

Editorial

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Precision, Prudence, and Pathophysiology: Integrating Vascular, Neurocognitive, Educational, and Technological Advances in Contemporary Practice

The current issue of the Middle East Journal of Family Medicine reflects a powerful convergence of vascular biology, neurocognitive science, medical education, technological innovation, and clinical prudence. Although the topics span hematology, dermatology, geriatrics, cardiovascular medicine, surgery, medical education, and artificial intelligence, they share a deeper unifying message: modern medicine increasingly requires an integrative perspective. Chronic disease is rarely isolated; it is systemic, inflammatory, vascular, and cumulative. At the same time, the methods by which we train physicians and deploy technology must evolve with equal rigor and ethical awareness.

A substantial portion of this issue addresses sickle cell disease (SCD), reframing it not merely as a hemoglobinopathy but as a lifelong endothelial injury syndrome. The presented data demonstrate the heavy burden of organ damage occurring early in life, including stroke, chronic renal disease, cirrhosis, pulmonary disease, and coronary pathology. The observation that mortality often occurs before the age of sixty underscores the accelerated vascular aging inherent in this disorder. Particularly notable is the finding that multidrug toxicity during acute painful crises is rare and not attributable to hydroxyurea alone. This supports a strong therapeutic stance: hydroxyurea should be optimized aggressively—even to the level of

moderate anemia—before reliance on repeated transfusion strategies. While transfusion remains lifesaving in emergency situations, prior sensitization and autoimmune hemolysis complicate later management. The clinical lesson is clear: proactive vascular stabilization reduces catastrophic crises more effectively than reactive intervention.

This vascular theme extends naturally into the discussion of lipid management and cognition. Concerns about statin-induced memory impairment have persisted for years and have occasionally resulted in premature discontinuation of therapy among older adults. However, the evidence reviewed in this issue demonstrates no consistent signal of cognitive harm across randomized trials and large observational cohorts. On the contrary, several analyses suggest a modest protective association with dementia risk, particularly with long-term statin exposure. Although rare reversible cognitive symptoms may occur in susceptible individuals, the broader clinical message is reassuring: vascular protection remains central to brain health. In aging populations—especially in regions experiencing rapid increases in cardiometabolic disease—the decision to discontinue statins due to unsubstantiated cognitive concerns may paradoxically increase long-term neurological vulnerability.

Neurodegeneration is explored further through discussion of dementia characterized by fluctuating cognition, recurrent well-formed visual hallucinations, spontaneous parkinsonism, REM sleep behavior disorder, and marked sensitivity to antipsychotic medications. This constellation of features strongly suggests dementia with Lewy bodies, a disorder that remains frequently unrecognized in clinical practice. Misdiagnosis as Alzheimer's disease or primary psychiatric illness can lead to inappropriate treatment and significant adverse effects, particularly when dopamine-blocking agents are used. Advances in neuroimaging and biomarker development have improved diagnostic precision, yet management remains challenging due to the delicate balance required between cognitive, psychiatric, and motor symptoms. The broader implication for family medicine and geriatric practice is the need for diagnostic nuance.

Cognitive decline is not homogeneous, and accurate phenotyping significantly alters both prognosis and therapeutic strategy.

Technological innovation also features prominently in this issue through discussion of ultraviolet-induced fluorescence dermoscopy, an emerging diagnostic modality that enhances traditional dermoscopy. By exploiting fluorescence mechanisms, this technology improves visualization of pigmented, inflammatory, infectious, and neoplastic skin conditions. Its portability, absence of darkroom requirements, and improved structural visualization make it particularly attractive for outpatient and primary care settings. Importantly, the technique complements rather than replaces conventional dermoscopy, providing additional structural detail and potentially reducing unnecessary biopsies. As dermatologic malignancies and inflammatory dermatoses remain common presentations in family practice, improved non-invasive diagnostic tools offer meaningful benefits for both clinicians and patients.

A seemingly straightforward surgical case presented in this issue offers another important lesson in longitudinal clinical thinking. What begins as an anal abscess evolves into a superficial fistula with persistent discharge. The progression illustrates a fundamental principle of surgical pathology: infections that fail to resolve structurally will recur. Persistent drainage signals tract formation, and antibiotics alone are insufficient. Recognition of fistulous anatomy and timely surgical management are essential to prevent chronic morbidity. This case highlights the importance of reassessment when symptoms recur—a principle applicable far beyond colorectal disease.

In addition to clinical science, this issue also highlights the evolving landscape of medical education. As healthcare systems grow increasingly complex, ensuring that graduating physicians possess both theoretical knowledge and practical competence remains a central challenge. Traditional assessment tools such as the Objective Structured Clinical Examination (OSCE) have long been used to evaluate clinical skills, yet they

face logistical and pedagogical limitations when applied to large cohorts of students. The article introducing the Watched Objective Structured Clinical Examination (WOSCE) proposes an innovative solution to this challenge.

WOSCE represents a technologically enhanced adaptation of traditional clinical assessment. By employing video-based clinical scenarios, standardized simulations, and remote examiner observation, this approach allows large numbers of students to be assessed under identical conditions while reducing dependence on live patients. Such a model addresses ethical concerns related to patient fatigue, logistical burdens associated with organizing large-scale OSCE examinations, and variability introduced by examiner differences. Importantly, WOSCE is not intended to replace traditional clinical examinations but to complement them, creating a hybrid system that combines the realism of direct patient interaction with the scalability and standardization offered by modern technology. As medical schools worldwide face increasing enrolment and limited clinical resources, such innovations may prove essential for maintaining rigorous educational standards while safeguarding patient welfare.

Beyond clinical practice and education, the issue also reflects on the broader role of artificial intelligence in medicine and society. A thought-provoking contribution presents an extended dialogue exploring the ethical, philosophical, and societal implications of artificial intelligence in healthcare. The discussion moves beyond technical considerations to address deeper questions about responsibility, integrity, and the relationship between human and machine intelligence.

The central message emerging from this reflection is that artificial intelligence should not be viewed simply as a computational tool but as a powerful extension of human knowledge systems. In healthcare, AI holds the potential to assist in diagnosis, data interpretation, medical education, and global knowledge sharing. However, this promise is accompanied by pro-

found ethical challenges. The quality of AI-generated insights depends heavily on the integrity of the data upon which they are trained. Without rigorous oversight, such systems may propagate misinformation, commercial bias, or harmful health advice. The article therefore emphasizes the need for ethical frameworks, transparent governance, and global standards to ensure that AI serves humanity rather than undermines it.

Importantly, the medical profession occupies a critical position in this evolving landscape. Physicians have long served as guardians of scientific integrity and patient welfare. As AI becomes increasingly integrated into clinical decision-making, clinicians must remain actively involved in guiding its development, validation, and responsible application. Artificial intelligence should augment—not replace—the clinical judgement, empathy, and ethical responsibility that define medical practice.

Across these diverse contributions, a shared biological and philosophical narrative emerges. Endothelial dysfunction in sickle cell disease, lipid-mediated vascular modulation in statin therapy, synuclein-associated neurodegeneration, inflammatory dermatoses visualized through fluorescence technology, chronic infection leading to fistulous disease, innovative educational strategies such as WOSCE, and emerging reflections on artificial intelligence all point toward a central theme: modern medicine operates at the intersection of biology, technology, and human responsibility.

Family medicine, geriatrics, and general internal practice increasingly require this integrative perspective. Patients rarely present with isolated diseases; rather, they experience overlapping inflammatory, vascular, metabolic, neurodegenerative, and psychosocial processes unfolding over decades. Effective care therefore demands both scientific precision and thoughtful clinical judgement.

This issue therefore does more than present diverse clinical studies. It reinforces a broader philosophy of modern medicine. Understanding

pathophysiology allows clinicians to anticipate complications before they become irreversible. Educational innovation ensures that future physicians are prepared for the realities of contemporary healthcare. Ethical technological integration expands our diagnostic and analytical capabilities while safeguarding human values.

Medicine advances most effectively when clinical observation, biological reasoning, educational innovation, and technological progress are harmonized rather than compartmentalized. The articles presented in this issue collectively remind us that scientific progress must remain anchored in integrity, compassion, and intellectual rigor.

Warm regards,
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