

Digital Medical Diagnosis over WiMax Network

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Abstract

WiMax (Worldwide Interoperability for Microwave Access) is a high-speed wireless broadband technology developed on the IEEE 802.16 standards to support mobile usage by advance standard IEEE 802.16e now, recent standard of 802.16m. It is used to make the video call point to point and point to multipoint to share, collaborate, and interact on the medical data from one location to other. The medical professionals can monitor, consult patient using videoconferencing & telemedicine software integrated with biomedical devices via WiMAX technology.

Keywords: WiMAX, Biomedical Devices, video Camera

Introduction:

With emerging wireless technologies, patients can access healthcare services not only from hospitals, but also from rural healthcare centers, ambulances, trains, or their homes. Three types of wireless systems satellite, cellular networks, and wireless LANs are used for digital healthcare services. In terms of mobility, satellite communications systems provide the highest flexibility. However, the cost of system operation is high, and the size of the networking equipment is large. For local telemedicine services WLAN-based systems would

be the most suitable. However, WLANs have limitations in terms of mobility and coverage area. Cellular networks are suitable to provide pre-hospital treatment in a mobile scenario. Even though cellular networks 3G, 4G offer a reasonable compromise between the mobility requirement and the cost of the system, transmission speed may not be high enough for high-quality diagnostic video and still images. The WiMAX is a feasible choice for providing digital health services in both fixed and mobile health environments as it provides features as wide bandwidth, integrated services.

The fast evolution of wireless technologies, including increased communication bandwidth, has accelerated developments in the field of digital health, mobile telemedicine. Wireless patient monitoring systems increase the mobility of patients and health professional and also improve the quality of health care. One of the Wi-Max enabled mobile telemedicine system developed by School of telemedicine and biomedical informatics, Sanjay Gandhi Post Graduate institute of medical sciences Lucknow Uttar Pradesh, India. The IEEE 802.16, WiMAX system describes a wireless broadband technology the wireless network which can connect the world in high data rate anywhere and anytime.

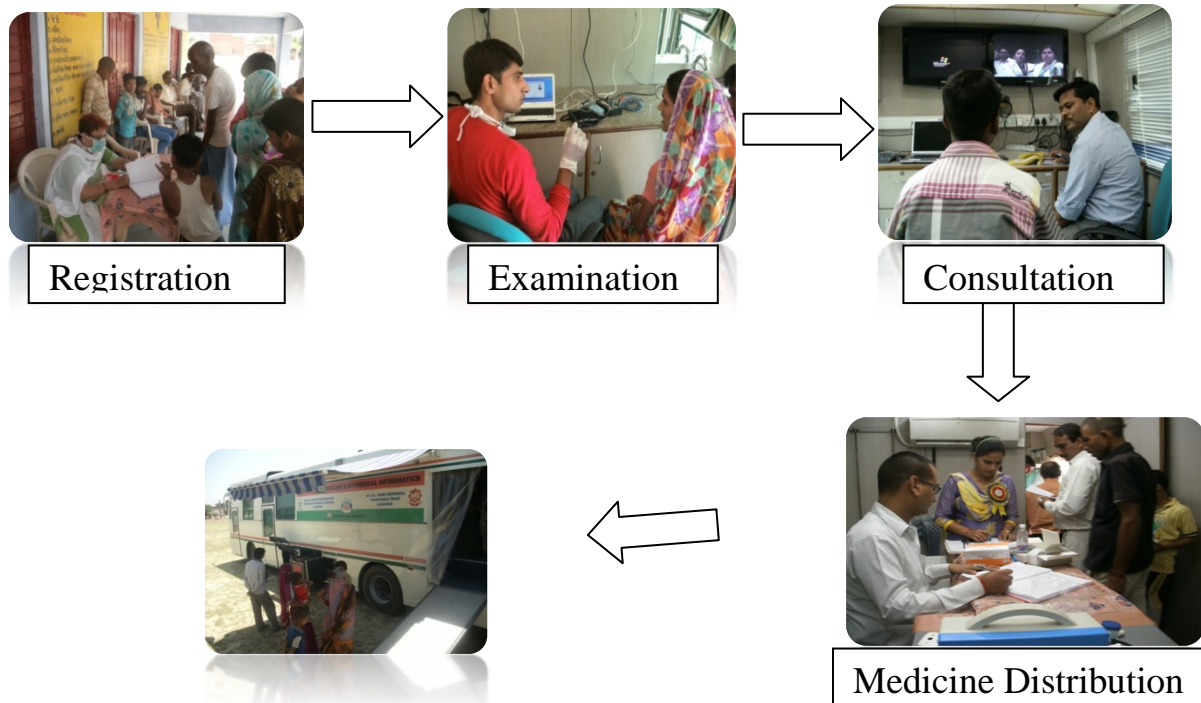
Operating Procedure

Fig.1 shows the process of mobile telemedicine system using WiMax



Steps followed;

1. Registration
2. Examination
3. Tele-consultation
4. Medicine distribution



Process Flow Diagram

Medical Diagnosis using WiMax

WiMax enabled Mobile system follows some standard operation protocol, firstly patients are registered. In registration patient demography, their complications, address with contact number is mentioned. In the examination process all the basic health parameter (NIBP, SPO2, ECG, Spirometry, temperature sugar test) is done. After the examination process all the parameter is digitized and is sent to the expert medical professionals. Then the patient come for the videoconferencing with expert doctor. The expert doctor goes through the report of the patient and writes medical prescription. According to the medical prescriptions patient can have the medicine and is benefited through WiMax network.

RESULTS

The wireless network used for telemedicine such as satellite, 2G, 3G, Wireless Local Loop and WiMax. Based on the experience and review findings depicted in table 1, WiMax found to be more reliable, feasible and cost effective wireless media for connectivity particularly in rural areas where health care facilities are not sufficient to serve. WiMax can play major role using Telemedicine to bridge the gap of demand & supply mismatch doctor wise, facilities wise & infrastructure wise.

Places	Patient Diagnosed/Treated	Offline consultation	Online Consultation with WiMAX
67	5722	28	39

Table-1

CONCLUSIONS

Architecture of mobile healthcare equipped with medical consultation platform, non invasive blood pressure spirometry, SPO2. Wi-Max wireless communications that it's a good alternative to other interface and IP based videoconferencing for focusing video of patient while the patient has no medical facility and far from the hospital. The system provides a much satisfaction for remote patient monitoring, and a remote monitoring clients of the physicians to analyze the data easily and

quickly and shows information via WiMAX technology.

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