SYSTEM, METHOD, AND APPARATUS FOR ELECTRONIC PATIENT CARE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a Continuation of U.S. patent application Ser. No. 16/654,391, filed Oct. 16, 2019 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Publication No. US-2020-0051190-A1, published Feb. 13, 2020, (Attorney Docket No. AA059) which is a Continuation of U.S. patent application Ser. No. 13/333,574, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Pat. No. 10,453,157, issued Oct. 22, 2019, (Attorney Docket No. 197) which is a Continuation-in-Part of U.S. patent application Ser. No. 13/011,543, filed Jan. 21, 2011 and entitled Electronic Patient Monitoring System, now abandoned (Attorney Docket No. 152), which claims priority to U.S. Provisional Patent Application No. 61/297,544, filed Jan. 22, 2010 and entitled Electronic Order Intermediation System for a Medical Facility (Attorney Docket No. H53), all of which are hereby incorporated herein by reference in their entireties.

BACKGROUND

Field of Disclosure

[0002] The present disclosure relates to patient care. More particularly, the present disclosure relates to a system, method, and apparatus for electronic patient care.

Description of Related Art

[0003] Providing patient care in a hospital generally necessitates the interaction of numerous professionals and caregivers (e.g., doctors, nurses, pharmacists, technicians, nurse practitioners, etc.) and any number of medical devices/systems needed for treatment of a given patient. Despite the existence of systems intended to facilitate the care process, such as those incorporating electronic medical records ("EMR") and computerized provider order entry ("CPOE"), the process of providing comprehensive care to patients including ordering and delivering medical treatments, such as medications, is associated with a number of non-trivial issues.

SUMMARY

[0004] In an exemplary embodiment involving the ordering and administration of medications, the electronic patient care system may comprise a first data-gathering module (e.g., a monitoring client) and a second order-input module (e.g., a fixed or portable monitoring client) having a user interface for transmitting an order or receiving patient-related information. The first module may be configured to receive and store measured parameters pertaining to a patient's current condition (i.e., patient-condition parameters), such as blood pressure, heart rate, heart rhythm, temperature, oxygenation, respiratory rate, or ventilation, for example. The first module may also be configured to receive information about pre-existing parameters related to the patient from a first database (e.g., an EHR database containing information about the patient), for example, including patient-condition parameters such as medication allergies or sensitivities, other currently administered medications presently in the patient's tissue, age, weight, height, kidney, or liver function. The first module may also be configured to obtain medication information about the ordered medication and/or pre-existing medications from a second database (e.g., a drug information database), such as known medication interactions, effects of the medication or pre-existing medications on blood pressure, pulse, heart rhythm, or respirations, for example. The first module can be configured to compare the patient's currently-measured, patient-condition parameters and received, pre-existing, patient-condition parameters with known normal ranges, and create a table of patient-condition parameters found to be outside the normal ranges. The first module may then compare the table of patient-condition parameters with a table of corresponding parameters obtained from the drug information database. If a match is found to exist between the table of patient-condition parameters and the table of corresponding parameters, the first module may then retrieve one or more pre-entered and stored messages for transmission to the second (order input) module. These messages may include, for example, warnings to a user of the second module that are appropriate for the particular medication ordered, the patient's pre-existing medications, and the patient's current and pre-existing medical condition. Optionally, further repetitions of warnings may be avoided once a warning has been received by the second module, and the warning has been acknowledged by the user of the second module through an input signal from the user interface.

[0005] In other embodiments, the electronic patient-care system may provide the user with editable default values derived from standard dosing and administration guidelines obtained from the drug information database, and can alert the user to modifications that may be indicated based on the patient's current and pre-existing medical condition, allergies, existing medications, or other patient-condition parameters. The electronic patient-care system preferably minimizes the amount of typed input from a user.

[0006] In other embodiments, the first module or other modules of the electronic patient-care system may also be used to identify ordered medications to be delivered to the patient's bedside (through the use of, for example, bar codes and readers, or RFID tags and scanners), and verify that the appropriate medication and dosage are being prepared and delivered to the patient. In an embodiment, the first module may also interact through a wired or wireless communications link with a patient-care device that administers treatment, such as an infusion pump or pill dispenser. In the case of an infusion pump, the first module or another connected module may provide the infusion pump with patient-treatment parameters, such as infusion settings including an infusion rate or infusion pressure, and receive from it various operating parameters, such for example, the presence of air in the infusion line, the amount of solution remaining in an IV bag to which it is connected, or the pressure of fluid in the infusion line. If the operating parameters are found to be abnormal, the first module may be configured to respond by signaling the infusion pump to halt infusion, respond by signaling a mechanical occlude to occlude the IV line, alter the infusion rate, and/or alert a health care provider or others of the abnormality, either directly through an alarm incorporated in the first module, or by transmission of an alarm to the second module. In a further embodiment, the first module may also be configured