

What is claimed is:

1. An electronic patient monitoring system comprising:

a first module monitoring client configured to receive and store information pertaining to a patient, said information including data related to a first parameter of the patient measured by a device connected to the patient, and data related to a second parameter of the patient received from a first database containing information about the patient; and

a second module configured to receive a treatment order from a user via a user interface associated with the second module, said second module being further configured to transmit said treatment order to the first module, a communications device configured to receive the treatment order from a user via a user interface and to transmit the treatment order to the monitoring client, wherein the said monitoring client is further configured to:

obtain medication information about a medication associated with the treatment order or other drugs from a second database, the medication information including data providing limitations under which the medication is generally administered;

determine whether the first parameter of the patient is outside of a predetermined range;

when the first parameter is determined to be outside of the predetermined range, request the device to take an unscheduled reading to determine a third parameter of the patient, wherein the third parameter of the patient is measured by the device, wherein the request is performed if the first parameter is determined to be outside of the predetermined range;

verify the authenticity of the second parameter by using the third parameter when the first parameter is determined to be outside of the predetermined range;

determine whether the treatment order must be confirmed by the second module communications device based on the medication information, the value of the first parameter and the value of the second parameter; and

transmit a pre-established message from the first module monitoring client to the second module communications device for display on the user interface, said message confirming or warning about the acceptability of said medication order.

2. The electronic patient monitoring system of claim 1, wherein the medication information includes drug interactions information, drug allergies information, blood pressure effects information, heart rate effects information, heart rhythm effects information, or respiration effects information, and wherein the first parameter or the second parameter include data about the patient's currently administered drugs, known drug allergies, current blood pressure, current pulse rate, current heart rhythm, current respiratory rate or current ventilation.

3. The electronic patient monitoring system of claim 2, wherein the pre-established message includes a warning about the potential effects of the ordered medication, said warning including measured data about the first parameter, received data about the second parameter, or medication information obtained by the first module monitoring client.

4. The electronic patient monitoring system of claim 3, wherein the first module monitoring client is configured to generate a signal that the medication order or a modified medication order is to be processed after the pre-established message has been transmitted and upon receipt of a confirmation signal from the second module communications device, the confirmation signal being triggered by an input signal from the user interface.

5. The electronic patient monitoring system of claim 3, wherein the first parameter is associated with a time stamp.

6. The electronic patient monitoring system of claim 3, wherein the third parameter is associated with a time stamp.

7. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to record the first parameter within the first database and associate the first parameter with the patient.

8. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to record the first parameter within the first database and associate the first parameter with the patient if the first parameter of the patient is outside of the predetermined range.

9. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to interrupt an infusion pump based upon at least one of the first and third parameters.

10. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to adjust an infusion pump based upon at least one of the first and third parameters.

11. The electronic patient monitoring system of claim 10, wherein the monitoring client is configured to adjust one of a flow rate of the infusion pump, an operating parameter of the infusion pump, and a treatment parameter of the infusion pump.

12. The electronic patient monitoring system of claim 3, wherein the monitoring client comprises a display, and the monitoring client is configured to display on an outer border of the display an indication of a status of a patient-care device.

13. The electronic patient monitoring system of claim 3, wherein the monitoring client comprises a display, and the monitoring client is configured to display on an outer border of the display an indication of progress of a patient-care device.

14. The electronic patient monitoring system of claim 13, wherein the indication of progress is displayed by a lighting a percentage of the border, wherein the percentage of the border corresponds to a percentage of progress of a patient care device.

15. A monitoring client comprising:
a display; and
at least one processor coupled to the display, wherein the at least one processor is configured to:

receive and store information pertaining to a patient, said information including data related to a first parameter of the patient measured by a device connected to the patient, and data related to a second parameter of the patient received from a first database containing information about the patient;

receive a treatment order;

obtain medication information about a medication associated with the treatment order from a second database, the medication information including data providing limitations under which the medication is generally administered;

determine whether the first parameter of the patient is outside of a predetermined range;

when the first parameter is determined to be outside of the predetermined range, request the device to take an unscheduled reading to determine a third parameter of the patient, wherein the third parameter of the patient is measured by the device, wherein the request is performed if the first parameter is determined to be outside of the predetermined range;

verify the authenticity of the second parameter by using the third parameter when the first parameter is determined to be outside of the predetermined range;

determine whether the treatment order must be confirmed by a communications device; and

transmit a pre-established message from the monitoring client to the communications device for display on a user interface, said message confirming or warning about the acceptability of said treatment order.

16. The monitoring client according to claim 15, wherein the processor is further configured to record the first parameter within the first database and associate the first parameter with the patient.

17. The monitoring client according to claim 15, wherein the processor is further configured to record the first parameter within the first database and associate the first parameter with the patient if the first parameter of the patient is outside of the predetermined range.

18. The monitoring client according to claim 15, wherein the processor is further configured to interrupt an infusion pump based upon at least one of the first and third parameters.

19. The monitoring client according to claim 15, wherein the processor is further configured to adjust an infusion pump based upon at least one of the first and third parameters.

20. The monitoring client according to claim 15, wherein the processor is further configured to display on an outer border of the display an indication of a status of a patient-care device.

21. A system for electronic patient care, the system comprising:

- a medical sensor configured to couple to a patient and measure a physiological parameter of the patient;

- a medical device configured to operatively receive the measured physiological parameter from the medical sensor, the medical device configured to communicate the measured physiological parameter; and

- a server in operative communication with the medical device to receive the measured physiological parameter for storage therein.

22. The system according to claim 21, wherein:

- the medical sensor is configured to receive an interrogation signal to at least partially power the medical sensor, and

- the medical device includes an interrogator circuit configured to interrogate the medical sensor to receive the measured physiological parameter.

23. The system according to claim 21, wherein:

- the medical sensor includes an accelerometer and the measured physiological parameter

- is a movement of the patient, and

- the medical device is configured to alarm if the movement of the patient does not exceed a predetermined threshold of movement.

24. The system according to claim 21, further comprising a second medical sensor configured to couple to the patient and measure a second physiological parameter of the patient.

25. The system according to claim 24, wherein the medical device is configured to determine a medical condition exists when a first pattern is detected in the measured physiological parameter and a second pattern is detected in the second measured physiological parameter, wherein the first and second patterns occur within a predetermined window of time.

26. The system according to claim 25, wherein the first and second patterns are scale independent.

27. The system according to claim 21, further comprising a gateway, wherein the medical device is configured to communicate with the server through the gateway.

28. The system according to claim 27, wherein the medical device communicates with the gateway using a web service, wherein the medical device is a web client of the web service and the gateway is a web server of the web service.

29. The system according to claim 28, wherein the medical device is configured to invoke at least one web method using the web service.

30. The system according to claim 28, wherein the medical device is configured to communicate with the gateway using at least one transaction-based communication via the web service.

31. The system according to claim 28, wherein the medical device is configured to communicate to the server a continuous quality event corresponding to at least one of a DERS override, a hard limit override, a soft limit override, and an internal error of the medical device.

32. A system for electronic patient care, the system comprising:

- a gateway configured to provide at least one of a routing functionality, a medical device software update, and a web service; and

- a medical device configured to operatively communicate with the gateway using the web service.

33. The system according to claim 32, wherein the gateway is a web server of the web service and the medical device is a client of the web service.

34. The system according to claim 32, wherein the web service is a transaction-based web service.

35. The system according to claim 32, wherein the medical device is an infusion pump.

36. A medical device, comprising:

a transceiver; and

at least one processor configured to interface with the transceiver to communicate via the transceiver, wherein the at least one processor is configured to communicate with a web service in operative communication with the transceiver.

37. The device according to claim 36, wherein the medical device is configured to be a web client of the web service.

38. The device according to claim 36, wherein the web service is a transaction-based web service.

39. The medical device according to claim 36, wherein the medical device is an infusion pump.

40. A method of communication between a medical device and a gateway, the method comprising:

establishing communications between the medical device and the gateway;

establishing a web service between the medical device and the gateway; and

communicating between the medical device and the gateway using the web service.

41. The method according to claim 40, wherein the gateway is a web server of the web service.

42. The method according to claim 40, wherein the medical device is a web client of the web service.

43. The method according to claim 40, wherein the gateway routes data for the medical device, wherein the data is communicated between the medical device and the gateway using the web service.

44. A system for electronic patient care, the system comprising:

- a first medical sensor configured to couple to a patient and measure a first physiological parameter of the patient;

- a second medical sensor configured to couple to the patient and measure a second physiological parameter of the patient; and

- a medical device configured to operatively receive the measured first and second physiological parameters from the first and second medical sensors, wherein the medical device is configured to:

- detect a first pattern using the first measured physiological parameter;

- detect a second pattern using the second measured physiological parameter;

- and

- determine a medical condition exists when the first and second patterns are detected within a predetermined amount of time relative to each other.

45. The system according to claim 44, wherein the medical device is configured to detect the first and second patterns without regard to a scale of the first and second measured physiological parameters.

46. The system according to claim 44, wherein the medical device is configured to detect the first and second patterns without regard to a starting value of the first and second measured physiological parameters.

47. The system according to claim 44, wherein the first pattern is a trend.

48. The system according to claim 47, wherein the medical device is configured to detect the first pattern without regard to a starting value of the first measured physiological parameter.

49. The system according to claim 47, wherein the second pattern is a second trend.

50. A system for electronic patient care, the system comprising:

- a first medical sensor configured to couple to a patient and measure a first physiological parameter of the patient;

- a second medical sensor configured to couple to the patient and measure a second physiological parameter of the patient;

- a medical device configured to operatively receive the measured first and second physiological parameters from the first and second medical sensors, and communicate the first and second measured physiological parameters; and

- a server in operative communication with the medical device, wherein the server is configured to:

- detect a first pattern using the first measured physiological parameter;

- detect a second pattern using the second measured physiological parameter;

- and

- determine a medical condition exists when the first and second patterns are detected within a predetermined amount of time relative to each other.

51. The system according to claim 50, wherein the server is configured to detect the first and second patterns without regard to a scale of the first and second measured physiological parameters.

52. The system according to claim 50, wherein the server is configured to detect the first and second patterns without regard to a starting value of the first and second measured physiological parameters.

53. The system according to claim 50, wherein the first pattern is a trend.

54. The system according to claim 53, wherein the server is configured to detect the first pattern without regard to a starting value of the first measured physiological parameter.

55. The system according to claim 53, wherein the second pattern is a second trend.

56. An RFID tag, comprising:

- an antenna configured to receive an interrogation signal;

- a rectifying circuit configured to rectify the interrogation signal to power the RFID tag;

- a modulation circuit configured to modulate the antenna to communicate using the interrogation signal;

- a read memory location and a corresponding read bit;

- a write memory location and a corresponding write bit;

- a processor configured to receive power from the rectifying circuit, the processor configured to perform a process associated with the read memory location when the corresponding read bit is set to true and is further configured to perform a process associated with the write memory location when the corresponding write bit is set to true; and

- a measuring component in operative communication with the processor to measure at least one physiological parameter.

57. A system, the system comprising:

- an interface into a drug error reduction system; and

- a field editor configured to edit a field of a drug entry of the drug error reduction system, wherein the field editor is configured to prompt a user to enter in a new field if a predetermined value is entered into the field.

58. A drug error reduction editing system, the system comprising:

- an interface into a drug error reduction system; and

- a field editor configured to edit a field of a drug entry of the drug error reduction system, wherein the field editor prompts a user to enter in a new field if a predetermined value is entered into the field.

59. The system according to claim 58, wherein the predetermined value of the field is a predetermined care area.

60. A system, the system comprising:

- an interface into a drug error reduction system;
- an interface into a continuous quality improvement system; and
- a field editor configured to edit a field of a drug entry of the drug error reduction system, wherein the field editor is configured to notify a user regarding information corresponding to the field using data within the continuous quality improvement system.

61. The system according to claim 60, wherein the notification is the percentage that a value entered into the field is overridden by a caregiver.

62. The system according to claim 60, wherein the notification is a suggestion of a value to enter into the field that is most commonly entered into the field as determined using the continuous quality improvement system.

63. A system comprising:

- an interface into a drug error reduction system; and
- a field editor configured to edit a field of a drug entry of the drug error reduction system, wherein the field editor is configured to suggest a standardized value to enter when a user attempts to enter a predetermined value into the field.

64. A system comprising:

- a first interface configured to interface into a drug error reduction system;
- a second interface configured to interface into a continuous quality improvement system; and
- a field editor configured to edit a field of a drug entry of the drug error reduction system using the first interface, wherein the field editor is configured to provide a user with data from the continuous quality improvement system corresponding to the field using the second interface.

65. A system comprising:

an interface into a drug error reduction system; and

a field editor configured to edit a field of a drug entry of the drug error reduction system using the interface, wherein the field is an end of infusion course of action.

66. A system comprising:

an interface into a drug error reduction system; and

a field editor configured to edit a field of a drug entry of the drug error reduction system using the interface, wherein the field is an indication the drug should be delivered despite an error in a medical device delivering the drug.

67. A system comprising:

an interface into a drug error reduction system;

a field editor configured to edit a field of a drug entry of the drug error reduction system using the interface; and

a medical device simulator configured to simulate a medical device using the edited field of the drug entry of the drug error reduction system.

Claims

1. An electronic patient monitoring system comprising:

a dock configured to monitor a patient-care device, the dock comprising a sandbox component configured to control access to at least one of a hardware resource and a software resource, wherein:

the dock is configured to identify the patient-care device and execute an application to monitor the patient-care device,

the dock executes the application within the sandbox component such that the application accesses the at least one of the hardware resource and the software resource through the sandbox component, and

the sandbox component is configured to prioritize access to the at least one of the hardware resource and the software resource,

a first module monitoring client configured to receive and store information pertaining to a patient, said information including data related to a first parameter of the patient measured by a device connected to the patient, and data related to a second parameter of the patient received from a first database containing information about the patient; and

a second module communications device configured to receive a treatment order from a user via a user interface associated with the second module communications device, said second module communications device being further configured to transmit said treatment order to the first module, a communications device configured to receive the treatment order from a user via a user interface and to transmit the treatment order to the monitoring client, wherein the said monitoring client is further configured to:

obtain medication information about a medication associated with the treatment order or other drugs from a second database, the medication information including data providing limitations under which the medication is generally administered;

determine whether the first parameter of the patient is outside of a predetermined range;

when the first parameter is determined to be outside of the predetermined range, request the device to take an unscheduled reading to determine a third parameter of the patient,

wherein the third parameter of the patient is measured by the device, wherein the request is performed if the first parameter is determined to be outside of the predetermined range;

verify the authenticity of the first parameter by using the third parameter when the first parameter is determined to be outside of the predetermined range;

determine whether the treatment order must be confirmed by the second module communications device based on the medication information, the value of the first parameter and the value of the second parameter; and

transmit a pre-established message from the first module monitoring client to the second module communications device for display on the user interface, said message confirming or warning about the acceptability of the treatment order,

wherein after confirmation by the second module communications device, the treatment order is communicated to the application to monitor the patient-care device and for initiation of treatment order by the patient-care device.

2. The electronic patient monitoring system of claim 1, wherein the medication information includes drug interactions information, drug allergies information, blood pressure effects information, heart rate effects information, heart rhythm effects information, or respiration effects information, and wherein the first parameter or the second parameter include data about the patient's currently administered drugs, known drug allergies, current blood pressure, current pulse rate, current heart rhythm, current respiratory rate or current ventilation.

3. The electronic patient monitoring system of claim 2, wherein the pre-established message includes a warning about the potential effects of the ordered medication, said warning including measured data about the first parameter, received data about the second parameter, or medication information obtained by the first module monitoring client.

4. The electronic patient monitoring system of claim 3, wherein the first module monitoring client is configured to generate a signal that the treatment order or a modified medication order is to be processed after the pre-established message has been transmitted and upon receipt of a confirmation signal from the second module communications device, the confirmation signal being triggered by an input signal from the user interface.

5. The electronic patient monitoring system of claim 3, wherein the first parameter is associated with a time stamp.
6. The electronic patient monitoring system of claim 3, wherein the third parameter is associated with a time stamp.
7. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to record the first parameter within the first database and associate the first parameter with the patient.
8. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to record the first parameter within the first database and associate the first parameter with the patient if the first parameter of the patient is outside of the predetermined range.
9. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to interrupt an infusion pump based upon at least one of the first and third parameters.
10. The electronic patient monitoring system of claim 3, wherein the monitoring client is further configured to adjust an infusion pump based upon at least one of the first and third parameters.
11. The electronic patient monitoring system of claim 10, wherein the monitoring client is configured to adjust one of a flow rate of the infusion pump, an operating parameter of the infusion pump, and a treatment parameter of the infusion pump.
12. The electronic patient monitoring system of claim 3, wherein the monitoring client comprises a display, and the monitoring client is configured to display on an outer border of the display an indication of a status of the patient-care device.

13. The electronic patient monitoring system of claim 3, wherein the monitoring client comprises a display, and the monitoring client is configured to display on an outer border of the display an indication of progress of the patient-care device.

14. The electronic patient monitoring system of claim 13, wherein the indication of progress is displayed by a lighting a percentage of the border, wherein the percentage of the border corresponds to a percentage of progress of a patient care device.

15. A monitoring client comprising:

a display;

a sandbox component configured to execute an application to monitor and control a patient care device; and

at least one processor coupled to the display, wherein the at least one processor is configured to:

receive and store information pertaining to a patient, said information including data related to a first parameter of the patient measured by a device connected to the patient, and data related to a second parameter of the patient received from a first database containing information about the patient;

receive a treatment order;

obtain medication information about a medication associated with the treatment order from a second database, the medication information including data providing limitations under which the medication is generally administered;

determine whether the first parameter of the patient is outside of a predetermined range; when the first parameter is determined to be outside of the predetermined range, request the device to take an unscheduled reading to determine a third parameter of the patient, wherein the third parameter of the patient is measured by the device, wherein the request is performed if the first parameter is determined to be outside of the predetermined range;

verify the authenticity of the second parameter by using the third parameter when the first parameter is determined to be outside of the predetermined range;

determine whether the treatment order must be confirmed by a communications device;
and

transmit a pre-established message from the monitoring client to the communications device for display on a user interface, said message confirming or warning about the acceptability of said treatment order,

wherein after confirmation by the communications device, the treatment order is initiated by the patient-care device while the application within the sandbox component monitors and controls the patient-care device.

16. The monitoring client according to claim 15, wherein the processor is further configured to record the first parameter within the first database and associate the first parameter with the patient.

17. The monitoring client according to claim 15, wherein the processor is further configured to record the first parameter within the first database and associate the first parameter with the patient if the first parameter of the patient is outside of the predetermined range.

18. The monitoring client according to claim 15, wherein the processor is further configured to interrupt an infusion pump based upon at least one of the first and third parameters.

19. The monitoring client according to claim 15, wherein the processor is further configured to adjust an infusion pump based upon at least one of the first and third parameters.

20. The monitoring client according to claim 15, wherein the processor is further configured to display on an outer border of the display an indication of a status of the patient-care device.