Editorial

Towards Accessible and Circular Wound Care: Integrating Innovation, Education, and Evidence into Clinical Practice

María del Rocío González García[1,2]

[1] *Faculty of Nursing and Health Sciences, Universidad Católica del Uruguay, Montevideo, Uruguay*
[2] *President of the Board of Directors of the Ibero-Latin American Society of Ulcers and Wounds and the Uruguayan Scientific Society of Wounds, Uruguay*
(mail: mdelrociogg@gmail.com)

Citation: González García MDR. "Towards Accessible and Circular Wound Care: Integrating Innovation, Education, and Evidence into Clinical Practice" (2026) *International Journal of Wound Research* 2(2): 111-115. DOI: https://doi.org/10.64115/ijwr-2026-535

There are moments in which clinical practice must move beyond routine thinking and reconsider its own foundations. Chronic wound care is currently experiencing one of those moments. It can no longer be regarded merely as a problem of tissue integrity or as a technical challenge reserved for specialists. Its magnitude reflects one of the most pressing public health issues of our time, bringing together many of the tensions that characterize contemporary healthcare systems.

Population ageing, the increasing burden of non-communicable diseases, persistent pressure on healthcare systems, and inequalities in access to specialized care are converging in ways that can no longer be ignored. In this context, complex wounds are far more than persistent tissue defects; they represent a growing challenge for healthcare organizations, care models, and ultimately for the ethical quality of the assistance we provide.[1]

One fundamental conviction underpins this reflection: the future of wound care will depend on our ability to overcome fragmentation and build a more integrated, critical, and ambitious vision of care.[2]

As the prevalence of chronic wounds steadily increases among vulnerable populations, so too do suffering, functional dependence, the risk of complications, and the human and economic burden that healthcare systems are required to bear.[3] This discussion becomes even more compelling in pediatrics and neonatology, where skin fragility and dependence on medical devices – together with other conditions of vulnerability – make skin integrity a direct indicator of the quality and safety of care. An avoidable skin injury in a newborn or a child represents pain, an increased risk of infection, prolonged hospitalization, and an unnecessary burden for families during a developmentally sensitive period.[4]

Recognizing this reality requires both clinical responsibility and ethical honesty: excellence in healthcare can only be claimed when the most vulnerable individuals are effectively protected.[5]

Responding to these challenges with inherited formulas or with excessive reliance on methodological frameworks that, although

Funding: This research received no external funding. **Conflict of Interest:** The author(s) declare no conflict of interest.

valuable, are no longer sufficient to capture the complexity of real-world practice would be a mistake. The field of wound care must reconsider the way it interprets evidence. The objective is not to abandon methodological rigor but to rescue it from an overly restrictive interpretation that risks excluding the complexity of everyday clinical practice.[6]

The unquestioned dominance of a linear hierarchy of evidence – where only selected study designs are perceived as legitimate sources of knowledge – has left insufficient room for the realities of routine care. In the management of people living with chronic wounds, context is not a secondary element but an essential component of clinical decision-making. Patients frequently present with multiple comorbidities, limited social and economic resources, fragmented care pathways, and clinical decisions that cannot wait for perfect evidence to emerge.[6]

Advocating for a circular model of evidence means promoting a science that is less dogmatic and more clinically useful – one capable of integrating randomized clinical trials with high-quality registries, observational research, and systematically collected professional experience.[6] Such an approach does not seek to replace traditional hierarchies of evidence but rather to enrich them by incorporating forms of knowledge that are essential in complex clinical environments. In wound care, where patient heterogeneity, contextual factors, organizational constraints, and implementation challenges all influence outcomes, the integration of different sources of knowledge can provide a more complete understanding of clinical effectiveness.[6]

Within this evolving perspective, technological innovation occupies a central position. However, technology should not be celebrated simply because it is new. It possesses no intrinsic value. Its significance lies in its ability to improve clinical decision-making, reduce uncertainty, expand access to care, and ultimately produce better patient outcomes.[7]

The digital transformation of wound care offers an extraordinary opportunity to move in this direction. Artificial intelligence applied to image analysis, tissue segmentation, automated wound measurement, and longitudinal comparison of lesion evolution represents an important step toward more objective and reproducible assessment, reducing interobserver variability and improving standardization.[7]

Nevertheless, the sophistication of an algorithm matters only if it improves clinical practice. Improving the ability to see is the first step toward improving the ability to prevent and to treat. In wound care, where every delay, omission, or misinterpretation may translate into prolonged healing or preventable complications, this distinction has profound clinical significance.[8]

Recent evidence suggests that AI-based systems can improve diagnostic accuracy and support clinical decision-making. However, further validation across diverse healthcare settings remains necessary before their widespread implementation.[8]

Similarly, telemedicine and remote monitoring should be viewed not merely as technological solutions but as instruments of health equity, capable of decentralizing expertise and reducing unnecessary patient displacement, particularly for individuals with limited mobility or restricted access to specialized services. Technological progress deserves its name only when it reduces inequalities rather than deepening them.[9]

The same principle applies to smart sensors and advanced biomaterials designed to monitor the wound microenvironment. Although many of these technologies still require further validation and clinical maturation, their direction of development signals an important paradigm shift. Moving from episodic assessment toward continuous, sensitive, and contextualized monitoring means envisioning a model of care that is less reactive, less delayed, and considerably more capable of anticipating deterioration before it becomes clinically evident.[10]

Regenerative medicine and photobiomodulation occupy this same frontier of innovation. These fields deserve enthusiasm – but enthusiasm disciplined by evidence rather than driven by expectations alone. A fundamental conceptual shift has occurred: the skin is no longer viewed simply as a passive physical barrier but as an immunologically active organ that plays a dynamic role in tissue repair and regeneration. Within this framework, photobiomodulation, including blue-light therapy, emerges as a promising option for difficult-to-heal wounds, although robust scientific evidence remains necessary to establish its definitive clinical role.[11,12]

Yet it would be naive to believe that innovation

alone can solve the challenges facing wound care. No technology can generate sustainable value without an organizational model capable of adopting it, evaluating it, and integrating it into routine clinical practice for the benefit of patients, families, and healthcare systems.

As care increasingly shifts from hospitals to homes and community settings, our understanding of efficiency must also evolve. Success should no longer be measured solely by the number of procedures performed but by the amount of suffering avoided, the complications prevented, the reduction in healing time achieved, and the quality of life preserved.

From this perspective, sustainability should not be presented as a constraint on innovation but rather as the ultimate demonstration of its maturity. An innovation that fails to improve outcomes or cannot be realistically integrated into healthcare systems is not a genuine solution; it is simply a promise that has not yet fulfilled its purpose.[13]

The second major pillar – and perhaps the most decisive – is specialized education. There is a persistent illusion, particularly during periods of rapid technological advancement, that devices and algorithms will compensate for weaknesses in clinical care. They will not.

No technological innovation can substitute for clinical judgment, trained observation, contextual interpretation, or the prudence required to make decisions in complex situations while considering the needs of both patients and their families.[14,15]

For this reason, continuing professional education should never be regarded as an optional complement but rather as the structural foundation of any serious strategy for improving care. Education in wound care extends far beyond technical instruction; it requires the development of clinical reasoning, ethical judgment, interdisciplinary collaboration, educational competence, and critical appraisal of scientific evidence.[16]

Within this process, specialized nursing represents the backbone of prevention, longitudinal follow-up, therapeutic education, and effective coordination of care. The progress achieved by highly skilled teams can rapidly disappear if education is reduced to isolated training events or if institutions fail to develop a culture capable of sustaining continuous professional growth. High staff turnover, heterogeneity of experience, and the daily pressures of healthcare delivery mean that excellence is always a fragile and dynamic equilibrium.[17]

This is why translating evidence into practical tools, shared consensus documents, clear algorithms, and effective educational strategies is essential. Scientific knowledge that does not reach the point of care in a language that clinicians can readily apply risks becoming academic prestige without meaningful clinical consequences.[18]

Recent advances in device-related pressure injury prevention, skin integrity monitoring, family-centered care, and specialized nursing competencies have further highlighted the need for approaches specifically tailored to newborns and children. As healthcare systems increasingly pursue safer and more personalized models of care, pediatric populations represent not only a challenge but also an extraordinary opportunity for innovation, interdisciplinary collaboration, and future research.[13]

The third pillar, clinical documentation, deserves even greater attention than it usually receives. In an era increasingly fascinated by artificial intelligence, it is worth recalling a simple truth: no intelligent system can compensate for poor, fragmented, or inconsistent clinical data. Clinical documentation remains the fundamental substrate upon which continuity of care, outcome evaluation, applied research, and the visibility of professional practice are built.[19]

When essential variables such as pain, nutritional status, wound progression, or performed interventions are inadequately documented, patient safety is compromised. Equally important, the opportunity to learn from experience and generate meaningful knowledge from routine practice is substantially weakened.[19]

Defending the quality of clinical documentation is therefore not merely defending an administrative requirement. It is defending an ethic of care that recognizes that every good future decision depends, at least in part, on the seriousness with which we document what we observe and what we do today.

Ultimately, the future of wound care will not be defined exclusively in laboratories, scientific congresses, or specialized units. It will also depend on our ability to build a scientific and clinical community that is less fragmented,

more collaborative, and more willing to share knowledge without transforming it into a privilege.[6]

In this regard, the commitment to accessible publishing models and more democratic systems of knowledge dissemination is not an ideological aspiration but a matter of coherence. If wound care seeks to address a global burden of disease, the knowledge it generates cannot remain accessible only to those with the resources to obtain it6.

Likewise, if we genuinely aspire to person-centered care, patients, families, and caregivers must no longer be considered passive recipients of healthcare but active partners in defining therapeutic priorities, care goals, and meaningful outcomes.

Ultimately, the future of wound care will not be determined by a single technological breakthrough or by an isolated scientific discovery. It will depend on our collective capacity to integrate meaningful innovation, robust education, plural forms of evidence, rigorous clinical documentation, and open collaboration into a coherent model of care. What is at stake is more than the evolution of a clinical discipline – it is the opportunity to build a healthcare system that is more intelligent, more equitable, and more faithful to the dignity of every person living with a wound. Faced with this responsibility, observing change is no longer sufficient. The time has come to decide what kind of difference we are willing to make.

References

1. Liu H, Sun W, Cai W, Luo K, Lu C, Jin A, Zhang J, Liu Y. Current status, challenges, and prospects of artificial intelligence applications in wound repair theranostics. *Theranostics.* 2025 Jan 2;15(5):1662-1688. https://doi.org/10.7150/thno.105109
2. Pinkova J, Monaro S. Integrating new approaches to care in a vascular wound clinic. *J Vasc Nurs.* 2024;42(2):83-88. https://doi.org/10.1016/j.jvn.2024.01.002
3. Sun H, Pulakat L, Anderson DW. Challenges and New Therapeutic Approaches in the Management of Chronic Wounds. *Curr Drug Targets.* 2020;21(12):1264-1275. https://doi.org/10.2174/1389450121666200623131200
4. Nicolosi B, Parente E, Fontani I, Idrizaj S, Stringi D, Bamonte C, et al. Risk factors for skin injuries in hospitalized children: a retrospective study. *Infermieristica J.* 2024;3(4):277-285. https://doi.org/10.36253/if-3159
5. Lorenz SG. Protection: clarifying the concept for use in nursing practice. *Holist Nurs Pract.* 2007;21(3):115-123. https://doi.org/10.1097/01.HNP.0000269148.42861.62
6. Nicolosi B. Healing through research: the future of wound care is accessible and circular. *Int J Wound Res.* 2025;1(1):1-4. https://doi.org/10.64115/ijwr-2025-1
7. Alotaibi YK, Federico F. The impact of health information technology on patient safety. *Saudi Med J.* 2017 Dec;38(12):1173-1180. https://doi.org/10.15537/smj.2017.12.20631
8. Griffa D, Natale A, Merli Y, Starace M, Curti N, Mussi M, Castellani G, Melandri D, Piraccini BM, Zengarini C. Artificial Intelligence in Wound Care: A Narrative Review of the Currently Available Mobile Apps for Automatic Ulcer Segmentation. *BioMedInformatics.* 2024; 4(4):2321-2337. https://doi.org/10.3390/biomedinformatics4040126
9. Chang DH, Nguyen DK, Nguyen TN, Chan CL. Artificial Intelligence-Assisted Clinical Decision Support System in Telemedical Wound Care: A Randomized Controlled Trial. *Ann Plast Surg.* 2026;96(2 Suppl 2):S61-S66. https://doi.org/10.1097/SAP.0000000000004554
10. Palani N, Mendonce KC, Syed Altaf RR, et al. Next-generation smart wound dressings: AI integration, biosensors, and electrospun nanofibers for chronic wound therapy. *J Biomater Sci Polym Ed.* 2026;37(5):962-1012. https://doi.org/10.1080/09205063.2025.2540362
11. Nicolosi B, Bastarelli E, Gregorini M, Ciprandi G. Rapid, Safe, and Tolerable Healing of Pediatric Skin Injuries with Blue Light Therapy: An Observational Case Series. *Children.* 2025; 12(6):801. https://doi.org/10.3390/children12060801
12. Caneschi E, Difalco B, Barbato R, Sousa H. Clinical use of platelet-rich plasma in neonatal and pediatric populations: a scoping review. *Int J Wound Res.* 2025;1(2):68-77. doi:10.64115/ijwr-2025-242.
13. Ciprandi G. What really matters in paediatric wound healing: sustainability comes first. *Int J Wound Res.* 2025;1(2):58-61. https://doi.org/10.64115/ijwr-2025-253.
14. Jiang F, Jiang Y, Zhi H, et al. Artificial intelligence in healthcare: past, present and future. *Stroke Vasc Neurol.* 2017;2(4):230-243. https://doi.org/10.1136/svn-2017-000101
15. Alowais SA, Alghamdi SS, Alsuhebany N, et al. Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC Med Educ.* 2023;23(1):689. https://doi.org/10.1186/s12909-023-04698-z
16. Martinengo L, Yeo NJY, Markandran KD, Olsson M, Kyaw BM, Car LT. Digital health professions education on chronic wound management: A systematic review. *Int J Nurs Stud.* 2020;104:103512. https://doi.org/10.1016/j.ijnurstu.2019.103512
17. Kielo-Viljamaa E, Ahtiala M, Suhonen R, Stolt M. Simulated Wound Care as a Competence Assessment Method for Student and Registered Nurses. *Adv Skin Wound Care.* 2021;34(11):588-595. https://doi.org/10.1097/01.ASW.0000792916.93340.68
18. Zecca S, Zappulla M, Nicolosi B. Nurses' knowledge and practice gaps in incontinence-associated dermatitis: findings from a cross-sectional survey. *Int J Wound Res.* 2025;1(2):94-105. https://doi.org/10.64115/ijwr-2025-37.
19. Nagle LM, Judd JM. Supporting continuity of information in the patient transfer process should there be a minimum data set across care settings?. *Stud Health Technol Inform.* 2006;122:746-748.