In this issue, Birch and colleagues assess the feasibility of introducing advanced minimally invasive surgery (MIS) into surgical practice. This thoughtful summary of the obstacles perceived by surgeons to limit introduction of advanced MIS identifies the priority to commit to an appropriate training model for surgeons and their teams. Indeed, many of our surgical colleagues have shown altruism by acquiring new skills, despite impacts on their own personal time and finances. However, this alone does not create a successful environment for change, as shown by the surgeons’ concerns about access to adequate resources and operating room equipment. This poses the question about redevelopment of the Canadian operating room, so that necessary infrastructure and physical design are present to support the delivery of novel services. The implications extend beyond advanced MIS to all types of surgery affected by the relentless pursuit of new technology. Surgeons need to be keenly aware of the process by which functional programs and conceptual design plans for operating rooms will incorporate new technology and of how to provide input into this process.

What are some key trends that drive changes in the operating suites? These trends can be summarized as advances in diagnostic and surgical techniques or equipment, communication technologies, workforce changes, population health pressures and increased demand for education. The trends toward to surgery with minimal access are at the forefront, but there are other compelling highlights. For example, advances in intraoperative imaging with MRI, fluoroscopy and angiography will promote image-guided interventions in vascular surgery and neurosurgery. Robotics is emerging with applications in urology, gynecology and cardiac surgery. Concurrent multiteam surgeries are being scheduled with greater frequency for complex oncology. Precision physiological monitoring is guiding procedures on the nerves, brain and spine; precision stereotaxis is guiding delivery of radiotherapeutics. Natural orifice therapeutic endoscopic surgery will merge the operating room with endoscopy. There are more bariatric patients in the population. A proliferation of implantable devices is needed to manage the burgeoning load of chronic diseases in cardiac, neurosurgical and orthopedic patients. Distance education with telecasting of intraoperative techniques is a reality of distributed medical education programs and continuing professional development. The workforce in the surgical operating team is aging. Significant shortages of anesthesiologists persist, and forecasts predict critical shortages of nursing staff who are qualified to help in operating and recovery rooms.

All of these trends need to be addressed while embracing rapid technological advancements. Some operating rooms must be larger to accommodate more equipment and larger surgical teams. Advanced MIS can be facilitated through integrated operating room technologies that have the capacity for increased storage of supplies, instruments, implants and equipment. Interventional technologies such as intraoperative angiography, fluoroscopy, ultrasound and MRI frequently challenge the limits of space within bounds of...
current footprints, necessitating redevelopment of facilities in other sites. Information systems need to be upgraded so that communication can occur with wireless technology. Electronic charting will be a reality, and audio, video and tracking devices will add essential value to the hub of education programs. All of these changes must be planned in an era when governments are struggling to address access to care with wait-time guarantees, which challenges the wisdom of closing rooms until construction is completed.

How can surgeons influence the comprehensive functional and conceptual operating redevelopment plan? First, such a plan should be shaped by an outline of objectives that surgeons have identified. These include attention to locations, space adequacies, pitfalls with existing layouts, need for support facilities, location of the postanesthetic recovery room, preoperative holding areas for patient visits to complete surgical site marking and sterile processing adjacencies. Second, a functional description needs to start with a definition of the predicted scope of service. Each surgical service should review evidence-based literature to forecast specific trends affecting operating room demand in their specialty. These trends must consider patient profiles, regional and provincial service deliveries, education and research roles of the hospital. Third, operational input is essential for those services that deliver a large volume of after hours or emergent care. For example, interventional operating room suites will provide for a population of very ill patients, necessitating central locations with convenient access for patient flow and clinical support from anesthesiology and from biomedical, diagnostic and perfusion supports. Fourth, workforce planning must accommodate surgeons who are acquiring new skills and support newly trained recruits. Finally, the hospitals that provide for education and research programs must receive input from academic surgical leaders.

In summary, the feasibility of introducing novel surgical technology into future practice necessitates careful review of aging infrastructure and physical design in our current operating rooms. Although surgeons need to prioritize their attention to appropriate models for their training, they must also play a key advisory role in redesigning the operating rooms for the future. Their involvement will help to ensure excellent care in world-class modern surgical environments that increase surgical capacity and achieve efficiency. This will help to preserve a healthy environment for patients and staff and bolster recruitment and retention of talented surgeons, staff, anesthesiologists and trainees. Surgeons who accommodate emerging and future medical technology will recognize that flexibility is the key to forecasting the needs of the Canadian operating room in 2020. We can dare to make our best predictions, but we must thoughtfully consider that some of us will not be operating then, while others will live with redesigned operating rooms as their career home!

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Reference

THE MACLEAN–MUELLER PRIZE

Attention: Residents and surgical department chairs

Each year the Canadian Journal of Surgery offers a prize of $1000 for the best manuscript written by a Canadian resident or fellow from a specialty program who has not completed training or assumed a faculty position. The prize-winning manuscript for the calendar year will be published in an early issue the following year, and other submissions deemed suitable for publication may appear in a subsequent issue of the journal.

The resident should be the principal author of the manuscript, which should not have been submitted or published elsewhere. It should be submitted to the Canadian Journal of Surgery not later than Oct. 1.

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