

Sustainability in Medicine: Primum non Nocere

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Sustainability refers to maintaining a process or a situation continuously over time by focusing on future effects of a current given policy, to meet the needs of the present without risking the ability to meet the needs of the future [1]. Likewise, *sustainability healthcare* refers to health policy that extends the responsibility of health services not only to patients today but also to those in the future by advocating evidence-based medicine to ensure a more sustainable approach to healthcare, society, and our planet [2].

Currently, the healthcare system faces multiple complex challenges, including an aging population, complicated diseases, and increasing consumption of medical services, but with limited human and economic resources, which have intensified during the present coronavirus disease 2019 (COVID-19) pandemic. For the system to remain viable, the capability to provide the public with high-quality and readily available health services is needed to ensure judicious use of resources and to promote more sustainable healthcare [2,3].

The first Congress on Sustainability in Medicine was held on 21 February 2022 at Ariel University in collaboration with Assuta Medical Centers. Both international and local speakers participated. The main theme of the congress was Primum non nocere (First, do no harm).

The current overuse of medical diagnostics and treatments in many countries not only endangers the sustainability of healthcare but also threatens the health of individuals [2,4].

It is estimated that 20% to 35% of healthcare activity is unnecessary [2,3]. These unnecessary tests, treatments, and diagnoses harm people through adverse effects of interventions and psychosocial impacts of labeling and present a considerable burden on health services [2-4]. The concept underpinning this conference was to tackle the crisis of medical overuse based on accumulating data and evidence-based medicine.

Prof. Yehuda Shoenfeld, president of Ariel University and chairman of the conference, opened the congress and highlighted that sustainability in medicine is crucial for the entire population in Israel and worldwide and should be emphasized, especially during the current period of medical practice. He announced that Ariel University plans to hold a conference on sustainability and medicine every year. Prof. Joshua Shemer, chairman of the Assuta Medical Centers network in Israel and co-chair of the conference, emphasized that sustainability in medicine is a global challenge. “We try to reduce the dangers of too much medicine we are creating,” he said. Medical excess threatens the health of individuals and the sustainability of health systems.

Every medical student learns first and foremost: do not harm. We must utilize the resources correctly and efficiently to maintain public health. Prof. Nachman Ash, the director-general of the Israeli

Ministry of Health, emphasized in his opening remarks that sustainability in medicine is a very important and timely issue to address and discuss among physicians and other therapists. Prof. Ash highlighted that even under the pressure imposed by the COVID-19 pandemic, with its associated morbidity and mortality, a special effort was made to avoid unjustified use of medications or vaccines and make evidence-based decisions.

Selected presentations at the congress are summarized in this special issue of the *Israel Medical Association Journal (IMAJ)*. Two world leaders on the topic of overuse in medicine, editors of the book *Hippocrasy: How Doctors are Betraying their Oath*, Prof. Rachele Buchbinder, a physician specialist in rheumatology, and Prof. Ian Harris, an orthopedic surgeon, both from Australia, revealed the real-world practice of current medicine and how doctors are letting their patients down. In their article *Are doctors living up to the ideals expressed in the Hippocratic Oath?* [5], they emphasize that contemporary medical practice is designed to maximize the delivery of healthcare rather than optimizing health. This situation has led to an avalanche of ineffective and low-value care that wastes money and exposes patients to unnecessary risks, depriving care of those who truly need it. The authors argued that the benefits of medical treatments are often wildly overstated while the harms are understated! With the rampant overdiagnosis and overtreatment currently prescribed, the current medical system does not fulfill its purpose of delivering high-quality health [5].

Dr. Anat Gaver from the Department of Family Medicine at Clalit Health Services emphasized that too much healthcare is currently prevalent, wasteful, and harmful globally as well as in Israel [6]. She clarified the terms of overdiagnosis and overuse. The last decade has witnessed exponential growth in medical publications emphasizing this situation. Likewise, Barnea and colleagues from Assuta Health Services provided a concise review of the overuse of healthcare services, concluding that "less is more (healthy)" [7]. The authors argued that apart from the physical and mental damage caused by overuse of medical services, the phenomenon has diverse implications, such as increasing waiting times for services, creating long queues, and incurring considerable financial costs. More than 10% of hospital expenses are used to treat medical errors or preventable infections. This cost contributes to the gap between the desired services and available ones. The authors suggested government intervention through economic arrangements, such as deductibles and pre-authorization of services, to ensure safety and quality of care with shared decision-making [7].

Environmental, social, and governance (ESG) is a forum of international philanthropic activists with the goal of making the world a better place. Berger and Weiss reviewed how activities within these three elements of ESG were implemented at Assuta Medical Centers since 2019, leading to platinum + grade in 2021 [8]. The activities include elements that are:

- Environmental: reducing consumption of energy, water, and waste
- Social: community volunteering, workforce diversity, employment of elderly and individuals with disabilities
- Governance: writing a local ethical code with the participation of all stakeholders.

The disability burden due to low back pain (LBP) has increased worldwide by 54% since 1990, thus threatening health-

care and social systems. The disability and burdens associated with LBP are partly iatrogenic, attributable to the overuse of expensive tests and treatments that provide no, or minimal, benefit and may even cause harm.

The Enhanced Trans-theoretical Model Intervention (ETMI) has shown effectiveness and cost-benefit. ETMI focuses on educating practitioners to reassure patients, empower them to increase physical activity, and improve their self-efficacy. The original article by Shahar et al. [9] explored the attitudes of family medicine residents toward low back pain and its therapeutic approaches. In addition, the authors examined whether these attitudes can be affected by the ETMI workshop. Feldman and colleagues [10] provided a study protocol for implementing ETMI in primary care.

Prof. Jeremy Lewis [11], a world leader in shoulder pain research from the UK, sent an open letter to individuals living with shoulder pain. This eye-opening letter focused on 90% of those who experience non-traumatic shoulder pain and includes important questions they should ask when they see a clinician. The original manuscript by Steinfeld-Mass and colleagues [12] described a marked increase in the number of Israel Defense Forces soldiers having hip arthroscopy based on MRI diagnosis of hip labral tears and/or impingement. In a retrospective review, they assessed outcomes and rate of return to duty in 117 of these soldiers. By the end of a one-year follow-up period, only 6% returned to their full pre-symptom activity. The lack of specificity of the diagnostic tools used to determine whether surgery for hip pain is likely to be beneficial in this population may have contributed to over-diagnosis and to over-treatment.

Several presentations elucidated the impact of healthcare overuse. Isaacson and Lahad [13] highlighted the negative consequences of inappropriate use of screening tests, often with no evidence-based studies, and concluded that the most important approach should be

real prevention rather than screening for early detection. Garfinkel and Levy [14] described the iatrogenic epidemic of inappropriate medication use and polypharmacy and documented that wise reduction of the medications used does not worsen human health. Ashkenazi [15] documented the high rates of current antibiotic overuse and its effects on our planet, including the selective pressure on the development of bacteria with multiple resistance to antibiotics, their spread in humans, animals, fish, rivers, and the earth (the One Health concept), and the high rate of mortality associated with these resistant bacteria [15]. Rubinstein et al. [16] reviewed the current literature regarding the medical benefits of cannabis and highlighted its positive therapeutic effects in defined rheumatic and autoimmune disorders. Finally, Halpert and colleagues [17] described the spectrum of diseases caused by silicone breast implants as a classic example of autoimmune/inflammatory syndrome induced by an adjuvant (ASIA).

It is hoped that the readers find this special issue of *IMAJ* on sustainable healthcare interesting and that it will increase the awareness and understanding of this crucial issue to make health systems healthier in the long term.

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Capsule

Combination anti-HIV antibodies provide sustained virological suppression

Sneller et al. reported the results of a two-component clinical trial involving the passive transfer of two HIV-specific broadly neutralizing monoclonal antibodies, 3BNC117 and 10-1074. The first component was a randomized, double-blind, placebo-controlled trial that enrolled participants who initiated antiretroviral therapy during the acute/early phase of HIV infection. The second component was an open-label single-arm trial that enrolled individuals with viraemic control who were naive to antiretroviral therapy. Up to 8 infusions of 3BNC117 and 10-1074, administered over a period of 24 weeks, were well tolerated without any serious adverse events

related to the infusions. Compared with the placebo, the combination broadly neutralizing monoclonal antibodies maintained complete suppression of plasma viraemia (for up to 43 weeks) after analytical treatment interruption, provided that no antibody-resistant HIV was detected at the baseline in the study participants. Similarly, potent HIV suppression was seen in the antiretroviral-therapy-naive study participants with viraemia carrying sensitive virus at the baseline.

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Capsule

Clonal dynamics of hematopoiesis across the human lifespan

Age-related change in human hematopoiesis causes reduced regenerative capacity, cytopenias, immune dysfunction and increased risk of blood cancer, but the reason for such abrupt functional decline after 70 years of age remains unclear. **Mitchell** et al. sequenced 3579 genomes from single cell-derived colonies of hematopoietic cells across 10 human subjects from 0 to 81 years of age. Hematopoietic stem cells or multipotent progenitors (HSC/MPPs) accumulated a mean of 17 mutations per year after birth and lost 30 base pairs per year of telomere length. Hematopoiesis in adults less than 65 years of age was massively polyclonal, with high clonal diversity and a stable population of 20,000–200,000 HSC/MPPs contributing evenly to blood production. By contrast, hematopoiesis in individuals aged over 75 showed profoundly decreased clonal diversity. In each of the older subjects, 30–60% of hematopoiesis was accounted for by 12–18 independent clones, each

contributing 1–34% of blood production. Most clones had begun their expansion before the subject was 40 years old, but only 22% had known driver mutations. Genome-wide selection analysis estimated that between 1 in 34 and 1 in 12 non-synonymous mutations were drivers, accruing at constant rates throughout life, affecting more genes than identified in blood cancers. Loss of the Y chromosome conferred selective benefits in males. Simulations of hematopoiesis, with constant stem cell population size and constant acquisition of driver mutations conferring moderate fitness benefits, entirely explained the abrupt change in clonal structure in the elderly. Rapidly decreasing clonal diversity is a universal feature of hematopoiesis in aged humans, underpinned by pervasive positive selection acting on many more genes than currently identified.

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