

Research on the Current Situation and Countermeasures of Smart Community Medical Service System in China

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Abstract. Smart community medical service is a new service which applies the Internet of Things technology to all aspects of community medical service in order to make the medical facilities, medical means and medical processes of community hospitals more intelligent. In order to systematically study the progress of this project, we did a lot of interviews, investigation and literature review. This paper introduces the current situation of the smart community medical system in China, and points out the drawbacks such as the disunity of the standard system of the Internet of Things technology, the hidden danger of the data security of the smart community medical service, the health prevention and the imperfect risk warning. It is proposed that the government should develop and unify the technical standards of the smart community medical service, strengthen the data privacy protection technology, and optimize the electronic case of the smart community hospital.

Background and Significance

In recent years, with the improvement of people's living standard and the enhancement of consumption concept, people have higher requirements on living standard and quality of life. At the same time, because of the city population growth and accelerated pace of life and other factors, sub-health state population is now increasing and in the process of population aging, the demand of elderly common diseases and chronic disease daily care and community health services is also increasing. Community health care system is rooted in the grassroots, and provides medical services for the community residents directly. It has the characteristics of fast response time and can serve a large quantity of people. It has a larger advantage especially in the elderly health care and chronic care. But at present, there are many problems such as insufficient manpower investment and low efficiency of medical service in community medical service, which greatly restricts the service level and service quality of community health care so that it cannot give full play to the unique advantages of community medical system. Therefore, it is necessary to study the community health care system to improve the efficiency and service level of community health care, which is of great significance to promote people's health and maintain social harmony.

The three session of the twelve National People's Congress on March 5, 2015, first proposed the "Internet plus" action plan in the government work report. The action is to combine the traditional industries with the Internet and information technology to create new forms. The concept of the smart of the community fully displays the "Internet plus" mode of thinking. It makes full use of the Internet and Internet technology, re-upgrades the traditional community management with information technology. Smart health care is part of the smart community which is committed to ensure the community pension services and build a harmonious community management and improve the quality of life of community residents. Smart health care is an attempt to get rid of the predicament of traditional medicine combined with the formation of the new medical reform program based on information technology development. It brings new opportunity to provide health care for the residents. The smart community medical service system based on the Internet of things uses the technology of the Internet of things deploys medical sensor networks in Home Furnishing environment and perceives and monitors signs data of human body. Medical staff and the family

can access health monitoring information of monitored objects through the Internet, mobile phone and other means .When the data is abnormal, alarm signal will be sent to the family, the doctor and the emergency center immediately to save valuable time. Doctors can also put forward suggestions and provide consulting services on the basis of health monitoring data. The smart community medical service system based on the Internet of things can provide daily health care for people and improve the efficiency of the rational allocation of medical resources. t is of great significance for people with chronic diseases and the early detection of disease as well as emergency alarm and monitoring.

The Present Situation of Medical Community Service System

While China's medical system is reforming like a raging fire, the emergence of the Internet of things makes a great advance in health care reform. Networking applications in the medical industry can make the production and use of the medical equipment more intelligent, it can also provide technical support for remote consultation. At present, there have appeared multiple successful applications in the medical industry in China. The success of these cases shown in Table1 indicates that the application of the Internet of things in the medical industry of our country will be studied in high priority.

Table1.Successful cases of applications of the Internet of things in the medical industry

Cases
1. The Fourth Military Medical University provides remote consultation on the earthquake wounded.
2. Hangzhou green hospital has realized automatic tracking
3. Tianjin Binhai New Area opened doctor-patient communication
4. “Hongyan” netlaunches “Telemedicine” channel
5. Fuzhou general hospital opened telemedicine
6. Application of remote cardiac pacemaker in Fuwai Hospital of Beijing
7. The emergency mobile medical vehicle of CISCO company

By 2020, and the smart community will have an indispensable position with the accelerating urbanization rate of population. A basic judgment is that medical Internet of things will bring aggregation of clinical information, surgical teaching, drug tracking, patient accident alarm and rescue system, wireless positioning and other industrial types. “Home and community telemedicine, in-patient health real-time monitoring and other areas will accelerate interoperability in the future”, experts pointed out.

In this context, the competition of the entrance to smart community will become increasingly fierce with the model innovation, technology promotion and data precipitation and will become a strategic focus of smart health care. Reporters learned that the overall market size of medical and technological networking in 2015 was 41 billion Yuan, which is expected to reach 200 billion and a compound growth rate of 36% by 2020. From the smart medical care to mobile medical care, from the remote medical intervention to the medical material landing, smart medical battle in the community is in full swing.

National health department attaches great importance to the development of smart community medical services and constantly provide financial and technical support to community health care services. The latest medical reform program has proposed that the governments at all levels expect medical investment to reach 850 billion Yuan in the next three years, an average annual investment of more than 283.3 billion Yuan. It is expected that this part of the funds will be invested in hospitals, especially in the information construction and the community medical service environment. In addition to the support of the government, the status of community health care in China has also led to the development of smart community medical services in the future trend. It is

foreseeable that in the wave of health care reform in the new round, the development of community health care services is an inevitable trend.

The Problems of Medical Community Service System in Smart Community

At present, China's Internet of Things applications and the smart medical treatment based on it are still in the primary stage of development and its development model mainly relies on the promotion of government. Many places are blindly following the trend. These may lead to the high investment to IoT and smart medical, at the same time the security and privacy mechanisms related to smart medical care have not yet sound up.

First, the standard of Internet of Things technology in community medical applications in the system is not unified. Internet of things in the field of medical applications is characterized by large scale application and low perceived node density. In the network layer, the core technology has matured; in the network transmission layer, 3G or Internet and other basic network facilities can meet the industrial needs, the key is to establish a standard for the medical industry as soon as possible. At present, the Fourth People's Hospital of Wuxi City has advised National Information Technology Standardization Technical Committee Sensor Network Standards Working Group on setting up a special set of sensor network medical application project group to the, aiming to complete and submit the medical industry for the Internet of things standard system research report as soon as possible.

Second, there are some risks in smart community health care data security. Internet of things can support a variety of complex polymorphic applications and the data involved is also varied so that the data will leak with interaction. The data of the Internet of Things is also massive and semantic rich and will produce a large number of implicit application semantics in the process of storage and processing. So unauthorized data is unable to identify and remotely locate and this problem is more prominent in the community medical services. For example, some illegal users can use the technology to interfere with the Internet technology and modify the accuracy of the information in the system collected by RFID tags, resulting chaos in the hospital information system and causing serious impact on the safety of patients.

Third, health prevention and risk warning is not perfect. Once the smart community health care service is put into use, it should build electronic files for people in a certain area for free, but the source of funding in this respect is a big problem. At present, China's smart community medical service compensation mechanism is not perfect. The government lacks personal health records management, health network consulting and health knowledge push service and other personalized service. How to use the health knowledge base in the background of rapid development of large data for the medical staff to provide scientific and effective personalized health services will become the future research topic.

Measures to Improve the Effect of Smart Community Medical Service

1. Develop and unify technical standards for smart community medical services. In the smart community medical service system, the most difficult thing is that there is no unified industry technical standard. The emergence of things greatly promotes the information construction of community medical service. In the process of the developing smart community medical service, we should establish a simple, standardized, reliable and unified industry technical standard from the technical and ethical level, and gradually promote and improve the standardization process of smart community medical services. We should also strengthen the development of uniform standards of Internet of things when the smart community health services are still in the primary stage of development.

2. Enhanced data privacy protection technology. The protection of patients' privacy in smart community health care should proceed from the following aspects: First, the protection of the patient's basic data. The technology of Internet of things (IOT) should be able to rearrange the basic data and form a new set of data. Decryption of this database is a process to break the basic data to

restore, and anyone who can carry out this operation must be given a certain authority. Second, the protection of location of patients. An important application of smart community medical services is patient positioning system and telemedicine services. So when the patient applied to this function, its especially important for the Internet of Things technology to protect the location of the patient's privacy. The intermediary's location method can be used to protect the location of the patient, and the role of the intermediary here is to act as the collector of information and the sender of the information.

3. Improve the electronic case of smart community hospital. The technical support of the electronic case in the smart community medical service is the Internet of things technology, which can also be referred to as a mobile electronic case, also known as the "RFID medical card". The role of electronic cases in smart community health services is pivotal. Its main function is the same as the traditional electronic case, which records the patient's name, gender, date of birth, ID number and other information cards, including a record of past medical history and allergies. But the electronic case in the smart community medical service should also include the measurement of the patient's daily physical signs, which is the embodiment of the convenience of medical services in the community. This electronic case should also be able to reduce the time patients wait in line and doctors enter the patient diagnosis and treatment information one by one. In the smart community medical services, electronic case system should have the ability to make large hospitals and community hospitals share information more convenient and accurate with the Internet of things technology.

Summary

This paper gives a brief overview of the status quo of the medical service system in the smart community. The existing problems and corresponding countermeasures of the smart community medical service system are put forward. Smart community medical service will be at a rapid pace toward the future on the basis of providing more convenient and efficient medical services. But the establishment of smart community medical service complete system still has a long way to go, which not only needs the support of the government, but also needs the support of the masses.

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