providers are about to initiate treatment, while preserving patient confidentiality and privacy (for example, in accordance with HIPAA requirements).

SUMMARY OF THE INVENTION

[006a] According to a first aspect of the present invention, there is provided a process for providing communications between a medical device to be used by a patient and a remote monitoring device via an internet-accesible wireless communications network, said process comprising the steps of:

obtaining identification information identifying the patient;

obtaining identification information identifying the medical device;

providing an indication of receipt of the patient identification information and/or the medical device identification information;

transmitting each of the patient identification information and the medical device identification information to the remote monitoring device via the internet-accesible wirelsess communications network;

receiving an acknowledgement status from the remote monitoring device via the internet-accessible wireless communications network; and

transmitting data corresponding to an output of at least one sensor of the medical device for said patient by the medical device via the internet-accessible wireless communications network when the received acknowledgement status represents a particular status.

[006b] According to a second aspect of the present invention, there is provided a patient monitoring system configured for providing communications between medical devices used by patients and a remote monitoring device via an internet-accessible wirelesss communications network, said system comprising:

a medical device to be used by a patient;

a patient identification device capable of receiving an input indicative of patient identification information of the patient and of transmitting the patient identification information; and

at least one relay module comprising:

a first receiver capable of wirelessly receiving data over a wireless relay network;

a second receiver capable of wirelessly receiving data over the internet-accessible wireless communications network;

a first transmitter capable of wirelessly transmitting the received data to a wireless relay module over the wireless relay network;

a second transmitter capable of wirelessly transmitting the received data over an internet-accessible wireless communications network to the remote monitoring device;

a control panel comprising one or more indicators providing an indication of receipt of the patient identification information and/or medical device identification information; and

a controller coupled to the first and second transmitters, wherein:

one or more of the patient identification device and the medical device are capable of transmitting patient identification data and medical device identification data to the at least one relay module over the wireless relay network,

said controller of said at least one relay module is configured to select one of said first transmitter or said second transmitter for transmitting the identification information to the remote monitoring device,

said at least one relay module being further configured to receive an acknowledgement status transmitted by the remote monitoring device at one of said first and second receivers, and to transmit the acknowledgement status by said first transmitter to the medical device over the wireless relay network, and

the medical device being further configured to receive the acknowledgement status and transmit medical device data corresponding to an output of at least one sensor of the medical device to the at least one relay module via the wireless relay network when the received acknowledgement status represents a particular status.

[007] Embodiments of the present invention are directed to a patient monitoring system for remotely monitoring medical devices used by patients. The system includes at least one medical device for use on or by a patient, at least one patient identification device for identifying the patient and at least one wireless relay module for providing networked communications between at least one medical device and a remote monitoring device. The patient identification device may be, for example, formed as an integral component of, fixedly attached to, coupled (wireless or wired) or disposed separate to the medical device.

[008] In accordance with a preferred embodiment of the invention, the one or more medical devices (including but not limited to, respirators, enteral feeding devices, pulse oximeters, blood pressure monitors, pulse monitors, weight scales and glucose meters) are provided at a patient facility. An interface circuit is coupled to each medical device, and is configured for communicating with the one or more wireless relay modules via a wireless relay network. The wireless relay modules communicate with the remote monitoring device over an internet-accessible wireless communication network, and preferably, over a wireless wide-area network (WWAN) such as a mobile telephone data network including (for example, based on a Global System for Mobile Communications (GSM) or Code Division Multiple Access (CDMA) cellular network or associated wireless data channels). For compliance with HIPAA regulations, for example, communications over each of the wireless networks are preferably conducted securely.

[009] Each of the plurality of wireless relay modules includes a first receiver capable of wirelessly receiving medical device data from respective interface circuits via the wireless relay network, a first transmitter capable of wirelessly transmitting medical device data to another one of the wireless relay modules over the wireless relay network, a second transmitter capable of wirelessly transmitting medical device data over an internet-accessible wireless communications network, a second receiver capable of wirelessly receiving medical device data over the internet-accessible wireless communications network, a controller coupled to the first and second transmitters and receivers, and a memory device coupled to the controller.

We claim:

1. A process for providing communications between a medical device to be used by a patient and a remote monitoring device via an internet-accessible wireless communications network, said process comprising the steps of:

obtaining identification information identifying the patient;

obtaining identification information identifying the medical device;

providing an indication of receipt of the patient identification information and/or the medical device identification information;

transmitting each of the patient identification information and the medical device identification information to the remote monitoring device via the internet-accessible wireless communications network;

receiving an acknowledgement status from the remote monitoring device via the internet-accessible wireless communications network; and

transmitting data corresponding to an output of at least one sensor of the medical device for said patient by the medical device via the internet-accessible wireless communications network when the received acknowledgement status represents a particular status.

2. The process of claim 1, wherein said particular status represents an authorization of use of the medical device by the patient that is at least one of:

based upon a pre-authorization record for the patient; or

obtained in response to a confirmation query conducted by the remote monitoring device.

3. The process of claim 1, further comprising the step of encrypting at least one of the patient identification information prior to transmitting the patient identification information to the remote monitoring device or the medical device identification information prior to transmitting the medical device information to the remote monitoring device.

4. The process of claim 1, wherein said step of transmitting the patient identification information to the remote monitoring device comprises the steps of:

receiving the patient identification information at the medical device; and

transmitting the patient identification information from the medical device via the internet-accessible wireless communications network to the remote monitoring device.

determining that the value of an indicator of an elapsed time at the wireless relay module between the steps of transmitting the prompt for the patient identification information and receiving the patient identification information is within a predetermined time-out period.

18. A patient monitoring system configured for providing communications between medical devices used by patients and a remote monitoring device via an internet-accessible wireless communications network, said system comprising:

a medical device to be used by a patient;

a patient identification device capable of receiving an input indicative of patient identification information of the patient and of transmitting the patient identification information; and

at least one relay module comprising:

a first receiver capable of wirelessly receiving data over a wireless relay network;

a second receiver capable of wirelessly receiving data over the internet-accessible wireless communications network;

a first transmitter capable of wirelessly transmitting the received data to a wireless relay module over the wireless relay network;

a second transmitter capable of wirelessly transmitting the received data over an internet-accessible wireless communications network to the remote monitoring device;

a control panel comprising one or more indicators providing an indication of receipt of the patient identification information and/or medical device identification information; and

a controller coupled to the first and second transmitters, wherein:

one or more of the patient identification device and the medical device are capable of transmitting the patient identification data and the medical device identification data to the at least one relay module over the wireless relay network,

said controller of said at least one relay module is configured to select one of said first transmitter or said second transmitter for transmitting the identification information to the remote monitoring device,

said at least one relay module being further configured to receive an acknowledgement status transmitted by the remote monitoring device at one of said first and second receivers, and to transmit the acknowledgement status by said first transmitter to the medical device over the wireless relay network, and