The use of apps in surgery

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As mobile communication technology proliferates globally with smart phones, hand-held tablets and hybrids of both, profound changes have occurred in software and hardware used to accomplish daily tasks. Health professionals have growing access to this technology. Surgeons have experienced challenges introducing such technology owing to potential interference with complex devices in the operating room, but newer operating systems are changing this paradigm.

The use of medical applications (apps) for smart phones is a burgeoning topic of interest. Apps are regularly reviewed on iMedicalApps.com. A quick scan reveals a plethora of (free) apps designed to assist in point-of-care decisions, medical education and patient education. For example, they can be used to access information on drugs and drug interactions, read textbooks and journal articles, perform medical calculations, determine prognosis and undertake professional development. Apps are available for Androids and iOS. They offer opportunities for surgeons to support preoperative, intraoperative and postoperative care.

Preoperatively, apps are available to help patients understand what procedures are being proposed. SurgAware is a tool to help patients provide informed consent by facilitating understanding of the information discussed and providing a record of the discussion. To help patients with the complicated lingo of anatomy when describing surgical interventions, some apps allow 3-dimensional viewing of organs with capability for zoom and rotation (e.g., 3D Brain, ShoulderDecideMD). HeartSurgeryRisk is an app for patients undergoing coronary artery–bypass grafting that identifies potential morbidity and mortality associated with this procedure. While this app may not be used by the surgeon, informed patients may bring such information to preoperative planning discussions. For preoperative evaluation of risk, the PreOpEval app allows evaluation of pre-existing medical conditions. While it may not replace multidisciplinary preoperative evaluation clinics, the app may prove helpful as a screening tool to avoid last-minute surgery cancellations. Surgeons and their residents can even refresh their knowledge of operative anatomy when preparing for infrequently performed procedures. Apps exist for classic procedural texts, such as Zollinger, Campbell's Orthopedics, Current Diagnosis and Treatment Surgery and AO Surgery Reference. These apps put instant updates at surgeons' fingertips when reference books may not be practical.

Intraoperatively, apps assist surgeons to improve availability of imaging. Apps, including Mobile MIM and OsiriX HD, are now available to load preoperative imaging into tablet-friendly formats, helping surgeons prepare for individual patients and reducing frustration from images on operating room workstations that time out. Such apps may also facilitate the sharing of imaging results among different jurisdictions and hospitals. Even the WHO Surgical Safety Checklist is available as an app. Entitled SafeSurgery, it covers all 3 phases of the surgical safety checklist and may help to audit compliance with the conduct of safe surgery.

Postoperative apps include SurgicalLogbook, which enables surgeons to keep a log of patients for whom they complete procedures. For trainees, this system is vital to satisfy surgical training requirements and may assist surgeons with documentation for practice audits necessary for successful recredentialling. Communication platforms have been developed as apps to facilitate interaction among surgeons, referring doctors, other health professionals and patients. For example, SurgiChart stores images, medical findings and information on procedures. Such robust, timely communication platforms deserve to be explored in this era of rapid communication.

As mobile communications and related apps proliferate, it is essential for surgeons to remain well-informed. Aside from reducing the burden of daily work, surgeons can anticipate new point-of-care knowledge. Some caveats bear scrutiny. First, mobile communications and apps are not necessarily regulated or reviewed by medical authorities. Content in these apps is no substitute for astute clinical judgment and rigorous peer-reviewed health literature. Wherever possible, the highest standard of scientific rigor should be linked to the data in the app. Second, apps that use and store confidential patient information may be particularly vulnerable to unintentional loss or theft. Passwords and robust encryption technologies are a must to prevent violation of confidentiality. Institutional policies must be updated constantly to review precautions and to update these for surgeons and trainees. Finally, proliferation of such technology should not detract from the strong personal communication vital to achieving top-quality surgical care. While it may be exciting to navigate a "cool app," we need to look at humans and speak to them — after all, they are patients and colleagues, not robots!

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