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Addressing telemedicine challenges for surgery clinics in the Post-COVID era

Telemedicine has emerged as a powerful tool in patient care, with great potential to enhance surgical clinician-patient encounters. The World Health Organisation defines this as 'the use of electronic communications and information technologies to provide clinical services when participants are at different locations'.[1] In surgery, telemedicine has the potential to enhance multiple points of the patient journey including clinical encounters, biomonitoring, health education patient engagement/adherence[2] and information transfer.[3,4] Telemedicine is best used if there is widespread availability of technologies such as smartphones and laptop computers with secure wireless data connections and user-friendly software to enable ready and secure transfer of voice, images and video information.[5] As seen during the COVID-19 pandemic, telemedicine permitted many patients to access components of healthcare when strict social distancing restrictions were enforced. From this, telemedicine uptake and innovations were accelerated, so that its benefits were noted. In this recent issue of the ANZJS, research into telemedicine, particularly in specialist usage[6] and patient perspectives,[7] will shed light on its best implementation.

The benefits of telemedicine in surgical clinics are well established in the literature.[8] Coupling clinical medicine with advanced technologies can greatly improve access, efficiency and cost savings. For access, technology enables the point to point connection of the health care provider directly to the patient's residence, thus immediately overcoming distance, travel, physical disability and enforced social distancing.[9,10] Access is further enhanced with government support, as shown in Australia where telemedicine services for specialists have financial remuneration.[6] Access may also occur with multiple specialists, such that simultaneous multi-disciplinary clinical encounters can be arranged via conference call.[11] Efficiency is thus gained with convenient scheduling, reduction in travel time and ready access to information that can streamline clinical encounters.[4] Cost analysis that has focussed on the economic viability and sustainability from the patient perspective clearly show patient cost savings in travel, loss of income and time burden,[12] and from the institute perspective, show benefit in resource use, staff salaries, space allocations and overall costs.[13]

However, key challenges have arisen and were magnified during the pandemic, which need to be met with further technology development assisted by robust processes around telemedicine use (Table 1). Infrastructure, usage support, integration and administrative burden are important barriers. Choice of user friendly, convenient, stable and secure technology platforms are required for reliable connection and communication,[2,14] with some institutes opting for 'telemedicine hubs' where infrastructure, IT and administrative support are available together in one clinic. Streamlined links with existing communication and data sources are key for information transfer and convenient access. Administrative support can be further improved by protocol

development (e.g., patient literacy screening), staff digital literacy education and adequate recognition of time requirements outside of patient contact time. Particular consideration needs to be given to support patients and their families given that, in some communities, resources are not present that match those available in institutions. Opportunities utilising community support such as community centres, GP hubs or library hubs may assist those patients by providing infrastructure, IT and administrative support, as well as, supporting digital literacy education.

Particularly in surgery, quality of care is a significant issue that is difficult to quantify.[15] Surgery brings forth interactions that may not be appropriate for telemedicine (e.g., consent, breaking bad news, clinical examination for surgical planning), and safety net alternatives need to be sought and accessed. Information transfer and interaction is clearly altered in telemedicine consults, with reports showing patients tend to downgrade symptoms,[16] and feel that, particularly when an intervention is required, face to face interactions better establish trust within the doctor-patient relationship and facilitate answering questions. Medicolegal concerns have been raised, particularly with a potential reduction in standards of communication and care that can lead to mis-interpretation or privacy concerns.[17] This is further compounded in minority groups where language and cultural barriers are not addressed by technology and can further segregate them. Perhaps telemedicine use can be scaled back so that there is time for the development of clinical practice guidelines to then steer targeted protocol development[18,19] better tailored to the health needs of the patient. In this process, health services should have mechanisms to collate and audit their individual data metrics for evaluation of clinical efficiency, safety, cost, provider and patient usage and satisfaction.[20]

There will always be a role for in-person clinical encounters, and surgery clearly requires this due to its interventional nature. The rollout of telemedicine in surgery clinics was rapid at a time of need but its continuity should be approached carefully. Some implementation of telemedicine and a degree of experience with its use has been seen, with benefits for telemedicine evident. Indeed, further technology innovations will further enhance its use and prove its applicability.[8] However, the current urgent need is to establish adequate evaluation mechanisms so that its benefits are truly highlighted with substantiating data.[20] This should be completed in a variety of contexts, whether that be without social restrictions, in different subspeciality clinics, within rural communities or in cultural minority groups. Identifying which encounters are not appropriate for telemedicine is as important as identifying those that are: and this then requires incorporation of this evidence into clinic protocols. Coupled with recommendation and guideline development, telemedicine use will be appropriately applied to further enhanced the goal of 'extend(ing) traditional practice of

Table 1 Challenges in telemedicine and possible solutions

Challenge	Steps towards solution
IT Support, for example, technology, infrastructure and connection issues	Careful selection of IT platform with high reliability, develop telehealth hubs, integrated system development
Administrative, for example, scheduling	Process development, digital literacy education, appropriate reimbursement/recognition of preparation and follow up requirements
Access in minority groups, for example, cultural, elderly, low socio-economic status	Novel infrastructure support, screening, outreach and education
Quality of care, for example, clinical appropriateness	Usage criteria and practice guidelines, safety net alternatives, for example, support person for patient, community hubs, protocolised follow-up consultations
Medico-legal	Consultation consent, establishment of expectations, modification in communication style, Privacy Act 1988 (Aust.) complaint software
Sustainability, for example, workplace/economic efficiency	Remuneration models, collect audit and research data to highlight benefits and develop recommendations

medicine outside the walls of the typical medical practice… with the aim of advancing the health of individuals and communities'.[1]

Author contributions

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References

1. World Health Organization. *Global diffusion of eHealth: making universal health coverage achievable: report of the third global survey on eHealth*. Geneva, Switzerland: World Health Organization; 2017.
2. Lu K, Marino NE, Russell D, Singareddy A, Zhang D, Hardi A, et al. Use of short message service and smartphone applications in the management of surgical patients: a systematic review. *Telemed J E Health*. 2018;**24**:406–14.
3. Asiri A, AlBishi S, AlMadani W, ElMetwally A, Househ M. The use of telemedicine in surgical care: a systematic review. *Acta Inform Med*. 2018;**26**:201–6.
4. Hakim AA, Kellish AS, Atabek U, Spitz FR, Hong YK. Implications for the use of telehealth in surgical patients during the COVID-19 pandemic. *Am J Surg*. 2020;**220**:48–9.
5. Lokken TG, Blegen RN, Hoff MD, Demaerschalk BM. Overview for implementation of telemedicine services in a large integrated multispecialty health care system. *Telemed J E Health*. 2020;**26**:382–7.
6. Wiadji E, Mackenzie L, Reeder P, Gani JS, Carroll R, Smith S, et al. Utilization of telehealth by surgeons during the COVID 19 pandemic in Australia: lessons learnt. *ANZ J Surg*. 2021;**91**:507–14.
7. Wiadji EM L, Reeder P, Gani J, Ahmadi S, Carroll R, Smith S, et al. Patient perceptions of surgical telehealth consultations during the COVID 19 pandemic in Australia: lessons for future implementation. *ANZ J Surg*. 2021.
8. McMaster T, Wright T, Mori K, Stelmach W, To H. Current and future use of telemedicine in surgical clinics during and beyond COVID-19: a narrative review. *Ann Med Surg*. 2021;**66**:102378.
9. Rajasekaran K. Access to telemedicine—are we doing all that we can during the COVID-19 pandemic? *Otolaryngol Head Neck Surg*. 2020; **163**:104–6.
10. Jue JS, Spector SA, Spector SA. Telemedicine broadening access to care for complex cases. *J Surg Res*. 2017;**220**:164–70.
11. Grenda TR, Whang S, Evans NR III. Transitioning a surgery practice to telehealth during COVID-19. *Ann Surg*. 2020;**272**:e168–9.
12. Reider-Demer M, Raja P, Martin N, Schwinger M, Babayan D. Prospective and retrospective study of videoconference telemedicine follow-up after elective neurosurgery: results of a pilot program. *Neurosurg Rev*. 2018;**41**:497–501.
13. Buvik A, Bergmo TS, Bugge E, Smaabrekke A, Wilsgaard T, Olsen JA. Cost-effectiveness of telemedicine in remote orthopedic consultations: randomized controlled trial. *J Med Internet Res*. 2019;**21**:e11330.
14. Kelly A, Belchos J, Wheatcroft M, Burke PE, Abdeldaim Y, Kavanagh EG, et al. An international experience of electronic communication and implementation of eHealth solutions in a vascular surgery clinic. *Ir J Med Sci*. 2021;**190**:291–6.
15. Wootton R, Hebert M. What constitutes success in telehealth? *J Telemed Telecare*. 2001;**7**(Suppl 2):3–7.
16. Balzarro M, Rubilotta E, Trabacchin N, Mancini V, Costantini E, Artibani W, et al. A prospective comparative study of the feasibility and reliability of telephone follow-up in female urology: the Patient Home Office Novel Evaluation (PHONE) study. *Urology*. 2020;**136**:82–7.
17. Wade VA, Eliott JA, Hiller JE. A qualitative study of ethical, medico-legal and clinical governance matters in Australian telehealth services. *J Telemed Telecare*. 2012;**18**:109–14.
18. Krupinski EA, Bernard J. Standards and guidelines in telemedicine and telehealth. *Healthcare (Basel)*. 2014;**2**:74–93.
19. Socarrás MR, Loeb S, Teoh JY-C, Ribal MJ, Bloemberg J, Catto J, et al. Telemedicine and smart working: recommendations of the European Association of Urology. *Eur Urol*. 2020;**78**:812–9.
20. AlDossary S, Martin-Khan MG, Bradford NK, Smith AC. A systematic review of the methodologies used to evaluate telemedicine service initiatives in hospital facilities. *Int J Med Inform*. 2017;**97**:171–94.

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