



Sustainable development goals for Japanese anesthesiologists: how to survive in times of turmoil

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Introduction

Since the environment surrounding Japanese anesthesiologists has undergone dramatic changes in the last decade, we need to implement long-term reforms that look to the future. Seventeen sustainable development goals (SDGs) were adopted by the United Nations General Assembly on an international level in September 2015 to address various issues [1]. Here, the author proposes five SDGs for Japanese anesthesiologists: work style reform, response to infectious diseases, stable supply of drugs, introduction of digital transformation, and research misconduct prevention. We need to consolidate our wisdom to achieve these goals (Fig. 1). This editorial discusses the author's thoughts on specific measures to accomplish these goals.

Work style reform

The Ministry of Health, Labour and Welfare (MHLW) of Japan defined *work style reform* in 2019 as enabling working people to choose diverse and flexible ways of working for themselves according to their circumstances. *Work style reform* includes caps on overtime work, introduction of a work interval system, and the obligation to properly monitor working hours. Although physicians have been exempted from the application of these reforms due to the unique nature of their work, the grace period for this exemption will end in April 2024 [2]. The number of anesthesiologists in Japan is increasing, and a labor shortage cannot be predicted simply in terms of the number of anesthesiologists. However, since physicians in general, and not only anesthesiologists, are concentrated in urban areas, a larger

clinical work force is needed in rural areas. Recognizing this problem, the government introduced a so-called “ceiling system”, which limits the number of physicians newly participating in specialist programs in each prefecture, to eliminate the uneven distribution of physicians. Considering these points, the approach to *work style reform* for Japanese anesthesiologists will differ depending on the region.

Since *work style reform* will limit physicians' working hours, there is concern that the level of medical care and research by physicians will decline. Compared to other medical specialties, the impact on the level of medical care provided by anesthesiologists might be limited, because few anesthesiologists are the primary physicians for their patients. Nevertheless, securing anesthesiologists to manage emergency surgeries at night and on holidays will become more difficult. The challenge for the future will be to keep anesthesiologists' working hours at an appropriate level without inconveniencing patients.

The Japanese Society of Anesthesiologists (JSA) actively promotes measures such as training perioperative management teams, including nurses who can carry out *designated procedures*. These measures, aimed at shifting tasks from anesthesiologists to trained nurses, might contribute to *work style reform* by reducing the workload of anesthesiologists. However, potential problems of this reform include confusion in clinical settings due to the initiation of multiple programs, and difficulty securing nurses to carry out such programs.

Response to infectious diseases

The coronavirus disease 2019 (COVID-19) has enormously impacted the medical field worldwide. Perioperative care involving anesthesiologists is no exception. As of May 2023, the medical industry is returning to normal, but three emergency declarations issued by the Japanese government in 2020 and 2021 caused a decrease in the number of surgeries

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Fig. 1 Sustainable development goals for Japanese anesthesiologists

and greatly affected anesthesiologists [3]. Furthermore, in the early days of the pandemic, medical equipment including ventilators and consumables such as masks and gloves were in short supply. In addition to situations where physicians themselves contracted COVID-19, they were sometimes considered as close contacts when their family members contracted the disease and were forced to restrict their employment, leading to a serious labor shortage in hospitals. Although the number of cases has decreased, complete eradication of COVID-19 is not in sight, and pathogens other than SARS-CoV-2 might threaten humanity again in the future. Anesthesiologists are skilled in systemic management, including management of ventilation and circulation. They have the potential to be actively involved in the treatment of critically ill patients who have been compromised by emerging infectious diseases [3].

Stable supply of drugs

The recent unstable supply of cefazolin in Japan, which has forced a change in the perioperative prophylactic antimicrobial agents used, is still fresh in our minds [4]. Although the unstable supply of cefazolin did not cause a serious problem because of the abundance of alternatives, supply instability in recent years of essential drugs for anesthesiologists, such as rocuronium and propofol, has also occurred.

The JSA issued a statement on the use of rocuronium in June 2020, urging its members to refrain from stockpiling the drug [5]. In May 2021, the JSA issued a notification that volatile anesthetics should be prioritized for maintaining anesthesia because of an unstable supply of propofol [6]. Although these disturbances were primarily due to supply chain disruptions caused by the coronavirus pandemic, we should be aware that Japan's unique circumstances also affect the situation. For example, Japanese anesthesiologists

need more neuromuscular blocking agent (NMBA) options. We previously reported that rocuronium's share among total NMBAs in Japan was 98.1% [7]. This situation differs significantly from that in other countries, where there is a wide variety of options for NMBAs [8]. In Japan, other than rocuronium, only suxamethonium is available, although it is rarely used except in anesthesia for electroconvulsive therapy. A lack of alternative NMBA options poses a significant risk to Japanese anesthesiologists since NMBAs are essential for general anesthesia.

To overcome the issues caused by drug supply instability, the JSA has repeatedly appealed to pharmaceutical companies and the government for improvements. The Japanese government, i.e., the MHLW, has held meetings with concerned parties regarding measures to ensure the stability of ethical drugs [9]. Yet, it is important for Japanese anesthesiologists to adopt a crisis mentality. In addition, if we always approach anesthesia management with the idea that less is more, we can reduce the use of drugs that are not necessary, which might help to solve the drug shortage problem.

Introduction of digital transformation

The digital transformation in recent years has been quite remarkable. In particular, as represented by ChatGPT, generative AI is transforming our lives. There is no doubt that these technologies will be introduced into the field of medicine.

Although the use of digitalization in the daily work of anesthesiologists is advancing, the progress is still insufficient. Although the development of automatic anesthesia machines is also progressing in Japan [10], they have yet to reach a level of use by general anesthesiologists. Many hurdles must be overcome, including how to pursue

responsibility in the event of an accident involving an automatic anesthesia machine.

For anesthesiologists, digital transformation should not be a burden, but should instead reduce their workload. Quantitative analysis of intraoperative vital signs might lead to more data-driven clinical research and better anesthesia management for patients. Digital transformation will likely reduce the anesthesiologists' workload even pre- and postoperatively. New technologies, including AI, can be useful for providing explanations to patients during preoperative consultations and in understanding patients' preoperative conditions. It would also enable identification of perioperative risks and postoperative complications in patients.

Research misconduct prevention

In recent years, research misconduct has become a problem in academia. Research misconduct by anesthesiologists is particularly serious [11, 12]. On The Retraction Watch Leaderboard, an Internet site that monitors for research misconduct, the top three authors in the papers identified as fraudulent are all anesthesiologists. Moreover, the first and third authors are Japanese [13]. Apart from the harmful effects of research misconduct, it is necessary to examine why it is so common among Japanese anesthesiologists.

One expert points out that “There are frequent opportunities for anesthesiologists to conduct clinical studies very quickly, potentially by themselves, without overview from other people” [11]. Indeed, since anesthesiologists often act alone in the operating room, it might be difficult for others to notice if they fabricate or falsify data. A situation unique to Japan might be the clear class hierarchy in hospitals. Although not limited to hospitals, there is a tendency for junior staff to have difficulty expressing their opinions to their seniors [14]. Japanese researchers, who produce only 5% of research papers, account for half of the top 10 researchers with the most retracted papers [14]. The Japanese scientific community, especially the medical community, must seriously address the distrust from the rest of the world.

Since the reasons for research misconduct vary from person to person, there is no absolute countermeasure. In recent years, publishers have encouraged researchers to publish the data used in their studies in public databases and an increasing number of academic organizations are requiring their members to take research ethics courses. In addition to these basic measures, centralized management of research data by

the department could help prevent research misconduct [15]. In this way, allowing many people to check research data might reduce data fabrication and falsification.

Conclusion

The SDGs that anesthesiologists aim for will naturally be different for each individual. In this editorial, the author has proposed a set of basic SDGs. Since I have only briefly touched on many issues due to length restrictions, a greater depth of discussion for each SDG is required in the future. However, I hope this editorial will shed light on the issues anesthesiologists should address.

Declarations

Conflict of interest The author declared that they have no conflict of interest.

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