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VIEWPOINT

INNOVATIONS IN HEALTH CARE DELIVERY

Medical Informatics and the “Three Long, One Short” Problem of Large Urban Hospitals in China

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China accounts for 19% of the world population¹ but only 5.5% of total gross domestic product for health expenditures.² Most of the medical resources (eg, well-trained medical workers, advanced medical equipment) are concentrated in large tertiary hospitals. The large tertiary hospitals in the large cities have been overcrowded and adversely affected by the so-called three long, one short conditions (long registration and queue times; long waiting times; long dispensary and payment queue times; and short physician visit times). These factors have led to widespread patient dissatisfaction and have contributed to the fatigue of Chinese physicians who work long hours with overloaded schedules. State President Xi Jinping has described large urban hospitals in China as war zones, always in a “state of war” and overcrowded.³ The relatively scarce and uneven distribution of medical resources causes a serious imbalance between supply and demand, which has contributed to deteriorating patient-physician relationships. The frequent incidence of patient-physician disputes resulting in violence directed at some physicians in recent years is a matter of great concern to the Chinese government and to the global medical community.⁴

Over the past few years, government policies have led to the rapid development of medical informatics (such as mobile internet, big data, and medical cloud computing). These technologies have penetrated many aspects of health care services, simplifying medical processes, optimizing resource allocation to hospitals, helping to ease the “three long, one short” problems, and reducing “patient-physician information asymmetry,” thereby improving the efficiency of medical services, enhancing effective patient-physician communication, and improving patient medical treatment experience. An example is the First Affiliated Hospital of Wenzhou Medical College, a large tertiary hospital with 3250 hospital beds and more than 10 000 daily outpatient visits. This hospital has eliminated the traditional in-person appointment and payment counters that usually required waiting in line for long periods, often several hours. Instead, beginning in 2010, the hospital adopted a “flexible time period appointment (FTPA)” service based on a variety of mobile internet technology channels, such as mobile client and WeChat (China’s biggest mobile chat app), as well as 260 self-service kiosks, through which patients can make appointments with a physician and even register for same-day surgery and complete financial payments by means of a “fee transaction payment system” (FTPS). Using the FTPS, the kiosks can recognize private insurance cards and accept payment for patient medical

bills. The kiosks can also print hospital maps and procedure guides for new patients, print laboratory reports, list medical prescriptions, and help patients choose between imported drugs or government-sponsored generic drugs.

Since 2012, this hospital has developed more than 50 new software programs that reformulate all clinical procedures.⁵ As a result, the hospital has improved the “three long, one short” problem and has achieved a virtually “zero line” of waiting patients. The physicians experience much less pressure and feel free to spend more time with each patient. These innovative services have received widespread favorable reception from patients and have won for this hospital the 2015 Asian Hospital Management Award.⁶

Changes similar to those instituted at the First Affiliated Hospital have been promoted nationally and effectively extended to many other major hospitals in China. The informatics process for clinic appointments has become widely used in tertiary hospitals throughout the country, thereby effectively triaging patients for treatment and helping to relieve the previous overcrowded conditions. According to the statistical data from the National Health and Family Planning Commission,⁷ by the end of November 2015, the average rate of outpatients who made appointments using informatics technologies rather than in-person counter registration had reached 32.1% for China’s tertiary hospitals, and the number of tertiary hospitals using the FTPA service had reached 39 477. Some provinces and cities achieved remarkable outcomes. As of September 2015, on average 76% of outpatients in Shanghai tertiary public hospitals were making their appointments through mobile internet, a 2.4% increase over the previous year. For specialist appointments, the proportion had reached 91.9%, an increase of 1.2% from 1 year earlier. For oral care, prenatal care, and follow-up appointments, the rate had already reached 100%. Zhejiang province has established a unified service website to help patients make appointments online. As of July 2015, more than 4 million users had registered on this website, and a total of 17 369 900 online appointments had been made.¹

By the end of November 2015, 1238 tertiary hospitals had established online patient-hospital interactive databases, offering a series of convenient online services that include outpatient guidance, medical inquiry, as well as payment services. A total of 660 tertiary hospitals introduced mobile internet technology to simplify outpatient clinical services, in addition to admission and discharge payment procedures. Medical informatics has also simplified the payment

procedures, thereby further improving patient experience. Patients could pay their medical bills on the mobile client app and conduct the admission and discharge process at the nursing stations, resulting in a radical improvement of the overcrowd conditions caused by the previous “window admission and discharge” procedures, as noted above for the First Affiliated Hospital of Wenzhou Medical College. Shengji Hospital of China Medical University developed an “outpatient guidance tracker” mobile app. This app can help new patients follow the procedures available and find them anywhere in the hospital easily and quickly. According to the National Health and Family Planning Commission,⁷ the First Affiliated Hospital of

Chongqing Medical University improved the clinic area layout and optimized the medical service process through medical informatics and reduced patient complaints by 24% within 1 year.

In summary, medical informatics has helped to mitigate the “three long, one short” problem of large hospitals in China, although the ultimate solution will be to improve the scarce and uneven distribution of the medical resources. The improvements already achieved could help to accelerate the pace of Chinese medical reforms and could provide useful lessons for the development and application of medical informatics in medical institutions in developing countries around the world.

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