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Based On Body Communication Wireless Medical Monitoring System Construction

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Abstract

the concept of the body communication is put forward, the rapid development of portable medical equipment, medical monitoring systems are improving. Through analyzing the characteristics of body communication and the restrictions of medical equipment, we proposed the idea of medical monitoring system of wireless, and elaborated the system's principle of work. The construction of this system to further promote the development of medical monitoring system and provide security for the healthy development of body society .

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Keywords :body communication; Portable; Can wear equipment; Medical monitoring system

1. Introduction

Due to the spread of the chronic high-risk disease and population aging degree intensifies, the healthy people, people on the widening the concept and keep healthy growing health awareness. Tradition with hospital as the centre, regard for the treatment of diseases of medical model has far object cannot satisfy the people to the health care growing huge demand. A brand-new to communities, families and individuals as the center, take preventive care primarily, early diagnosis and early treatment of medical

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model is gradually worldwide inoculation and development. With medical model of this historic transformation, medical instruments work of occasions, operation characteristics and use object also have changed. Complete the traditional medicine hospital oriented has obviously does not adapt instrument design requirements change. So today's medical instruments and market demand hot also gradually by complex, applied in large hospital medical equipment, steering applicable to family, community and personal miniaturization, intelligent, networked medical monitoring instrument /device. From engineering point of view, "miniaturised can wear of the portable medical instruments," is the traditional family, community and to enter the medicine pattern change only road. And mems technology and communication technology, material technology, biological sensor technology development, for the development of medical instrument wearable provide the possibility. But wearable medical instruments on the successful development of the people of sub-health, and real-time monitoring data obtained will also test in the patient's databases kept. Provide the patients with real and effective health monitoring database system, meanwhile, the data can also provide a powerful similar cases for the study of the evidence. Not only can realize the establishment of base patients (especially those action inconvenience, elderly) never leave home can get the doctor's real-time diagnosis. Also for scientific research institution and the hospital provides the effective analyzing data.

2. Body communication

In 1995, the Massachusetts Institute of Technology by dr Zimmerman put forward the concept of body domain nets. Currently body domain nets technology already internationally many universities and scientific research units has been very big development. Body communication according to the signal with body body coupling way different, current body communication can be divided into two kinds: 1, Capacitive coupling capacitance coupling model (type); 2, current coupling model (Galvanic couplingtype). Because of current coupling the realization process of body communication type grounding factors and unaffected by surrounding environment influence, compared to the capacitance coupling model has better adaptability and technical stability, has become a new body communication technology development branch.



Figure1 wireless body communication network

The related body communication especially current body communication research coupling model is still at the beginning. Most of the literature, results concentrated in body trials, prototype and numerical simulation level. The channel model has many equivalent circuit model and finite Element model (FEM) Finit Element Methods, mainly, and not a good description of body channel characteristic, the distribution of electrical signals into the body body and spreading way lack an universal applicability, couldn't be more correct understanding of influence from the essence of body communication quality of internal mechanism and external factors make reasonable explanation. The experimental results caused by all parties to the debate, the most problems related to this only exist in speculated that level. Therefore, body communication this lack of theoretical support research situation, the love is largely restricted its further development, also is the technology into actual application delayed the main reason.

3. Based on body communication wireless monitoring medical system

With the progress of science and technology, the aging of the population intensified. The existing medical resources cant satisfy the future needs of the elderly and patient care units, especially with the global fifth of the population of China is very outstanding. In order to deal with this issue, various countriesall positively preparation. But the problem lies in not everyone wants to stay in the hospital inside time, on the one hand, the inside of the hospital limited resources; On the other hand for economic, work and some other problem restrictions make most people could not stay in the hospital inside moments. And their health problems and real-time monitoring the must be. Thus wireless monitoring medical system will become future body a portable, real-time monitoring of hospital.

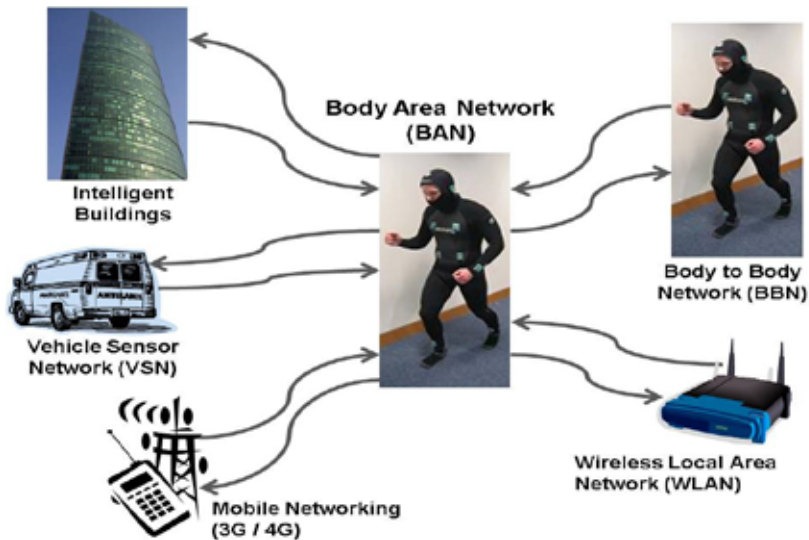


Figure2 body domain nets signal transmission

Wireless monitoring medical system

Refers to the use of body communication technology, the body body each health monitoring index of transmission to the PDA users. PDA with users wirelessly area wireless monitoring server, through the server will be patient returned the indicators of the medical diagnosis system and fixed treatment system. When the patient's some indexes, the system through sudden happened a controlled instruction to PDA server medical devices let the patient wear make emergency relief measure, and at the same time through wireless send relief signal. Thought for the best treatment time patients. Figure 3 wireless monitoring medical system diagram.

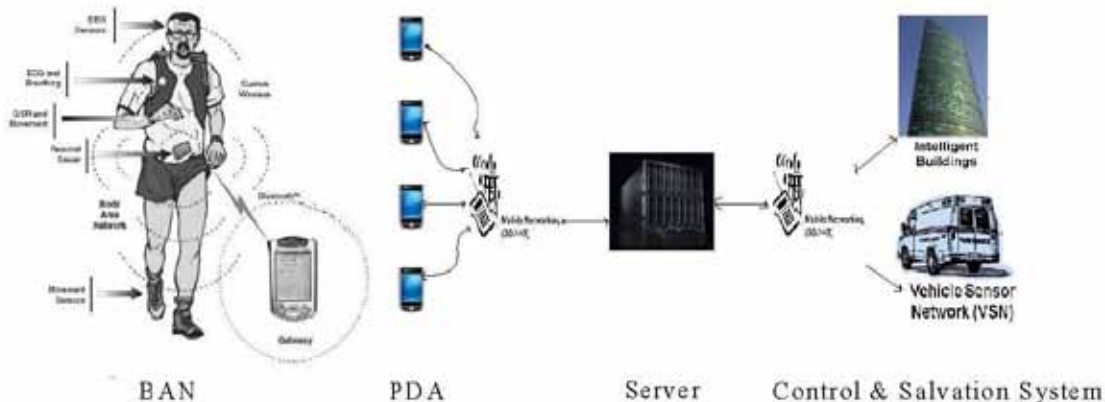


Figure3 wireless monitoring medical system

Future medical monitoring system, both at home, or in the community, even between activities; the city As long as it is dressed in monitoring equipment, equipment will be real-time monitoring the body body the physical and health indicators. These indicators through the sensor Zigbee wireless network (short distance communication, GSM, etc) transmission give body communication central PDA. In mobile work, PDA through wireless network (WiFi, GPRS, etc.) from real-time monitoring information to the signal acquisition server patients recently. Data is server pretreatment later will data to the control system and emergency system. Control system according to get information: on the one hand, will return data analysis of data transmission to health model, through the treatment of patients with health models give opinions through server returned to patients a PDA. When patients in case of emergency, the server will give PDA issued an emergency treatment instructions, PDA will give patients out of portable treatment equipment, injecting emergency treatment instructions to drug; Meanwhile the server will also be relief from patients message to the rescue equipment, recently won the best treatment for patients with time. On the other hand gave the patient medical records for establishing electronic archives, establish healthy patients with files.

The system of operation, on one hand reduces the cost of patients and save a lot of manpower resources. On the other hand, also provides 24 hours for patient monitoring service 24 hours a day, body life security has been duly guaranteed.

4. Conclusion

Although the system is still in the test phase, many key problems haven't been solved, such as: wireless network information transmission safety, security, stability, and portable devices automatic control issues are still to be further perfected. But the system research and development will provide safeguard for body health, the development of mobile medical equipment play role.

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