Taipei Veterans General Hospital secure open-source telemedicine system—TeleCARE

Ai Seon Kuan[a,b,c], Tzeng-Ji Chen[c,d,e], Yu-Chun Chen[c,d,*]

[a]*Division of Neurosurgery, Neurological Institute, Taipei Veterans General Hospital, Taipei, Taiwan, ROC;* [b]*Institute of Public Health, National Yang Ming Chiao Tung University, Taipei, Taiwan, ROC;* [c]*School of Medicine, National Yang Ming Chiao Tung University, Taipei, Taiwan, ROC;* [d]*Department of Family Medicine, Taipei Veterans General Hospital, Taipei, Taiwan, ROC;* [e]*Big Data Center, Taipei Veterans General Hospital, Taipei, Taiwan, ROC*

The COVID-19 pandemic and various lockdown measures pose huge challenges to our daily life and healthcare delivery. Telemedicine may play a vital role in timely delivery of care and protect both patients and healthcare workers from exposure.[1,2] While there was an increase in demand for virtual healthcare, the expansion of telemedicine was hindered by a lack of hardware and technical resources in many places.[3] To lower the entry barrier for both provision and receipt of virtual healthcare, a telemedicine system that utilizes existing workforces, infrastructures, and software is ideal. Nevertheless, concerns have been raised regarding security and privacy of some commercial video conferencing software, which have gained wide popularity among education and business users.

The Taipei Veterans General Hospital has developed a secure and reliable Telemedicine system for health Consultation, Assessment, monitoRing, and Education (TeleCARE) based on the open-sourced Jitsi platform (Fig. 1). Individuals with medical needs can make a regular (clinic) appointment on the TeleCARE platform. The system will then create an encrypted "virtual room" and send invitations containing QR codes and single-use log-on credentials with SSL certificate to the patient, clinician, and any invited individuals to a multiparty video conference via their
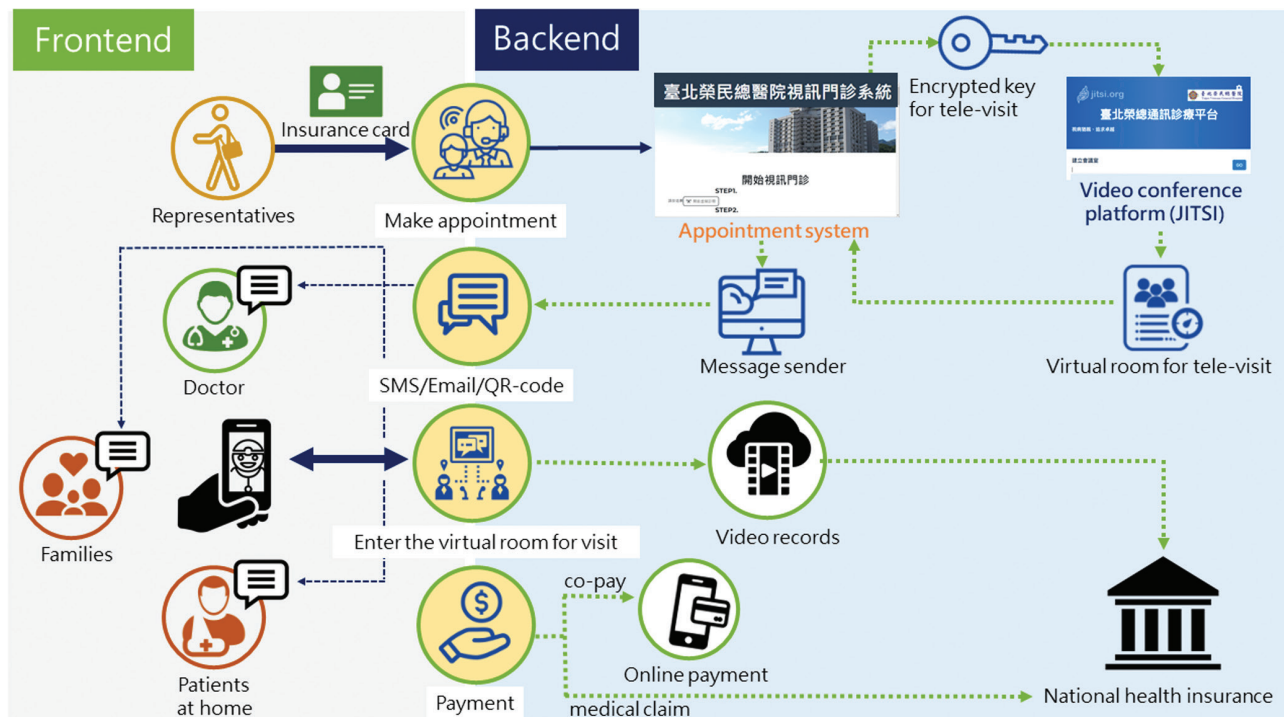

Fig. 1 Taipei Veterans General Hospital TeleCARE system.

*Address correspondence: Dr. Yu-Chun Chen, Department of Family Medicine, Taipei Veterans General Hospital, 201, Section 2, Shi-Pai Road, Taipei 112, Taiwan, ROC. E-mail address: ycchen22@vghtpe.gov.tw (Y.-C. Chen).
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mobile phones. Clinicians will then see the patient during their "virtual visit" in a regular clinic. The patient's identity will be confirmed through on-screen validation of their identity card. The "virtual visit" is audio-and-video-recorded for reimbursement purposes, and a transcript of the consultation can be generated automatically by the system. All data are processed and stored in designated in-house servers, and the connection is encrypted, which avoids any possible leakage of sensitive information. The system also allows consultation with or referral to other clinicians who are also running a clinic at the same time. Patients or their representatives may choose to collect their prescriptions at a designated dispensary or have their prescriptions mailed to them. Payment can be made securely online through the platform. When necessary, patients will be referred to emergency service.

TeleCARE is a good alternative to emergency services or in-person clinic visits during a contagious disease pandemic. TeleCARE also provides a viable option for any individuals including those with suspected or confirmed SARSCoV-2 infections to get needed healthcare advice when they remain quarantined or isolated at home. The Taiwanese government has ensured that administrative and legal structures are in place to support the provision of telemedicine care.[4] With an anticipated increasing number of COVID-19 patients and isolated or quarantined individuals in the coming days,[5] our low-entry-barrier TeleCARE system will allow medical institutions and clinicians to adapt quickly and respond effectively to the escalating demand for virtual healthcare.

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