Efficiency in the Age of Sustainability: A Binary General Surgeon's Perspective

An elegant harmony exists between efficiency and sustainability in modern surgical practice, one that is poised to address the population's evolving healthcare needs. At a societal level, shifts in population demographics, cost of living, climate change and uneven resource distribution are placing significant strain on the hospital environment. This has been compounded by workforce shortages and burnout in the context of a global pandemic. On an individual level, demands on our time are increasing and work-life balance can feel like a dichotomous choice. These ever-growing and interrelated challenges underscore the need to consider deliberate and greater efficiency in healthcare. Time has emerged as one of our scarcest non-renewable resources, and must be precisely managed for sustainable progress. Fortunately, viewed through a binary surgical lens, there appears to be an abundance of creative technological advancements which offer the tools and systems to achieve this objective. Mastery of these advancements can help empower health networks to meet society's evolving needs and interests, and allow Surgeons to navigate their myriad of commitments. However, within this cadence, hastened initiatives can strain resources and create disparities in care. To ensure high-quality care for future generations, there is a need to balance traditional experience and modern digital efficiencies. This perspective is guided by the ethical tenets of healthcare and broader societal values of equity, evidence-based decision making and resource preservation.

Efficiency and sustainability should be viewed as distinct yet complementary principles of surgical care which facilitate progress towards an optimal system. Efficiency is the art of enhancing patient care through judicious and strategic efforts which minimise costs and waste. Meanwhile, sustainability involves addressing current demands through equitable, economically viable and environmentally responsible practices which then safeguards the quality of future care. Optimal efficiency requires changing our focus from wielding a scalpel at the advanced stages of disease, to proactive measures that improve access to care, education and allow timely interventions. Improving accessibility in a sustainable way requires holistic efforts that promote equity, such as supporting education, infrastructure and government policy to target socioeconomic disparities in health. Striking a balance between efficient and sustainable practices demands meticulous preparation and effective resource

management. A useful approach involves analysing public health data, highlighting current trends and emerging issues to then inform strategic planning. Decision makers can then, for example, optimise theatre scheduling, minimise surgical waitlists and prevent cancellations. Overall, a preparedness to bridge disparities in access and navigate health trends with data-driven precision can promote both efficiency and sustainability in surgical care.

The digital revolution has emerged as a prime catalyst for efficient and sustainable surgical practices, enhancing both patient care and practitioner well-being. The digitisation of health data and processes promotes improved communication, interconnectivity and flexibility in work environments. This has far reaching benefits for safeguarding quality service provision, including for informed decision making and equitable healthcare access. The emergence of telehealth is a prime example, which can enhance access to specialist consultations and post-operative care in regional and remote communities while reducing the carbon footprint. Meanwhile, digital health records allow real-time information sharing, which can streamline surgical planning to minimise delays in management and optimise resource allocation. Diagnostics and personalised treatments are also being optimised through the expanding field of machine learning, reducing the risk of errors and complications. Beyond advantages for patient care, technology can enhance Surgeon well-being through its intrinsic capacity for administrative efficiency. Outsourcing administrative tasks liberates Surgeons' time to direct to other professional and personal responsibilities, while mitigating risk of burnout which erodes the quality of the workforce. Collectively, technology plays a dual role in enhancing efficiency and sustainability in surgery, with tangible benefits for patient health and practitioner well-being.

While having a myriad of advantages, the drive for efficient healthcare can inadvertently foster unsustainable practices and requires careful navigation. Rapid digitisation and upgrading of processes and systems can be resource intensive, costly and create unintended e-waste. It can also increase energy consumption and associated carbon emissions. Rushed initiatives to improve access can be poorly informed, causing institutionalised discrimination and wider

health disparities. Expanding infrastructure without synchronising with existing systems can exacerbate redundancy and amplify errors. Furthermore, an overreliance on technology can limit clinical acumen and erode the patient-Surgeon relationship. In order to mitigate these risks, innovations require thoughtful planning, resource management and audit. Actions also need to be underpinned by a patient-centred approach and broader ethical considerations that align with societal values such as equity, security and evidence-based practice. Focusing on patient autonomy, shared decision-making, accessibility and responsible resource allocation ensures surgical care remains attuned to the needs of our dynamic society.

Through a binary general surgical lens, it is clear that harmonising efficiency and sustainability serves as a powerful catalyst for equitable healthcare reform. The interplay of shifting demographics and community expectations, within the context of broader social, environmental and economic concerns, underscores the need for a multifaceted and data-driven approach. Achieving an efficient and sustainable healthcare framework demands equitable access, collaborative decision making and optimal resource management. Meanwhile the costs of innovations, which encompass training and workflow disruptions, need to be a long-term investment in patient care and staff wellbeing. Striving to harmonise efficient and sustainable healthcare practices, supported by carefully considered technological innovations and ethical decision-making, is seen as a pathway to secure high-quality care for future generations.