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(54) **SYSTEM FOR DIAGNOSING REAL-TIME PHYSIOLOGICAL SIGNAL**

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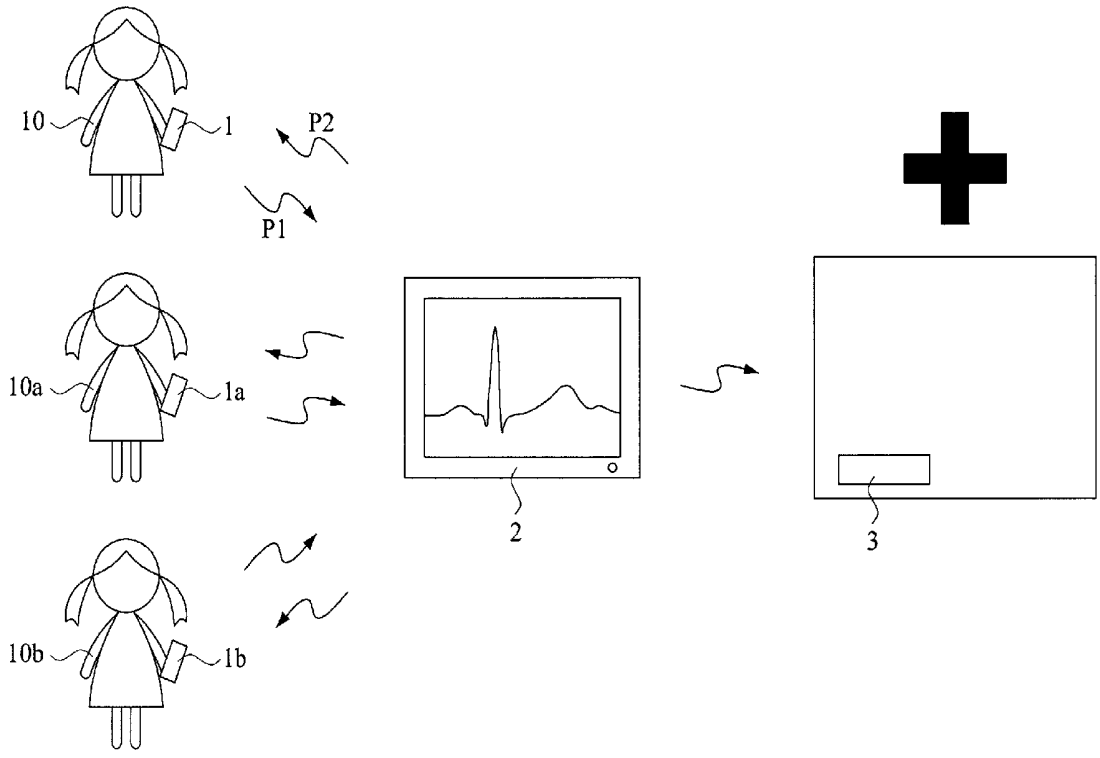
(57) **ABSTRACT**

A diagnose system includes a signal-capturing device and a real-time diagnose device coupled electrically to the signal-capturing device. The signal-capturing device includes a signal-receiving interface for acquiring a physiological signal of a person, a micro processing unit for processing the physiological signal and promptly converting into a physiological parameter, and a wireless transceiver module for transmitting the physiological parameter. The real-time diagnose device includes a wireless reader for receiving the physiological parameter and a memory unit including a distinguishing database and a prescription database. The distinguishing database is stored with a plurality of standard physiological parameters for judging. The prescription database is stored with several prescribed treatments, one of which is corresponding to the physiological parameter when the physiological parameter is abnormal, and a processor coupled electrically to the reader and the memory unit for promptly analyzing the distinguishing database, thereby distinguish whether the physiological parameter is normal or not.



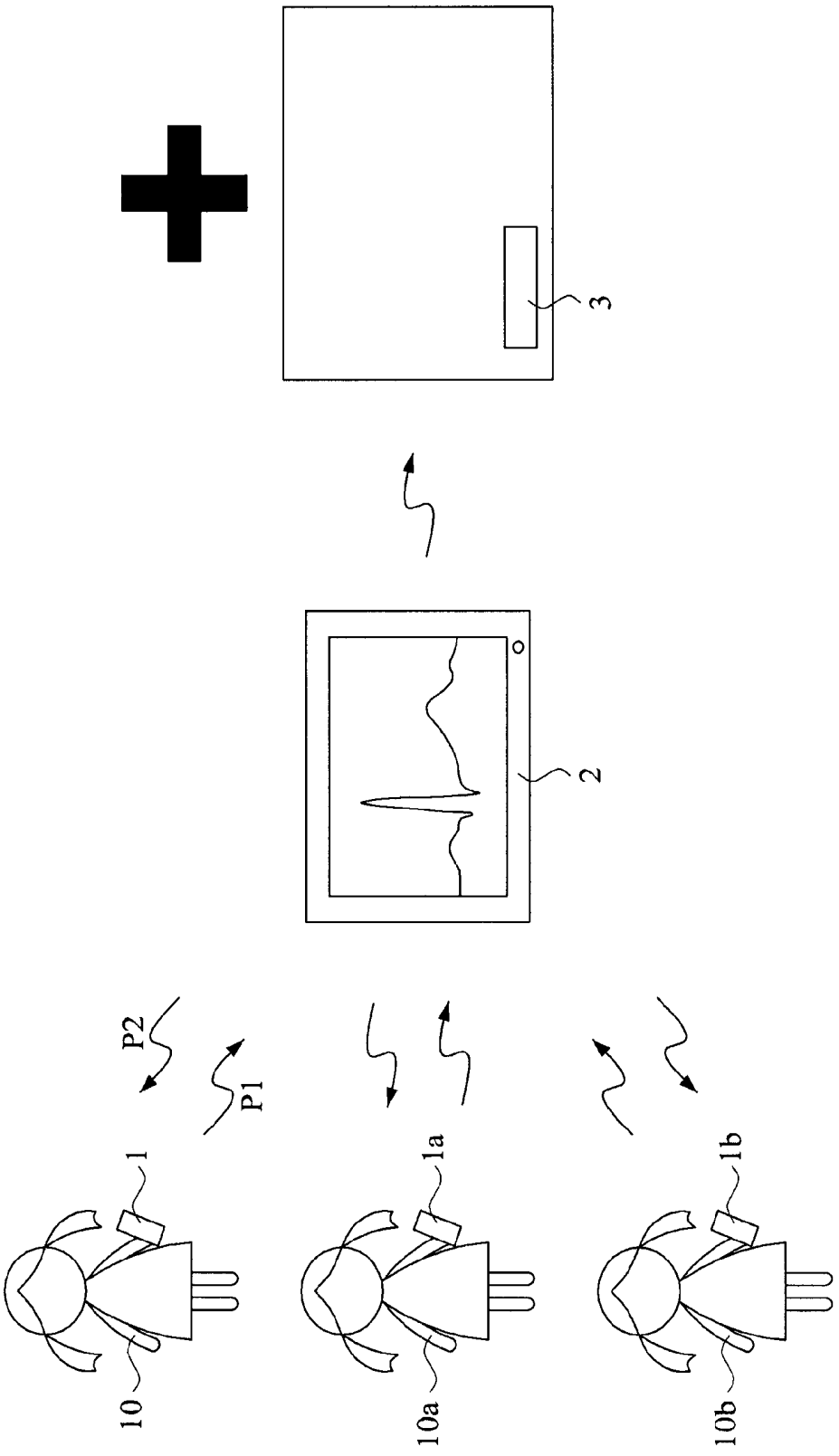


FIG.1

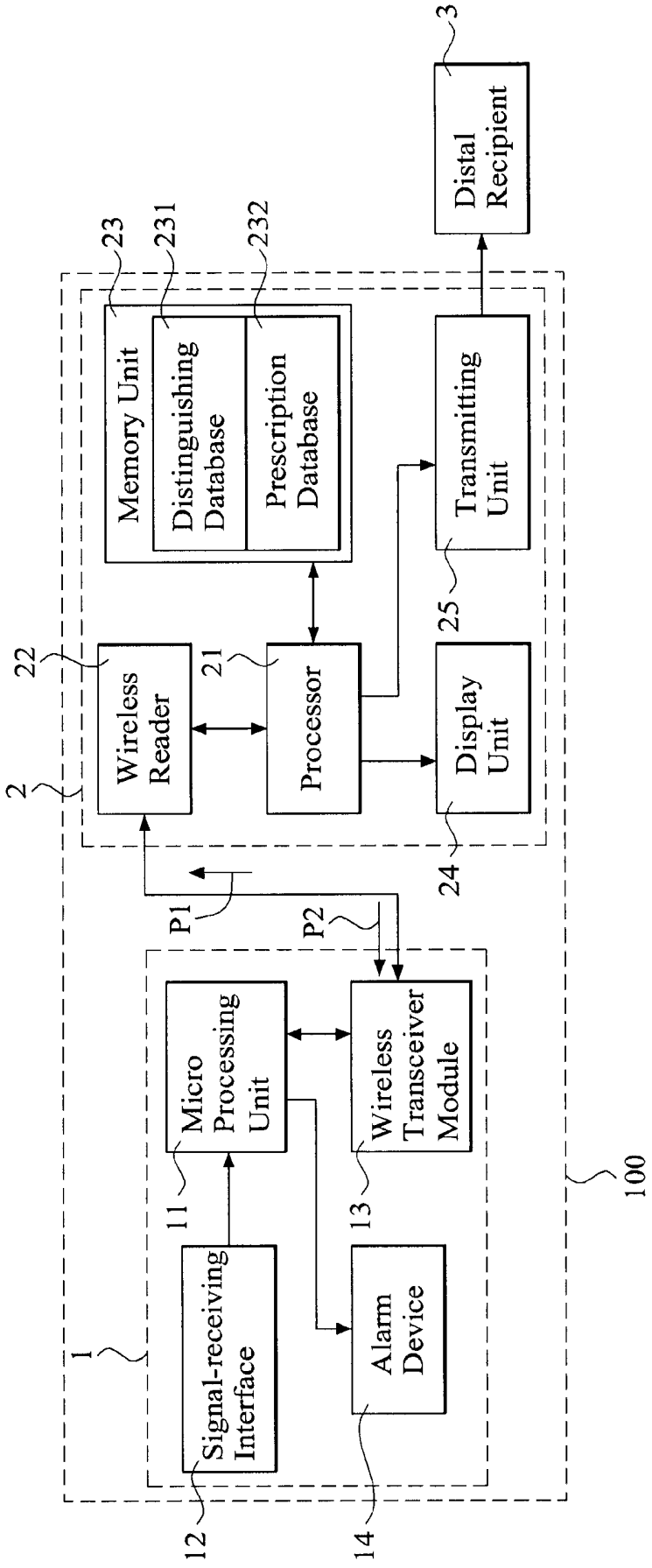

3
Distal Recipient
23
231
232
Memory Unit
Distinguishing Database
Prescription Database
Transmitting Unit
25
22
21
Wireless Reader
Processor
Display Unit
2
24
P1
P2
Micro Processing Unit
Wireless Transceiver Module
11
13
Signal-receiving Interface
Alarm Device
1
12
14
100

FIG.2

SYSTEM FOR DIAGNOSING REAL-TIME PHYSIOLOGICAL SIGNAL

[0001] This application claims the benefit of the Taiwan Patent Application Serial NO. 098112646, filed on Feb. Apr. 16, 2009, the subject matter of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a real-time physiological signal diagnose system, more particularly to a diagnose system in which, the physiological signal of a patient is promptly diagnosed and the diagnosis resulting thereby is displayed promptly in a display unit of the diagnose system.

[0004] 2. Description of the Prior Art

[0005] Health condition of our people living in Taiwan improves lately due to rising living standard so that population of aged is on the rise continuously. Thus, Taiwan faces an old-aged community composed of elders beyond 65 years. Presently, the old-aged community occupies 7% of the whole population. What we now face is an urgent problem of how to look after these elders in case they are not provided with appropriate care at homes by their families.

[0006] The older the people get, the easier for them to be stricken with chronic disease due to gradual decrease of resistance. The physiological signals of these elders should be observed frequently. In order to maintain the good health, there should be certain caretakers to take them regularly to medical centers for check up and bring back home after treatment. Since the majority of the elders are not properly looked after at homes by their families, they are entrusted to the sanatorium or medical centers for attending to their needs. Some family faces financial problem in case their elder is entrusted to the sanatorium or medical center.

[0007] Of late ten years, several remote-control health care systems or detection system have been invented, provide relatively nice medical cares so that such detection systems partially share the high medical expenses and reduce the burden of the medical staff, thereby saving undesired medical expenses. Long time and continuously monitoring the health condition of the elder can notice the abnormal symptom of the patient. Therefore, taking good care at home plays an important part to protect the elder from being stricken with disease

[0008] ROC (Republic of China) Patent Publication No. 200417355 discloses "a wireless medical device for collecting real-time physiological signals", which is adapted to download the physiological signal in a short time to a monitor system for undergoing analysis so as to record and monitor the data, thereby activating the alarm device for reminding the medical staff in case the data is abnormal. Because the monitored physiological signals need to be temporarily stored for undergoing analysis and registering, in case of critical or emergency situation, it is hard to grab the prime time opportunity effectively for saving the patient's life.

[0009] In another ROC Patent Publication No. M328933, "a wireless transmission and diagnose device" is disclosed, in which, a conventional cabled measuring medical device is converted into a wireless ones, that is capable of capturing not only the physiological signal but also transmitting the same so as to be stored within a database for future application by the medical staff. However, during the period of transmitting the physiological signal to the database and in case the patient being monitored encounters an emergency case, he is left without an alarm device for reminding the ambient persons, thereby missing the golden opportunity for saving the patient's life.

[0010] Later, ROC Patent Publication No. 200808267 discloses "a medical care system" that provides proper care and reduces the waste of medical source. The system is capable of diagnosing in case of monitoring abnormal physiological signals of the patient kept under observation and promptly activate the alarm device to remind of the abnormal physiological signal. However, the aforesaid care system is applicable only on the one-to-one basis, the alarm device can only remind the abnormal physiological signal and is unable to advise the ambient persons how to treat the patient in time of critical and emergency in order to maintain the condition from getting worse, thereby saving the golden opportunity for saving the patient's life.

[0011] Though the prior art medical care systems and devices can provide some sort of medical care, but fail to provide prompt diagnose and the diagnosis is not promptly shown in the display unit of the system. In addition, the prior art is applicable only on one-to-one basis and unable to provide one system for multiple patients. Therefore, it is the object of the present invention to provide a diagnose system for continuously monitoring the physiological signals of the patient. In case the physiological signal turns abnormal, the alarm device will generate a reminding sound or symbol to the patient's family or the medical staff so as to swiftly attend to the needs of the patient. After undergoing analysis of the physiological signals, an appropriate treatment or prescription will be given to the patient in order to remedy the critical situation, thereby eliminating the drawbacks encountered during use of the prior art medical system or device. When the present diagnose system is applied, a relative amount of medical expense can be lowered.

SUMMARY OF THE INVENTION

[0012] Since the prior art diagnose system or medical care system fails to provide prompt diagnose and the diagnosis is not immediately shown in a display unit, the object of the present invention is to provide a prompt diagnose system, in which, the captured physiological signal is promptly analyzed and the diagnosis or appropriate treatment resulting thereby is given to the patient (or the ambient persons) in order to meet the critical situation of the patient in time of emergency.

[0013] Therefore, a diagnose system of the present invention includes a signal-capturing device and a real-time diagnose device. The signal-capturing device includes a signal-receiving interface for acquiring a physiological signal of a person under observation, a micro processing unit coupled electrically to the signal-receiving interface for processing the physiological signal and promptly converting the physiological signal into a physiological parameter, and a wireless transceiver module coupled electrically to the micro processing unit for transmitting the physiological parameter. The real-time diagnose device is coupled electrically to the signal-capturing device and includes a wireless reader coupled electrically to the wireless transceiver module for receiving the physiological parameter and a memory unit including a distinguishing database and a prescription database. The distinguishing database is stored with a plurality of standard physiological parameters as reference for judging whether the physiological parameter is normal or abnormal. The prescrip-

tion database is stored with a plurality of prescribed treatments, one of which is corresponding to the physiological parameter in case the latter is abnormal. A processor is coupled electrically to the wireless reader and the memory unit for promptly analyzing the distinguishing database, thereby distinguishing the physiological parameter received in the wireless reader. In case the physiological parameter is abnormal, the processor will select a respective prescribed treatment from the prescription database in response to the abnormal physiological parameter after comparing the abnormal physiological parameter with respect to the standard physiological parameters.

[0014] When the diagnose system of the present invention is compared to the prior art ones, the present diagnose system possesses the ability of promptly diagnosing and analyzing the physiological signal and promptly providing a treatment direction in time of emergency. In case the physiological signal is abnormal, a respective prescribed treatment will be given in addition to alarming the medical staff for attending to the needs of the patient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Other features and advantages of the present invention will become more apparent in the following detailed description of the preferred embodiment of this invention, with reference to the accompanying drawings, in which:

[0016] FIG. **1** is a real-time physiological signal diagnose system of the present invention in application; and

[0017] FIG. **2** is a block diagram representing the real-time physiological signal diagnose system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] Since the real-time physiological signal diagnose system of the present invention is capable of directly capturing the physiological signal of the person under observation and is widely applied in emergency device. Thus, the following embodiment is described only for better understanding and the scope of the invention should not be limited thereto.

[0019] FIG. **1** shows a real-time physiological signal diagnose system **100** of the present invention in application, wherein the diagnose system **100** is applied to three persons (preferably patients) **10**, **10***a* and **10***b* for monitoring, capturing and diagnosing the physiological signals thereof. The diagnose system **100** accordingly includes a real-time diagnose device **2** and three signal-capturing devices **1**, **1***a* and **1***b* respectively fastened to the persons **10**, **10***a* and **10***b* in such a manner to capture the physiological signals thereof.

[0020] FIG. **2** is a block diagram representing the real-time physiological signal diagnose system of the present invention. As illustrated, each of the signal-capturing devices **1** includes a signal-receiving interface **12**, a micro processing unit **11**, a wireless transceiver module **13** and an alarm device **14**. The signal-receiving interface **12**, the wireless transceiver module **13** and an alarm device **14** are respectively and electrically connected to the micro processing unit **11**.

[0021] The real-time diagnose device **2** includes a processor **21**, a wireless reader **22**, a memory unit **23**, a display unit **24** and a transmitting unit **25**. The wireless reader **22**, the memory unit **23**, a display unit **24** and a transmitting unit **25** are respectively and electrically connected to the processor **21**. The memory unit **23** includes a distinguishing database **231** and a prescription database **232**. The distinguishing database **231** is stored with a plurality of standard physiological parameters as reference for judging whether the physiological parameter P**1** is normal or abnormal. The prescription database **232** is stored with a plurality of prescribed treatments, one of which is corresponding to the physiological parameter P**1** in case the latter is abnormal.

[0022] Referring to FIGS. **1** and **2** again, the signal-receiving interface **12** of the signal-capturing device **1** is used for acquiring a physiological signal of the person **10** under observation and the physiological signal is later transmitted to the micro processing unit **11**. The micro processing unit **11** is coupled electrically to the signal-receiving interface **12** for processing (such as magnifying, filtering, and converting from analog to digital) the physiological signal and promptly converting the physiological signal into the physiological parameter P**1**. The wireless transceiver module **13** is coupled electrically to the micro processing unit **11** for transmitting the physiological parameter P**1** to the wireless reader **22** of the real-time diagnose device **22**.

[0023] In the present invention, the physiological signal can be an ECG (Electrocardiogram) signal or a blood pressure of the person under observation or an amount of blood glucose of the person under observation. Preferably, the wireless transceiver module **12** and the wireless reader **22** can be a Radio Frequency Modem.

[0024] The wireless reader **22** is coupled electrically to the wireless transceiver module **12** for receiving the physiological parameter P**1** and transfers the same to the processor **21** so that the physiological parameter P**1** is displayed in the display unit **24**. At the same time, the physiological parameter P**1** is compared with the standard physiological parameters in the distinguishing database **231** to find out whether the physiological parameter P**1** is normal or abnormal.

[0025] In the event, the physiological parameter P**1** is normal, the processor **21** will store the physiological parameter P**1** within the memory device **23**. In the event, the processor **21** judges that the physiological parameter P**1** is abnormal after comparing with the standard physiological parameters in the distinguishing database **231**, the abnormal physiological parameter P**2** is transmitted to the micro processing unit **11** via the wireless reader **22** and the wireless transceiver module **13** so as to activate the alarm device **14**.

[0026] At the same time, the processor **21** compares the abnormal physiological parameter P**2** with those in the prescription database **232**, where, the abnormal physiological parameter P**2** is displayed in the display unit **24** so as to remind the ambient persons or the patient **10** to take life saving treatment. When the physiological parameter is abnormal, the processor **21** will select a respective prescribed treatment from the prescription database **232** in response to the abnormal physiological parameter P**2** after comparing the latter with respect to the standard physiological parameters. The processor **21** will transmit the abnormal physiological parameter P**2**, the normal physiological parameter P**1** and the respective prescribed treatment to the distal recipient **3** via the transmitting unit **25**.

[0027] In the present invention, the transmitting unit **25** is connected to the distal recipient **3** via the Internet. Preferably, the distal recipient **3** can be a PC (Personal Computer) installed in a medical center or hospital. The real-time diagnose device **2** can also be a PC (Personal Computer).

[0028] From the above-mentioned explanation, one can note that the diagnose system of the present invention is

applied in a condition for capturing the physiological signals of several persons **10**, **10***a*, **10***b* for analyzing the same to judge whether the signals are normal, thereby effectively providing a respective prescribed treatment in time of critical and emergency time.

[0029] While the invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

What is claimed is:

1. A diagnose system comprising:

a signal-capturing device including

a signal-receiving interface for acquiring a physiological signal of a person under observation,

a micro processing unit coupled electrically to said signal-receiving interface for processing said physiological signal and promptly converting said physiological signal into a physiological parameter, and

a wireless transceiver module coupled electrically to said micro processing unit for transmitting said physiological parameter;

a real-time diagnose device coupled electrically to said signal-capturing device and including

a wireless reader coupled electrically to said wireless transceiver module for receiving said physiological parameter,

a memory unit including a distinguishing database and a prescription database, said distinguishing database being stored with a plurality of standard physiological parameters as reference for judging whether said physiological parameter is normal or abnormal, said prescription database being stored with a plurality of prescribed treatments, one of which is corresponding to said physiological parameter in case the latter is abnormal, and

a processor coupled electrically to said wireless reader and said memory unit for promptly analyzing said distinguishing database, thereby distinguishing said physiological parameter received in said wireless reader;

wherein, in case said physiological parameter is abnormal, said processor will select a respective prescribed treatment from said prescription database in response to said abnormal physiological parameter after comparing said abnormal physiological parameter with respect to said standard physiological parameters.

2. The diagnose system according to claim **1**, wherein said real-time diagnose device further includes a display unit coupled electrically to said processor for displaying said respective prescribed treatment and said physiological parameter received in said wireless reader.

3. The diagnose system according to claim **1**, wherein said signal-capturing device further includes an alarm device coupled electrically to said micro processing unit.

4. The diagnose system according to claim **3**, wherein said processor transmits said abnormal physiological parameter to said micro processing unit via said wireless reader and said wireless transceiver module so that said micro processing unit activates said alarm device.

5. The diagnose system according to claim **1**, wherein said real-time diagnose device further includes a transmitting unit coupled electrically to said processor.

6. The diagnose system according to claim **5**, wherein said processor transmits said physiological parameter, said abnormal physiological parameter and said respective prescribed treatment to a distal recipient via said transmitting unit.

7. The diagnose system according to claim **6**, wherein said transmitting unit is connected to said distal recipient via the Internet

8. The diagnose system according to claim **6**, wherein said distal recipient is a PC (Personal Computer) installed in a medical center.

9. The diagnose system according to claim **1**, wherein said real-time diagnose device is a PC (Personal Computer).

10. The diagnose system according to claim **1**, wherein said wireless transceiver module is a Radio Frequency Modem.

11. The diagnose system according to claim **1**, wherein said wireless reader is a wireless frequency reader.

12. The diagnose system according to claim **1**, wherein said physiological signal is an ECG (Electrocardiogram) signal.

13. The diagnose system according to claim **1**, wherein said physiological signal is a blood pressure of the person under observation.

14. The diagnose system according to claim **1**, wherein said physiological signal is an amount of blood glucose of the person under observation.

* * * * *

专利名称(译)	用于诊断实时生理信号的系统		
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[标]申请(专利权)人(译)	私立中原大学		
申请(专利权)人(译)	中原大学		
当前申请(专利权)人(译)	中原大学		
[标]发明人	JEN EN WU YI JHEN CHEN GUAN YING		
发明人	JEN, EN WU, YI-JHEN CHEN, GUAN-YING		
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外部链接	Espacenet USPTO		

摘要(译)

诊断系统包括信号捕获设备和与信号捕获设备电连接的实时诊断设备。信号捕获装置包括：信号接收接口，用于获取人的生理信号;微处理单元，用于处理生理信号并迅速转换为生理参数;以及无线收发器模块，用于发送生理参数。实时诊断设备包括用于接收生理参数的无线读取器和包括区分数据库和处方数据库的存储器单元。区分数据库存储有多个标准生理参数用于判断。处方数据库存储有若干规定的处理，其中一个处理对应于生理参数异常时的生理参数，处理器电耦合到读取器和存储单元，用于快速分析区分数据库，从而区分是否生理参数是否正常。