Japan is challenged with unique social problems because of its declining birthrate and rapidly aging population. By the year 2025, all of Japan’s baby boomers will be 75 years or older, making Japan a “superaging” society. Japanese healthcare expenditures are rapidly climbing because of the need for increasingly complex medical-surgical treatments for this aging population. In addition, a major shortage of anesthesiologists has produced serious threats to patient safety, as well as to quality and timeliness of surgical care. In an attempt to meet the demand for anesthesia services and to ensure access and quality care, the Japanese Ministry of Health, Labor and Welfare has identified a potential role for nurses as anesthesia practitioners, as an innovative solution. Nurse and physician educators in Japan have begun educating and training nurses in the practice of anesthesia; however, nationally recognized licensure or certification does not yet exist for graduates of these programs. The purpose of this article is to review the unique challenges facing Japan’s anesthesia practice and to make recommendations about the potential introduction of nurse anesthetists in Japan.

Keywords: Advanced nursing practice, anesthesia practice, Japan, nurse anesthetists.
The purpose of this article is to review the unique issues and challenges accompanying the potential introduction of nurse anesthetists into Japan’s healthcare system.

**Issues and Challenges Facing Japanese Anesthesia Practice**

The Japanese healthcare system is challenged by a critical shortage of anesthesiologists according to a labor survey conducted by the Japanese Society of Anesthesiologists in 2012 to 2013; only 65% of participating institutions had either a full-time or part-time anesthesiologist in their system. About one-third of nonuniversity hospitals had only 1 full-time anesthesiologist, whereas most university hospitals reported that they had 15 to 25 full-time anesthesiologists. This large maldistribution of anesthesiologists between university hospitals and nonuniversity hospitals remains, despite the fact the number of anesthesiologists nationwide in Japan grew from 6,206 in 2006 to 9,162 in 2016, an increase of almost 50% in 10 years. This rapid increase in number of anesthesiologists has not solved the issues facing Japan’s anesthesia practice. Potential reasons for this are the concomitant increase in demand for surgical services by Japan’s aging population and a backlog in service due to longstanding delays and the inaccessibility of anesthesia providers. Maldistributions of physicians, including anesthesiologists, have been reportedly exacerbated disparities in access to quality care between urban and rural facilities. Although rural Japanese healthcare consumers generally prefer to receive care in their communities, they tend to travel to a bigger city to seek surgical care at a well-staffed and highly specialized university hospital.

Japanese anesthesiologists are responsible not only for providing surgical anesthesia but also for managing chronic pain, palliative care, and patients in intensive care units. The demand for an expansion of the scope of practice and responsibility for anesthesia services is expected to increase over the next decade in direct proportion to the rise in patient acuity and care complexity. Obstetric anesthesia is one specialized area of anesthesia practice in which rapid growth is anticipated. The frequency of cesarean deliveries has been rapidly increasing. In 2017, the rate of cesarean deliveries exceeded 25% compared with a reported rate of 11.2% in 1990. The use of epidural anesthesia for labor pain is not common in Japan, but it has also been steadily increasing over the years. An expansion of demand is further anticipated for monitored anesthesia care and anesthesia sedation for procedures such as gastrointestinal endoscopies, dental procedures, and ophthalmology (e.g., cataract surgery).

Exhausting workloads and poor working conditions for anesthesiologists remain a serious concern. Kawasaki et al found that the levels of stress experienced by Japanese anesthesiologists were significantly associated with the number of anesthesia hours worked per week, and these anesthesia hours refer only to the time spent in surgery without including activities such as case preparation, preanesthesia assessment, and postanesthesia management. Predictors of higher stress levels included working at a hospital with a large number of beds (>500 beds), total anesthesia hours worked per week (>29.1 hours), estimated annual number of cases managed (>433.1 cases per year), and stressful feelings due to a lack of support from colleagues and superiors. Although 70% of anesthesiologists reported that their job was rewarding, nearly half reported that public recognition of the importance of their role as an anesthesiologist in healthcare was inadequate.

Over the past decade there has been a drastic increase in the number of female anesthesiologists. In 2015, female anesthesiologists made up 37.4% of all anesthesia practitioners, an increase of 11.8% between 2001 and 2015. This increase in female practitioners has not resulted in sustained contributions to healthcare, however, because inadequate social infrastructure and a lack of support for working mothers have restricted their contributions to overall workforce demands. The nature of anesthesia service, such as long working hours, night shifts, overtime, on-call responsibilities, and emergency cases, creates particular hardship for female anesthesiologists wishing to combine a career with raising a family. As a result, almost 50% of female anesthesiologists discontinue practicing in this specialty. The Japanese Society of Anesthesiologists takes this issue seriously and has been making efforts to improve working conditions for female colleagues. However, the true availability and engagement of anesthesia providers remain lower than needed to meet the demand.

To overcome the shortage of anesthesiologists, the Japanese Society of Anesthesiologists firmly believes there is a need to improve working conditions, especially for female physicians, to allow those in the profession to continue working while raising a family. The society’s vision for females and younger colleagues starting families is supported and encouraged by the Japanese government’s new initiative: “task shifting”. In April 2019, the task shifting initiative was launched with the purpose of creating desirable working conditions to address issues secondary to an aging society with a low birthrate. Task shifting entails revising labor laws to reduce individuals’ working hours and developing new policies regarding equal treatment and compensation to encourage retirees to reenter the workforce. It is hoped that such changes would improve quality of life and provide support for young couples starting a family. Before the initiative, restrictions on hours of labor and overtime did not apply to physicians; in 2016, for example, 38% of physicians worked more than 60 hours weekly in hospitals, and more than 70% of all surgeons worked more than 60 hours per week.
Although enforcement of the new guideline provides a strategy for improving quality of life for physicians, the Japanese healthcare system is now faced with the challenge of supplementing a workforce that relied on physicians working an excessive number of hours per week. The Japanese anesthesia practice, where the critical shortage of anesthesiologists remains unresolved, faces even greater challenges.

Patient safety and improved anesthesia outcomes are a universal priority for anesthesia care providers. Yet in Japan, anesthesia care can be provided legally by any licensed physician possessing minimal or no training in anesthesia.\(^7,23\) In fact, approximately 30% of anesthesia is delivered by nonanesthesiologists.\(^9\) A vigorous discussion of patient safety has been fueled by anesthesia-related adverse events caused by nonanesthesiologists.\(^23\) In recent years, several devastating incidents have resulted from labor epidural pain management.\(^15\) The need for anesthesia providers designated for labor pain management is increasing. \(\textit{Concurrent anesthesia procedures}\) is defined as one anesthesiologist simultaneously performing anesthesia care for multiple patients.\(^7\) In such cases, during the absence of the anesthesiologist, the patient under anesthesia is monitored by a surgical nurse or staff member who is experienced in surgical care but untrained in anesthesia.\(^7,20\) Anesthesiologists do not support concurrent anesthesia procedures, realizing that safety and quality of care are jeopardized in such situations.\(^7\) In fact, the Japanese Society of Anesthesiologists clearly states that this practice violates the guideline for safe anesthesia.\(^20,24\) The introduction of graduate nurses trained in an anesthesia specialty could be one strategy to overcome threats to patient safety resulting from the critical shortage of anesthesiologists.

### Potential for a Role of Advanced Nursing Practice in Anesthesia in Japan

An expansion of the nursing role has been explored in Japan. Four programs exist to educate and train nurses in anesthesia care: (1) a perioperative management team (PMT); (2) a certificate in perioperative nursing by the Japanese Nursing Association; (3) a nursing competency for specific medical interventions provided by the Ministry of Health, Labor and Welfare; and (4) a master of science in nursing degree that focuses on perianesthesia nursing (Table).

**• Perioperative Management Team.** In 2007, the Japanese Society of Anesthesiologists proposed the idea of formulating a PMT in an endeavor to reduce the workload of anesthesiologists and to create a double-check system for improving safety.\(^16,25\) A PMT consists of anesthesiologists, registered nurses, pharmacists, clinical engineers, and clerks; each team member fulfills a different role within their scope of practice to provide safe and effective perioperative care to patients.\(^25\) The Japanese Society of Anesthesiologists has developed a certification system for each member of a PMT; as of April 2018, a total of 1,672 nurses, 113 pharmacists, and 8 clinical engineers had been certified.\(^25\) It is important to note that this certification is awarded by the Japanese Society of Anesthesiologists and is not a licensure issued by the government. To be certified, a nurse must hold a Japanese nursing license and have a minimum of 2 years of working experience, attend at least 2 seminars over a 3-year period or complete online learning modules, and successfully pass the certification examination.\(^25\)

**• Certificate in Perioperative Nursing.** A certificate in perioperative nursing is one of several certificate programs offered by the Japanese Nursing Association.\(^26,27\) Although this certificate program does include 45 hours of anesthesia-specific content, its purpose is to prepare nurses to become clinical leaders in perioperative nursing, focused on reducing surgical complications and improving patient outcomes.\(^26\) Certified nurses clearly could make important contributions to the advancement of perioperative care, yet this solution might not be ideal for Japanese anesthesia practice. These programs have been closing since 2018 to merge with the Nursing Competency for Specific Medical Interventions.

**• Nursing Competency for Specific Medical Interventions.** In 2015, in an attempt to meet the increasing demand for medical care by Japan’s rapidly growing population of older people, the Ministry of Health, Labor and Welfare established a system to train nurses to perform certain medical interventions.\(^27\) Included are 38 medical procedures (eg, adjusting mechanical ventilator settings, placing a peripherally inserted central catheter line) that can be delegated to nurses who have successfully completed a program accredited by the Ministry of Health, Labor and Welfare.\(^27\) In June 2019, the Japanese Society of Anesthesiologists made a public announcement that the society will participate in training nurses to perform certain medical procedures in the field of anesthesia.\(^28\) The society proposed the development of a program to lighten the workload of anesthesiologists and facilitate “task shifting”; however, interestingly, examples of learning objectives in the proposal are nursing tasks already fulfilled by nurses who have not participated in the competency program, such as assessing postoperative pain and nausea, educating patients regarding anesthesia care, and reviewing medical records for medical-surgical history and laboratory results.\(^28\) The proposed task shifting does not appear to be innovative enough to provide the changes needed in Japanese healthcare.

**• Master of Science in Nursing Focused on Perianesthesia Nursing.** In English-speaking countries, peri anesthesia nursing generally refers to nursing specialized in preanesthesia and postanesthesia care, ambulatory surgery, and pain management.\(^26\) In Japan, the term peri anesthesia nursing is more closely aligned with nurse

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Table. Education/Training Program Options in Nurse Anesthesia

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<tr>
<th>Title</th>
<th>Definition</th>
<th>Requirements for certification/graduation</th>
<th>Certificate of origin</th>
<th>Examples of activities after training</th>
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<tr>
<td>Nurse as a member of perioperative management team¹⁶,²⁵</td>
<td>A nurse who serves as a member of perioperative management team and fulfills a role within the scope of nursing practice. This team was created in an attempt to reduce the workload of anesthesiologists and to create a double-check system to improve safety.</td>
<td>• Attend at least 2 seminars over a 3-year period or complete online learning modules. • Successfully pass the certification examination</td>
<td>• Japanese Society of Anesthesiologists</td>
<td>• Start peripheral IV catheters. • Second check of anesthesia IV medications. • Prepare machine and equipment. • Collect blood samples. • Check blood for transfusion. • Monitor vital signs. • Monitor and maintain patient body temperature. • Prepare PCA pump.</td>
</tr>
<tr>
<td>Certificate in Perioperative Nursing²⁶,²⁷</td>
<td>A nurse who serves a role of a clinical leader in perioperative nursing to reduce surgical complications and improve patient outcomes</td>
<td>• Take 630 hours of mandatory courses and 360 hours of electives. Anesthesia-specific content is 45 hours of total mandatory courses.</td>
<td>• Japanese Nursing Association</td>
<td>• Function as a circulator who has knowledge and skills to care for perioperative patients. • Fulfill a leadership role to improve surgical patient outcomes. • Provide consultation and support to other nursing staff.</td>
</tr>
<tr>
<td>Nursing Competency for Specific Medical Interventions²⁷</td>
<td>A nurse who is trained to perform certain medical interventions</td>
<td>• Complete lectures and workshops through a program certified by the Ministry of Health, Labor, and Welfare. • Successfully pass examinations.</td>
<td>• Programs accredited by the Ministry of Health, Labor, and Welfare</td>
<td>• Perform 38 specific medical interventions, which include adjusting mechanical ventilator settings and placing peripherally inserted central catheter line.</td>
</tr>
<tr>
<td>Master of science in nursing focused on perianesthesia nursing³⁰,³¹</td>
<td>A nurse who performs anesthesia care under the direction of an anesthesiologist</td>
<td>• Complete 2 years of master of science in nursing education. Requirements of didactic and clinical training vary by program</td>
<td>• A university that is accredited by Japanese Ministry of Education, Culture, Sports, Science and Technology</td>
<td>• Perform preanesthesia assessment. • Provide anesthesia care for surgical and other procedures, which include intubation and general anesthesia. • Activities vary from one institution to another.</td>
</tr>
</tbody>
</table>

anesthesia practices in other countries where the focus of education is to prepare nurses to perform anesthesia care under the direction of an anesthesiologist.³⁰

Five universities now offer perianesthesia nursing education at the master’s degree level: Shiga University of Medical Science, Nara Medical University, St Luke’s International University, Yokohama City University, and Shinshu University. The students spend 2 years and complete 46 credits of education³¹; however, no national licensure examination exists for these advanced practice nurses to perform perianesthesia nursing legally. Japanese “perianesthesia” nurses have not been trained to practice or make decisions independently as of now.

Recommendations

Japanese healthcare providers may be thinking of the American nurse anesthesia practice when they use the term nurse anesthesia. In the early 2000s, the Japan Hospitals Association and Japan’s Ministry of Health, Labor and Welfare adopted the position that the introduction of the nurse anesthetists’ role would solve the problem of a nationwide shortage of anesthesiologists. However, before a discussion of how America’s nurse anesthesia practice might be applied to the Japanese healthcare system, it is important to understand the historical and cultural differences between America and Japan as they relate to nursing, medicine, and healthcare. A direct modeling of the American nurse anesthesia practice will likely not be accepted or even achievable in Japan without specific research measures.

As mentioned earlier, 5 Japanese Universities have launched programs in perianesthesia nursing (the term
is similar to nurse anesthesia) at a master’s degree level. Although national licensure does not yet exist and only certain hospitals employ these graduates, one can envision the role continuing to evolve in a manner that would meet the needs of patients for safe, high-quality anesthesia care. After these graduates assume the role that they are trained to perform, the日本の看護師が導入されることも考えられる。The Japanese government, the Japanese Society of Anesthesiologists, the Japan Society of Anesthesiologists, and the Japan Surgical Society, and the Japanese government must work together to overcome differences in positions and policies. Careful, cooperative planning and further research are imperative and must be implemented immediately to avoid the increasing potential for adverse patient outcomes.

**Conclusion**

Japanese anesthesia services face unique challenges complicated by an aging population, a decreasing birthrate, and the government’s task shifting. The need for nurses to become involved in anesthesia care as advanced practice nurses was identified 15 years ago. To ensure access to safe, timely, and high-quality surgical treatment for Japanese citizens, all important stakeholders, including the Japanese Society of Anesthesiologists, the Japanese Nursing Association, the Japan Surgical Society, and the Japanese government must work together to overcome differences in positions and policies. Careful, cooperative planning and further research are imperative and must be implemented immediately to avoid the increasing potential for adverse patient outcomes.

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