EDITORIAL

Balancing Technology and Clinical Skills: A Call to Preserve the Art of Medicine

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21st-century medicine has seen incredible advancements in diagnostics, therapeutics and clinical care, with molecular and genetic breakthroughs offering hope for previously incurable diseases thus reducing morbidity and mortality.[1] However, this technological leap has inadvertently led to the decline in the art of clinical medicine, a compassionate, patient-centred approach based on clinical examination. Our predecessors, the esteemed physicians of the past, exemplified the true art of clinical medicine by developing compassionate and empathetic relationships built on trust and understanding. Their attentive listening, thorough physical examinations, and personalized care plans earned them deep respect within their communities.

But nowadays modern medicine prioritizes a quick diagnosis based on expensive investigations like detailed laboratory workup, X-rays and computed tomography (CT) scans. There are concerns among the internal medicine community about the decline in physical examination skills among both learners and educators.[2] In an autopsy study, the authors determined that ultrasound and CT scanning provided misleading information for 7% of patients, whereas history and physical examinations rarely misled physicians (1% for history and 2% for physical examination).[3] Over-reliance on technology, without understanding the sensitivity and specificity of diagnostic tests, increases healthcare costs and exposes patients to unnecessary risks. These include excessive investigations, additional scans that may result in radiation exposure, and iatrogenic infections such as hepatitis.[4] Furthermore, the increasing use of electronic health records (EHR) can distract doctors from direct patient interaction, hindering the development of strong doctor-patient relationships.[5]

Traditionally physicians were known for diagnosing patients based on history and clinical examination. The major advantage of clinical examination was establishing a rapport between doctors and patient; the opportunity to note findings, avoid unnecessary investigations, the magical healing touch of physicians and utilizing the placebo effect. In this approach the physician was not a dispenser of therapies, but rather an embodiment of therapy. This patient-centered approach has been shown to improve health outcomes, increase satisfaction, and reduce medical errors.

In medical school, the first lesson taught to students is to take a detailed history followed by a thorough and focussed clinical examination, which remains the backbone of medical evaluation. This approach not only streamlines the diagnostic process but also reduces the need for extensive, costly and sometimes unnecessary investigations. We believe that even in the current era of technology driven healthcare majority of conditions can be diagnosed based on history and clinical examination in most of the cases and then investigation can be ordered to confirm or rule out other differentials.[6-8] In a global survey of more than 2600 practicing clinician's majority agreed that physical examination was 'almost always valuable' in acute general medical referrals.[7]

The integration of modern technology and the increasing pressure to minimize medical errors have inadvertently shifted the focus away from the core principles of clinical medicine. While advancements in diagnostic techniques and molecular medicine offer invaluable insights, they can sometimes overshadow the importance of patient-centered care. In this context, the actual patients are reduced to a series of test results and medical records, rather than individuals with unique experiences and concerns. Their dissatisfaction with the system starts when they spend more time in waiting rooms for laboratory or radiology tests and less time with their doctor, who is often focussed on reviewing the reports than listening to them . Ultimately, the patient feels uncomfortable sharing sensitive details with a doctor who is either disinterested or preoccupied with entering data, often neglecting physical examination. Over-reliance on technology can ultimately weaken a physician's ability to connect with patients on a personal level, affecting the delivery of compassionate and effective care. This shift risks neglecting the timeless wisdom of Sir William Osler, who emphasized that "a good physician treats the disease, while a great physician treats the patient who has the disease".[8]

The pressure to conform to perceived standards of modern medical practice, often driven by patient expectations influenced by media portrayals and the pursuit of extensive

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investigations, may overshadow the importance of core clinical skills. This is further exacerbated by the fear of litigation and the desire to minimize perceived risk. In an attempt to avoid potential legal repercussions, physicians may resort to ordering a battery of tests, even when clinically unnecessary, creating a culture of "defensive medicine.

While concerns about the declining emphasis on clinical examination are valid, it is important to acknowledge the immense value that technology brings to modern medicine when used appropriately. Advances in medical technology have revolutionized diagnosis, treatment, and patient monitoring, enabling early detection of diseases, precision in interventions, and improved patient outcomes. Imaging modalities such as MRI and CT scans provide detailed anatomical insights that physical examination alone cannot achieve, while laboratory tests offer important biochemical and molecular data necessary for accurate diagnoses. Moreover, digital tools such as EHRs facilitate comprehensive documentation, aiding in continuity of care and minimizing errors. The integration of artificial intelligence (AI) and machine learning further enhances clinical decision-making by analyzing vast datasets to identify patterns that may not be immediately apparent to the human eye. However, technology should be viewed as a complementary tool rather than a replacement for bedside clinical skills. A balanced approach, where clinicians use technology to confirm and refine their clinical impressions rather than rely on it exclusively, is essential for high-quality patient care. By integrating both approaches, healthcare providers can achieve a more holistic and patient-centered model of care, leveraging technology to enhance efficiency without losing the human touch that remains at the core of medical practice. Ultimately, the goal should be to strike a balance where technological advancements support, rather than overshadow, the invaluable role of clinical examination and patient interaction in achieving optimal healthcare outcomes.

It is important to recognize the limitations of modern medicine, despite its remarkable advancements. While often viewed as purely scientific, medicine inherently involves an art of interpretation and application. While the mathematical equation "two plus two equals four" may hold true universally, the human body and its responses to disease are far more complex and nuanced. Furthermore, the intricate nature of human biology often surpasses the capabilities of even the most sophisticated algorithms. Therefore, purely algorithmic approaches and artificial intelligence cannot fully replicate the human element of clinical judgment. Experienced physicians possess the ability to integrate scientific knowledge with clinical observation, patient history, and nuanced understanding of individual circumstances. This "art of medicine" is crucial in guiding therapy and appropriate investigations preventing unnecessary procedures, and ultimately ensuring patient safety.

This trend poses significant challenges for resource-limited settings, where access to advanced technology and expensive investigations is often limited. However, experienced clinicians in such settings have historically honed their observational and diagnostic skills, effectively compensating for the lack of sophisticated equipment. For instance, a skilled clinician might accurately diagnose pneumonia based on a thorough patient history and a few key physical examination findings, rather than immediately ordering a chest X-ray. While technology undoubtedly plays a crucial role in modern medicine, it is important to remember that a strong foundation in clinical skills and sound medical judgment remains indispensable, as eloquently expressed by Theodore Fox: "The patient may be safer with a physician who is naturally wise than with one who is artificially learned."[9]

The case of a patient presenting with headache exemplifies this point. A physician focused on technological investigations might order a CT scan, missing subtle signs of increased intracranial pressure, such as papilloedema, that could be detected by doing funduscopy during clinical examination. This oversight could delay diagnosis and potentially lead to irreversible vision loss in a patient with idiopathic intracranial hypertension. While technology plays an indispensable role in modern medicine, it should not overshadow the critical importance of clinical expertise, patient-centered care, and the art of medical practice

We agree that technology has undoubtedly expanded our diagnostic capabilities, but it is important to acknowledge the inherent limitations of both clinical examination and medical technology. While technology can help overcome certain limitations of human observation, it comes at a cost –both financial and in terms of potential harm. The widespread use of advanced imaging and laboratory tests can significantly increase healthcare expenditures.[10] Moreover, these tests may yield false-positive or false-negative results, potentially leading to unnecessary interventions or missed diagnoses.[11] For instance, a normal chest X-ray in a patient with pneumonia or a normal CT scan in a patient with a hyper acute stroke, normal ECG in acute Myocardial infarction highlights the limitations of relying solely on technology.

The decline of clinical medicine should be a serious

concern, as it can lead to misdiagnoses, overtreatment, and increased healthcare costs. It is important for doctors to take the time to listen to their patients and perform thorough physical examinations. This will help to ensure that patients receive the best possible care. By fostering a renewed focus on the human element of healthcare, we can ensure that patients receive the most effective and compassionate care possible

We acknowledge that technology has revolutionized modern medicine. However, it must not come at the expense of losing clinical skills that form the foundation of compassionate patient care. A thorough clinical examination and detailed history-taking remain important tools that not only create a strong doctor-patient relationship but also contribute to accurate diagnoses, cost-effective healthcare, and improved patient safety. The challenge for today's clinicians is to strike a balance— using technological advancements to enhance, rather than replace, bedside clinical acumen. Medical education and healthcare systems must prioritize learning and practicing of clinical skills alongside the responsible integration of technology to ensure a patient-centered approach. The future of medicine lies in combining human expertise and technological innovation, where the art of listening, observing, and examining remains as valued as the precision of modern diagnostic tools

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References

1. Loukas, Chatzis., Ourania, D, Argyropoulou., Konstantinos, Panagiotopoulos., Panagiota, Palla., Athanasios, G., Tzioufas. 2. Precision of diagnostic approaches and individualized therapy toward improving patient outcomes. New Era of Precision Medicine 2024.pp.173-194. doi: 10.1016/b978-0-443-13963-5.00006-6
2. Elhassan M. Can Physical Examination Skills Survive the Era of Modern Diagnostic Tests? MedEdPublish 2017;6:3. doi: 10.15694/mep.2017.000003.
3. Kirch W, Schafii C. Misdiagnosis at a university hospital in four medical eras: report on 400 cases. Medicine (Baltimore). 1996; 75:29-40
4. Iglehart JK. The new era of medical imaging—progress and pitfalls. N Engl J Med. 2006;354:2822-2828.
5. Peterson MC, Holbrook JH, Hales DV, et al. Contributions of the history, physical examination, and laboratory investigation in making medical diagnoses. West J Med. 1992;156:163-165
6. Sandler G. The importance of the history in the medical clinic and the cost of unnecessary tests. Am Heart J. 1980;100:928-931.
7. Elder AT, McManus IC, Patrick A, Nair K, Vaughan L, Dacre J. The value of the physical examination in clinical practice: an international survey. Clin Med (Lond). 2017 ;17:490-498. doi: 10.7861/clinmedicine.17-6-490.
8. Becker RE. Remembering Sir William Osler 100 years after his death: what can we learn from his legacy?. The Lancet. 2014;384:2260-3.
9. Saunders J. The practice of clinical medicine as an art and as a science. Medical Humanities. 2000;26:18-22.
10. Winkens R, Dinant GJ. Evidence base of clinical diagnosis: Rational, cost effective use of investigations in clinical practice. BMJ. 2002;324:783. doi: 10.1136/bmj.324.7340.783. PMID: 11924663; PMCID: PMC1122712.
11. Afzal A. Molecular diagnostic technologies for COVID-19: Limitations and challenges. J Adv Res. 2020;26:149-159. doi: 10.1016/j.jare.2020.08.002.