Unit 12

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DESIGN AND IMPLEMENTATION OF PORTABLE MULTI PARAMETER LIFE MONITOR

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Abstract:
The Patient Monitoring System (PMS) is a monitoring system, it is used for monitoring signals including Electrocardiograph (ECG), Invasive and Non-Invasive Blood Pressure, Oxygen Saturation in Human Blood (SpO2), Body Temperature and other Gases etc. In PMS, the multiple sensors and is used for receiving signals like as ECG, SpO2Finger Sensor, Blood Pressure Cuff and Temperature Probe to measure the signals. The system consists of a pulse rate monitoring software and a wearable device that can measure a subject's temperature and pulse rate only by using a fingertip. The device is able to record the measurement data and interface to PC via Arduino microcontroller.
Keywords: Electrocardiograph, Respiration Rate, Temperature, Oxygen Saturation in Blood

Introduction of Patient Monitoring Systems (PMS)

The Patient Monitoring System (PMS) is a monitoring system used for monitoring signals including Electrocardiogram, Invasive and Non-Invasive Blood Pressure, (SpO2), Body temperature and other Gases etc. In PMS the multiple sensors are used for receiving signals like as ECG, SpO2, Finger Sensor, Blood Pressure Cuff and Temperature to measure the signals. Therefore, patient monitoring systems has always been a very important role in the field of medical devices. The improvement not only helps us with the vital signs of the medical personnel but also the with result raise the monitoring efficiency of patients. In the past the products manufactured by medical industry manufacturers are mainly those for single parameter measurement. But in case, a multi-parameter patient monitor is commonly used in hospitals. The single parameter monitoring system is used for measuring blood pressure of a human body, Electrocardiograph monitor, SpO2 monitor [1].

Fig. 1 Multiparameter Patient Monitoring System

A (PMS) is for multiple signs of the patient to transmit the information like Electrocardiograph, Blood pressure etc. Therefore, multi parameter PMS has always been a very significant position in the field of medical industry. The heart and the circulatory system, referred to as cardiovascular diseases, strike without warning and prompt treatment is required if death is to beavered. Such treatment is best provided in area as “intensive care unit.” (ICU). The hospital units provide constant monitoring of the condition and provide immediate emergency treatment whenever it is required [2].

Wearable Parameter Patient Monitoring System

Wearable devices that consumers can wear smartwatches, and are designed to collect the data of users' personal health and exercise. These devices can even send a user's health data to a doctor or other healthcare professional in real [3, 4].

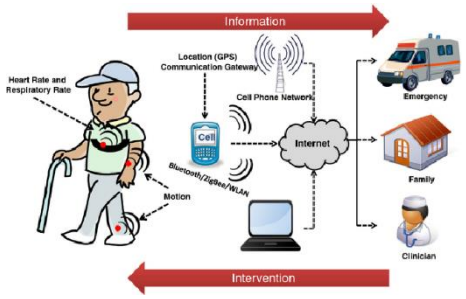

Fig. 2 Wearable Parameter Patient Monitoring System

Conclusions

The medical field is growing up on daily basis, the new development introduces for patient care and safety. The (PMS) is a monitoring system, it can monitor signals including (ECG), Invasive and Non-Invasive Blood Pressure, (SpO2), Body Temperature and other Gases etc. Patient monitor has been useful in a very important position in the field of medical industry. The latest new model in patient monitoring system, the system has multiple measurement tools and it can used in Intensive Care Unit (ICU), Critical Care Unit (CCU), Operation Rooms and Emergency Rooms of hospital [5].

REFERENCES:

1. Edan Instruments Inc. Patient Monitoring Systems (Model M9/M9A). Available at: http://www.edan.com.cn/Detail.aspx?D=34,50042,146,133 [Accessed Date: 25th August 2009].

2. Philips Health Care Systems. Patient Monitoring Systems (IntelleVue MP40 and MP50 patient monitors). Available at: http://www.medical.philips.com/main/products/patient_monitoring/ [Accessed Date: 25th August 2009].

3. Fukuda Denshi. Patient Monitoring System (Integrated Flexible Monitor DYNASCOPE DS-7200). Available at: http://www.fukuda.co.jp/english/products/patient_monitoring/pdf/ds_7200.pdf [Accessed Date: 28th August 2009].

4. From Wikipedia, the free encyclopedia. Bus computing (Internal hardware Buses system). 5. Available at: http://en.wikipedia.org/wiki/Internal_Bus [Accessed Date: 13th October 2009].

5. From Wikipedia, the free encyclopedia. Open Architecture Approach. Available at: http://en.wikipedia.org/wiki/Open_architecture [Accessed Date: 17th October 2009].

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РОЗРОБКА ТА ВПРОВАДЖЕННЯ ПОРТАТИВНОГО БАГАТОПАРАМЕТРИЧНОГО МОНІТОРА ЖИТТЯ

Анотація: Система моніторингу параметрів пацієнту (СМП) є дуже важливою системою моніторингу, використовується для контролю сигналів, включаючи електрокардіограф (ЕКГ), дихання, інвазивний та неінвазивний артеріальний тиск, насичення киснем крові людини (SpO2), температуру тіла та інше. У ПМС багаторазовий датчик та електроди використовуються для прийому сигналів, таких як ЕКГ-електроди, датчик SpO2, манжета кров'яного тиску та зонд температури для вимірювання фізіологічних сигналів. Система складається з програмного забезпечення для контролю частоти пульсу та носійного пристрою, який може вимірювати температуру та частоту пульсу обстежуваного лише за допомогою датчиків пальця. Пристрій здатний записувати дані вимірювань та інтерфейс на ПК через мікроконтролер Arduino

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