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Research Article

Beyond the Bedside: How Future Tech is Revolutionizing Medical Care

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ABSTRACT

The landscape of medical care is undergoing a profound transformation, moving beyond the traditional confines of hospital bedsides to embrace a future where technology plays a pivotal role in every facet of health management. This abstract explores key technological advancements poised to revolutionize medical care, enhance patient outcomes, and improve healthcare accessibility. We delve into the impact of artificial intelligence (AI) and machine learning (ML) in diagnostics, personalized treatment plans, and drug discovery. The integration of wearable sensors and the Internet of Medical Things (IoMT) for continuous monitoring and proactive intervention will be discussed, alongside the potential of virtual and augmented reality (VR/AR) in surgical training, pain management, and remote consultations. Furthermore, we examine the ethical considerations, data privacy challenges, and the necessity of robust regulatory frameworks to ensure equitable and responsible implementation of these innovations. Ultimately, this paper posits that future tech will empower individuals with greater control over their health, foster preventative care models, and pave the way for a more efficient, personalized, and patient-centric healthcare ecosystem.

KEYWORDS

Artificial Intelligence (AI), Machine Learning (ML), Internet of Medical Things (IoMT), Wearable Sensors, Virtual Reality (VR), Augmented Reality (AR), Telemedicine, Personalized Medicine, Preventive Care, Healthcare Technology, Digital Health, Diagnostics, Remote Monitoring.

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Introduction

The traditional image of medical care a patient in a hospital bed, attended by a doctor or nurse is rapidly becoming an incomplete snapshot of a dynamic and evolving reality. For centuries, healthcare has largely been reactive, focused on diagnosis and treatment after the onset of illness. However, we are now at the precipice of a paradigm shift, driven by an unprecedented surge in technological innovation. This introduction will explore how the convergence of cutting-edge technologies is propelling medical care "beyond the bedside," ushering in an era of proactive, personalized, and accessible healthcare that promises to revolutionize the well-being of individuals and populations worldwide.

The impetus for this transformation is multifaceted. Global health challenges, including aging populations, the rise of chronic diseases, and the increasing demand for specialized care, are placing immense pressure on existing healthcare systems. Concurrently, advancements in computing power, data analytics, connectivity, and miniaturization have created fertile ground for the development and integration of technologies previously confined to the realm of science fiction. The COVID-19 pandemic, while a global crisis, also served as a catalyst, accelerating the adoption of telemedicine and highlighting the critical need for resilient and adaptable healthcare solutions [1-22]. This confluence of need and capability is fueling an exciting and transformative journey into the future of medicine.

At the heart of this revolution lies the exponential growth of Artificial Intelligence (AI) and Machine Learning (ML). No longer confined to theoretical discussions, AI and ML algorithms are demonstrating remarkable capabilities in sifting through vast datasets, identifying subtle patterns, and making predictions with astonishing accuracy. In diagnostics, AI is already assisting radiologists in detecting anomalies in medical images with greater precision and speed than the human eye alone. It is aiding pathologists in identifying cancerous cells and helping dermatologists diagnose skin conditions [23-39]. Beyond diagnosis, AI is poised to personalize treatment plans, analyze a patient's unique genetic makeup and lifestyle to predict their response to various therapies, thereby optimizing outcomes and minimizing adverse effects. Furthermore, the drug discovery pipeline, historically a lengthy and expensive endeavor, is being significantly accelerated by AI, which can rapidly screen potential drug candidates and predict their efficacy and safety, bringing life-saving medications to patients faster.

Complementing the intelligence of AI is the omnipresence of the Internet of Medical Things (IoMT) and wearable sensors. These interconnected devices are dissolving the physical boundaries of healthcare, transforming homes into active monitoring hubs. From smartwatches tracking heart rate and sleep patterns to continuous glucose monitors for diabetics and smart patches monitoring vital signs, these devices collect real-time, continuous health data. This constant stream of information allows for proactive interventions, enabling healthcare providers to detect early warning signs of deterioration, manage chronic conditions more effectively, and even prevent hospital readmissions. Imagine a future where an individual's wearable device alerts their doctor to a potential cardiac event hour before symptoms manifest, allowing for timely intervention and potentially saving a life. This shift from episodic care to continuous monitoring empowers individuals to take a more active role in managing their health, fostering a culture of preventative well-being.

The visual and immersive capabilities of Virtual Reality (VR) and Augmented Reality (AR) are also poised to reshape medical education, clinical practice, and patient experience. In surgical training, VR simulations offer aspiring surgeons a safe and realistic environment to practice complex procedures, hone their skills, and prepare for real-world scenarios without risk to patients. AR overlays real-time patient data onto a surgeon's field of view during an operation, providing critical information precisely when and where it's needed. Beyond the operating room, VR is demonstrating promise in pain management, offering immersive distractions that can reduce the need for opioid painkillers. For patients, VR and AR can provide a calming and engaging escape during stressful medical procedures or offer therapeutic exercises for rehabilitation. Telemedicine, already gaining traction, will be further enhanced by VR/AR, enabling more immersive and interactive remote consultations, blurring the lines between physical presence and virtual interaction [40-59].

This technological revolution, however, is not without its challenges and considerations. The proliferation of sensitive health data necessitates robust data privacy and cybersecurity measures to protect patient information from breaches and misuse. Ethical considerations surrounding the autonomous decision-making of AI, the potential for algorithmic bias, and the equitable access to these advanced technologies must be thoroughly addressed. Regulatory frameworks will need to evolve rapidly to keep pace with innovation, ensuring patient safety, product efficacy, and responsible deployment. Furthermore, the human element of healthcare remains paramount; technology should augment, not replace, the compassionate care provided by healthcare professionals.

In essence, the future of medical care is an intricate tapestry woven with threads of innovation, accessibility, and personalization. By moving beyond the traditional bedside, these emerging technologies promise to democratize healthcare, empowering individuals with greater control over their health, fostering preventative care models, and paving the way for a more efficient, equitable, and patient-centric healthcare ecosystem. The journey has just begun, and the potential for transforming human well-being is immeasurable [60-70].

Challenges

While the promise of future technology in revolutionizing medical care is immense, its widespread and equitable adoption faces a significant array of challenges. These hurdles span technological, ethical, regulatory, and socio-economic domains, demanding careful consideration and collaborative solutions to ensure that these innovations truly benefit all.

Data Privacy and Cybersecurity

Perhaps the most critical challenge is the inherent sensitivity of health data. The transition to digital health involves the collection, storage, and transmission of vast amounts of highly personal information, from genetic sequences and medical records to real-time biometric data from wearable devices. This makes healthcare systems prime targets for cyberattacks. The consequences of a data breach in healthcare can be devastating, leading to identity theft, financial fraud, compromised patient care, and a profound erosion of public trust. Ensuring robust encryption, stringent access controls, regular security audits, and adherence to evolving regulations like HIPAA (in the US) or GDPR (in Europe) is paramount. Moreover, the increasing interconnectedness of systems and reliance on third-party vendors for data storage and processing introduce additional vulnerabilities that must be meticulously managed.

Ethical Considerations and Algorithmic Bias

The integration of AI and ML into decision-making processes introduces complex ethical dilemmas. AI models are trained on historical data, and if this data contains biases (e.g., underrepresentation of certain demographic groups), the AI can perpetuate or even amplify existing healthcare disparities. This could lead to unequal diagnostic accuracy, biased treatment recommendations, or disproportionately affect marginalized communities. Furthermore, the "black box" nature of many advanced AI algorithms makes it difficult to understand how

they arrive at a particular conclusion, raising concerns about accountability and liability when errors occur. Who is responsible for a misdiagnosis or adverse outcome when an AI system is involved? Ensuring transparency, explainability, and fairness in AI algorithms, along with robust validation against diverse datasets, are crucial to building trust and preventing harm. The question of informed consent also arises, as patients may not fully grasp the extent of AI's involvement in their care.

Regulatory Frameworks and Validation

The rapid pace of technological innovation often outstrips the ability of regulatory bodies to establish comprehensive and appropriate guidelines. Traditional regulatory pathways for medical devices and pharmaceuticals are not always well-suited for rapidly evolving software, AI algorithms, or interconnected digital health solutions. Regulators face the challenge of ensuring safety and efficacy without stifling innovation. This involves developing new frameworks for continuous monitoring (post-market surveillance), addressing the unique challenges of AI-driven devices (e.g., learning algorithms that change over time), and harmonizing regulations across different countries to facilitate global adoption and prevent market fragmentation. The validation of these technologies, especially those involving AI, requires rigorous testing and clinical trials to demonstrate their real-world effectiveness and safety [71-81].

Interoperability and Data Silos

Despite the proliferation of Electronic Health Records (EHRs) and other digital systems, healthcare data often remains fragmented and trapped in disparate silos across different healthcare providers, specialties, and institutions. A lack of universal standards for data collection, formatting, and exchange significantly hampers the seamless flow of patient information. This interoperability challenge prevents a holistic view of a patient's health, hinders coordinated care, and limits the effectiveness of AI algorithms that thrive on comprehensive datasets. Overcoming this requires widespread adoption of standardized protocols (e.g., FHIR), investment in robust integration platforms, and a shift away from proprietary systems that "lock in" data.

Cost and Implementation Barriers

The development, deployment, and maintenance of advanced healthcare technologies are inherently expensive. This includes the cost of sophisticated hardware, software licenses, data storage, and the significant investment required for training healthcare professionals. For smaller clinics, rural hospitals, or healthcare systems in developing nations, these costs can be prohibitive, exacerbating existing disparities in access to care. Furthermore, integrating new technologies into existing, often outdated, legacy IT systems can be complex and disruptive to established workflows, requiring substantial upfront investment and a willingness to adapt.

Digital Divide and Health Equity

While technology promises to democratize healthcare, it also risks widening the "digital divide." Access to reliable high-speed internet, smart devices, and the digital literacy necessary to effectively use these tools is not universal. Socioeconomic status, geographic location (especially rural areas), age, education level, and disability can all create significant barriers to accessing digital health services like telehealth or remote monitoring. If these disparities are not proactively addressed, advanced technologies could inadvertently leave vulnerable populations further behind, exacerbating existing health inequities. Strategies to bridge this divide include expanding broadband infrastructure, providing digital literacy training, designing user-friendly interfaces, and offering low-tech alternatives where digital access is limited.

Workforce Adoption and Training

The successful integration of new technologies requires a well-trained and adaptable healthcare workforce. Doctors, nurses, and allied health professionals need to be equipped with the skills to effectively utilize AI tools, interpret data from wearables, conduct virtual consultations, and troubleshoot technical issues. There is a need for continuous education and training programs to ensure that healthcare providers are comfortable and proficient with these new tools, seeing them as augmentations to their practice rather than replacements. Resistance to change, fear of job displacement, or a lack of understanding can hinder adoption, underscoring the importance of involving clinicians in the design and implementation process.

Future Works

The transformative potential of future technology in medical care necessitates ongoing research, development, and strategic implementation to overcome the challenges identified. The following areas represent crucial directions for future work to fully realize the promise of a truly revolutionized healthcare system:

Advancing AI and Machine Learning Capabilities

- **Explainable AI (XAI) in Clinical Decision Support:** Future research must focus on developing AI models that are not only accurate but also transparent and interpretable to clinicians. This involves creating "explainable AI" that can articulate its reasoning, thereby building trust and facilitating adoption by healthcare professionals. This is crucial for liability and accountability, as well as for allowing clinicians to critically evaluate AI's recommendations.
- **Mitigating Algorithmic Bias and Promoting Fairness:** Dedicated research is needed to identify, quantify, and actively mitigate biases embedded in healthcare AI datasets and algorithms. This includes developing robust methods for training AI on diverse and representative patient populations, and creating tools to audit and validate AI models for fairness across different demographic groups.
- **AI for Proactive Disease Prediction and Prevention:** Beyond diagnosis, future work will focus on leveraging AI for more sophisticated predictive analytics to identify individuals at high risk for specific diseases *before* symptoms appear. This involves integrating multi-modal data (genomic, lifestyle, environmental, IoMT data) to create highly personalized risk profiles and trigger preventative interventions.
- **Accelerated Drug Discovery and Personalized Therapeutics:** Continued investment in AI for drug discovery, including novel molecule design, drug repurposing, and prediction of drug-target interactions, will accelerate the development of new treatments. Further, AI will be critical in developing highly

personalized therapeutic strategies, tailoring drug dosages and combinations based on individual patient responses predicted by AI models.

Enhancing IoMT and Wearable Technologies

- **Integration of Multi-Modal Biometric Data:** Future IoMT devices will integrate an even broader range of physiological and biochemical markers, moving beyond basic vital signs to include continuous monitoring of biomarkers (e.g., lactate, glucose in non-diabetics, stress hormones) and real-time analysis of sweat, breath, and saliva. This requires advancements in miniaturized, non-invasive sensor technology.
- **Edge Computing and On-Device AI for Real-Time Analysis:** To ensure rapid response and minimize reliance on constant cloud connectivity, future IoMT systems will increasingly incorporate edge computing and on-device AI. This will enable real-time analysis of data at the source, triggering immediate alerts or interventions without significant latency.
- **Robust Security and Privacy by Design for IoMT:** Given the vulnerability of interconnected medical devices, future work must prioritize "security by design" principles, embedding robust encryption, authentication, and secure update mechanisms directly into the hardware and software of IoMT devices from inception. Research into decentralized data storage solutions, like blockchain, could also play a role in enhancing data integrity and privacy.
- **Standardization and Interoperability of IoMT Data:** A critical area for future work is the development and widespread adoption of universal data standards and interoperability protocols for IoMT devices. This will ensure seamless data exchange between different devices, platforms, and electronic health records, enabling comprehensive patient views and facilitating data-driven insights.

Advancing VR/AR in Clinical Practice

- **Tactile Feedback and Haptic Integration in Surgical Simulations:** To make VR surgical training even more realistic, future developments will focus on advanced haptic feedback systems that accurately simulate the tactile sensations of surgical tools interacting with human tissue. This will further enhance skill development and muscle memory for surgeons.
- **AR for Real-time Intraoperative Guidance:** Research will continue to refine AR systems for real-time intraoperative guidance, moving beyond simple overlays to dynamic, adaptive visualizations that integrate live imaging (e.g., ultrasound, endoscopy) and patient data directly into the surgeon's field of view, significantly enhancing precision and safety.
- **Personalized VR/AR Therapeutics:** Future work will explore the development of highly personalized VR/AR therapeutic interventions, especially in mental health (e.g., exposure therapy for phobias, PTSD), pain management, and physical rehabilitation, adapting content and challenges based on individual patient progress and physiological responses.
- **Accessible and Affordable VR/AR Hardware:** To expand the reach of VR/AR in healthcare, future efforts will focus on developing more affordable, lightweight, and user-friendly hardware that can be easily deployed in various clinical and home settings, making these transformative tools accessible to a wider patient population.

Policy, Regulatory, and Ethical Frameworks

- **Adaptive Regulatory Sandboxes:** Governments and regulatory bodies should establish "regulatory sandboxes" that allow for the testing and iterative development of novel healthcare technologies in a controlled environment, fostering innovation while ensuring patient safety.
- **Global Harmonization of Regulations:** Given the global nature of healthcare technology development, future work should focus on harmonizing regulatory frameworks across different countries to streamline market access and reduce the burden on innovators.
- **Ethical AI Review Boards and Public Engagement:** The establishment of independent ethical AI review boards and robust public engagement initiatives will be crucial to ensure transparent and responsible development and deployment of AI in healthcare, addressing societal concerns and building trust.
- **Incentivizing Data Sharing and Interoperability:** Policies that incentivize healthcare providers and technology developers to adopt open standards and facilitate secure data sharing will be critical to overcoming data silos and unleashing the full potential of interconnected health data.

Bridging the Digital Divide and Ensuring Health Equity

- **Inclusive Design and User-Centered Development:** Future development of digital health technologies must prioritize inclusive design principles, ensuring interfaces are intuitive, accessible, and culturally competent for diverse user groups, including those with limited digital literacy or disabilities.
- **Investment in Digital Infrastructure and Connectivity:** Governments and private organizations must invest in expanding broadband internet access, particularly in underserved rural and low-income urban areas, to ensure that all individuals can benefit from digital health solutions.
- **Digital Literacy and Health Education Programs:** Comprehensive programs to improve digital literacy and health literacy among the general public and healthcare professionals will be essential to empower individuals to effectively use and trust future healthcare technologies.
- **"Hybrid" Care Models:** Future healthcare delivery models should embrace a "hybrid" approach, seamlessly integrating digital and in-person care to cater to diverse patient needs and preferences, ensuring that technology augments, rather than replaces, human connection.

Conclusion

The journey "beyond the bedside" is not merely an incremental improvement to existing medical practices; it represents a fundamental redefinition of healthcare itself. As we have explored, the confluence of artificial intelligence, the Internet of Medical Things, wearable technologies, and immersive realities like VR/AR is paving the way for a future where medical care is profoundly more proactive, personalized, and accessible. No longer will

healthcare be primarily a reactive response to illness, confined within the walls of hospitals and clinics. Instead, it is evolving into a continuous, data-driven ecosystem that empowers individuals to actively manage their health, often from the comfort of their homes.

The promise of this technological revolution is immense. AI and machine learning hold the potential to transform diagnostics, unlock personalized treatment pathways based on an individual's unique biological blueprint, and drastically accelerate the discovery of life-saving drugs. Wearable sensors and the IoMT are already turning our everyday environments into silent guardians of health, providing continuous insights that enable early intervention and more effective chronic disease management. Virtual and augmented realities are poised to revolutionize medical education, enhance surgical precision, and offer innovative therapeutic avenues for pain and mental health. Telemedicine, bolstered by these advancements, will continue to dissolve geographical barriers, bringing expert care to remote and underserved populations.

References

1. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Odontoiatria digitale e intelligenza artificiale. 2024.
2. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Dentisterie numérique et intelligence artificielle. 2024.
3. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Odontología digital e inteligencia artificial. 2024.
4. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Stomatologia cyfrowa i sztuczna inteligencja. 2024.
5. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Medicina dentária digital e inteligência artificial. 2024.
6. Omid Panahi. Stammzellen aus dem Zahnmark. 2024.
7. Omid Panahi. Células madre de la pulpa dental. 2024.
8. Omid Panahi. Стволовые клетки пульпы зуба. 2024.
9. Omid Panahi. Cellules souches de la pulpe dentaire. 2024.
10. Omid Panahi. Cellule staminali della polpa dentaria. 2024.
11. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Struktur. Funktion und klinisches Management. 2024.
12. Omid Panahi, Sevil Farrokh Eslamlou. Peridoncio: Estructura, función y manejo clínico. 2024.
13. Omid Panahi, Sevil Farrokh Eslamlou. Le péridontium: Structure, fonction et gestion Clinique. 2024.
14. Omid Panahi, Sevil Farrokh Eslamlou. Peridonio: Struttura, funzione e gestione clinica. 2024.
15. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Struktura, funkcja i postępowanie kliniczne. 2024.
16. Maryam Gholizadeh, Omid Panahi. Sistema de Investigação em Sistemas de Informação de Gestão de Saúde. NOSSO CONHECIMENTO Publishing. 2021.
17. Maryam Gholizadeh, Omid Panahi. Система исследований в информационных системах управления здравоохранением. SCIENCIA SCRIPTS Publishing. 2021.
18. Leila Ostovar, Kamal Khadem Vatan, Omid Panahi. Clinical Outcome of Thrombolytic Therapy. Scholars Press Academic Publishing. 2020.
19. Maryam Gholizadeh, Omid Panahi. System in Health Management Information Systems. Scholars Press Academic Publishing. 2021.
20. Maryam Gholizadeh, Omid Panahi. Untersuchungssystem im Gesund heits management Informations systeme. Unser wissen Publishing. 2021.
21. Maryam Gholizadeh, Omid Panahi. Sistema de investigación en sistemas de información de gestión sanitaria. NUESTRO CONOC, MENTO Publishing. 2021.
22. Maryam Gholizadeh, Omid Panahi. Système d'investigation dans les systèmes d'information de gestion de la santé. EDITION NOTRE SAVOIR Publishing. 2021.
23. Maryam Gholizadeh, Omid Panahi. Indagare il sistema nei sistemi informativi di gestione della salute. SAPIENZA Publishing. 2021.
24. Maryam Gholizadeh, Omid Panahi. Systeemonderzoek in Informatiesystemen voor Gezondheidsbeheer. ONZE KENNIS Publishing. 2021.
25. Maryam Gholizadeh, Omid Panahi. System badawczy w systemach informacyjnych zarządzania zdrowiem. NAZSA WIEDZA Publishing. 2021.
26. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Искусственный интеллект в стоматологии. SCIENCIA SCRIPTS Publishing. 2024.
27. Shima Esmaielzadeh, Omid Panahi, Fatmanur Ketenci Çay. Application of Clay's in Drug Delivery in Dental Medicine. Scholars Press Academic Publishing. 2020.
28. Panahi O. The evolving partnership: surgeons and robots in the maxillofacial operating room of the future. J Dent Sci Oral Care. 2025; 1: 1-7.
29. Panahi O. The Future of Medicine: Converging Technologies and Human Health. Journal of Bio-Med and Clinical Research. RPC Publishers. 2025; 2.
30. Panahi O. Nanomedicine: Tiny Technologies, Big Impact on Health. Journal of Bio-Med and Clinical Research. RPC Publishers. 2025; 2.
31. Panahi O. The Age of Longevity: Medical Advances and The Extension of Human Life. Journal of Bio-Med and Clinical Research. RPC Publishers. 2025; 2.
32. Panahi O. Predictive Health in Communities: Leveraging AI for Early Intervention and Prevention. Ann Community Med Prim Health Care. 2025; 3: 1027.
33. Panahi O. Digital Health Equity: Leveraging IT and AI for

Community Well-being. Ann Community Med Prim Health Care. 2025; 3: 1028.

34. Panahi DU. HOC A Networks: Applications. Challenges, Future Directions. Scholars' Press. 2025.
35. Omid Panahi. Teledentistry: Expanding Access to Oral Healthcare. J Dental Sci Res Rep. 2024; 6: 1-3.
36. Omid P, Reza S. How Artificial Intelligence and Biotechnology are Transforming Dentistry. Adv Biotech Micro. 2024; 18: 555981.
37. Omid Panahi. "AI: A New Frontier in Oral and Maxillofacial Surgery". Acta Scientific Dental Sciences. 2024; 8: 40-42.
38. Omid Panahi, Reza Safaralizadeh. AI and Dental Tissue Engineering: A Potential Powerhouse for Regeneration. Mod Res Dent. 2024; 8.
39. Omid Panahi. Artificial Intelligence: A New Frontier in Periodontology. Mod Res Dent. 2024; 8.
40. Omid P. Empowering Dental Public Health: Leveraging Artificial Intelligence for Improved Oral Healthcare Access and Outcomes. JOJ Pub Health. 2024; 9: 555754.
41. Omid P. Artificial Intelligence in Oral Implantology, Its Applications, Impact and Challenges. Adv Dent & Oral Health. 2024; 17: 555966.
42. Omid Panahi. "AI Ushering in a New Era of Digital Dental Medicine". Acta Scientific Medical Sciences. 2024; 8: 131-134.
43. Panahi O, Zeinaldin M. AI-Assisted Detection of Oral Cancer: A Comparative Analysis. Austin J Pathol Lab Med. 2024; 10: 1037.
44. Panahi O. AI in Surgical Robotics: Case Studies. Austin J Clin Case Rep. 2024; 11: 1342.
45. Panahi O, Zeinaldin M. Digital Dentistry: Revolutionizing Dental Care. J Dent App. 2024; 10: 1121.
46. Panahi O. Wearable Sensors and Personalized Sustainability: Monitoring Health and Environmental Exposures in Real-Time. European Journal of Innovative Studies and Sustainability. 2025; 1: 1-19
47. Omid Panahi, Sevil Farrokh. USAG-1-Based Therapies: A Paradigm Shift in Dental Medicine. Int J Nurs Health Care. 2024; 1: 1-4.
48. Omid Panahi, Sevil Farrokh. Can AI Heal Us? The Promise of AI-Driven Tissue Engineering. Int J Nurs Health Care. 2024; 1: 1-4.
49. Panahi O. Algorithmic Medicine. Journal of Medical Discoveries. 2025; 2.
50. Panahi O. Deep Learning in Diagnostics. Journal of Medical Discoveries. 2025; 2.
51. Omid P, Soren F. The Digital Double: Data Privacy, Security, and Consent in AI Implants. West J Dent Sci. 2025; 2: 108.
52. Panahi O, Ketenci Çay F. NanoTechnology. Regenerative Medicine and Tissue Bio-Engineering. Acta Sci Dent Sci. 2023; 7: 118-122.
53. Panahi O. Smart Robotics for Personalized Dental Implant Solutions. Dental. 2025; 7: 21.
54. Panahi P, Bayılmış C, Çavuşoğlu U, Kaçar S. Performance evaluation of lightweight encryption algorithms for IoT-based applications. Arabian Journal for Science and Engineering. 2021; 46: 4015-4037.
55. Panahi U, Bayılmış C. Enabling secure data transmission for wireless sensor networks based IoT applications. Ain Shams Engineering Journal. 2023; 14: 101866.
56. Omid Panahi, UrasPanahi. AI-Powered IoT: Transforming Diagnostics and Treatment Planning in Oral Implantology. J AdvArtifIntell Mach Learn. 2025; 1: 1-4.
57. Panahi P, Dehghan M. Multipath Video Transmission over Ad Hoc Networks Using Layer Coding and Video Caches. In ICEE2008, 16th Iranian Conference on Electrical Engineering. 2008; 50-55.
58. Baki koyuncu, pejman panahi. Kalman Filtering of Link Quality Indicator Values for Position Detection by Using WSNS. IJCCIE. 2014; 1: 129-133.
59. Pejman Panahi, Cneyt Baylm. Car indoor gas detection system. International Conference on Computer Science and Engineering (UBMK). 2017.
60. Panahi P. Providing consistent global sharing service over VANET using new plan. In 2009 14th International CSI Computer Conference. IEEE. 2009: 213-218.
61. Uras Panahi. Redes AD HOC: Aplicações, Desafios, Direcções Futuras. Edições Nosso Conhecimento. 2025.
62. Uras Panahi. Sieci AD HOC: Zastosowania, wyzwania, przyszłe kierunki. Wydawnictwo Nasza Wiedza. 2025.
63. Uras Panahi. Reti AD HOC: Applicazioni, sfide e direzioni future. Edizioni Sapienza. 2025.
64. Uras Panahi. Redes AD HOC: Aplicaciones, retos y orientaciones futuras. Ediciones Nuestro Conocimiento. 2025.
65. Uras Panahi. Réseaux AD HOC: Applications, défis et orientations futures. Editions Notre Savoir. 2025.
66. Uras Panahi. AD HOC-Netze: Anwendungen, Heraus forderungen, zukünftige Wege. Verlag Unser Wissen. 2025.
67. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Künstliche Intelligenz in der Zahnmedizin. Unser wissen Publishing. 2024.
68. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Artificial Intelligence in Dentistry. Scholars Press Publishing. 2024.
69. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Inteligencia artificial en odontología. NUESTRO CONOC, MENTO Publishing. 2024.
70. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. L'intelligence artificielle dans l'odontologie. EDITION NOTRE SAVOIR Publishing Publishing. 2024.
71. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Intelligenza artificiale in odontoiatria, SAPIENZA Publishing. 2024.

72. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Inteligência Artificial em Medicina Dentária. NOSSO CONHECIMENTO Publishing. 2024.
73. Omid Panahi, Sevil Farrokh Eslamlou. Peridontium: Estrutura, função e gestão clínica. 2024.
74. Omid Panahi, Shabnam Dadkhah. AI in der modernen Zahnmedizin. 2024.
75. Panahi P. Multipath local error management technique over ad hoc networks. 2008 International Conference on Automated Solutions for Cross Media Content and Multi-Channel Distribution. 2008; 187-194.
76. Omid Panahi, Shabnam Dadkhah. La IA en la odontología moderna. 2024.
77. Omid Panahi, Shabnam Dadkhah. L'IA dans la dentisterie modern. 2024.
78. Omid Panahi, Shabnam Dadkhah. L'intelligenza artificiale nell'odontoiatria moderna. 2024.
79. Omid Panahi, Shabnam Dadkhah. Sztuczna inteligencja w nowoczesnej stomatologii. 2024.
80. Omid Panahi, Shabnam Dadkhah. A IA na medicina dentária moderna. 2024.
81. Omid Panahi, Sevil Farrokh Eslamlou, Masoumeh Jabbarzadeh. Digitale Zahnmedizin und künstliche Intelligenz. 2024.