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Herbst et al.

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(54) **ALERT MANAGEMENT UTILIZING MOBILE DEVICES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **Oct. 7, 2015**

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(51) **Int. Cl.**
G08B 5/22 (2006.01)
G08B 21/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***G08B 21/02*** (2013.01); ***G06F 19/3418*** (2013.01); ***G06F 19/3425*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC combination set(s) only.
See application file for complete search history.

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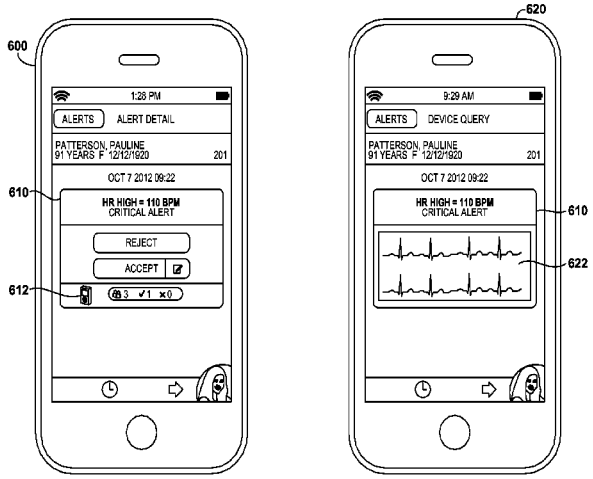
Primary Examiner — Travis Hunnings
(74) *Attorney, Agent, or Firm* — Shook, Hardy & Bacon L.L.P.

(57) **ABSTRACT**

Methods, computer systems, and computer-storage medium are provided for managing patient alerts using a mobile device. A mobile device associated with a patient caregiver receives a critical alert related to the patient, and the alert is presented on the mobile device. The alert includes important contextual information that enables the caregiver to make a quick assessment of how to effectively address the alert. The alert includes options for accepting the alert or rejecting the alert. Acceptance of the alert enables the caregiver to communicate the alert to selected caregivers that can assist in managing the alert. Rejecting the alert causes the alert to be automatically communicated to additional caregivers associated with patient.

20 Claims, 9 Drawing Sheets



(51) **Int. Cl.**

H04M 1/725	(2006.01)
H04M 19/04	(2006.01)
G06F 19/00	(2011.01)
G08B 25/01	(2006.01)
G08B 27/00	(2006.01)

(52) **U.S. Cl.**

CPC ***H04M 1/72541*** (2013.01); ***H04M 19/04*** (2013.01); *G08B 25/016* (2013.01); *G08B 27/006* (2013.01)

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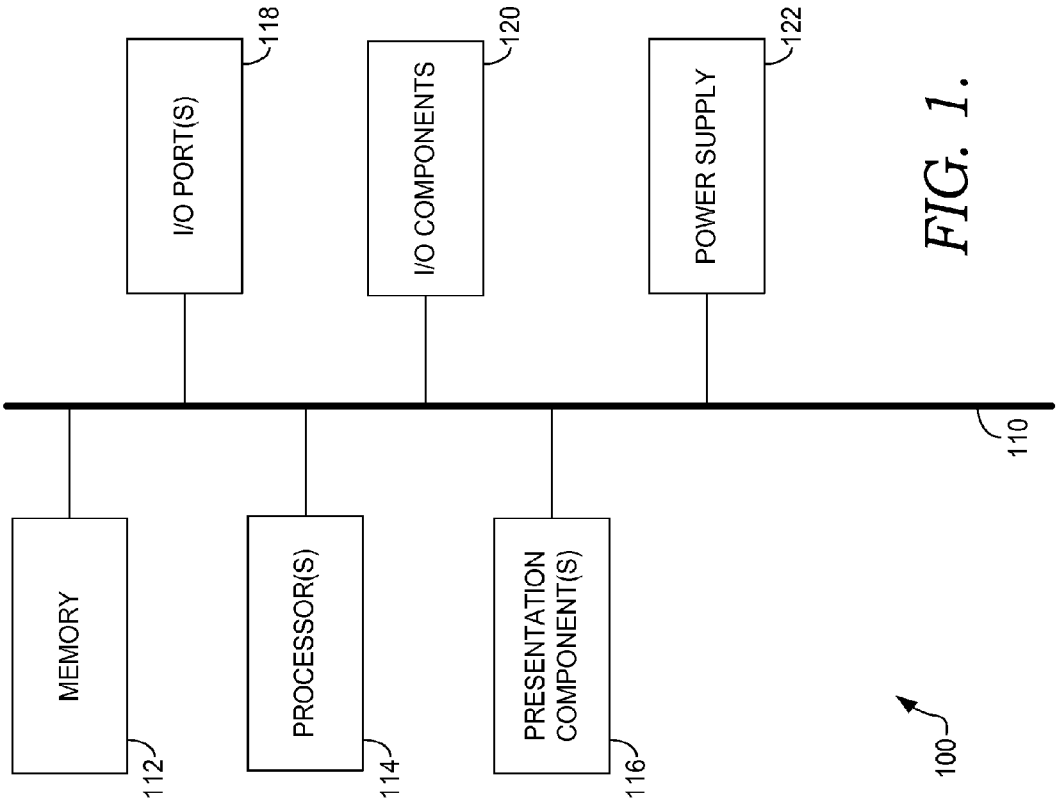

I/O PORT(S)
118
I/O COMPONENTS
120
POWER SUPPLY
122
110
MEMORY
112
PROCESSOR(S)
114
PRESENTATION COMPONENT(S)
116
100

FIG. 1.

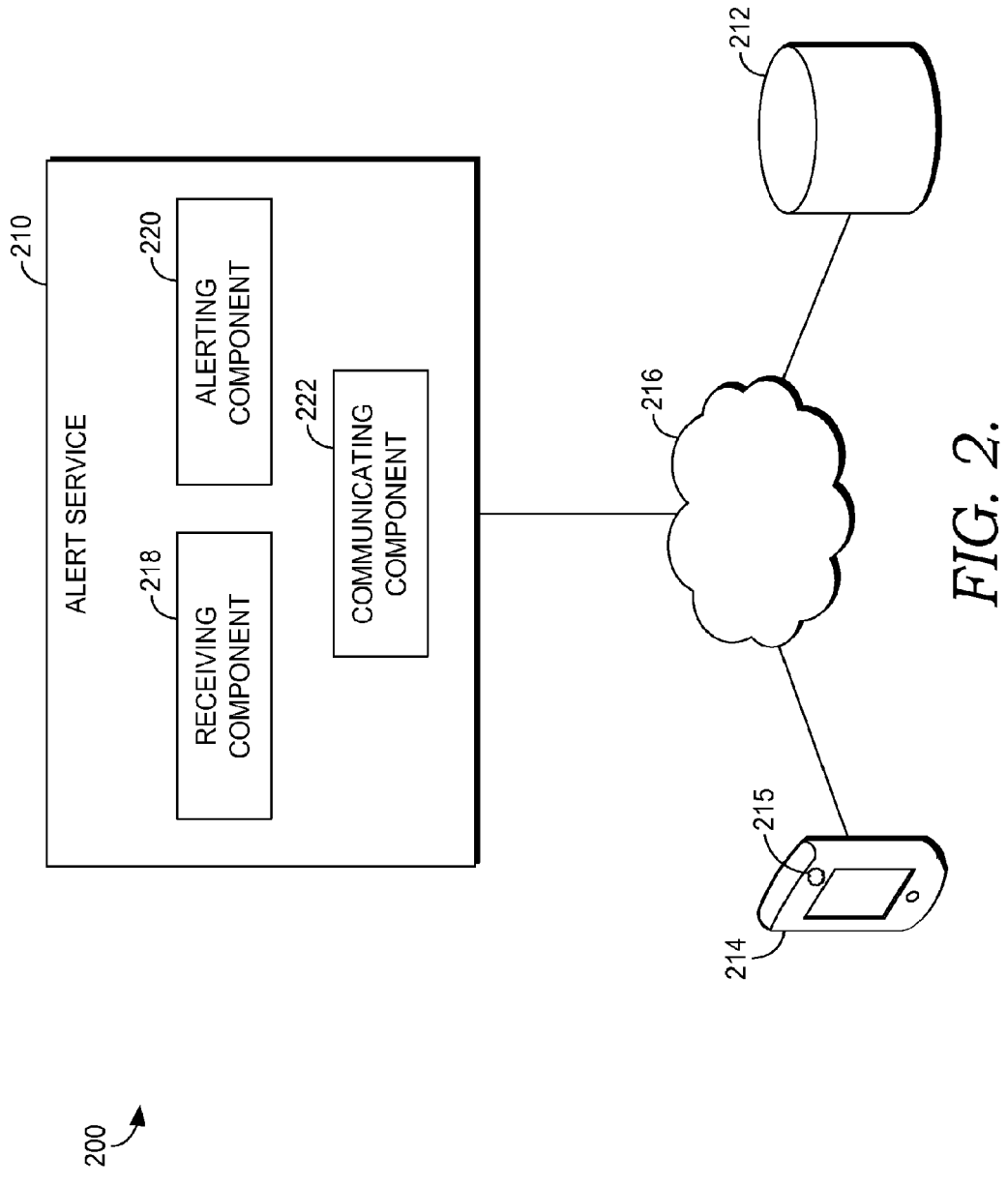

200
210
ALERT SERVICE
220
ALERTING COMPONENT
222
COMMUNICATING COMPONENT
218
RECEIVING COMPONENT
216
212
215
214

FIG. 2.

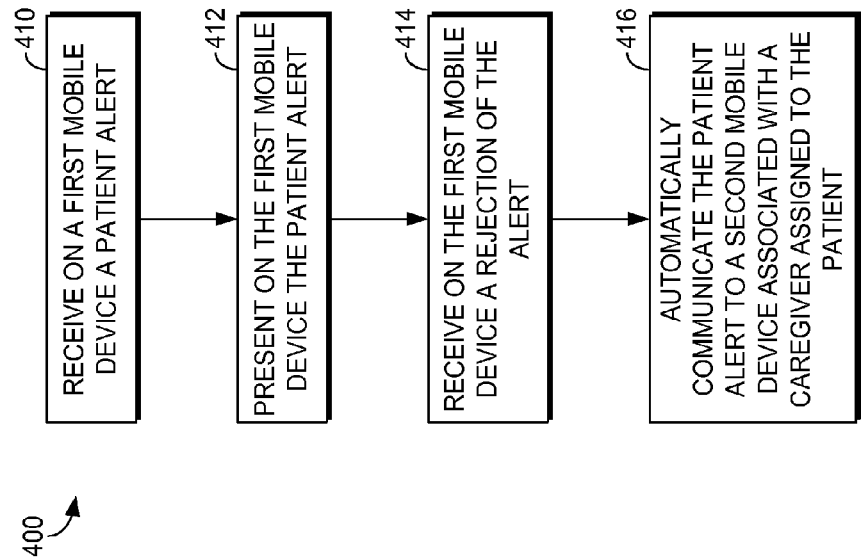

400
410
RECEIVE ON A FIRST MOBILE DEVICE A PATIENT ALERT
412
PRESENT ON THE FIRST MOBILE DEVICE THE PATIENT ALERT
414
RECEIVE ON THE FIRST MOBILE DEVICE A REJECTION OF THE ALERT
416
AUTOMATICALLY COMMUNICATE THE PATIENT ALERT TO A SECOND MOBILE DEVICE ASSOCIATED WITH A CAREGIVER ASSIGNED TO THE PATIENT

FIG. 4.

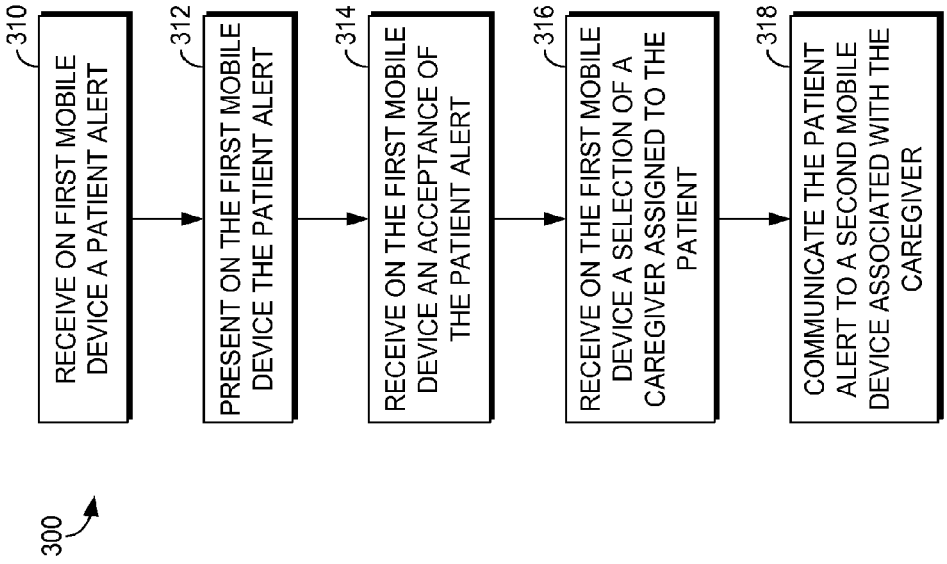
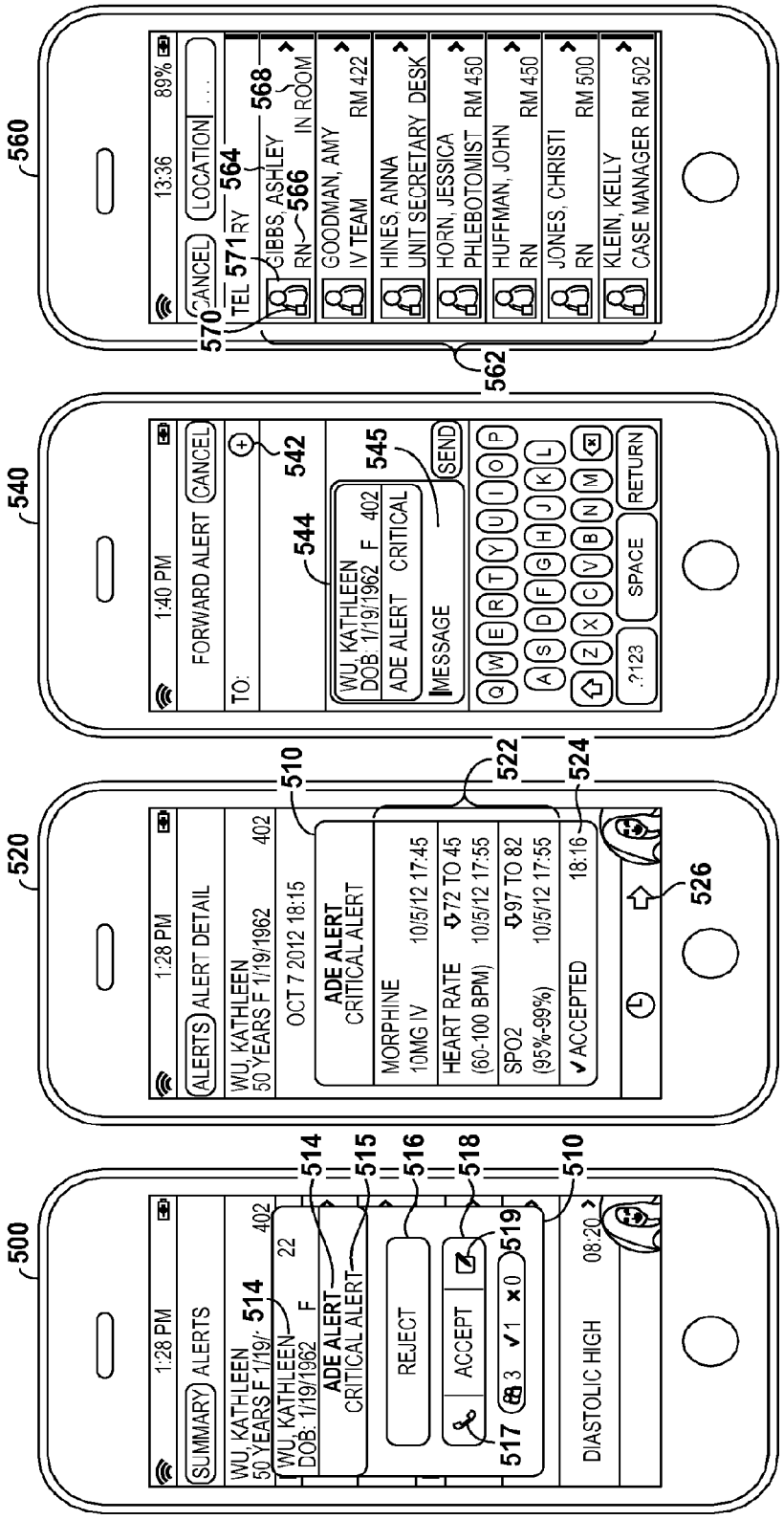

300
310
RECEIVE ON FIRST MOBILE DEVICE A PATIENT ALERT
312
PRESENT ON THE FIRST MOBILE DEVICE THE PATIENT ALERT
314
RECEIVE ON THE FIRST MOBILE DEVICE AN ACCEPTANCE OF THE PATIENT ALERT
316
RECEIVE ON THE FIRST MOBILE DEVICE A SELECTION OF A CAREGIVER ASSIGNED TO THE PATIENT
318
COMMUNICATE THE PATIENT ALERT TO A SECOND MOBILE DEVICE ASSOCIATED WITH THE CAREGIVER

FIG. 3.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ALERTS
WU, KATHLEEN
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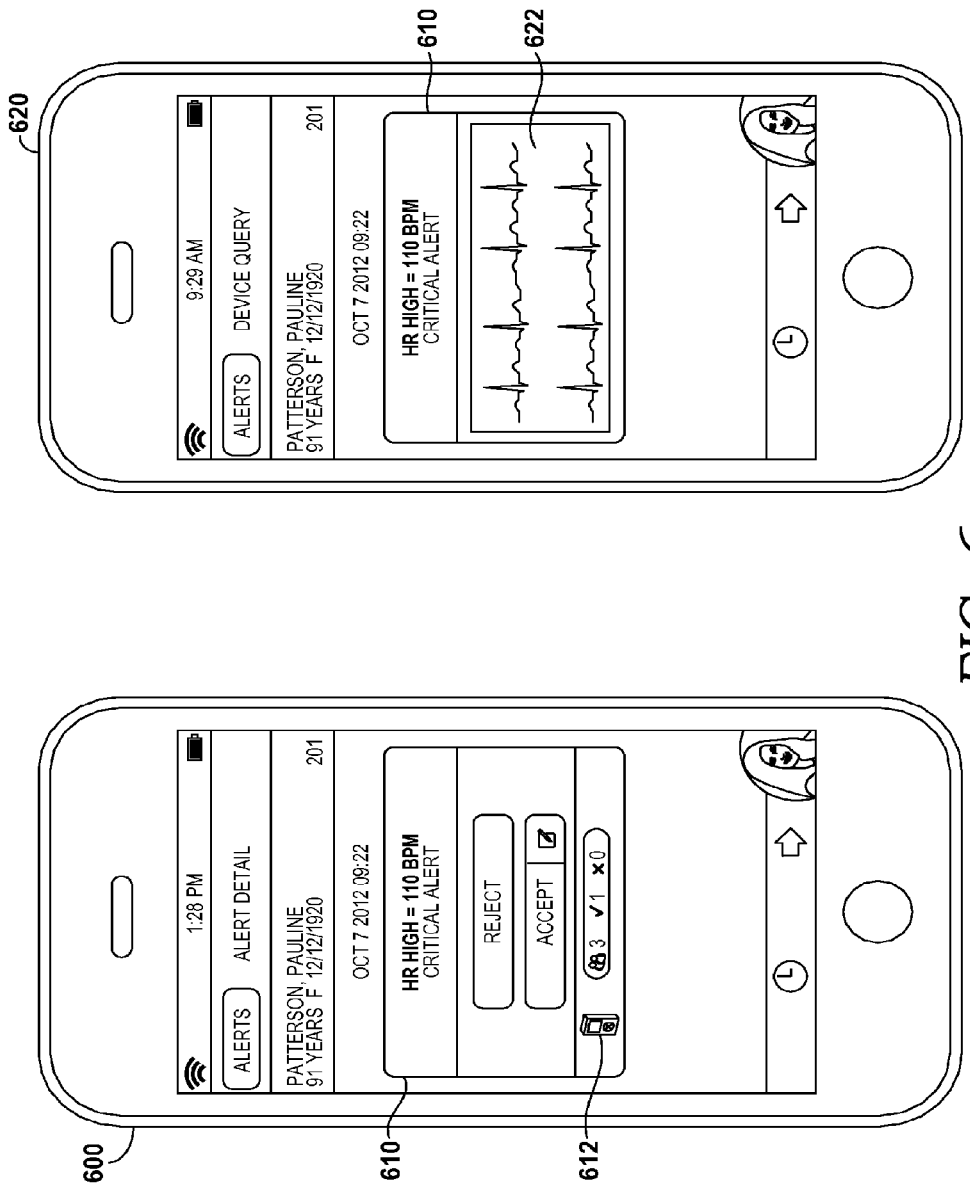
DOB: 1/19/1962
ADE ALERT
CRITICAL ALERT
REJECT
ACCEPT
DIASTOLIC HIGH
08:20
514
515
516
518
519
510
517
520
1:28 PM
ALERTS
ALERT DETAIL
WU, KATHLEEN
50 YEARS F 1/19/1962
402
OCT 7 2012 18:15
ADE ALERT
CRITICAL ALERT
MORPHINE
10MG IV
10/5/12 17:45
HEART RATE
(60-100 BPM)
72 TO 45
10/5/12 17:55
SPO2
(95%-99%)
97 TO 82
10/5/12 17:55
ACCEPTED
18:16
510
522
524
526
540
1:40 PM
FORWARD ALERT
CANCEL
TO:
542
544
WU, KATHLEEN
DOB 1/19/1962 F 402
ADE ALERT CRITICAL
MESSAGE
545
SEND
RETURN
SPACE
560
13:36
89%
CANCEL
LOCATION
TEL 571
RY
564
GIBBS, ASHLEY
RN
566
IN ROOM
568
570
562
GOODMAN, AMY
IV TEAM
RM 422
HINES, ANNA
UNIT SECRETARY DESK
HORN, JESSICA
PHLEBOTOMIST RM 450
HUFFMAN, JOHN
RN
RM 450
JONES, CHRISTI
RN
RM 500
KLEIN, KELLY
CASE MANAGER RM 502

FIG. 5.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ALERTS
ALERT DETAIL
PATTERSON, PAULINE
91 YEARS F 12/12/1920
201
OCT 7 2012 09:22
HR HIGH = 110 BPM
CRITICAL ALERT
REJECT
ACCEPT
3 ✓1 ×0
610
612
620
9:29 AM
ALERTS
DEVICE QUERY
PATTERSON, PAULINE
91 YEARS F 12/12/1920
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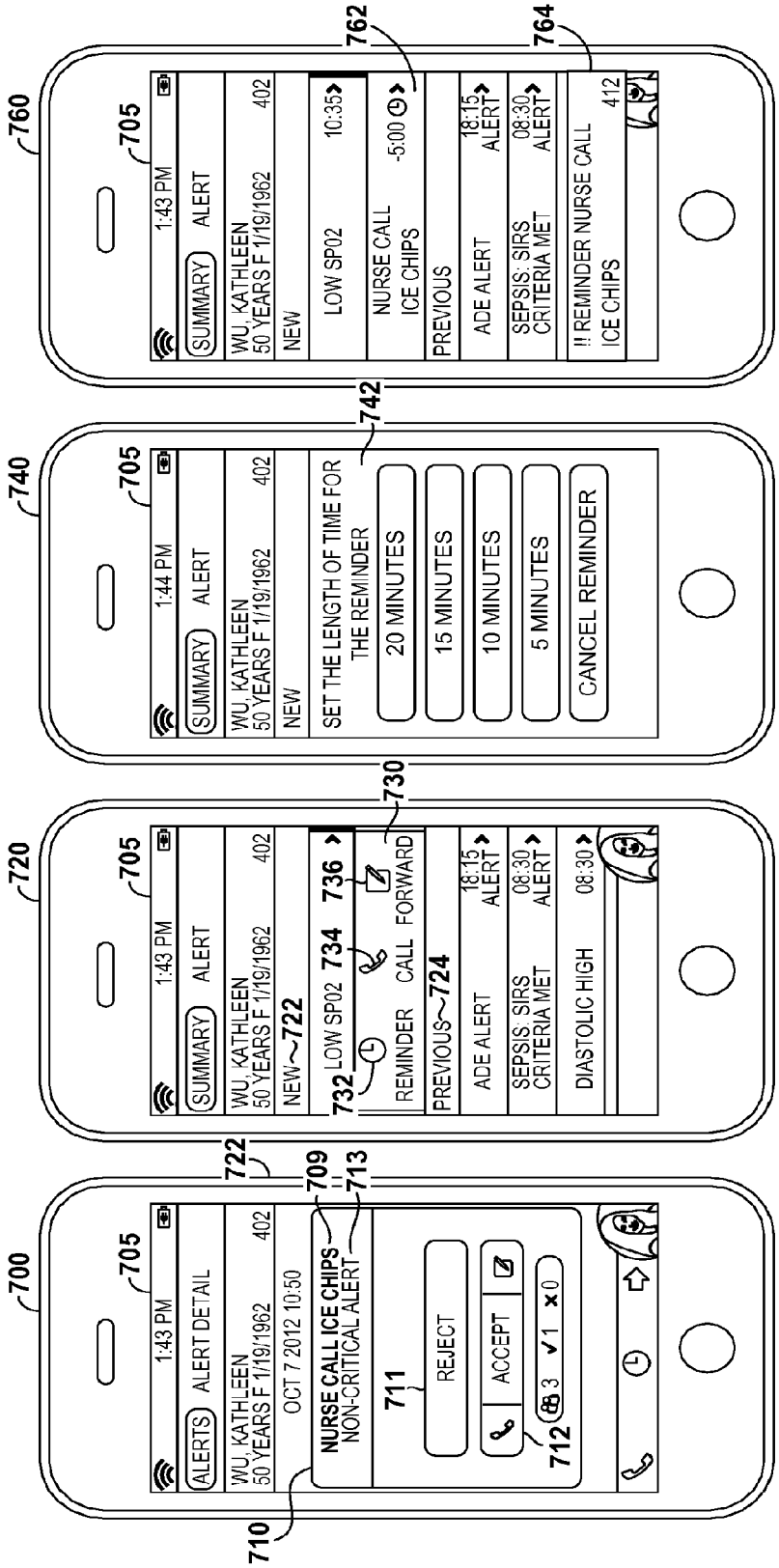
OCT 7 2012 09:22
HR HIGH = 110 BPM
CRITICAL ALERT
610
622

FIG. 6.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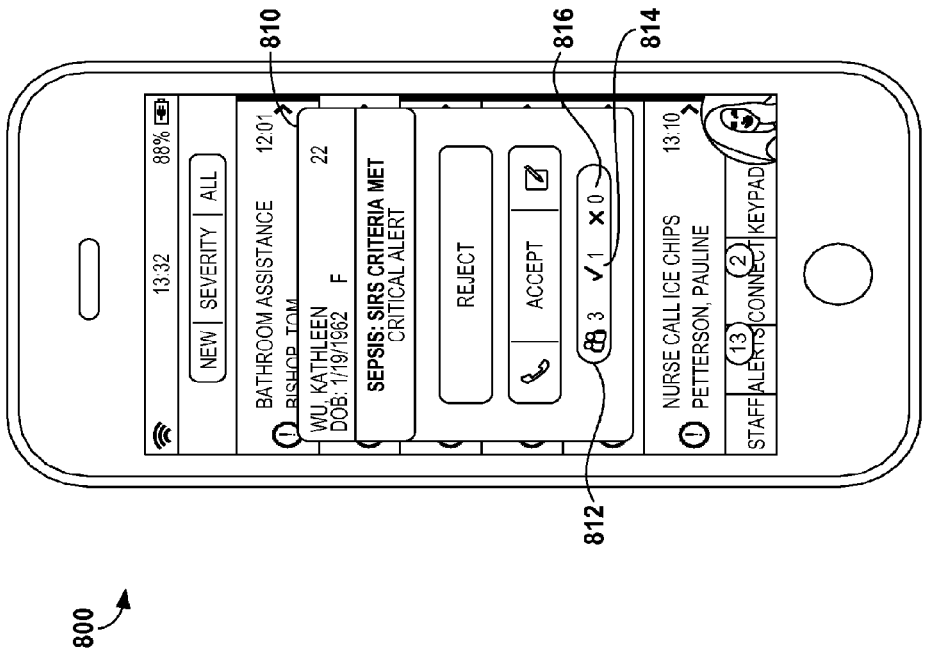
705
1:43 PM
ALERTS
ALERT DETAIL
WU, KATHLEEN
50 YEARS F 1/19/1962
402
OCT 7 2012 10:50
NURSE CALL ICE CHIPS
NON-CRITICAL ALERT
REJECT
ACCEPT
3 1 0
710
711
712
709
713
720
722
SUMMARY
ALERT
NEW
LOW SP02
REMINDER
CALL
FORWARD
732
734
736
730
PREVIOUS
724
ADE ALERT
18:15
SEPSIS: SIRS CRITERIA MET
08:30
DIASTOLIC HIGH
740
1:44 PM
742
SET THE LENGTH OF TIME FOR THE REMINDER
20 MINUTES
15 MINUTES
10 MINUTES
5 MINUTES
CANCEL REMINDER
760
762
764
10:35
NURSE CALL ICE CHIPS
-5:00
!! REMINDER NURSE CALL ICE CHIPS
412

FIG. 7.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810
816
814
812
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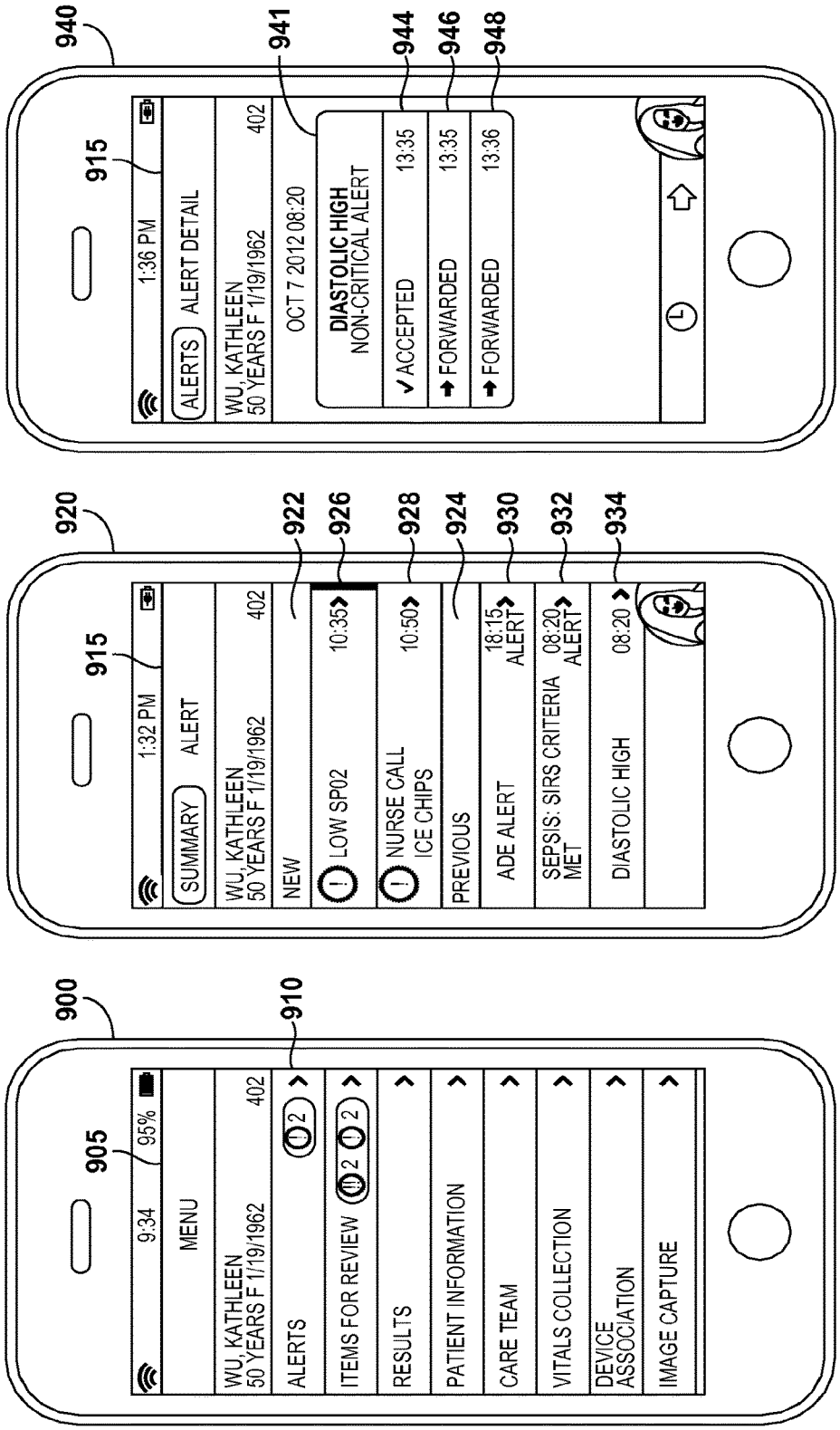
88%
NEW
SEVERITY
ALL
BATHROOM ASSISTANCE
12:01
WU, KATHLEEN
DOB: 1/19/1962
22
F
SEPSIS: SIRS CRITERIA MET
CRITICAL ALERT
REJECT
ACCEPT
3
1
0
NURSE CALL ICE CHIPS
13:10
PETTERSON, PAULINE
STAFF
13
ALERTS
2
CONNECT
KEYPAD

FIG. 8.


900
905
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95%
MENU
WU, KATHLEEN
50 YEARS F 1/19/1962
402
910
ALERTS
ITEMS FOR REVIEW
RESULTS
PATIENT INFORMATION
CARE TEAM
VITALS COLLECTION
DEVICE ASSOCIATION
IMAGE CAPTURE
920
915
1:32 PM
SUMMARY
ALERT
922
926
928
924
930
932
934
NEW
LOW SP02
10:35
NURSE CALL
ICE CHIPS
10:50
PREVIOUS
ADE ALERT
18:15 ALERT
SEPSIS: SIRS CRITERIA MET
08:20 ALERT
DIASTOLIC HIGH
08:20
940
941
944
946
948
1:36 PM
ALERTS
ALERT DETAIL
OCT 7 2012 08:20
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NON-CRITICAL ALERT
ACCEPTED
13:35
FORWARDED
13:35
FORWARDED
13:36

FIG. 9.

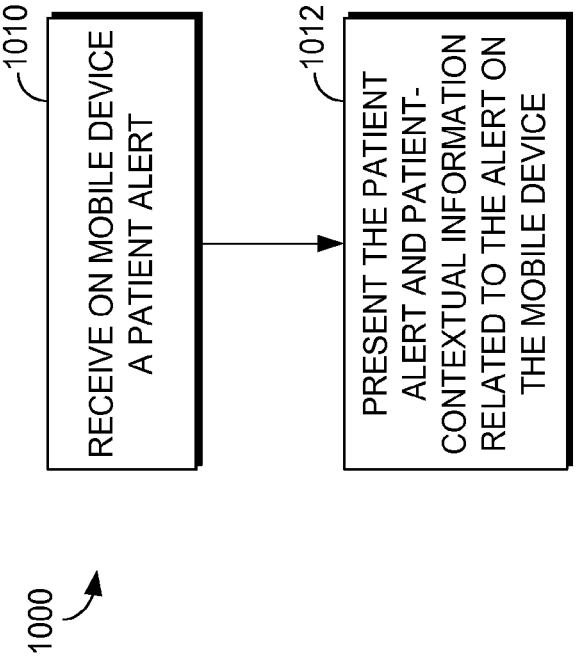
1010
RECEIVE ON MOBILE DEVICE A PATIENT ALERT
1012
PRESENT THE PATIENT ALERT AND PATIENT-CONTEXTUAL INFORMATION RELATED TO THE ALERT ON THE MOBILE DEVICE
1000

FIG. 10.

ALERT MANAGEMENT UTILIZING MOBILE DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application, having "Alert Management Utilizing Mobile Devices," is a continuation application of pending U.S. application Ser. No. 13/731,191, filed Dec. 31, 2012 and entitled "Alert Management Utilizing Mobile Devices." The entirety of the afore-mentioned application is incorporated by reference herein.

BACKGROUND

Typical nurse management of patient alerts utilizes stationary computer terminals located at, for example, a nursing station associated with a nursing unit. The stationary terminals are manned by unit secretaries who receive alerts or other important information related to patients on the unit. The unit secretary then identifies the caregivers assigned to those patients and may attempt to contact the caregivers through a variety of methods such as electronic paging, calling a patient's room to see if the caregiver is in the room, or overhead paging. Caregivers then either have to call the unit secretary or return to the nursing station to retrieve the alerting information. The result is inefficient communication, unproductive workflows, and time lags between when alerting information is received and when it is acted on by the caregiver.

In those situations where a patient alert is pushed to a caregiver's mobile device, the alert often lacks important patient-contextual information, such as medical values, images, or device readings associated with the alert, that help the caregiver in deciding how to appropriately respond to the alert. The caregiver must then either return to the nursing station to access the information or open up a computer application on the mobile device to access the needed information—both of which consume valuable time resources. Further, though the caregiver may receive an alert, the caregiver is generally not given an opportunity to further interact with the alert. For instance, the alert generally cannot be communicated to another caregiver that can assist in addressing the alert.

SUMMARY

This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter. The present invention is defined by the claims.

In brief and at a high level, this disclosure describes, among other things, methods, systems, and computer-storage media for managing patient alerts using mobile devices. A patient alert is received and presented on a caregiver's mobile device; the caregiver is part of the patient's care team. The alert includes patient-identifying information along with the alert identifier and contextual patient data related to the alert. If the alert is a critical alert, the alert must be acknowledged in some manner before the caregiver can resume use of the mobile device. Acknowledgment of the alert may comprise rejecting the alert or accepting the alert. Rejection of the alert by the caregiver causes the alert to be automatically communicated to another caregiver assigned to the patient. Acceptance of the alert by the caregiver enables the caregiver to access members of the patient's care team and to forward the alert on to selected members of the team that can assist the caregiver in addressing the alert.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments are described in detail below with reference to the attached drawing figures, wherein:

FIG. **1** is a block diagram of an exemplary computing environment suitable to implement embodiments of the present invention;

FIG. **2** is a block diagram of an exemplary system for managing patient alerts suitable to implement embodiments of the present invention;

FIG. **3** is a flow diagram of an exemplary method of accepting and managing patient alerts using a mobile device in accordance with an embodiment of the present invention;

FIG. **4** is a flow diagram of an exemplary method of managing patient alerts when an alert is rejected in accordance with an embodiment of the present invention;

FIG. **5** is a series of exemplary graphical user interfaces illustrating the acceptance and management of patient alerts in accordance with an embodiment of the present invention;

FIG. **6** is a series of exemplary graphical user interfaces illustrating the ability to see trending data related to a patient alert in accordance with an embodiment of the present invention;

FIG. **7** is a series of exemplary graphical user interfaces illustrating the ability to utilize reminders with non-critical alerts in accordance with an embodiment of the present invention;

FIG. **8** is an exemplary graphical user interface illustrating the additional information presented with an alert in accordance with an embodiment of the present invention;

FIG. **9** is a series of exemplary graphical user interfaces illustrating the ability of a caregiver to review an alert history in accordance with an embodiment of the present invention; and

FIG. **10** is a flow diagram of an exemplary method of receiving an alert that includes patient-contextual information related to the alert using a mobile device in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

The subject matter of the present invention is described with specificity herein to meet statutory requirements. However, the description itself is not intended to limit the scope of this patent. Rather, the inventors have contemplated that the claimed subject matter might also be embodied in other ways, to include different steps or combinations of steps similar to the ones described in this document, in conjunction with other present or future technologies. Moreover, although the terms "step" and/or "block" may be used herein to connote different elements of methods employed, the terms should not be interpreted as implying any particular order among or between various steps herein disclosed unless and except when the order of individual steps is explicitly described.

Embodiments of the present invention are directed to methods, systems, and computer-storage media for managing patient alerts using mobile devices. A patient alert is received and presented on a caregiver's mobile device; the caregiver is part of the patient's care team. The alert includes patient-identifying information along with the alert identifier and contextual medical data related to the alert. If the alert

is a critical alert, the alert must be acknowledged in some manner before the caregiver can resume use of the mobile device. Acknowledgment of the alert may comprise rejecting the alert or accepting the alert. Rejection of the alert by the caregiver causes the alert to be automatically communicated to another caregiver assigned to the patient. Acceptance of the alert by the caregiver enables the caregiver to access members of the patient's care team and to forward the alert on to selected members of the team that can assist the caregiver in addressing the alert.

An exemplary computing environment suitable for use in implementing embodiments of the present invention is described below. FIG. **1** is an exemplary computing environment (e.g., medical-information computing-system environment) with which embodiments of the present invention may be implemented. The computing environment is illustrated and designated generally as reference numeral **100**. The computing environment **100** is merely an example of one suitable computing environment and is not intended to suggest any limitation as to the scope of use or functionality of the invention. Neither should the computing environment **100** be interpreted as having any dependency or requirement relating to any single component or combination of components illustrated therein.

The present invention might be operational with numerous other purpose computing system environments or configurations. Examples of well-known computing systems, environments, and/or configurations that might be suitable for use with the present invention include personal computers, server computers, hand-held or laptop devices, multiprocessor systems, microprocessor-based systems, set top boxes, programmable consumer electronics, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above-mentioned systems or devices, and the like.

The present invention might be described in the general context of computer-executable instructions, such as program modules, being executed by a computer. Exemplary program modules comprise routines, programs, objects, components, and data structures that perform particular tasks or implement particular abstract data types. The present invention might be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules might be located in association with local and/or remote computer storage media (e.g., memory storage devices).

With continued reference to FIG. **1**, the computing environment **100** comprises a computing device in the form of a control server **102**. Exemplary components of the control server **102** comprise a processing unit, internal system memory, and a suitable system bus for coupling various system components, including data store **104**, with the control server **102**. The system bus might be any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, and a local bus, using any of a variety of bus architectures. Exemplary architectures comprise Industry Standard Architecture (ISA) bus, Micro Channel Architecture (MCA) bus, Enhanced ISA (EISA) bus, Video Electronic Standards Association (VESA) local bus, and Peripheral Component Interconnect (PCI) bus, also known as Mezzanine bus.

The control server **102** typically includes therein, or has access to, a variety of computer-readable media. Computer-readable media can be any available media that might be accessed by control server **102**, and includes volatile and nonvolatile media, as well as, removable and nonremovable media. By way of example, and not limitation, computer-readable media may comprise computer storage media and communication media. Computer storage media includes both volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by control server **102**. Communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. Combinations of any of the above should also be included within the scope of computer-readable media.

The control server **102** might operate in a computer network **106** using logical connections to one or more remote computers **108**. Remote computers **108** might be located at a variety of locations in a medical or research environment, including clinical laboratories (e.g., molecular diagnostic laboratories), hospitals and other inpatient settings, veterinary environments, ambulatory settings, medical billing and financial offices, hospital administration settings, home healthcare environments, and clinicians' offices. Clinicians may comprise a treating physician or physicians; specialists such as surgeons, radiologists, cardiologists, and oncologists; emergency medical technicians; physicians' assistants; nurse practitioners; nurses; nurses' aides; pharmacists; dieticians; microbiologists; laboratory experts; laboratory technologists; genetic counselors; researchers; veterinarians; students; and the like. The remote computers **108** might also be physically located in nontraditional medical care environments so that the entire healthcare community might be capable of integration on the network. The remote computers **108** might be personal computers, servers, routers, network PCs, peer devices, other common network nodes, or the like and might comprise some or all of the elements described above in relation to the control server **102**. The devices can be personal digital assistants or other like devices.

Computer networks **106** comprise local area networks (LANs) and/or wide area networks (WANs). Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet. When utilized in a WAN networking environment, the control server **102** might comprise a modem or other means for establishing communications over the WAN, such as the Internet. In a networking environment, program modules or portions thereof might be stored in association with the control server **102**, the data store **104**, or any of the remote computers **108**. For example, various application programs may reside on the memory associated with any one or more of the remote computers **108**. It will be appreciated by those of ordinary skill in the art that the network connections

shown are exemplary and other means of establishing a communications link between the computers (e.g., control server **102** and remote computers **108**) might be utilized.

In operation, an organization might enter commands and information into the control server **102** or convey the commands and information to the control server **102** via one or more of the remote computers **108** through input devices, such as a keyboard, a pointing device (commonly referred to as a mouse), a trackball, or a touch pad. Other input devices comprise microphones, satellite dishes, scanners, or the like. Commands and information might also be sent directly from a remote healthcare device to the control server **102**. In addition to a monitor, the control server **102** and/or remote computers **108** might comprise other peripheral output devices, such as speakers and a printer.

Although many other internal components of the control server **102** and the remote computers **108** are not shown, such components and their interconnection are well known. Accordingly, additional details concerning the internal construction of the control server **102** and the remote computers **108** are not further disclosed herein.

Turning now to FIG. **2**, an exemplary computing system environment **200** is depicted suitable for use in implementing embodiments of the present invention. The computing system environment **200** is merely an example of one suitable computing system environment and is not intended to suggest any limitation as to the scope of use or functionality of embodiments of the present invention. Neither should the computing system environment **200** be interpreted as having any dependency or requirement related to any single module/component or combination of modules/components illustrated therein.

The computing system environment **200** includes an alert service **210**, a data store **212**, and a mobile device **214** all in communication with one another via a network **216**. The network **216** may include, without limitation, one or more secure local area networks (LANs) or wide area networks (WANs). The network **216** may be a secure network associated with a facility such as a healthcare facility. The secure network **216** may require that a user log in and be authenticated in order to send and/or receive information over the network **216**.

In some embodiments, one or more of the illustrated components/modules may be implemented as stand-alone applications. In other embodiments, one or more of the illustrated components/modules may be integrated directly into the operating system of the alert service **210**. The components/modules illustrated in FIG. **2** are exemplary in nature and in number and should not be construed as limiting. Any number of components/modules may be employed to achieve the desired functionality within the scope of embodiments hereof. Further, components/modules may be located on any number of servers. By way of example only, the alert service **210** might reside on a server, cluster of servers, or a computing device remote from one or more of the remaining components.

It should be understood that this and other arrangements described herein are set forth only as examples. Other arrangements and elements (e.g., machines, interfaces, functions, orders, and groupings of functions, etc.) can be used in addition to or instead of those shown, and some elements may be omitted altogether. Further, many of the elements described herein are functional entities that may be implemented as discrete or distributed components or in conjunction with other components/modules, and in any suitable combination and location. Various functions described herein as being performed by one or more entities may be carried out by hardware, firmware, and/or software. For instance, various functions may be carried out by a processor executing instructions stored in memory.

The data store **212** is configured to store information for use by, for example, the alert service **210** and/or the mobile device **214**. The information stored in association with the data store **212** is configured to be searchable for one or more items of information stored in association therewith. The information stored in association with the data store **212** may comprise general information used by the alert service **210** and/or the mobile device **214**.

The data store **212** may store electronic medical records (EMRs) of patients associated with one or more healthcare facilities. EMRs may comprise electronic clinical documents such as images, clinical notes, orders, summaries, reports, analyses, or other types of electronic medical documentation relevant to a particular patient's condition and/or treatment. Electronic clinical documents contain various types of information relevant to the condition and/or treatment of a particular patient and can include information relating to, for example, patient identification information, images, alert history, culture results, physical examinations, vital signs, past medical histories, surgical histories, family histories, histories of present illnesses, current and past medications, allergies, symptoms, past orders, completed orders, pending orders, tasks, lab results, other test results, patient encounters and/or visits, immunizations, physician comments, nurse comments, other caretaker comments, and a host of other relevant clinical information.

Additionally, the data store **212** may store information concerning decision-support algorithms, reference materials, standards of care, recommendation protocols, alert protocols, and the like. This information may be specific to a healthcare facility, or the information may be promulgated by, for example, nationally-recognized medical organizations or governing bodies. Information stored in the data store **212** may also include staffing assignments (e.g., which caregivers are assigned to care for a patient), and availability information for the different caregivers. For instance, a caregiver who is logged into the network **216** is flagged as available; a caregiver who is logged into the network **216** but who has indicated that he/she is busy is flagged as available but busy; and a caregiver who is not logged into the network **216** is flagged as offline. Staffing and availability information is continually updated. As used throughout this application, the term "caregiver" generally means healthcare workers such as registered nurses, aids, respiratory therapists, physical therapists, occupational therapists, and the like. Caregivers such as these provide the day-to-day care of patients but normally do not have ordering privileges.

The content and volume of such information in the data store **212** are not intended to limit the scope of embodiments of the present invention in any way. Further, though illustrated as a single, independent component, the data store **212** may, in fact, be a plurality of storage devices, for instance, a database cluster, portions of which may reside on the alert service **210**, the mobile device **214**, and/or any combination thereof.

The mobile device **214** may be any type of wireless-telecommunications device. Such devices may include any type of mobile and portable devices including cellular telephones, personal digital assistants, tablet PCs, smart phones, and the like. The mobile device **214** includes a set of embodied computer-executable instructions **215** that carry out various functional aspects of the invention. In one aspect, the mobile device **214** may be associated with or assigned to a caregiver by the healthcare facility. In another

aspect, the mobile device **214** may be owned by the caregiver and registered with the healthcare facility. The mobile device **214** is capable of communicating with other associated or registered mobile devices by utilizing the secure network **216**.

As shown, the mobile device **214** includes a display screen. The display screen is configured to display information to the user of the mobile device **214**. The information may include communications initiated by and/or received by the mobile device **214**, patient alerts, medical data related to the patient alerts, care lists, availability information, and the like. Embodiments are not intended to be limited to visual display but rather may also include audio presentation, combined audio/visual presentation, and the like.

Components of the alert service **210** and the mobile device **214** may include a processing unit, internal system memory, and a suitable system bus for coupling various system components, including one or more data stores for storing information (e.g., files and metadata associated therewith). The alert service **210** and the mobile device **214** typically include, or has access to, a variety of computer-readable media.

The computing system environment **200** is merely exemplary. While the alert service **210** is illustrated as a single unit, it will be appreciated that the alert service **210** is scalable. For example, the alert service **210** may in actuality include a plurality of computing devices in communication with one another. Moreover, the data store **212**, or portions thereof, may be included within, for instance, the alert service **210** and the mobile device **214** as a computer-storage medium. The single unit depictions are meant for clarity, not to limit the scope of embodiments in any form.

As shown in FIG. **2**, the alert service **210** comprises a receiving component **218**, an alerting component **220**, and a communicating component **222**. In some embodiments, one or more of the components **218**, **220**, and **222** may be implemented as stand-alone applications. In other embodiments, one or more of the components **218**, **220**, and **222** may be integrated directly into the operating system of a computing device such as the remote computer **108** of FIG. **1** or the mobile device **214**. It will be understood that the components **218**, **220**, and **222** illustrated in FIG. **2** are exemplary in nature and in number and should not be construed as limiting. Any number of components may be employed to achieve the desired functionality within the scope of embodiments hereof.

The receiving component **218** is configured to receive information related to patient alerts. Such information may include data from medical devices electronically associated with a patient. Such devices are numerous but representative examples may include respirators, pulse oximeters, blood pressure monitors, blood glucose monitors, heart rate/rhythm monitors, input/output monitors, fetal monitors, and the like. Data from medical devices includes values, waveform tracings, images, and the like. The receiving component **218** may also receive patient-identifying information from, for example, the data store **212** along with an alert history for the patient and normal value ranges for the patient.

Continuing, the receiving component **218** is further configured to receive staffing assignments from, for example, the data store **212** or a staffing/scheduling system associated with the healthcare facility caring for the patient. Staffing assignments include caregivers assigned to care for the patient during a specified time frame. Staffing assignments may depend on the patient's medical condition. By way of illustrative example, a patient who is rehabilitating from a serious car accident may be assigned a primary caregiver (e.g., a nurse), a secondary caregiver that cares for the patient when the primary caregiver is busy, a respiratory therapist, a physical therapist, and an occupational therapist.

The receiving component is additionally configured to receive availability information for each of the patient's assigned caregivers. This information may be stored in association with the data store **212** or with the staffing/scheduling system. The availability status for any one caregiver may include the status of available, available but busy, and offline. The status of available occurs when the caregiver is logged in and authenticated to the secure network **216**. The status of available but busy occurs when the caregiver is logged in but has marked himself as busy using, for example, the mobile device **214**. The status of offline occurs when the caregiver is logged off of the network **216**.

The receiving component **218** also receives location information for the caregivers, the patient, and devices associated with the patient from, for example, a real-time location service associated with the healthcare facility. Such services use a variety of methods known in the art to track location information including radio-frequency identification (RFId) tags and sensors located throughout the healthcare facility.

The receiving component additionally receives information from the nurse call system of the healthcare facility. The nurse call system enables communication between the patient and caregivers utilizing a number of different devices such as a pillow speaker. Some systems enable the patient to enter information concerning the nurse call before it is transmitted to the nurse. For instance, the patient may input that he/she would like ice chips, or that he/she is having difficulty breathing or is in pain.

The alerting component **220** is configured to use the information received by the receiving component **218** to generate alerts. The alerting component **220** may utilize the information in association with clinical guidelines, alerting protocols, and/or standardized recommendations to determine if and what type of alert should be generated. The alerts can be broadly categorized as critical alerts and non-critical alerts. Critical alerts can be generally defined as those alerts that can have a negative impact on a patient's health if not addressed in a timely manner. On the other hand, non-critical alerts can be generally defined as those alerts that do not negatively impact the patient's health if not addressed in a timely manner. Some representative examples of critical alerts may include a heart arrhythmia, low oxygen saturation, low respiratory rate, elevated blood pressure, presence of sepsis indicators, and the like. Some representative examples of non-critical alerts include patient requests for ice chips or toiletry assistance, lab values or device readings that are slightly outside of the normal range, indication that a new patient order has been received, and the like.

The communicating component **222** is configured to communicate patient alerting information to the mobile device **214**. The alerting information includes an alert identifier, status indicators related to the alert, patient-identifying information, lab values related to the alert, medication orders related to the alert, and device readings related to the alert. In one aspect, lab values, medication orders, and device readings (e.g., waveform tracings, values, and/or images) are related to the alert if they triggered the alert. The waveform tracings, values, and/or images may be time-stamped and may include a predefined time period before the alert was triggered, a time period corresponding to the alert trigger, as well as a predefined time period after the alert was triggered. The mobile device **214** then presents this information to the caregiver as more fully described below.

In one aspect, the communicating component **222** communicates the patient's alerting information initially to the mobile device associated with the patient's primary caregiver. If the primary caregiver rejects the alert, the communicating component **222** may next communicate the patient's alerting information to the mobile device associated with the patient's secondary caregiver. If the secondary caregiver rejects the alert, the communicating component **222** may communicate the patient's alerting information to the mobile device associated with the charge nurse of the patient's unit. If the charge nurse rejects the alert, the communicating component **222** may communicate the alert to mobile devices associated with every member of the patient's care team.

In another aspect, the communicating component **222** determines the caregiver role best suited to initially address the particular patient alert, and communicates the alerting information to mobile devices associated with caregivers in that role. By way of illustrative example, a patient alert indicates that a patient's oxygen saturation levels have dropped below recommended ranges. The communicating component **222** determines that a respiratory therapist would be suited to address this alert and communicates the alerting information to the mobile device associated with the respiratory therapist. The alerting information may at the same time be communicated to the mobile device associated with the patient's primary caregiver.

In yet another aspect, the communicating component **222** determines caregivers in close proximity to the patient that is the subject of the alert, determines if the role of those caregivers that are located close to the patient is suited to meet the particular patient alert, and, if so, communicates the initial alert to those caregivers. The alerting information may at the same time be communicated to the mobile device associated with the patient's primary caregiver. Any and all of such aspects, and any combination thereof, are contemplated as being within the scope of the invention.

The communicating component **222** is further configured to receive communications from the mobile device **214**. Such communications may comprise notifications that the alert has been acknowledged and accepted by the recipient. This information is time-stamped and may be stored in association with the patient's electronic medical record. Another communication may comprise a notification that the alert was rejected by the recipient. Other communications from the mobile device may include indicators that the recipient of the alert has communicated the alert to other members of the care team. The indicators may include the identities of the additional recipients, whether the additional recipients acknowledged receipt of the alert, and a time the alert was forwarded. Communications from the mobile device **214** may additionally include requests for more information.

Turning now to FIG. **3**, a flow diagram is depicted of an exemplary method **300** of managing patient alerts on a mobile device. At a step **310**, a first mobile device such as the mobile device **214** of FIG. **2** receives an alert related to a patient being cared for at a healthcare facility. In one aspect, the alert may be received from a communicating component of an alert service such as the communicating component **222** of the alert service **210**. In another aspect, the alert may have been communicated by another mobile device. The first mobile device, in one aspect, has previously been registered, associated with or assigned to a member of the patient's care team such as the patient's primary and/or secondary caregiver. The receipt of the alert may be accompanied by an auditory sound or a physical action such as a vibration to alert the caregiver that an alert has been received.

At a step **312**, the alert is presented on the first mobile device. If the alert is a critical alert, the alert is configured to interrupt or supersede any applications that are currently running on the first mobile device. For instance, the alert may be presented as a pop-up that overlies other content on the mobile device. The caregiver cannot access other functionalities associated with the first mobile device until the caregiver acknowledges the alert by either accepting or rejecting the alert. This helps to ensure that critical alerts are addressed in a timely manner by the caregiver.

The alert presented on the first mobile device includes patient-identifying information such as the patient's name, room location, and the patient's date of birth. The alert also includes an alert identifier and an alert status. The alert identifier conveys to the caregiver the nature of the alert. For instance, identifiers may include phrases such as "ADE" for an adverse drug event, "HR high" to indicate the heart rate is outside of the normal range, "Low SPO2" to indicate low blood oxygen saturation, "Diastolic High" to indicate that diastolic blood pressure is high, and "SEPSIS: SIRS Criteria Met" to indicate that the patient is possibly becoming septic. These are just a few representative examples provided for illustration purposes only. Any identifier that provides a brief description of the nature of the alert is contemplated as being within the scope of the invention. The alert status may be indicated by textual phrases such as "Critical Alert," color coding, flashing images, and the like.

The alert may also comprise a short summary of lab values, medications, images, or device readings that are pertinent to the alert. In one aspect, the values, medications, images, or device readings that triggered the alert are presented in the short summary. The device readings may include a snippet of a waveform tracing or trending graph that was taken by the monitoring device at the time the alert was triggered. The snippet may be time-stamped and may include a time period before the alert, a time period during the alert, and a time period after the alert was triggered. For instance, an elevated heart rate alert may include the detected heart rate along with a snippet of a heart rate rhythm waveform tracing captured around the time the alert was triggered. This important patient-contextual information is presented in association with the alert to assist the caregiver in making a quick assessment of the alert situation. The alert may also include options for accepting the alert or rejecting the alert. Exemplary options include an accept icon, button or bar, and a reject icon, button or bar.

At a step **314**, an acceptance of the alert by the caregiver is received by the first mobile device. The caregiver may accept the alert by tapping, swiping, or otherwise selecting, for example, the acceptance icon, bar, or button. Once selected, at a step **316**, a list of one or more additional caregivers assigned to the patient is presented on the first mobile device. The list may include the names of the other caregivers, a thumbnail picture of the caregiver, roles associated with each of the caregivers, locations of the caregivers, and/or the availability status of the caregivers. The list may be ordered based on caregiver role such that caregivers most suited to meet the alert needs are presented at the top of the list. The list may also be ordered based on proximity to the patient location. Thus the recipient of the alert can quickly assess which caregivers are located closest to the patient. The list may additionally be ordered based on a combination of user role and proximity to the patient. Other ways of ordering the list include alphabetical order and

availability status. Any and all such aspects, and any combination thereof, are contemplated as being within the scope of the invention.

Caregivers on the list are associated with an availability status indicator. These indicators may indicate that the caregiver is available, available but busy, or is not currently logged into the network. Availability status indicators may include color-coded indicators such as green for available, white for offline, and red for available but busy. Other ways of indicating availability status may include textual descriptions, and other types of visual indicators known in the art.

At a step **316**, a selection of one or more additional caregivers is received by the first mobile device. This may occur, for example, when the recipient of the alert selects a caregiver by tapping or swiping on the caregiver's information. Once selected, at a step **318**, the first mobile device communicates the alert to at least a second mobile device associated with the selected caregiver. In one aspect, the original recipient of the alert can simply call a caregiver on the list. In another aspect, the alert is communicated as a short message service (SMS) message or a multimedia message service (MMS) message. The alert that is communicated to the selected caregiver includes the patient-identifying information, the alert identifier, the alert status, and lab values, device readings, medication orders, images, and/or trending graphs associated with the alert. Further, when the alert is communicated as a SMS message or a MMS message, the original recipient may optionally enter a textual message in association with the alert. In one aspect, the original recipient receives a notification when the selected caregiver acknowledges the alert.

Turning now to FIG. **4**, a flow diagram is depicted illustrating an exemplary method **400** of managing patient alerts using a mobile device. At a step **410**, a patient alert is received on a first mobile device such as the mobile device **214** of FIG. **2**. The patient alert may be communicated to the first mobile device by an alert service such as the alert service **210** of FIG. **2**. The first mobile device is associated with or assigned to a member of the patient's care team, such as the patient's primary or secondary caregiver.

At a step **412**, if the alert is a critical alert, the alert is presented on the first mobile device such that it interrupts or supersedes any currently running applications on the mobile device. The alert may be received and presented in association with an audible sound, and/or a physical action such as a vibration. If the alert is a non-critical alert, the recipient may be notified of the alert via a pop-up message, or the alert may be briefly presented. Non-critical alerts generally do not supersede currently running applications on the mobile device. As discussed above, the critical alert includes patient-identifying information, the alert identifier, the alert status, lab values, device readings, images, trending graphs, and/or waveform tracings that are related to the alert, and options for accepting or rejecting the alert.

At a step **414**, a rejection of the alert is received by the first mobile device. In one aspect, the rejection may be initiated by the alert recipient affirmatively selecting a rejection button, icon, bar, or the like. The recipient caregiver may reject the alert if he or she is currently busy and cannot address the alert in a timely manner. At a step **416**, the alert is automatically communicated to a second mobile device associated with at least a second caregiver assigned to care for the patient. The selection of the second caregiver may be based on an alerting protocol associated with, for example, a data store such as the data store **212** of FIG. **2**. The second caregiver may, in one aspect, comprise the secondary caregiver assigned to the patient. The alert may automatically be communicated to more than one additional caregiver.

The alert that is automatically communicated to the second mobile device at step **416** is substantially identical to the original alert. For example, it includes patient-identifying information, alert name, alert status, lab values, device readings, images, waveform tracings, and/or trending graphs, along with options to accept or reject the alert. The caregiver associated with the second mobile device can accept the alert which initiates the steps outlined above with respect to FIG. **3**. Alternatively, the caregiver associated with the second mobile device can reject the alert which initiates the steps outlined above with respect to FIG. **4**.

In one aspect, failure by the alert recipient to address the alert within a predetermined period of time causes the alert to be automatically communicated to additional mobile devices such as mobile devices associated with the patient's secondary caregiver, the charge nurse, or other caregivers on the patient's care team. The predetermined period of time may range from one minute up to five minutes and may be dependent on the criticality of the alert.

FIG. **10** is a flow diagram of an exemplary method **1000** of receiving patient-contextual information related to an alert on a mobile device. At a step **1010**, a patient alert is received on a first mobile device associated with a first caregiver caring for the patient. In one aspect, the first caregiver is the patient's primary caregiver. At a step **1012**, the patient alert is presented on the first mobile device. The patient alert may include patient-identifying information such as patient name, age, gender, and room location. The alert may also include one or more items of patient information relevant to the alert. In one aspect, patient information is relevant to the alert if it triggered the alert. For example, a lab value that is outside the normal range may trigger the alert, and the lab value would be presented on the mobile device. Patient information relevant to the alert may include lab values, medication orders, and/or device readings. Device readings, in turn, may include waveform tracings, trending graphs, images, and the like.

Turning now to FIG. **5**, a series of exemplary graphical user interfaces (GUIs) **500**, **520**, **540**, and **560** are depicted; the series of GUIs illustrate how patient alerts are managed using a mobile device such as the mobile device **214** of FIG. **2**. GUI **500** is the first in the series and depicts a critical alert **510** presented on the mobile device. The alert **510** overlays existing content of the mobile device and is displayed until acted on by the recipient of the alert **510**. The alert **510** includes a patient identification area **512** that presents information such as patient name, patient identification number, room number, date of birth, and the like. The alert **510** also includes an alert identifier **514** and an alert status **515**. The alert identifier **514** (e.g., "ADE ALERT") provides a brief description of the alert, and the alert status **515** indicates that the alert is critical. In one aspect, only critical alerts are presented utilizing the methods described above. The alert **510** additionally includes a selectable "reject" bar **516** and a selectable "accept" bar **518**. Although bars are depicted, other selectable options are contemplated such as icons or buttons. The accept bar **518** has a call option **517** and a message option **519**. In one aspect, when the call option **517** is selected, the recipient is automatically presented with a call contact list comprising members of the patient care team. The call contact list includes names of the caregivers, pictures of the caregivers, availability indicators, location information, user role, and the like. In another aspect, when the call option **517** is selected, a call to the patient room is automatically placed so that the caregiver can speak with the

patient. When the message option **519** is selected, the recipient is presented with a messaging GUI as shown in the GUI **540**.

GUI **520** depicts the presentation of additional information **522** associated with the alert **510**. The additional information **522** may be presented when the alert recipient selects, for example, the alert identifier **514** or some other portion of the alert **510**. The additional information **522** may include such items as medications, lab values, device readings, and the like. Medication information may include the dosage amount, the dosage route, and the day and time when the medication was last administered. Lab value information and device reading information may include a normal range, a previous value, a current value, a date and time when obtained, and an indicator that indicates whether the current value is greater or lesser than the previous value. Each of the items of information **522** provides patient context to the alert **510** and assist the alert recipient to make an informed decision regarding how to effectively address the alert. The GUI **520** also includes an acceptance area **524** that indicates the time the alert **510** was accepted by the recipient.

The GUI **540** may be presented when the recipient selects the message option **519**, or when the recipient advances to the next screen utilizing a forward page icon as shown at item **526** on GUI **520**. The GUI **540** includes an alert depiction **544** that includes patient-identifying information, the alert identifier, and the alert status. The alert depiction **544** also includes a message area **545** where the recipient can input a message. The GUI **540** also includes a selectable icon **542**, that, when selected, initiates the presentation of a list of caregivers that are on the patient's care team.

GUI **560** depicts the care team list **562** that is presented upon selection of the selectable icon **542** of GUI **540**. The care team list **562** includes all caregivers that are currently assigned to the patient. Using caregiver Ashley Gibbs **564** as an illustrative example, information presented in association with Ashley Gibbs **564** includes a picture **571**, a role **566** (e.g., "RN"), a location **568** (e.g., "In Room"), and an availability indicator **570**. The availability indicator **570** may be color coded to indicate availability. For example, the indicator **570** may be colored green if the caregiver **564** is available, red if the caregiver **564** is available but busy, and white if the caregiver **564** is offline. Further, for those users who are color-blind, the color coded indicators may be placed in different locations so the user can distinguish between, for example, a red indicator and a green indicator. For example, green indicators may be presented on the right side of the screen, and red indicators may be presented on the left side of the screen.

The list **562** may be categorized by user role, availability status, and/or proximity to the patient. Although not shown, the alert recipient can select by, for example, swiping, tapping, or using other gestures known in the art, one or more caregivers on the list and communicate the alert to the selected caregivers. The alert information **522** is communicated with the alert so that the selected caregivers can quickly access the needed information.

FIG. **6** depicts a series of two exemplary GUIs **600** and **620** illustrating the presentation of waveform tracings associated with a patient alert. GUI **600** includes an alert **610** that includes the information already outlined above with respect to, for example, the alert **510** of FIG. **5**. The GUI **600** further includes a display icon **612**. Selection of the display icon **612** initiates the presentation of GUI **620**. The GUI **620** includes the alert **610** along with a waveform tracing **622**. The waveform tracing **622** is captured and time-stamped by the patient's device at the time the alert was triggered and may include segments of time before and after the alert was triggered to provide additional context for the waveform tracing. Although a waveform tracing is shown, it is also contemplated that an image captured by a camera or a monitoring device may be presented. For instance, a caregiver may take a picture of a patient's wound and this image may be included with the alert **610**. The waveform tracing **622**, and/or image, is used by the alert recipient to select other caregivers to notify so that the alert can be properly addressed.

FIG. **7** depicts a series of exemplary GUIs **700**, **720**, **740**, and **760** that illustrate how reminders can be generated for non-critical alerts. GUI **700** depicts an alert review screen **705** on which a non-critical alert **710** has been selected. The alert review screen **705** may be accessed from a general menu (not shown). Non-critical alerts differ from critical alerts in that they generally do not supersede any currently running applications. Non-critical alerts may be presented as a pop-up that persists for a short period of time before fading. The pop-up may be dismissed by the user by, for example, selecting a different area of the display screen. Non-critical alerts may also be presented to the caregiver on the mobile device as a notification message, and the caregiver can review the alert at his/her discretion. Non-critical alerts differ from critical alerts in that reminders may be set for non-critical alerts. By contrast, because of the time-sensitive nature of critical alerts, reminders cannot be set for critical alerts.

The non-critical alert **710** includes an alert identifier **709**, an alert status **713**, a reject option **711**, and an accept option **712**. If the caregiver chooses to accept the non-critical alert **710** by tapping, swiping, or otherwise selecting, a set of options **730** is presented as shown on the GUI **720**. The GUI **720** includes the alert review screen **705**. The set of options **730** includes a reminder option **732** to set a reminder, a call option **734** to call a caregiver or to call the patient's room, and a message option **736** to message a caregiver on the patient's care team. The alert review screen **705** in the GUI **720** also depicts new patient alerts **722** and previous patient alerts **724**; the new patient alerts **722** and the previous patient alerts **724** include both critical and non-critical alerts. Each alert includes an alert identifier, and a time when the alert was triggered.

GUI **740** depicts the alert review screen **705** and a reminder screen **742** that is initiated upon a user selection of the reminder option **732** in the set of options **730** of GUI **720**. The reminder screen **742** enables the caregiver to select from a range of reminder times or to cancel the reminder. Reminder times may include 5 minutes, 10 minutes, 15 minutes, and 20 minutes.

GUI **760** depicts the alert review screen **705** after a reminder time has been selected. As shown by alert **762**, the non-critical alert for ice chips is now associated with a reminder time of 5 minutes. Further, area **764** is a visual indicator that one or more reminders have been initiated for non-critical alerts. The area **764** includes the names of alerts that have been associated with a reminder, as well as an indicator to draw the user's attention to the area **764** (e.g., an exclamation point).

FIG. **8** depicts an exemplary GUI **800** illustrating additional information that may be associated with a critical alert. The GUI **800** includes a critical alert **810**. The critical alert **810** includes the same information as outlined above with respect to the alert **510** of FIG. **5**. The alert **810** may further include a number of people that were sent the alert as indicated by element **812**. Thus, in this case, the alert **810** was communicated to three caregivers associated with the

patient. The alert **810** also includes an indication of the number of caregivers who accepted the alert **810**; this is shown by element **814**. In this case, one caregiver has accepted the alert. Additionally, the alert **810** includes an indication of the number of caregivers who have rejected the alert **810** (in this case, zero caregivers have rejected the alert **810**).

FIG. **9** depicts a series of exemplary GUIs **900**, **920**, and **940** that illustrate the ability of a caregiver to review an alert history for a patient. The GUI **900** depicts a general menu screen **905**. The general menu screen includes an alerts review **910** bar by which the caregiver can review alerts related to the patient (e.g., patient Kathleen Wu). Upon selection of the alerts review bar **910**, the user is taken to an alerts review screen **915** that is similar to the alerts review screen **705** of FIG. **7**. The alerts review screen **915** includes a new alert area **922** and a previous alert area **924** similar to the new alert area **722** and the previous alert area **724** of FIG. **7**. The new alert area **922** includes both a critical alert **926** and a non-critical alert **928**. The previous alert area **924** includes three critical alerts **930**, **932**, and **934**. Upon selection of an alert, such as the alert **934**, an alert detail screen is presented as shown by alert detail screen **941** of the GUI **940**.

The GUI **940** includes the alert review screen **915** and the alert detail screen **941**. The alert detail screen **941** includes the alert identifier and the alert status. The alert detail screen **941** further includes a notification **944** that the alert **934** was accepted and the time it was accepted. Additionally, it includes two forwarding indications **946** and **948** that indicate that the alert **934** was forwarded twice and the times when the alert **934** was forwarded.

The present invention has been described in relation to particular embodiments, which are intended in all respects to be illustrative rather than restrictive. Further, the present invention is not limited to these embodiments, but variations and modifications may be made without departing from the scope of the present invention.

What is claimed is:

1. One or more non-transitory computer-storage media storing computer-useable instructions that, when used by one or more mobile devices, cause the one or more mobile devices to perform a method of managing patient alerts, the method comprising:

receiving on a first mobile device an alert related to a patient, the first mobile device associated with a first caregiver assigned to care for the patient;

determining that the alert is a critical alert or a noncritical alert;

based on determining that the alert is a critical alert, superseding applications running on the first mobile device to present the alert;

presenting on the first mobile device the alert;

receiving on the first mobile device one of an acceptance or a rejection of the alert by the first caregiver; and

upon receiving one of the acceptance or the rejection, resuming the applications running on the first mobile device.

2. The media of claim **1** further comprising, upon receiving the rejection of the alert, automatically communicating the alert to one or more additional mobile devices associated with one or more additional caregivers.

3. The media of claim **2**, wherein the rejection of the of the alert is generated upon one of a received input on the first mobile device and a failure to respond to the alert within a predetermined period of time.

4. The media of claim **2**, wherein the one or more additional caregivers are determined based on one or more of the following for each additional caregiver of the one or more additional caregivers: a staffing assignment associated with the patient, a role associated the each additional caregiver, and an availability status of the each additional caregiver.

5. The media of claim **2**, wherein the availability status of the each additional caregiver includes one selected from the following: available, offline, or available but busy.

6. The media of claim **2**, wherein the one or more additional caregivers are determined based on a location associated with each additional caregiver of one or more additional caregivers.

7. The media of claim **6**, wherein the alert is communicated to the one or more mobile devices associated with the one or more additional caregivers in an order based on a location proximity of the each additional caregiver to the patient.

8. The media of claim **4**, wherein the alert is communicated to the one or more mobile devices associated with the one or more additional caregivers in an order based on the role associated with the each additional caregiver of the one or more additional caregivers.

9. The media of claim **2**, wherein subsequent to communicating the alert to the one or more additional mobile devices, the first caregiver receives a notification that the alert has been acknowledged by at least one additional caregiver of the one or more additional caregivers.

10. The media of claim **1**, wherein the alert comprises patient-identifying information.

11. The media of claim **10**, wherein the alert further comprises one or more lab values related to the alert, medication orders related to the alert, or device readings related to the alert.

12. The media of claim **2**, wherein the alert is communicated to the one or more additional mobile devices as at least one of a short message service (SMS) message or a multimedia message service (MMS) message.

13. A system in a healthcare computing environment that facilitates managing patient alerts, the system comprising:

an alerting component for generating an alert comprising one of a critical alert and a noncritical alert relating to a patient, wherein the critical alert is configured to block functionalities of a mobile device that are unrelated to an alert response interface until a response to the critical alert is communicated by the mobile device; and

a communicating component for communicating the alert to a first mobile device, the first mobile device associated with a first caregiver assigned to care for the patient, and for receiving one or more responses to the alert.

14. The system of claim **13**, wherein the first caregiver is the primary caregiver assigned to the patient.

15. The system of claim **13**, wherein the critical alert is configured to enable the functionalities of the mobile device when the response to the critical alert is communicated by the mobile device.

16. The system of claim **13**, wherein the critical alert and the noncritical alert comprise patient identifying-information and one or more of lab values related to the patient, medication orders related to the patient, images related to the patient, or device readings related to the patient.

17. A non-transitory computer-storage medium having stored thereon instructions, executable by a mobile device,

for an alert user interface for managing patient alerts, the alert user interface comprising:

an alert identifier area that presents on the mobile device a medical alert comprising one of a critical alert or a noncritical alert, wherein the alert identifier area comprises an alert acceptance area configured to receive a user acceptance of the medical alert and an alert rejection area configured to receive a user rejection of the medical alert;

wherein the mobile device is configured to block functionalities of the mobile device other than the alert identifier area when the critical alert is presented in the alert identifier area; and

wherein the mobile device is configured to enable the functionalities of the mobile device upon receiving one of the user acceptance of the critical alert or the user rejection of the critical alert.

18. The alert user interface of claim **17**, wherein the alert identifier area is further configured to present additional information related to the medical alert upon receiving the user acceptance of the medical alert.

19. The alert user interface of claim **18**, wherein the additional information related to the medical alert comprises one or more lab values related to the medical alert, one or more device readings related to the medical alert, or one or more medication orders related to the medical alert.

20. The alert user interface of claim **19**, further comprising a display icon, selection of the display icon initiating a trending graph associated with at least one of the one or more device readings related to the medical alert.

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