the last five years (2021–2025) were prioritized, considering the rapid evolution of artificial intelligence systems and the need to incorporate evidence aligned with the current state of technological development[12].

The main publications used in the development of the essay are summarized in Table 1[1,3–8,13–17], organized according to topic, type of publication, and contribution to the proposed discussion.

Table 1. Summary of the main publications used in the development of the theoretical essay.

Reference	Year	Type of publication	Main topic	Contribution to the essay
Rajpurkar et al.[1]	2022	Review	AI in healthcare	Conceptual foundations of AI applied to healthcare
Morley et al.[3]	2020	Review	AI ethics	Discussion of ethical principles and the practical application of AI
Rippon et al.[4]	2024	Review	AI in wound care	Clinical applications of AI in wound assessment and treatment
Griffa et al.[5]	2024	Narrative review	Apps for wound analysis	Automated segmentation and wound monitoring technologies
Reifs Jiménez et al.[6]	2025	Systematic review	AI in chronic wounds	Evidence on diagnostic support and clinical decision-making
Grosman-Rimon et al.[7]	2024	Reflection article	Ethics and digital security	Risks, responsibilities, and safety in the use of healthcare technologies
Roustan and Bastardot[8]	2025	Review	Large language models	Limitations, hallucinations, and clinical use of generative models
Lee et al.[14]	2023	Perspective article	GPT-4 in medicine	Benefits, limitations, and risks of generative models in clinical practice
Iqbal et al.[15]	2025	Umbrella review	ChatGPT and healthcare	Impacts of language models on healthcare delivery and health education
Ibrahim et al.[13]	2024	Original article	Privacy and confidentiality	Data protection and ethical challenges related to the sharing of clinical information
Ridley and Pawlick-Potts[16]	2021	Conceptual article	Algorithmic literacy	Development of competencies for the critical interpretation of algorithms
Ahmed et al.[17]	2025	Review	Health data ethics	Ethical aspects related to data use, information mining, and professional responsibility

AI: artificial intelligence.

The analysis was conducted using a hermeneutic-dialectical procedure structured around three axes: the clinical potential of AI as a tool to support professional judgment; ethical and legal risks related to the uncritical use of automated systems; and contemporary challenges involving privacy, data protection, and professional accountability[11,13]. As this is a theoretical essay, no empirical data were collected, and review by a research ethics committee was not required.

RESULTS

Artificial intelligence in healthcare and enterostomal therapy

The presence of AI in healthcare is no longer a promise, but a reality that is gaining ground and acceptance every day[1–3]. Today, algorithms are capable of interpreting images, estimating prognoses, suggesting therapies, and even drafting progress reports[2,3]. In enterostomal therapy, this technological integration is particularly sensitive because the object of care is visible, dynamic, and subject to subtle variations, whether it is a wound, a stoma, or vulnerable skin[4].

Computer vision-based tools have demonstrated increasing accuracy in lesion measurement, tissue classification, and the longitudinal analysis of clinical photographs[4–6]. Applications for professional use already make it possible to compare images and suggest clinical management strategies[4,5], but none of these systems can comprehend the pain, odor, texture, or human context of each wound. This sensory and subjective dimension remains exclusive to nurses' clinical judgment and experience[7].

Among the most advanced technologies are *Generative Pre-trained Transformers* (GPTs), AI models capable of processing large volumes of language and images, recognizing patterns, describing clinical findings, and generating interpretations[14]. These systems learn from extensive databases, which enables them to formulate contextualized responses and adapt to different tasks[14,15,18]. In healthcare, GPTs have been applied to report preparation, decision support, and professional education[15,18], although their direct clinical use still requires scientific validation, ethical regulation, and continuous human supervision[7–9].

Several GPT-based systems have been developed specifically for wound care[4–6]. Advanced digital tools combine different AI models to generate severity scores, precise segmentations, and personalized therapeutic support from clinical images[4,5]. Multimodal models integrating language and images have been tested to improve referral decisions and risk classification in complex lesions[5,6]. *Swift Skin & Wound* and *Healthy.io*, in turn, employ computer vision using *smartphone* cameras, enabling objective measurement, standardized documentation, and remote monitoring by specialists[4–6]. These resources exemplify how the convergence of automated analysis and clinical practice can support nurses in decision-making and continuous monitoring, provided that their use is guided by ethical criteria and professional validation[7–9].

Currently, GPT-based models trained to recognize and analyze clinical images are already available and are capable of assessing wounds in real time based on photographs submitted by healthcare professionals[15,18,19]. These systems identify patterns of coloration, depth, the presence of exudate, and areas of necrosis, suggesting preliminary classifications or management strategies[4–6]. Although promising, they require rigorous safety protocols and ethical oversight, since the use of sensitive images and the partial automation of clinical assessment require consent and continuous professional validation[8–10].

Caution is necessary: these models may still exhibit biases, classification errors, and inaccurate interpretations, particularly when applied outside the context for which they were trained[13]. Nurses who simply accept the first response provided by an AI system relinquish the clinical judgment that underpins their autonomy[7–9].

The usefulness of these systems lies not only in their ability to recognize patterns, but also in how they organize information and enhance clinical reasoning[1,2,7]. AI can help nurses visualize therapeutic possibilities, anticipate complications, and compare clinical scenarios that are often overlooked amid the fast pace of everyday work[1,2].

The value of AI, therefore, lies in its potential to enhance nurses' analytical capacity rather than replace them[1,7]. Mastering the interpretation of algorithms entails developing algorithmic literacy, that is, the ability to understand, validate, and contextualize machine-generated recommendations[16]. AI-mediated care requires professionals capable of translating technological reasoning into decisions consistent with the reality and unique characteristics of each patient[7–9].

The recent evolution of generative models further expands this landscape. While earlier tools, such as GPT-4, had already demonstrated considerable ability to synthesize clinical data[2], more current versions, such as the latest generative models and their multimodal variants, offer greater accuracy, improved contextual interpretation, and lower hallucination rates[15]. This evolution not only changes the technical performance of these systems but also redefines how nurses interact with them[1,2,7]. The more sophisticated the model, the greater the responsibility for validation, safety, and critical interpretation of its responses[7–9,13]. Technology is advancing rapidly; it is the professional's responsibility to keep pace with this evolution without losing sight of the ethical principles that guide care[7,9].

Ethical challenges: autonomy, explainability, and blind trust

When applied to healthcare, the primary value of AI lies in supporting clinical decision-making[1,2]. Rather than replacing human reasoning, it organizes and presents data, patterns, and probabilities that help professionals choose among

possible courses of action[3]. However, the more complex and reliable these systems appear, the greater the risk that nurses will transfer part of the responsibility for the decision to the machine[4,7].

This phenomenon, known as automation bias, occurs when algorithmic recommendations are not critically compared with clinical judgment and ultimately come to be accepted automatically[20]. In enterostomal therapy, where small variations in coloration, moisture, or pain can completely change clinical management, such blind trust poses a concrete risk to patient safety[4–6].

Following automated recommendations without appropriately comparing them with the nursing process represents more than a technical weakness; it may constitute an ethical violation and, under certain circumstances, result in administrative, civil, and even criminal liability[11]. Nurses remain ultimately responsible for the decision and are accountable for it, even when influenced by decision-support systems[18,19].

The ethical use of AI requires recognizing that algorithms do not think; they merely process data[1,7]. They broaden clinical insight but do not replace the experience, empathy, or moral reasoning that guide care[3,8]. Therapeutic decisions remain human decisions, resulting from the combination of technical knowledge, ethical sensitivity, and accumulated experience[3,7,9].

In this context, system explainability, defined as the possibility of understanding how and why an AI system arrived at a particular recommendation, becomes an essential requirement[2,5,16]. An algorithm that cannot be understood should not be used as the sole basis for clinical management[5,14]. AI can indicate probabilities, but it is the nurse's responsibility to interpret the context and assume ultimate responsibility for the choice[11,19].

Professional autonomy is strengthened when technology is used critically and consciously. The challenge is not to reject innovations, but to know how to integrate them into practice without relinquishing professional discernment[11]. Clinical judgment is the point at which calculation meets care, a function that belongs to human beings[1,3,7].

The General Data Protection Law and responsibility for data

The LGPD establishes a solid foundation for the processing of sensitive personal information, such as clinical records and images[16]. For enterostomal therapy nurses, compliance with these standards is not merely a legal requirement, but a natural extension of ethical care itself. Confidentiality, a longstanding principle of nursing, takes on new dimensions in an era of digitalization and instantaneous sharing[20].

The handling of clinical data requires informed consent, an explicit purpose, and security mechanisms that prevent unauthorized access[16,20]. Storing photographs on personal devices or unauthorized platforms violates not only the LGPD[16], but also the CEPE, which ensures the protection of patient privacy in all forms of documentation[21].

In the daily routine of healthcare services, the widespread use of mobile phones and messaging applications creates areas of vulnerability. Images taken with the intention of documenting a lesion or recording treatment progress may cross institutional boundaries and circulate without control, undermining the relationship of trust that underpins professional practice[13,21]. In a context in which photographs can be replicated, stored in the cloud, and interpreted by AI systems, protecting data means protecting people[20].

The circulation of clinical images through personal applications, particularly in real time, constitutes the processing of sensitive data without a legal basis, contrary to the principles of the LGPD. National studies have shown that nursing professionals still face difficulties in implementing privacy and confidentiality in the digital environment[9,22,23], demonstrating that clinical urgency does not eliminate the ethical and legal obligation to protect patient information.

Ethical responsibility is not limited to formal compliance with the law; it involves constant vigilance, discernment, and awareness of the risks inherent in every act of documentation[20,21]. Professionals must be the first guardians of patient privacy and the final safeguard before any sensitive data becomes public. Respect for the LGPD, therefore, is more than a legal obligation; it represents an extension of the moral commitment that underpins nursing[9,20–23].

The expanded role of the enterostomal therapy nurse in the digital era

AI challenges nurses to redefine their professional identity. The role, previously centered on performing techniques and directly monitoring[1,3] patients, is expanding to include the interpretation and management of technologies[1,7]. Clinical reasoning, once guided solely by observation and experience, is now complemented by data, images, and predictions. Thus, a new type of clinical judgment emerges that is hybrid, analytical, and ethical, as it combines human sensitivity with algorithmic precision[2,6].

In this context, the enterostomal therapy nurse occupies a position at the frontier: neither resistant to innovation nor submissive to it[3]. This is the professional who translates calculation into care, balancing the logic of algorithms with the complexity of real human bodies[6]. The role is not to compete with machines, but to ensure that care remains human, even when mediated by technology.

When properly guided, AI can free up time for the more human dimensions of care: listening, support, and relationship-building. However, when used without reflection, it turns professionals into mere executors of commands, distancing them from the essence of caring. The future of enterostomal therapy will depend on nurses' ability to guide technology through critical thinking while maintaining command of clinical judgment and keeping the person receiving care at the center[1,3].

In enterostomal therapy, where every assessment arises from meticulous observation of the skin and wound and from sensory experience that no machine can attain, professionals must integrate technology without losing sight of the bodily and subjective dimensions of care[3,7].

Technical proficiency, therefore, is not enough. Professionals in the digital era must cultivate cognitive and ethical competencies that enable them to engage with intelligent systems without losing autonomy[7,14]. Continuous education, understanding how algorithms work, and recognizing their limitations are practices that reaffirm the technical and moral authority of nursing[9,11,22,23]. At the intersection of data and people, the principle remains: technology is a means, not an end[1,3,17].

DISCUSSION

The integration of AI into clinical practice introduces a new cognitive logic into care. Technology enhances observation and analysis, but it also repositions professionals in the face of a growing volume of data that requires contextual and prudent interpretation[1,3]. For nurses, dealing with algorithms is not limited to understanding numerical outputs or automated classifications, but involves assigning meaning to them while considering the unique characteristics of each patient[6].

In this process, classic bioethical dilemmas re-emerge with renewed force. The tension between autonomy and beneficence, which already permeated traditional practices, takes on specific dimensions when mediated by intelligent systems[3,7]. In many healthcare services, a paternalistic logic persists, sustained by the idea that "if it is for the patient's benefit, it is acceptable," leading some professionals to justify questionable decisions, violate privacy, or apply algorithmic recommendations without critical discussion[9,22,23]. This reasoning is guided by the logic that the outcomes would justify the means employed, a perspective that finds little support in contemporary bioethics[3]. Beneficence does not authorize ethical shortcuts, nor does it legitimize the erosion of patient autonomy or professional discernment[7,17].

Recent literature highlights important benefits of AI: greater diagnostic accuracy, reduced errors, optimization of care time, and standardization of records[1,3]. These benefits, however, are realized only when mediated by clinical judgment[1,6]. Technology can broaden possibilities, but it does not replace the balancing of evidence, experience, and prudence. Therapeutic decision-making remains a human, context-specific act that requires technical responsibility and moral sensitivity[7].

As an applied science, nursing operates by integrating knowledge, context, and humanity. Automated systems organize data, but it is the nurse who gives them direction and meaning[6]. This new reality requires digital literacy, ethical awareness, and the ability to recognize when to trust the machine, when to disagree with it, and when to discontinue its use[3]. It is in this discernment, rather than in technological advancement, that the integrity of care in the digital era resides[7].

Study limitations

This theoretical essay is based exclusively on the available literature, without the use of empirical data that would allow direct assessment of the clinical applicability of artificial intelligence systems in enterostomal therapy. Most of the evidence analyzed consists of narrative reviews, conceptual analyses, and reports on technological development[1–6,14,15,18], which limits inferences regarding clinical effectiveness, error reduction, and patient safety.

In addition, studies on artificial intelligence applied to wound care acknowledge limitations related to algorithmic biases, classification errors, and inconsistent performance across different clinical contexts[6,13,15]. Another relevant aspect concerns the rapid evolution of generative models, whose capabilities are continually changing[2,15], making it difficult to establish stable recommendations over time.

In the ethical and legal domains, part of the literature still presents discussions predominantly based on general principles of bioethics and regulation, with limited exploration of situations specific to the practice of enterostomal therapy nurses[7–11,16,20–23]. These limitations reinforce the need for clinical studies and systematic evaluations that deepen the understanding of the actual impacts of artificial intelligence on specialized care.

Recommendations

The identified gaps highlight the need for research evaluating the accuracy and applicability of artificial intelligence systems in real-world clinical settings, particularly in the care of complex wounds, considering variables such as coloration, exudate, and texture, which still pose challenges for algorithmic measurement[4–6,13]. Research aimed at developing strategies to mitigate bias and enhance system explainability also remains relevant, since understanding algorithmic reasoning is an important element in safe decision-making[2,5,7,14].

In the ethical and legal domains, the increasing incorporation of artificial intelligence into clinical practice reinforces the importance of developing digital and algorithmic literacy among healthcare professionals[14], fostering critical evaluation of automated recommendations and reducing the risks of excessive reliance on generative models[1,3,7–9,15]. Likewise, strengthening institutional data protection policies remains essential to ensure compliance with the LGPD and alignment with the CEPE[9–11,16,20–23].

In addition, enterostomal therapy education may benefit from the inclusion of discussions related to privacy, professional responsibility, and the limits of artificial intelligence use in care, contributing to safe and ethical practices guided by patient autonomy[3,7,17].

CONCLUSION

The advancement of AI marks a pivotal moment for enterostomal therapy. This is not a matter of antagonism between humans and machines, but of understanding that all technology, however efficient, remains subordinate to the ethical values that guide care. AI enhances clinical reasoning, expands analytical capacity, and provides valuable support for complex decisions. Its value, however, is realized only when professionals retain critical authority over what the tool suggests.

The main risk in this new landscape lies not in the replacement of nurses by intelligent systems, but in the uncritical use of these technologies, as though their recommendations were sufficient to guide clinical decisions without the necessary professional validation. The promise of technological precision does not legitimize privacy violations, unilateral decisions, or the notion that the patient's best interests justify ethical shortcuts. Bioethics has rejected this type of reasoning since long before AI; the digital context merely makes the issue more urgent and explicit.

Preserving patient autonomy, respecting rights, protecting sensitive data, and maintaining clinical judgment as the cornerstone of decision-making are responsibilities that cannot be delegated. The future of specialized care will not be defined by the speed at which algorithms are adopted, but by the ethical maturity of the professionals who use them.

Enterostomal therapy remains a field in which the skin speaks, the body tells stories, and sensory experience guides clinical management in ways that no machine can fully replicate. Technology is a means, not an end. It is precisely at the intersection of science, sensitivity, and moral responsibility that nursing reaffirms its essence in the face of innovations yet to come.

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