Kelvin Open Science Publishers
Connect with Research Community

Research Article Volume 1 | Issue 1

KOS Journal of Public Health and Integrated Medicine
https://kelvinpublishers.com/journals/public-health-and-integrated-medicine.php

The AI Rx: Reshaping the Medical Landscape

Fenella Chadwick*

Department of Public Health, Harvard University, Massachusetts Hall, Cambridge, USA

***Corresponding author:** Prof. Fenella Chadwick, Department of Public Health, Harvard University, Massachusetts Hall, Cambridge, USA

Received: June 02, 2025; **Accepted:** June 11, 2025; **Published:** June 13, 2025

Citation: Fenella Chadwick. (2025) The AI Rx: Reshaping the Medical Landscape. *KOS J Pub Health Int Med.* 1(1): 1-7.

1. Abstract
The biomedical landscape is undergoing a profound transformation driven by the exponential growth of data and the advanced analytical capabilities of Artificial Intelligence (AI). This abstract explores how the convergence of big data and AI is revolutionizing biomedical science, moving beyond traditional hypothesis-driven research to data-driven discovery. The explosion of genomic, proteomic, clinical, imaging, and real-world data presents unprecedented opportunities to uncover novel insights into disease mechanisms, personalize treatments, and accelerate drug discovery. We discuss the critical role of AI algorithms, including machine learning and deep learning, in extracting meaningful patterns from complex, high-dimensional datasets that are often inaccessible to human analysis. Challenges such as data integration, standardization, privacy, and the interpretability of AI models are also addressed. Ultimately, this integration promises to usher in an era of precision medicine, predictive health, and more efficient biomedical innovation, fundamentally reshaping our understanding of human biology and disease.

2. Keywords
Artificial Intelligence (AI), Healthcare, Medicine, Medical imaging, Diagnostics, Drug discovery, Precision medicine, Personalized treatment, Predictive analytics, Clinical decision support, Digital health

3. Introduction
For centuries, medicine has evolved through painstaking observation, empirical discovery, and incremental scientific advancement. From the rudimentary practices of ancient healers to the marvels of modern surgery and pharmacology, progress has been a testament to human ingenuity and dedication. Yet, despite these monumental strides, healthcare systems globally grapple with persistent challenges: escalating costs, growing physician burnout, diagnostic delays, the arduous journey of drug development, and the inherent variability in patient responses to treatment. These systemic pressures underscore a profound need for disruptive innovation-a catalyst that can fundamentally reshape how we prevent, diagnose, and treat disease. That catalyst is emerging in the form of Artificial Intelligence (AI), acting as a powerful "prescription" (Rx) for many of medicine's most pressing ailments, thereby reshaping the medical landscape in ways previously confined to science fiction [1-23].

The advent of AI into healthcare is not a futuristic concept; it is a present reality, with capabilities that are rapidly maturing and expanding. AI, in its broadest sense, refers to the simulation of human intelligence processes by machines, especially computer systems. These processes include learning, reasoning, problem-solving, perception, and understanding language. Within medicine, AI manifests across a spectrum of technologies, from sophisticated machine learning algorithms that identify patterns in vast datasets to deep neural networks that mimic the human brain's ability to learn from complex visual information. The surge in AI's relevance stems from two converging forces: The exponential growth of big data in healthcare-encompassing Electronic Health Records (EHRs), genomic sequences, medical images, sensor data from wearables, and research findings-and the dramatic increase in computational power capable of processing this data [24-43].

The impact of "The AI Rx" is multifaceted, extending across the entire patient journey and the broader healthcare ecosystem. Consider the realm of diagnostics**.** AI-powered image analysis systems are now demonstrating remarkable accuracy in detecting subtle anomalies in X-rays, MRI scans, CT scans, and pathology slides, often surpassing the capabilities of the human eye alone. This enables earlier detection of diseases like cancer, diabetic retinopathy, and neurological conditions, leading to more timely interventions and improved patient outcomes. Beyond imaging, AI algorithms are sifting through vast clinical data to identify complex diagnostic patterns that might elude human clinicians, reducing misdiagnosis rates and streamlining the diagnostic process [44-59].

Furthermore, AI is poised to revolutionize treatment planning and precision medicine. By analyzing a patient's unique genetic profile, medical history, lifestyle factors, and even their microbiome, AI can predict individual responses to various therapies. This moves us away from a "one-size-fits-all" approach to medicine towards highly personalized treatment regimens that are optimized for efficacy and minimized for adverse effects. For instance, in oncology, AI can help predict which immunotherapy will be most effective for a particular cancer patient, or identify drug resistance mechanisms before they manifest. The ability to tailor treatments to the individual represents a paradigm shift, promising superior patient outcomes and more efficient resource allocation [60-72].

The implications of AI also extend significantly into drug discovery and development, traditionally a painstakingly slow, incredibly expensive, and high-risk endeavor. AI algorithms can analyze vast chemical libraries, predict the properties of novel compounds, identify potential drug targets with greater precision, and even simulate molecular interactions *in silico*, dramatically reducing the need for costly and time-consuming laboratory experiments. Generative AI, for example, is now being used to design novel molecular structures with desired therapeutic properties. This acceleration of the research and development pipeline could lead to new medications reaching patients faster, addressing unmet medical needs with unprecedented efficiency.

Beyond these clinical applications, AI is also driving efficiencies in healthcare operations and administration. From automating routine tasks like medical coding, billing, and scheduling to optimizing hospital bed utilization and predicting patient flow, AI is freeing up valuable human resources, allowing healthcare professionals to dedicate more time to direct patient care. This operational streamlining contributes to reducing administrative burdens and potentially mitigating issues like physician burnout [73-83].

In essence, "The AI Rx" is not merely a technological enhancement; it is a profound philosophical shift in how we conceive and deliver healthcare. It offers the promise of a future where medical insights are gleaned with unparalleled speed, treatments are custom-designed for each individual, and healthcare resources are deployed with optimal efficiency. However, realizing this potential requires a nuanced understanding of the challenges and ethical considerations that accompany such a powerful transformation. This introduction sets the stage for a deeper exploration into the diverse ways AI is reshaping the medical landscape, and the critical factors that will determine its successful and equitable integration into the future of global health [83-88].

4. Challenges

The profound promise of Artificial Intelligence (AI) in reshaping the medical landscape, while undeniably exciting, is shadowed by a complex array of challenges that must be meticulously navigated. Simply deploying AI without addressing these hurdles risks exacerbating existing disparities, eroding trust, and even causing harm. These challenges span data governance, algorithmic integrity, ethical considerations, regulatory complexities, and the practicalities of implementation within established healthcare systems.

4.1. Data-related challenges: the foundation of AI

At the heart of any AI system is data, and the quality, quantity, and accessibility of medical data present formidable obstacles:

- **Data silos and interoperability:** Healthcare data is notoriously fragmented. Electronic Health Records (EHRs) from different providers, hospitals, and even departments often reside in disconnected systems that cannot easily "speak" to each other. Integrating diverse data sources - from genomic sequences and imaging scans to wearable device data and social determinants of health - is a monumental technical and logistical task. Lack of universal standards for data formats, terminology, and coding exacerbates this issue, creating significant barriers to building comprehensive patient profiles and population-level insights.
- **Data quality and completeness:** AI models are only as good as the data they are trained on. Medical data, while abundant, is frequently incomplete, inconsistent, erroneous, or poorly structured. Missing values, coding errors, subjective physician notes, and variations in data collection practices can introduce significant noise and bias. "Garbage in, garbage out" is a stark reality, meaning faulty training data can lead to unreliable or even harmful AI outputs.
- **Data volume and management:** The sheer volume of medical data being generated (e.g., high-resolution imaging, whole-genome sequencing) is staggering. Storing, processing, and curating this data requires massive computational infrastructure and sophisticated data management strategies, posing significant financial and technical burdens for healthcare organizations.
- **Data privacy and security:** Health data is among the most sensitive personal information. Protecting patient privacy while leveraging data for AI innovation is a delicate balancing act. Compliance with stringent regulations like HIPAA in the U.S., GDPR in Europe, and other regional data protection laws is complex. The risk of data breaches, re-identification from anonymized datasets, and misuse of sensitive information is a constant concern, demanding robust cybersecurity measures and innovative privacy-preserving techniques like federated learning.

4.2. Algorithmic and technical challenges: The "AI" in "AI Rx"

Even with perfect data, designing and deploying effective and trustworthy AI models presents its own set of technical complexities:

- **Algorithmic bias and fairness:** AI models learn from the patterns in their training data. If this data disproportionately represents certain demographics (e.g., predominantly male, Caucasian patients in historical clinical trials) or reflects existing societal biases (e.g., lower referral rates for certain ethnic groups), the AI system will inadvertently perpetuate and amplify these biases. This can lead to disparate outcomes, such as misdiagnoses or suboptimal treatment recommendations for underserved or minority populations, exacerbating health inequities. Ensuring algorithmic fairness is a critical, ongoing challenge.
- **Interpretability and explainability (XAI):** Many powerful AI models, particularly deep learning networks, operate as "black boxes". Their decision-making processes are opaque, making it difficult for humans to understand *why* a particular recommendation was made. In clinical settings, where decisions directly impact human lives, clinicians need to understand the rationale behind an AI's output to trust it, validate it, and take accountability. The lack of interpretability hinders adoption, complicates error detection, and poses significant ethical and regulatory hurdles.
- **Generalizability and robustness:** An AI model trained on data from one specific hospital or patient population may not perform effectively when deployed in a different setting due to variations in demographics, clinical practices, equipment, or disease prevalence. Ensuring that AI models are robust, reliable, and can generalize across diverse real-world clinical environments is crucial for widespread utility. Continuous monitoring and adaptation are often required as real-world data may "drift" from training data.
- **Validation and Efficacy in Real-World Settings:** Rigorously validating AI models in controlled laboratory environments is one thing; proving their efficacy and safety in complex, dynamic clinical settings is another. Designing appropriate clinical trials for AI-powered diagnostics or therapeutics, especially for continuously learning models, presents unique methodological challenges for regulatory bodies.

4.3. Ethical, legal, and societal challenges: navigating the human element

The integration of AI into medicine raises profound questions about responsibility, human agency, and societal impact:

- **Accountability and Liability:** When an AI system contributes to a diagnostic error or adverse patient outcome, determining legal and ethical accountability becomes complex. Is it the AI developer, the clinician who used the AI, the hospital, or a combination? Clear legal frameworks for liability in AI-driven healthcare are still nascent.
- **Maintaining the Human Touch and Preventing Deskilling:** While AI excels at data analysis, medicine remains fundamentally a human endeavor rooted in empathy, communication, and complex judgment. There are concerns that over-reliance on AI could lead to deskilling among healthcare professionals or depersonalize patient care. Striking the right balance between AI augmentation and human oversight is crucial to ensure that technology serves, rather than supplants, compassionate medical practice.
- **Patient Trust and Education:** For AI to be widely adopted, patients must trust these technologies with their most sensitive data and their health outcomes. Concerns about privacy, algorithmic bias, and the perceived loss of human connection can erode this trust. Effective communication, transparency, and public education are vital to fostering acceptance.
- **Regulatory frameworks and compliance:** Regulatory bodies worldwide are grappling with how to effectively oversee and approve AI-powered medical devices and software. The dynamic nature of AI, particularly continuously learning algorithms, presents unique challenges for traditional regulatory pathways designed for static devices. Developing agile, risk-based frameworks that ensure safety and efficacy without stifling innovation is a monumental task.

4.4. Implementation and operational challenges: bridging the gap to practice

Even if all other challenges are met, putting AI into practice within existing healthcare systems is a complex undertaking:

- **Cost and resource investment:** Implementing AI solutions requires significant financial investment in infrastructure, software, and specialized talent (AI engineers, data scientists, clinical informaticians). Smaller healthcare providers may struggle to afford these upfront and ongoing costs, potentially exacerbating health disparities.
- **Workforce training and adaptation:** The successful integration of AI requires a healthcare workforce that is AI-literate. Clinicians, nurses, and administrators need training not only in how to use AI tools but also in understanding their capabilities, limitations, and ethical implications. Reskilling and upskilling programs are essential.
- **Integration into clinical workflow:** AI tools must seamlessly integrate into existing, often already complex and time-constrained clinical workflows. Poorly designed interfaces or systems that add to clinician burden will face resistance and slow adoption.
- **Resistance to change:** As with any disruptive technology, there can be resistance from healthcare professionals who are comfortable with established practices, or who harbor skepticism about AI's reliability and impact on their roles. Effective change management strategies are crucial.

5. Future Works

The "AI Rx" is not a static solution but an evolving paradigm. Future work in reshaping the medical landscape with AI will focus on deepening its capabilities, broadening its reach, and ensuring its equitable and ethical application. These efforts will span several key interconnected areas:

5.1. Next-generation AI models and data integration

- **Truly multimodal and multi-omics AI:** While current AI can process various data types, future work will focus on developing AI models that seamlessly integrate and synthesize information from *all* available modalities - genomics, proteomics, metabolomics, high-resolution imaging (radiology, pathology), clinical notes, wearable sensor data, and even social determinants of health. This will move beyond simple concatenation to sophisticated models that understand the complex interplay between these diverse data streams, providing a truly holistic view of patient health and disease. Expect advancements in "Large Multimodal Models" (LMMs) specifically trained for medical contexts.

- **Causal AI and mechanistic understanding:** Current AI excels at identifying correlations. Future research will increasingly focus on **causal inference** - developing AI models that can discern *cause-and-effect* relationships in biological systems and disease progression. This shift from correlation to causation will be pivotal for designing more effective and predictable interventions, understanding disease mechanisms at a deeper level, and moving towards truly rational drug design.
- **Generative AI for discovery and design:** Beyond analyzing existing data, generative AI (e.g., advanced LLMs, diffusion models) will play an increasingly prominent role in *creating* novel solutions. This includes designing new drug molecules with desired properties, generating synthetic medical images for training purposes, simulating complex biological interactions, and even synthesizing realistic patient data for research while protecting privacy. This could dramatically accelerate the discovery and development cycle.
- **Explainable AI (XAI) for clinical trust and accountability:** The "black box" problem remains a significant barrier. Future work will intensely focus on developing AI models that are inherently more transparent or can provide clear, actionable explanations for their predictions and recommendations. This includes techniques that highlight which data features led to a specific diagnosis or treatment suggestion, fostering clinician trust, enabling validation, and meeting regulatory requirements for accountability.

5.2. Deepening Clinical Integration and Workflow Transformation

- **Proactive and Predictive Health Management:** The future will see AI moving from reactive disease treatment to proactive health management. AI models, continuously learning from integrated data streams (including real-time data from wearables and remote monitoring), will predict individual risk for specific diseases well in advance, flagging potential health issues before symptoms even appear. This will enable personalized prevention strategies and timely interventions, shifting the focus towards maintaining wellness.
- **AI as a "Clinical Co-Pilot":** Instead of replacing clinicians, future AI will act as an intelligent co-pilot, augmenting human decision-making. This involves AI systems providing real-time decision support at the point of care, synthesizing patient data, suggesting diagnostic pathways, recommending personalized treatment options, and even assisting with complex surgical planning. The emphasis will be on intuitive interfaces and seamless integration into existing clinical workflows to enhance efficiency and reduce cognitive load on healthcare professionals.
- **Personalized Patient Engagement and Education:** AI will empower patients to take a more active role in their health. This includes AI-powered virtual health assistants and chatbots providing personalized health information, medication reminders, appointment scheduling, and tailored educational content. Future work will explore how AI can foster greater patient literacy and adherence to treatment plans.
- **Autonomous AI Systems (for specific tasks):** While human oversight will remain critical for complex decisions, future work may explore the deployment of highly specialized, *autonomous* AI systems for specific, well-defined tasks where human intervention is less critical or where speed is paramount (e.g., certain diagnostic screening, automated quality control in labs). This would require robust regulatory frameworks and stringent validation.

5.3. Addressing ethical, regulatory, and societal grand challenges

- **Robust ethical AI frameworks and bias mitigation:** As AI becomes more deeply embedded, ongoing research and policy development will focus on comprehensive frameworks for ethical AI. This includes developing advanced techniques for bias detection and mitigation, ensuring fairness and equity across all demographic groups, and establishing transparent processes for auditing AI systems for unintended discriminatory outcomes. The "FUTURE-AI" guidelines represent a step in this direction, emphasizing continuous stakeholder engagement and data protection.
- **Harmonized global regulatory landscape:** The rapid pace of AI innovation necessitates agile and harmonized regulatory approaches. Future work will involve international collaboration to develop consistent standards for AI validation, approval, and post-market surveillance in healthcare, accommodating continuously learning models and ensuring patient safety across borders.
- **Rethinking workforce education and training:** A critical area for future investment is the widespread upskilling and reskilling of the healthcare workforce. This involves integrating AI literacy into medical school curricula, developing specialized training programs for existing clinicians and nurses, and fostering interdisciplinary collaboration between medical professionals and AI specialists.
- **Economic and equity impact assessments:** As AI transforms healthcare, future work will need to rigorously assess its economic impact (cost savings vs. investment) and its effect on healthcare equity. Research will focus on models that ensure AI benefits are broadly distributed and do not exacerbate existing health disparities, particularly in underserved communities.

5.4. Exploring frontier technologies and synergies

- **Quantum computing for AI in medicine:** While still in its early stages, quantum computing holds immense potential to unlock new capabilities for AI in medicine. Future research will explore how quantum algorithms can accelerate complex simulations for drug discovery, enhance molecular modeling, improve medical imaging resolution, and revolutionize genomic analysis, pushing the boundaries of what classical AI can achieve.
- **Neuro-AI integration:** Exploring the direct integration of AI with neural interfaces and Brain-Computer Interfaces (BCIs) for diagnostics, prosthetics, and rehabilitation is a nascent but promising field. This could lead to breakthroughs in treating neurological disorders and restoring lost function.
- **Sustainable AI:** As AI models grow in complexity, their energy consumption increases. Future work will also focus on developing more energy-efficient AI algorithms and infrastructure for healthcare, contributing to environmental sustainability alongside healthcare improvements.

6. Conclusion

The AI Rx is not merely a technological intervention; it represents a profound paradigm shift in how we conceive and deliver healthcare. Its success hinges not just on algorithmic prowess, but on a collective commitment to ethical principles, transparent development, and inclusive deployment. By diligently addressing the technical, ethical, and practical challenges, and by fostering an environment of collaboration between technologists, clinicians, policymakers, and patients, we can ensure that AI truly delivers on its promise. The reshaping of the medical landscape by AI is well underway, moving us towards a future where healthcare is more intelligent, accessible, and profoundly impactful for every individual.

7. References

1. Omid Panahi. (2025) Holistic Approaches in Healthcare: Integrating Surgical and Oral Therapies. Journal of Surgical Case Reports and Investigations. 1(1): 15-20.
2. Panahi O. (2025) The oral-systemic link: Using AI to analyze dental data for cardiovascular risk assessment. Ann Cardiol. 2(1): 1008.
3. Omid Panahi. (2025) Health in the Age of AI: A Family and Community Focus. Archives of Community and Family Medicine. 8(1): 11-20.
4. Panahi O. (2025) Robotic Surgery Powered by AI: Precision and Automation in the Operating Room. Sun Text Rev Med Clin Res. 6(2): 225.
5. Panahi DU, HOC A. (2025) Networks: Applications. Challenges, Future Directions. Scholars' Press.
6. Omid Panahi. (2024) f: Expanding Access to Oral Healthcare. Journal of Dental Science Research Reviews & Reports. SRC/JDSR-203.
7. Omid P, Reza S. (2024) How Artificial Intelligence and Biotechnology are Transforming Dentistry. Adv Biotech & Micro. 18(2): 555981.
8. Omid Panahi. (2024) AI: A New Frontier in Oral and Maxillofacial Surgery. Acta Scientific Dental Sciences. 8(6): 40-42.
9. Omid Panahi, Reza Safaralizadeh. (2024) AI and Dental Tissue Engineering: A Potential Powerhouse for Regeneration. Mod Res Dent. 8(2): 682.
10. Omid Panahi. (2024) Artificial Intelligence: A New Frontier in Periodontology. Mod Res Dent. 8(1): 680.
11. Omid P. (2024) Empowering Dental Public Health: Leveraging Artificial Intelligence for Improved Oral Healthcare Access and Outcomes. JOJ Pub Health. 9(1): 555754.
12. Omid P. (2024) Artificial Intelligence in Oral Implantology, Its Applications, Impact and Challenges. Adv Dent & Oral Health. 17(4): 555966.
13. Omid Panahi (2024) AI Ushering in a New Era of Digital Dental-Medicine. Acta Scientific Medical Sciences. 8(8): 131-134.
14. Panahi O, Zeinaldin M. (2024) AI-Assisted Detection of Oral Cancer: A Comparative Analysis. Austin J Pathol Lab Med. 10(1): 1037.
15. Panahi O. (2024) AI in Surgical Robotics: Case Studies. Austin J Clin Case Rep. 11(7): 1342.
16. Panahi O, Zeinaldin M. (2024) Digital Dentistry: Revolutionizing Dental Care. J Dent App. 10(1): 1121.
17. Uras Panahi. AD HOC-Netze: Anwendungen, Herausforderungen, zukünftigeWege, Verlag Unser Wissen. ISBN: 978-620-8-72963-9.
18. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Künstliche Intelligenz in der Zahnmedizin. Unserwissen Publishing. ISBN: 978-620-3-6722696.
19. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Artificial Intelligence in Dentistry. Scholars Press Publishing. ISBN: 978-620-6772118.
20. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Inteligencia artificial enodontología. NUESTRO CONOC, MENTO Publishing. ISBN: 978-620-6622764.
21. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) L'intelligenceartificielledansl'odontologie. EDITION NOTRE SAVOIR Publishing. ISBN: 978-620-6622771.
22. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Intelligenzaartificiale in odontoiatria. SAPIENZA Publishing. ISBN: 978-620-6622788.
23. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Inteligência Artificial em Medicina Dentária. NOSSO CONHECIMENTO Publishing. ISBN: 978-620-6622795.
24. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Estrutura, função e gestãoclínica. ISBN: 978-620-8-74561-5.
25. Omid Panahi, Shabnam Dadkhah. AI in der modernen Zahnmedizin. ISBN: 978-620-8-74877-7.
26. Omid Panahi, Shabnam Dadkhah. La IA en la odontologíamoderna. ISBN: 978-620-8-74881-4.
27. Omid Panahi, Shabnam Dadkhah. L'IA dans la dentisteriemoderne. ISBN: 978-620-8-74882-1.
28. Omid Panahi, Shabnam Dadkhah. L'intelligenzaartificialenell'odontoiatriamoderna. ISBN: 978-620-8-74883-8.
29. Omid Panahi, Shabnam Dadkhah. Sztucznainteligencja w nowoczesnejstomatologii. ISBN: 978-620-8-74884-5.
30. Omid Panahi, Shabnam Dadkhah. A IA namedicinadentáriamoderna. ISBN: 978-620-8-74885-2.
31. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Digitale Zahnmedizin und künstliche Intelligenz. ISBN: 978-620-8-73910-2.
32. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Odontología digital e inteligencia artificial. ISBN: 978-620-8-73911-9.
33. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Dentisterienumérique et intelligence artificielle. ISBN: 978-620-8-73912-6.
34. Panahi O. (2025) Wearable Sensors and Personalized Sustainability: Monitoring Health and Environmental Exposures in Real-Time. European Journal of Innovative Studies and Sustainability. 1(2): 11-19.
35. Omid Panahi, Sevil Farrokh. (2024) USAG-1-Based Therapies: A Paradigm Shift in Dental Medicine. Int J Nurs Health Care. 1(1): 1-4.
36. Omid Panahi, Sevil Farrokh. (2024) Can AI Heal Us? The Promise of AI-Driven Tissue Engineering. Int J Nurs Health Care. 1(1): 1-4.
37. Panahi O. (2025) Algorithmic Medicine. Journal of Medical Discoveries. 2(1).
38. Panahi O. (2025) Deep Learning in Diagnostics. Journal of Medical Discoveries. 2(1).
39. Omid P, Soren F (2025) The Digital Double: Data Privacy, Security, and Consent in AI Implants. West J Dent Sci. 2(1): 108.
40. Panahi O, Ketenci Çay F. (2023) NanoTechnology. Regenerative Medicine and Tissue Bio-Engineering. Acta Sci Dent Sci. 7(4): 118-122.
41. Panahi O. (2025) Smart Robotics for Personalized Dental Implant Solutions. Dental. 7(1).
42. Panahi P, Bayılmış C, Çavuşoğlu U, et al. (2021) Performance evaluation of lightweight encryption

algorithms for IoT-based applications. Arabian Journal for Science and Engineering. 46(4): 4015-4037.
43. Panahi U, Bayılmış C. (2023) Enabling secure data transmission for wireless sensor networks based IoT applications. Ain Shams Engineering Journal. 14(2): 101866.
44. Omid Panahi, Uras Panahi. (2025) AI-Powered IoT: Transforming Diagnostics and Treatment Planning in Oral Implantology. J Adv Artif Intell Mach Learn. 1(1): 1-4.
45. Panahi P, Dehghan M. (2008) Multipath Video Transmission over Ad Hoc Networks Using Layer Coding and Video Caches. In: ICEE2008, 16th Iranian Conference on Electrical Engineering. 50-55.
46. Bakikoyuncu, Pejmanpanahi. (2014) Kalman Filtering of Link Quality Indicator Values for Position Detection by Using WSNS. Int'l Journal of Computing, Communications & Instrumentation Engg. 1(1): 129-133.
47. Pejman Panahi, Cneyt Baylm. (2017) Car indoor gas detection system. International Conference on Computer Science and Engineering.
48. Panahi P. (2009) Providing consistent global sharing service over VANET using new plan. In: 14th International CSI Computer Conference. 2009: 213-218.
49. Panahi P, Dehghan M. (2008) Multipath Video Transmission Over Ad Hoc Networks Using Layer Coding and Video Caches. In: 16th Iranian Conference on Electrical Engineering. 50-55.
50. Uras Panahi. Redes AD HOC: Aplicações, Desafios, Direcções Futuras, Edições Nosso Conhecimento. ISBN: 978-620-8-72962-2.
51. Uras Panahi. Sieci AD HOC: Zastosowania, wyzwania, przyszłekierunki, Wydawnictwo Nasza Wiedza. ISBN: 978-620-8-72967-7.
52. Uras Panahi. Reti AD HOC: Applicazioni, sfide e direzioni future, Edizioni Sapienza. ISBN: 978-620-8-72965-3.
53. Uras Panahi. Redes AD HOC: Aplicaciones, retos y orientacionesfuturas, Ediciones Nuestro Conocimiento. ISBN: 978-620-8-72966-0.
54. Uras Panahi. Réseaux AD HOC: Applications, défis et orientations futures, Editions Notre Savoir. ISBN: 978-620-8-72964-6.
55. Panahi O. (2025) Predictive Health in Communities: Leveraging AI for Early Intervention and Prevention. Ann Community Med Prim Health Care. 3(1): 1027.
56. Panahi O. (2025) Digital Health Equity: Leveraging IT and AI for Community Well-being. Ann Community Med Prim Health Care. 3(1): 1028.
57. Omid Panahi. (2025) Innovations in Surgical Healthcare: The Future of Medicine. Journal of Surgical Case Reports and Investigations. 1(1): 1-8.
58. Omid Panahi. (2025) Advancing Healthcare: A Surgical and Oral Medicine Perspective. Journal of Surgical Case Reports and Investigations. 1(1): 21-27.
59. Omid Panahi. (2025) The Interconnectedness of Modern Medicine: Surgery, Oral Health, and Implantology. Journal of Surgical Case Reports and Investigations. 1(1): 9-14.
60. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Odontoiatriadigitale e intelligenzaartificiale. ISBN: 978-620-8-73913-3.
61. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Stomatologiacyfrowaisztucznainteligencja. ISBN: 978-620-8-73914-0.
62. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Medicinadentária digital e inteligência artificial. ISBN: 978-620-8-73915-7.
63. Omid Panahi. Stammzellenausdem Zahnmark. ISBN: 978-620-4-05355-4.
64. Omid Panahi. Célulasmadre de la pulpa dental. ISBN: 978-620-4-05356-1.
65. Omid Panahi. Стволовыеклеткипульпызуба. ISBN: 978-620-4-05357-8.
66. Omid Panahi. Cellules souches de la pulpedentaire. ISBN: 978-620-4-05358-5.
67. Omid Panahi. Cellule staminali della polpa dentaria. ISBN: 978-620-4-05359-2.
68. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Struktur, Funktion und klinisches Management. ISBN: 978-620-8-74556-1.
69. Omid Panahi, Sevil Farrokh Eslamlou. Peridoncio: Estructura, función y manejoclínico. ISBN: 978-620-8-74557-8.
70. Omid Panahi, Sevil Farrokh Eslamlou. Le péridontium: Structure, fonction et gestionclinique. ISBN: 978-620-8-74558-5.
71. Omid Panahi, Sevil Farrokh Eslamlou. Peridonio: Struttura, funzione e gestioneclinica. ISBN: 978-620-8-74559-2.
72. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Struktura, funkcja I postępowanie kliniczne. ISBN: 978-620-8-74560-8.
73. Maryam Gholizadeh, Omid Panahi. (2021) Sistema de Investigaçãoem Sistemas de Informação de Gestão de Saúde. NOSSO CONHECIMENTO Publishing. ISBN: 978-620-3-67052-3.
74. Maryam Gholizadeh, Omid Panahi. (2021) Системаисследований в информационныхсистемахуправленияздравоохранением. SCIENCIA SCRIPTS Publishing. ISBN: 978-620-3-67053-0.
75. Leila Ostovar, Kamal KhademVatan, Omid Panahi. (2020) Clinical Outcome of Thrombolytic Therapy. Scholars Press Academic Publishing. ISBN: 978-613-8-92417-3.
76. Maryam Gholizadeh, Omid Panahi. (2021) Investigating System in Health Management Information Systems. Scholars Press Academic Publishing. ISBN: 978- 613-8-95240-4.
77. Maryam Gholizadeh, Omid Panahi. (2021) UntersuchungssystemimGesundheits management Informationssysteme. Unser Wissen Publishing. ISBN: 978-620-3-67046-2.
78. Maryam Gholizadeh, Omid Panahi. (2021) Sistema de investigaciónensistemas de información de gestión sanitaria. NUESTRO CONOC, MENTO Publishing. ISBN: 978-620-3-67047-9.
79. Maryam Gholizadeh, Omid Panahi. (2021) Systèmed'investigationdans les systèmesd'information de gestion de la santé. EDITION NOTRE SAVOIR Publishing. ISBN: 978-620-3-67048-6.
80. Maryam Gholizadeh, Omid Panahi. (2021) Indagareilsistemaneisistemiinformativi di gestionedella salute. SAPIENZA Publishing. ISBN: 978-620-3-67049-3.
81. Maryam Gholizadeh, Omid Panahi. (2021) Systeemonderzoek in InformatiesystemenvoorGezondheidsbeheer. ONZE KENNIS Publishing. ISBN: 978-620-3-67050-9.
82. Maryam Gholizadeh, Omid Panahi. (2021) System badawczy w

systemachinformacyjnychzarządzaniazdrowiem. NAZSA WIEDZA Publishing. ISBN: 978-620-3-67051-6.
83. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. (2024) Искусственныйинтеллект в стоматологии. SCIENCIA SCRIPTS Publishing. ISBN: 978-620-6622801.
84. Shima Esmaielzadeh, Omid Panahi, Fatmanur Ketenci Çay. (2020). Application of Clay's in Drug Delivery in Dental Medicine. Scholars Press Academic Publishing. ISBN: 978-613-8-94058-6.
85. Panahi O. (2025) The evolving partnership: Surgeons and robots in the maxillofacial operating room of the future. J Dent Sci Oral Care. 1(1): 1-7.
86. Panahi O. (2025) The Future of Medicine: Converging Technologies and Human Health. Journal of Bio-Med and Clinical Research. RPC Publishers. 2(1).
87. Panahi O. (2025) Nanomedicine: Tiny Technologies, Big Impact on Health. Journal of Bio-Medand Clinical Research. RPC Publishers. 2(1).
88. Panahi O. (2025) The Age of Longevity: Medical Advances and The Extension of Human Life. Journal of Bio-Med and Clinical Research. RPC Publishers. 2(1).