

# High Time to Discuss Future-Oriented Telemedicine

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In 2013, the Korean government attempted to permit telemedicine between medical personnel and patients, a measure to expand the practice of telemedicine among medical personnel already permitted in 2002. Doctors' organizations, however, expressed all-out opposition, on the grounds that telemedicine would exacerbate some disadvantageous circumstances in the country's medical care—notably, absolutely low medical insurance premiums and the destruction of medical delivery systems. As a result, a series of heated debates have been taking place among the government, insurers, medical service providers, and medical consumers. At this juncture, we planned a special issue on telemedicine out of a sense of duty that *Healthcare Informatics Research* (HIR), as a privileged journal not only in Korea but across Asia, should provide an arena for academic discussion to look back at the past of telemedicine, examine the current situation, and prepare for the coming years. As a result of a two-year-long effort, HIR's special issue on telemedicine (Vol. 21, No. 4) has now become officially available for all interested readers.

This issue consists of fifteen unique contributions on a variety of telemedicine or telehealth issues: six review articles, seven original research papers, one case report, and one book review. In particular, the review articles in this issue offer valuable knowledge on the latest international telemedicine trends, current circumstances in Korea, obstacles to the introduction of telemedicine, and telemedicine for geriatric-age patients with rapidly increasing demand, as well as suggestions for frameworks designed for telemedicine

assessment. In addition, one of the original research papers features past achievements directly analyzed by the research team of Prof. Ahn, who was responsible for research into the telemedicine program in Gangwon Province, which has the longest history in Korea and has been evaluated as the country's most successful program [1]. Other papers cover issues pertaining to the management of chronic diseases by using a QI and agent operated through mobile Electronic Health Records (EHR) and mobile applications and to the security framework in telemedicine through the Internet of Things (IoT). Finally, the case report introduces some studies on wearable devices, which have been one of the most interesting topics among the public. I can say with confidence that this special issue will offer a rare opportunity to access, in a single copy of this journal, diverse issues encompassing the past and the present, international trends and unique circumstances in Korea, and PC-based telemedicine delivered by mobile device, agents, the IoT, and wearable device.

The articles in this issue tell us that telemedicine goes beyond the readily available image of real-time, face-to-face medical treatment mediated by screens. In the early days of telemedicine, a considerable effort was made to realize the 'real-time' and 'face-to-face' aspects, despite technological restrictions such as slow network speed and poor hardware specifications. Therefore, studies on early telemedicine largely focused on addressing such technological restraints [2-5]. Those restrictions, however, were mostly solved by the development of information and communications technology, and a number of things that had not been possible became reality, which will be described in detail in this special issue (Vol. 21, No. 4).

Nevertheless, the government and politicians tend to believe that telemedicine is all about 'real-time' and 'face-to-face' interaction. In fact, telemedicine must be performed in real time and via face-to-face interaction in some cases,

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because it is necessary to overcome the spatial restrictions that hinder access to medical services. Face-to-face medical services provided in real time are required, for instance, for those working at space stations, sailing at sea for a long time, and living on a doctorless island. Actually, this mode of telemedicine has produced certain achievements on vessels sailing for long distances [6-10] and on doctorless islands [11].

Researchers have also made endeavors to overcome the 'real-time' boundary. Park et al. [12] already excluded the real-time factor in 1995 when monitoring fetal heart sounds, overcoming the technological restrictions of time to a certain extent. In addition, Costa and Oliveira [13] demonstrated that electrocardiographic or echocardiographic analysis could assist in treatment of patients with cardiac issues. Likewise, there have been efforts to tackle the limits of 'face-to-face' treatment. Kim et al. [14] showed the possibility of diagnosing acute appendicitis of pediatric patients by using real-time ultrasonography images in a remote place. Among others, the review article by Wilson and Maeder [15] in this issue explains such issues in detail by categorizing telemedicine into synchronous and asynchronous telemedicine and suggests that telemedicine be practiced based on distinctions regarding high-volume and high-critical conditions.

As also described in other papers published in this special issue, the future of telemedicine has already arrived, and the sum of mobile devices, the IoT, wearable device and increasingly advancing ICT will contribute to telemedicine. We need an opportunity to realize more creative ideas, so as to benefit all humankind by eliminating blind spots in medicine and identifying health issues at early stages. To this end, the government and politicians need to reconsider all outdated restrictions that fail to keep pace with technological development, and medical personnel should stop focusing on their interest and instead embrace new ideas and come up with creative suggestions. I hope this special issue of *Healthcare Informatics Research* will truly inspire our readers.

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