

Editorial

Rational Medicine: The Culture of Stewardship and the Role of the Physician

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The significant rise in healthcare costs arising from precision medicine and artificial intelligence use in the industrialised parts of the world is compounded by the background challenge of overdiagnosis. Rational medicine can be defined as the practice of medicine that maintains or improves the quality of healthcare whilst controlling/driving down its cost through preventing overdiagnosis via unnecessary tests, preventing overtreatment and leading scientific efforts to improve performance. The rational and judicious use of resources to sustain affordable high-quality healthcare is therefore likely to increasingly define the role of the future physician.

In 2009, the four chief medical officers of each of the countries of the United Kingdom, the British Medical Association, the Royal Colleges, the General Medical Council, National Health Service (NHS) Employers, the Medical Schools Council, and the Postgraduate Medical Education and Training Board issued a consensus statement clarifying the doctor's role to inform medical education, training, and workforce planning [1]. It stated: "Doctors alone amongst healthcare professionals must be capable of regularly taking ultimate responsibility for difficult decisions in situations of clinical complexity and uncertainty, drawing on their scientific knowledge and well-developed clinical judgement. The doctor's role must be defined by what is in the best interest of patients and of the population served." This statement very much outlined the role of a physician/general practitioner (GP) very well at the time. Since then, two major technological dimensions have emerged which call for a revisiting of the role definition of a doctor, especially that of a physician/GP: Precision medicine and artificial intelligence (AI) applications. They provide opportunities as well as challenges in medical practice.

Precision medicine, sometimes known as "personalised medicine", is an innovative approach to tailoring disease prevention and treatment that takes into account differences in people's genes, environments, and lifestyles. Next generation sequencing tests are capable of rapidly identifying or 'sequencing' large sections of a person's genome for guiding treatment. It enables clinicians to select medications, dosages, or interventions that are more likely to be effective and less likely to cause adverse effects, often using genomic information to identify disease risks, pre-

dict drug responses, and guide targeted therapies, such as in cancer treatment where tumour genetics inform therapy selection and in rheumatological conditions based on autoimmune profiles. AI exponentially increases the scope of personalised medicine with high-cost drugs and designer weight-loss strategies with incretin-based therapies being the latest addition.

As of now, there are significant uncertainties about the true cost-effectiveness of AI tools, as infrastructure and environmental costs as well as ongoing licensing expenditures are not accounted for in nearly all cost-effectiveness studies [2]. Evidence about the cost-effectiveness of health interventions is usually provided by economic evaluation studies. In some ways, AI could have reduced healthcare costs [3], but a recent PricewaterhouseCoopers report suggests the reverse, with the medical cost trend expected to hit 9% next year, the highest in 17 years in the United States [4]. Due to this risk of cost escalation with AI-driven decision-making, it is important that decision makers are provided with key information about the nature of the AI intervention and potential implications for its cost-effectiveness [5].

Healthcare costs affect millions of people, even in Europe's richest countries, as revealed in a report on universal health coverage [6]. The report highlights that out-of-pocket payments push between 1% and 12% of households into poverty or make them poorer. There are eloquent discussions on the price of "precision medicine" [7], at a time when high-cost drugs started to flood the market. Using an analogy from the novel *Jurassic Park* by Michael Crichton, the authors argue that ultimately, patients, caregivers, and insurers will need to become "outraged" enough to bring about the prediction: "Something will force [the pharmaceutical company] to see reason, and to sell a drug at a lower cost" which society as a whole will accept and can sustain. The value-based approach is essential for policymakers for any social healthcare system like the British NHS, emphasising the importance of social accountability and equity.

Overdiagnosis refers to the diagnosis of a medical condition that would not have produced any symptoms or problems if left undiagnosed. The incidence of overdiagnosis has risen sharply with the use of screening tests, because of the importance laid on detecting potentially deadly or curable illnesses before they produce symptoms. Overdiagno-



sis is one of the most harmful and costly problems in modern healthcare. One driving factor behind such overdiagnosis of diseases is fear, both the physicians' fear of missing the diagnosis and endangering the patient or rendering oneself liable to legal penalties; and the patient's fears of becoming sick or dying. The problem reached such a scale that several international Preventing Overdiagnosis conferences have been held since 2013, which identified the challenge of overdiagnosis and overtreatment. This was seen to cause direct harms to patients and citizens, misallocation of resources, and, over the longer term, threaten the sustainability of universal healthcare systems and so undermine global health [8]. Overuse in healthcare is frequent and happens when tests or treatments are used in contexts where harms outweigh benefits. This low-value care leads to unwarranted use of resources and unhelpful diagnoses, which can in turn lead to more overuse.

Overdiagnosis, one consequence of overuse, is also linked to expanding disease definitions and is a known harm of screening. Overuse and overdiagnosis have raised concerns about the sustainability of healthcare, which has led to the creation of the Global Center for Sustainable Healthcare [9]. In Australia, a multi-institutional research collaboration supporting evidence-based sustainable healthcare for everyone by producing and translating high-quality research has developed to foster equity, sustainability and reducing harm [10].

As is evident from the foregoing, one of the central roles of the future physician is to be firmly focused on stewardship of resources. For that, physicians will have to use their “strong intellectual skills” and their ability to deal with “uncertainty and ambiguity” as mentioned in the UK consensus statement [1]. This has to be based on a deep understanding of the basic sciences, to be able to individualise treatments.

Like common grazing land, universal health systems include shared finite resources that should be used for the common good of the population covered. Resources include money, workforce (both the people and their time), organisational priorities, carbon (and physical materials) and physical infrastructure. Understanding the Tragedy of the Commons and how to avoid it is important – it impacts clinicians and the people they serve. Whilst overdiagnosis, precision medicine and AI tools interact with each other to escalate costs to the point of making healthcare unaffordable for large sections of the population and increasingly difficult to fund publicly, physicians will have to espouse the culture of stewardship. In 2015, the UK NHS Confederation, led by Sir Muir Gray, defined the three dimensions of value in healthcare, a concept termed ‘triple value’. The first is allocative value, which asks whether we have allocated resources to different groups equitably and in a way that maximises value for the whole population. Then there is technical value, in which improving quality and safety of healthcare increases the value derived from resources allo-

cated to a particular service. Finally, there is personalised value, and this relates to ensuring decisions are based on conditions and values of individuals, including the value they place on good and bad outcomes. Practising medicine with a focus on the three dimensions of value calls for the development of a culture of stewardship amongst physicians [11].

As physicians, we have not effectively used the abilities science has already given us, and “we have not made remotely adequate efforts to change that”, as Atul Gawande discusses in his book *Better*. The scientific effort to improve performance in medicine, which gets a minuscule portion of research budgets, can arguably save more lives at present times than bench science [12]. Whilst fantastic advances are being made in healthcare technology, the chasm between the possible and the actual is widening due to costs and leading to widening health inequalities.

Making healthcare systems affordable and sustainable is a global challenge. As healthcare technology and AI proliferate, the various tendencies that see healthcare and the practice of medicine as a benevolent human endeavour are coming conceptually closer in what can be described as rational medicine. At a practical level, this means reducing over-reliance on tests and championing the importance of good history taking and rational clinical examination in improving quality and value of healthcare practice. The rational clinical examination series, published in the *Journal of the American Medical Association (JAMA)* since 1992 and compiled into a book in 2009, remains a major tool for rational medical education and practice [13]. An integral part of teaching rational medicine is the development of an understanding of the limitations of applying multiple body-part-based guidelines and standards to a real-life patient with multiple problems. Such a protocol-driven approach based on multiple body-part-based guidelines misses the central point about healthcare and creates clinical variance and uncertainty [14]. This is where physicians can make a difference by practising and teaching medicine more holistically, bearing in mind complexities and comorbidities, with the question of value in mind. Physicians as leaders of the multidisciplinary teams are best placed to tailor the three dimensions of value in healthcare—technical, allocative and personal dimensions—for individual patients and populations.

In summary, rational medicine seems to be the centrepiece for future practising physicians, especially in universal healthcare systems (e.g., NHS), navigating through increasingly complex comorbid patients in a landscape characterised by overdiagnosis, AI tools and precision medicine.

Key Points

- Making healthcare systems affordable and sustainable is a global challenge.

- Whilst fantastic advances are being made in health-care technology, including the application of artificial intelligence and precision medicine, the chasm between the possible and the actual is widening due to costs, often leading to the exclusion of much of the population from access to basic, evidence-based healthcare in many health economies.

- Rational medicine is the practice of medicine that maintains and improves the quality of healthcare whilst controlling and driving down its cost—by Preventing Overdiagnosis through unnecessary tests and preventing overtreatment through application of unbiased evidence.

- Rational medicine (rational and judicious use of resources) to sustain affordable high-quality healthcare through developing a culture of stewardship is therefore likely to define the role of the future physician increasingly.

- There are many highly developed initiatives and tendencies within healthcare and medical practice globally, like Preventing Overdiagnosis conferences, the Global Center for Sustainable Healthcare and the Wiser Healthcare research collaboration, to name a few, which can broadly be seen as part of this historic movement towards rational medicine.

Availability of Data and Materials

Not applicable.

Author Contributions

All elements of the study and subsequent write-up were carried out by the author [RM]. The author read and approved the final manuscript. The author has participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

Not applicable.

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Conflicts of Interest

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