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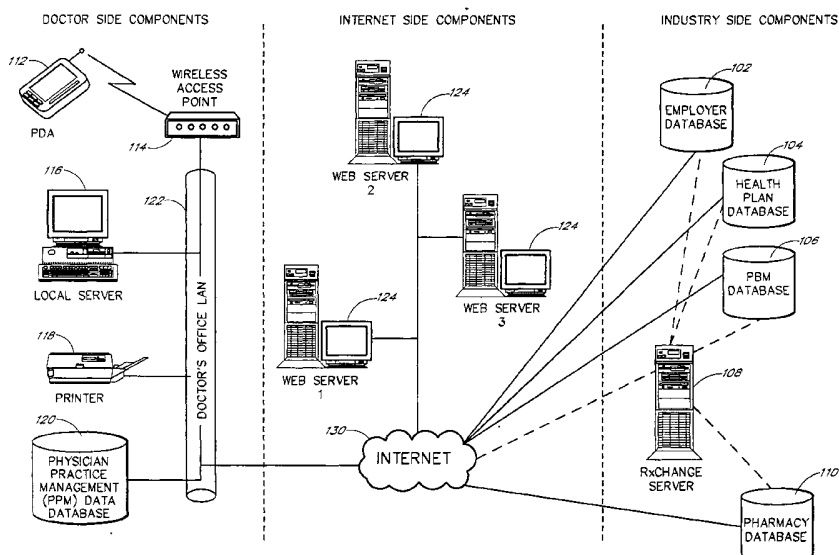
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(54) Title: MEDICAL SERVICE AND PRESCRIPTION MANAGEMENT SYSTEM



(57) **Abstract:** A point-of-care device (112) is connected by wire or wirelessly to a local server (116) at a doctor's office. The local server (116) can also connect to a health plan database (104), which includes health plan coverage policies of health plan providers of patients. During a session with a patient, the doctor reviews information about the patient on the point-of-care device (112), and writes prescriptions using the device. The point-of-care device allows the doctor to search for drugs and performs drug allergy, interaction, and duplication checking. The prescriptions are printed on a printer (118) in the doctor's office, or automatically sent to the pharmacy to be filled.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

MEDICAL SERVICE AND PRESCRIPTION MANAGEMENT SYSTEM

Background of the Invention

Field of the Invention

This invention relates to methods and systems for collecting, providing and managing information related to patient care. More specifically, the invention relates to methods and systems for automating and streamlining the processes associated with writing prescriptions by medical professionals.

Description of the Related Art

As medicine has grown from a specialized profession into a full grown industry, the modern practice of medicine has evolved to include the interaction between a large number of individuals and organizations, each of which performs a role in patient care. Doctors and other medical professionals provide direct patient care such as diagnosis and writing prescriptions. Pharmaceutical companies research and develop new pharmaceutical treatments. Pharmacies stock and dispense medications based upon doctor's prescriptions. Health plan providers package and resell the services of various medical and pharmaceutical professionals, as well as providing an insurance function. Employers select and pay for health plans for their employees. Pharmacy Benefit Management companies (PBM's) provide aggregation and management to health plan providers when interacting with pharmacies.

Due to the number of players and the high degree of compartmentalization involved in the medical industry, something as simple as treatment for a sore throat or sprained ankle may involve a half dozen organizations, each processing the patient's data independently, and often redundantly. Furthermore, many of these organizations, particularly the doctors and other healthcare workers, can greatly benefit from the availability of information regarding the other organizations. For example, it would be desirable for a doctor to easily determine, at the time of writing a prescription, whether the prescription is covered by the patient's health plan.

There are presently at least 70,000 drugs available in the US and other countries in a variety of doses, with new drugs being developed. The large number of drugs makes it difficult for doctors to choose the best drug for a patient in the course of an office visit, particularly if the doctor has only a short period of time such as a few minutes to make the decision. The existence of nutraceuticals, herbs and other non-prescription treatments makes the process even more difficult. The doctor also needs to quickly ensure that the prescriptions do not trigger allergies, cause drug-to-drug interactions or duplications.

Summary of the Invention

One aspect of the invention relates to a point-of-care device for facilitating medical service and prescription writing. The device includes a synchronization module configured to receive patient information data of a patient from a local server, a display module configured to display the received patient information data to a

doctor, and a prescription module configured to prompt the doctor to write a prescription for the patient upon viewing the displayed patient information data of the patient. The synchronization module is also configured to send data regarding the written prescription to the local server.

Another aspect of the invention relates to a computing device for facilitating medical service and prescription writing. The computing device includes a communication module, a patient queue module and a synchronization module. The communication module is configured to receive over a network updates to health plan coverage policy data and updates to formulary data. The patient queue module is configured to maintain patient information for a list of patients who are scheduled to visit a doctor's office. The synchronization module is configured to send patient information of a patient on the list of patients to a point-of-care device and to receive prescription data for the patient from the point-of-care device. The synchronization module is also configured to send to the point-of-care device the updates to health plan coverage policy data and the updates to formulary data.

Yet another aspect of the invention relates to a method for facilitating medical service and prescription writing. The method includes receiving on an electronic device patient information of a patient visiting a doctor, displaying the received patient information on the electronic device to the doctor, prompting the doctor to enter diagnosis or prescription for the patient on the electronic device, and sending the entered diagnosis or prescription from the electronic device over a network to a computer data storage device.

Brief Description of the Drawings

FIGURE 1 illustrates an overview for one embodiment of the described prescription and medical service management system.

FIGURE 2 illustrates one embodiment of a login screen of a point-of-care device.

FIGURE 3 illustrates one embodiment of a patient queue screen of a point-of-care device.

FIGURE 4 illustrates one embodiment of a patient queue screen of a point-of-care device, with a popped-up portion of command list.

FIGURE 5 illustrates one embodiment of a favorites management screen of a point-of-care device.

FIGURE 6 illustrates one embodiment of a settings screen of a point-of-care device.

FIGURE 7 illustrates one embodiment of a patient prescription history screen of a point-of-care device.

FIGURE 8 illustrates one embodiment of a patient prescription history details screen of a point-of-care device.

FIGURE 9 illustrates one embodiment of a patient allergy/miscellaneous medications screen of a point-of-care device.

FIGURE 10 illustrates one embodiment of a patient allergy/miscellaneous medications screen of a point-of-care device, with a popped-up portion of command list.

FIGURE 11 illustrates one embodiment of a patient allergy edit screen of a point-of-care device.

FIGURE 12 illustrates one embodiment of a patient miscellaneous medications edit screen of a point-of-care device.

FIGURE 13 illustrates three drug search screens of one embodiment of a point-of-care device.

FIGURE 14 illustrates one embodiment of an off-formulary warning screen of a point-of-care device.

FIGURE 15 illustrates one embodiment of a coverage warning screen of a point-of-care device.

FIGURE 16 illustrates one embodiment of a drug interaction/allergy/duplication warning screen of a point-of-care device.

FIGURE 17 illustrates one embodiment of a prescription tablet screen of a point-of-care device.

FIGURE 18 illustrates one embodiment of a prescription review screen of a point-of-care device.

FIGURE 19 is a flowchart illustrating an overview of one embodiment of a process using the disclosed system.

FIGURE 20 is a flowchart illustrating one embodiment of a process of conducting medical tests for a patient.

Detailed Description of Preferred Embodiments

The following description and figures describing the preferred embodiment are made to demonstrate one configuration of a system. It is not intended to limit the disclosed concepts to the specified embodiments. A "system," "application," "module" or "device" as used herein may refer to any combination of software, firmware, or hardware used to perform the specified function or functions. A plurality of systems, applications, modules, devices or databases may be combined into a smaller number of units. One system, application, module, device or database may be separated into multiple units. Systems, applications, modules, devices and databases may reside at different physical locations connected through a wired or wireless network including the Internet.

The term "doctor" is used in the application to refer to a physician or other healthcare worker, including an emergency room healthcare worker. The term "drug" or "prescription" not only refers to prescription or over-the-counter medications, but may also refer to therapies or lab tests performed for a patient. The term "synchronizes" refers to the downloading or uploading of data between a PDA and a desktop computer in a preferred embodiment, and also refers to the transmitting, transferring or copying of data between two computing devices. The term "medical products or services" refers to products or services related to a patient's medical profile. For example, a woman's maternity dress or a baby's crib, being related to the woman's pregnancy as a medical condition, may be considered "medical products" in the context of providing marketing offers matched with patient medical profiles.

FIGURE 1 illustrates an overview for one embodiment of the described prescription and medical service management system. For ease of description, the components shown in FIGURE 1 are categorized into three general groups. The first group includes the "industry side" components for industry organizations such as PBM's, health plan providers, and pharmacies, shown on the right side of FIGURE 1. They include an employer database 102, a health plan database 104, and a PBM database 106. A RxChange server 108 and a pharmacy database 110 may also be included.

The second group includes "doctor side" components located in a doctor's office and related to a doctor or medical group's medical practice, shown on the left side of FIGURE 1. In one preferred embodiment, these may include a point-of-care device (such as a PDA) 112, a wireless access point 114, a doctor's desktop computer 116, a printer 118, a physician practice management (PPM) database 120 and a doctor's office network 122. A doctor's office may refer to a clinic for a doctor or a group of doctors, a hospital, a nursing home, or any facility that provides direct medical care to patients.

The third group includes "Internet side" servers 124 and occupies the middle portion of FIGURE 1. A computer network such as the Internet 130 may be used for communicating between the doctor side components and the industry side components. It should be noted that the three groups are categorized for ease of description only. For example, the RxChange server 108 may also be categorized as a web server 124 located among the Internet side components. The health plan database 104, the PBM database 106 and the PPM database 120 may be directly connected to a Internet site and served by web servers 124, and therefore categorized as Internet side components.

Referring to the right portion of FIGURE 1, the employer database 102 includes data about an employer's rules and guidelines, which are negotiated with its health care provider(s) and made known to the employees of the company. These rules may include limitations on coverage such as an annual limit on coverage or a policy excluding certain types of treatment (*e.g.* chiropractic or massage therapy) from coverage at the employer's expense. In addition to storing the rules regarding coverage, the employer database 102 may also include such information as the names of the covered employees, as well as the names of any other individuals covered under the same policy (*e.g.* spouse, children or other live-in dependents), and demographic data (*e.g.*, address, phone number, age, gender) of the covered individuals. Data related to optional coverage available through the employer may also be stored.

The employer database 102 may be maintained directly by the employer itself, or by the health plan provider(s) selected by the employer. In either case, the health plan provider(s) will desirably have access to the information stored in the employer database 102 in order to properly process claims made against the health plan. Although the employer database 102 is shown schematically as independent from the health plan database 104, the data stored in the employer database 102 may be stored within the same repository as the health plan data without altering the nature of the described system.

The health plan provider data is generally stored in the health plan database 104, which is managed by the health plan provider itself, or by a company hired by the health plan provider for the purpose of managing this data. This data includes the health plan provider's rules regarding coverage and exclusions, and data related to the employers that the health plan provider serves. For instance, coverage rules may include a list of the doctors that fall within the plans of the health plan provider and how those doctors are treated (*e.g.* whether the doctor is part of the HMO coverage for the plan, a PPO for the plan, or whether the doctor is covered in some other way), as well as information relating to rules regarding referrals to specialists.

The PBM database 106 includes information related to what coverage the PBM will provide to health plan providers regarding prescription medication. In particular, the PBM data includes the formulary for the particular PBM. The formulary includes a listing of medications and treatments covered by the PBM and the degree to which (*i.e.* what portion of their cost) they are covered by the PBM when filling prescriptions for its member health plans. Although the PBM database 106 is shown schematically as independent from the health plan database 104, the PBM data may be stored within the same repository as the health plan data without altering the nature of the described system. A plurality of employers, health plan providers, and PBMs may combine their respective data into one or more databases. As described below, the health plan database 104 or the PBM database 106 may also store patients' prescription data received from the doctor's offices and prescription filling data received from pharmacies.

The formulary is typically maintained by the PBM. The continuous updating of the covered drugs within the formulary, as well as the continuous updating of the degrees to which these drugs are covered is a time consuming and data intensive task. It is important for the PBM to have this data easily and quickly accessible to doctors who may be prescribing drugs using one of the PBM's member health plans.

The pharmacy database 110 provides information such as drug availability in the pharmacy. In a preferred embodiment, the pharmacy database 110 connects to an inventory and ordering system of the pharmacy to provide the availability of drugs at particular stores. Drug price information may also be included in the pharmacy database 110. In one arrangement, each pharmacy store or pharmacy chain has its own pharmacy database 110. In another arrangement, a plurality of pharmacy chains share a pharmacy database 110 maintained by the RxChange server 108.

As drug availability and price information is of particular use to PBM's who are paying for covered prescription medication, PBM's may desire access to the pharmacy database 110. In particular, the PBM's and the pharmacy database 110 may communicate using existing standards for data exchange between them, such as those defined by the National Council for Prescription Drug Programs (NCPDP). The NCPDP provides a known universal interface for communication with retail pharmacies by PBM's. The industry side systems in FIGURE 1 may be connected in a variety of ways, for example by the Internet, Intranets, virtual private networks, and so forth.

In one embodiment, a RxChange server 108 serves the PBM database 106. The RxChange server 108 may be owned by a PBM and located within a firewall of the PBM. The RxChange server 108 may also serve the PBM databases of a plurality of PBM's. In one embodiment, the RxChange server 108 can also serve the health plan database 104 and optionally the employer database 102. The RxChange server 108 can also handle data communication between the local server 116 and the employer database 102, the health plan database 104, and the PBM database 106. The RxChange server 108 as shown in FIGURE 1 may represent a plurality of connected servers. Although FIGURE 1 displays a RxChange server 108 and three "web servers" 124, it should be understood that one or more RxChange servers 108 or one or more servers 124 can function together or in place of each other.

Referring to the left portion of FIGURE 1, the doctor side components include a local server 116 for processing and storing electronic data. The local server 116 is typically a desktop computer or a plurality of

connected desktop computers. The doctor side components also include one or more point-of-care devices 112, wireless communications access points 114 for connecting the point-of-care devices 112 to the local server 116, a printer 118, a physician practice management (PPM) database 120, and a doctor's office network 122. Although the terms "local server" and "doctor side components" are used for ease of description, it is to be understood that such components can be located away from a doctor's physical office but connected by a network.

The local server 116 stores and manages data regarding patient scheduling, payments, billing, patient records, and such other information for the running of a clinical medical practice. The local server 116 receives health plan data and PBM data from the health plan database 104 and the PBM database 106. The local server 116 may also receive drug availability and price information from the pharmacy database 110.

The point-of-care device 112 may include a personal digital assistant (PDA), portable computer, network appliance, computer terminal, programmable cell phone or other electronic device that the doctor uses as he or she works with patients. The device 112 can be connected to the local server 116 to download or upload data.

In a preferred embodiment, the point-of-care device 112 can be connected wirelessly to the local server 116. For example, the point-of-care device 112 can be equipped with a wireless Ethernet card conforming to the IEEE 802.11 wireless standard. This wireless network card operates to communicate with other 802.11 compliant hardware, which may include other wireless Ethernet adapters or a wireless access point 114.

The wireless access point 114 is connected to the local server 116 via a network connection, and provides a relay function for wireless devices within range of the access point 114 (typically a few hundred feet). Although FIGURE 1 shows only a single wireless access point 114 and a single wireless device 112, it may be desirable in certain circumstances for multiple access points to be used in order that a large area has complete wireless network coverage. In these configurations, a given wireless device is able to "roam" from the coverage zone of one access point 114 to another. Additional access points can be added to the network. Multiple mobile devices 112 can be supported simultaneously by a single access point 114. In another embodiment, the access point 114 is not a wireless access point, but a wired connection, and the point-of-care devices 112 are connected to the local server 116 by wire.

In a preferred embodiment, the point-of-care device 112 is a hand-held computing device such as a PDA. A PDA can be connected to a network, for example, via a wireless Ethernet adapter. Commercially available PDAs include Compaq iPaq, HP Jornada, Vadem Clio, Palm handheld, Handspring Visor, Psion, and so forth. PDAs may operate on a variety of operating systems, including Windows CE, PalmOS, EPOC or others. In a preferred embodiment described herein, the point-of-care device 112 is a Compaq iPaq PDA running Windows CE from Microsoft.

As noted above, tablet computers, laptop computers or other computing devices may also be used in place of a handheld PDA device to access the system. Examples of tablet computers include the Qbe from Aqcess Computers, the 6600 series of computers from Intermec, the Point and Stylistic series of computers from Fujitsu, and others. Any computer that can be connected to a network wirelessly, for example with an 802.11b or

other wireless Ethernet card, may be used as a point-of-care device 112. Computers may operate using any of a variety of operating systems, including Windows CE, Linux, Unix, Windows 2000, Windows XP, BeOS, Windows 98, Windows ME, Apple System 9, Apple OS X, an embedded operating system, and so forth. Any computer that can be connected to a network by wire can also be used as a point-of-care device 112. The point-of-care device 112 may be configured to work with a variety input devices, such as keyboards, keypads, touch pads or touch screens, voice input and others.

It should be noted that although the point-of-care device and other devices are described herein as "connected" and shown as such in FIGURE 1, the operation of the system does not require that all such systems be connected at all times to all other systems. In particular, the point-of-care device may be temporarily disconnected from the network without effecting its operation. Those functions that take place within the point-of-care device as described herein and illustrated in the accompanying FIGURES and do not rely on the actual transmission of data to or from other systems may be performed without an active connection to the network. For instance, because all of the formulary and patient data for any current patients is transferred to the point-of-care device during synchronization, there is no need to contact any other system via the network in order to write a prescription, perform drug interaction or allergy checking, perform formulary alternative processing, or confirm the prescription. Synchronization is described more fully below.

Only those functions which require the transfer of data to or from the point-of-care device require an active network connection. These functions include loading new patient data, updated formulary or pharmaceutical data, or other synchronization processes, as well as transmitting a prescription to the appropriate pharmacy and health plan providers. If these functions are to be attempted while the device is not connected, the operations will be stored in a cache on the point-of-care device, and then processed at the next opportunity that a connection is present to the doctor's office system.

Because most of the databases of information are only changed periodically (*e.g.*, the formulary rules are not generally updated every single day), the synchronization process will only need to transmit new information to the point-of-care device sporadically, rather than continuously. This conserves the available bandwidth between the point-of-care device and the remainder of the doctor's systems, and also allows for the unconnected operation of the point-of-care device. It should also be noted that the point of care device may be connected to the appropriate systems via remote connections such as via a Virtual Private Network (VPN), dialup connection, via the Internet, or any other remote access technique as is known in the art. Because a constant connection is not required, this allows a doctor or other practitioner using the point-of-care device to perform any necessary operations, even when physically remote from his office if the appropriate connection means are available.

A printer 118 may be provided in order to print out prescriptions or other information for a patient or doctor. The printer may be a standard network capable printer that can be connected to either the local server 116 directly, or to the network 122 within the doctor's office. The doctor's office network 122 is desirably a local area network (LAN), but can also be another network such as a virtual private network (VPN) or a wide area

network (WAN). In another embodiment, the components 112, 114, 116, 118 and 120 can also communicate using the Internet directly.

The physician practice management (PPM) database 120 stores data which is made available to the doctors in order to specify the health plan coverage for patients. For each of the patients of the doctor, the PPM data identifies the health plan of the patient and the PBM that provides formulary services for the patient. The PPM data may be downloaded periodically from the health plan database 104 and the PBM database 106. For example, the PPM data may be downloaded daily using a standard protocol such as FTP via the Internet. In one arrangement, after a complete set of data has been downloaded from the health plan database 104 and the PBM database 106, only updates to the PPM data are downloaded daily.

In another embodiment, the doctor side components do not include a PPM database 120 for storing the PPM data. Instead, the doctor uses the local server 116 or the point-of-care device 112 to directly access the information from the health plan database 104 and the PBM database 106.

Referring to the middle portion of FIGURE 1, The components shown in FIGURE 1 include a plurality of servers 124. Also shown in this portion of the diagram is the Internet 130. The Internet 130 is a global network of computers. The structure of the Internet, which is well known to those of ordinary skill in the art, includes a network backbone with networks branching from the backbone. These branches, in turn, have networks branching from them, and so on. Routers move information packets between network levels, and then from network to network, until the packet reaches the neighborhood of its destination. From the destination, the destination network's host directs the information packet to the appropriate terminal, or node.

In one advantageous embodiment, the Internet routing hubs comprise domain name system (DNS) servers, as is well known in the art. DNS is a Transfer Control Protocol/Internet protocol (TCP/IP) service that is called upon to translate domain names to and from Internet Protocol (IP) addresses. The routing hubs connect to one or more other routing hubs via high-speed communication links.

The Internet 130 may be used in the described system to provide communication between any of the computers or components described herein. Access to the Internet can be realized using TCP/IP and a variety of other protocols (such as File Transfer Protocol, Hypertext Transport Protocol, HTTP-Secure, Simple Object Application Protocol, and telnet) and in a variety of formats (such as Hypertext Markup Language and Extended Markup Language). Security may be implemented using a variety of methods, including Secure Socket Layer (SSL) encryption, PGP encryption, firewalls, and others.

The Internet 130 provides a means to connect the various components described herein. For example, the local server 116 can connect to the health plan database 104 and to the PBM database 106 using the Internet. Methods such as VPN tunneling or requiring passwords can be used to provide security. Components can also establish direct network communications. Whenever information is described herein as being sent or copied from one system to another, the information may be passed using any communications medium including the Internet.

The servers 124 send data from the industry side components to the local server 116. Such data include formularies and insurance coverage policies, and drug use recommendations and drug availability. Such data also include periodic updates. The data are sent to the local server 116. In one embodiment, the data can be sent directly to the doctor's point-of-care device 112. The servers 124 also receive data from the local server 116, for example the data associated with the prescriptions which are written by the doctors.

A group of three servers 124 are shown in FIGURE 1, however any number of servers may be used as may be appropriate to the application and the number of doctors and PBM's which are making use of the system. The functions of the servers 124 may be separated in a variety of ways. For instance, the servers 124 can all store identical data and handle requests based upon which machine has the available processing power when the request is received, and then update the data stored on the other machines. Alternately, the servers 124 can each perform separate parts of the server function. For example, one server 124 stores the electronic pharmacopoeia (a collection of prescription writing recommendations such as suggested dosage for each drug), while another handles the storage of prescription transactions, and a third handles the updating and storage of the formularies for various PBM's.

With respect to the communication and storage of data, a patient's transaction data is preferably separated from the patient's identity information, in order to protect the patient's privacy, to guard against security breaches, and to comply with regulations. For example, the local server 116 sends a patient's prescription data to the health plan database 104 or the PBM database 106. The local server 116 also sends data about the patient's visiting session to the health plan database 104 to collect payment for the doctor from the health plan provider. The local server 116 may also send the patient's prescription data to a pharmacy database 110, and the pharmacy database 110 may send data to the health plan database 104 or the PBM database 106 to get reimbursement after the prescription is filled. For each of these communications of transaction data, the patient's name, address and other identity information are preferably excluded from the sent data. The patient is preferably identified by an identification code, such as an insurance number issued by the health plan provider. Many health plan providers issue an insurance card with an insurance number to each of its policy holders.

The patient's name, address and other identity information are preferably stored at secured locations on the local server 116, secured locations in the health plan database 104 and secured locations of other servers or databases, and preferably not combined with the transaction data to form records. Therefore, even if the transaction data communication over the network is compromised, or even if the transaction data stored on the servers or databases are compromised, the patient's identity information is still secure at the secured locations. The patient's identity information can also be stored at a different server or a different database with better security. Security arrangements such as firewalls and others can be used to provide secured locations.

When the patient's identity information is needed, for example when the health plan provider sends a billing statement to the patient, a program retrieves the patient's identity information from its secured location in the health plan database 104, retrieves the patient's transaction data from another location in the database 104, and

produces the billing statement. The patient's identity information and transaction data can be linked by keys, such as the patient's identity code.

Although the servers 124 are shown in FIGURE 1 as Internet side components, some or all of the servers 124 may be located on the industry side. For example, a server 124 may be located within a PBM's firewall to handle the PBM's formulary updates. The servers 124 can analyze data to assist organizations in decision making. For example, the servers 124 analyze the prescriptions written by the doctors to identify the most popular drugs for certain symptoms or diseases, and to identify the most popular drugs that are not on the formulary of a PBM. The PBM's can then update the formulary to better serve the doctors and patients. FIGURE 2 illustrates one embodiment of a login screen 200 of a PDA 112. The login screen 200 includes a pull-down menu 202 that allows the selection of a doctor's office location. Optionally, a location may be entered using the keyboard 216, which automatically appears or accessed by hitting the keyboard icon 214. The doctor name may be selected from a pull-down menu or may be entered using the keyboard 216. In the embodiment shown in FIGURE 2, the password is case sensitive, expires every 120 days, is alphanumeric and must be at least 4 characters. After entering his or her name and password, the doctor hits the "Login" button 218 to proceed to a "Patient Queue" screen of FIGURE 3.

As an alternate means to authenticate a doctor to the PDA, various techniques other than passwords may be used. These may include biometric systems for identifying a doctor based upon such identifying characteristics as fingerprints, handwriting, signature, voice, face or retinal scans.

Still referring FIGURE 2, the Toolbar 204 also includes command icons including the "Doctor" icon 206 (to be described in connection with FIGURE 4), the "Patient" icon 208 (to be described in connection with FIGURE 10), the "<<" icon 210 and the "Logout" icon 212. The "<<" icon 210 may also be referred to as the "back" icon and returns to the last screen that was accessed. The "Logout" icon 212 may be used to log the doctor out and return the point-of-care device 112 to the "Login" screen. This may prevent a new doctor from picking up a device and prescribing medication for a patient under another doctor's name, as well as ensuring that each doctor is presented with his or her own schedule of patients and not the schedule of another doctor.

After the doctor logs in, the point-of-care device 112 searches for patients scheduled to visit the doctor on the present day, and displays the list of patients on the point-of-care device 112. FIGURE 3 illustrates one embodiment of a "Patient Queue" screen 300 of a PDA 112. The screen 300 displays a list of patients who are scheduled to see the doctor. In one embodiment illustrated in FIGURE 3, the patients are displayed in alphabetical order. In another embodiment, the patients are displayed according to their appointment times on the present day.

The list of patient appointments are stored in the local server 116, and copied to the point-of-care device 112 by synchronization. Information for a walk-in patient without appointment is entered in the local server 116 and copied to the point-of-care device 112 by synchronization. In another embodiment, Information for a walk-in patient can also be entered directly in the point-of-care device 112 and then copied to the local server 116 by synchronization.

The patient queue screen 300 also includes a "New Rx" button 302, a "Rx History" button 304, and a "Allergy/Misc" button 306. By highlighting a patient name on the patient list and hitting the "New Rx" button 302, the doctor can proceed to another screen to write a new prescription for the selected patient. In one embodiment, the doctor proceeds to one of the drug search screens of FIGURE 13. In another embodiment, the doctor proceeds to the prescription tablet screen of FIGURE 17.

Referring back to FIGURE 3, by highlighting a patient name on the patient list and hitting the "Rx History" button 304, the doctor proceeds to a prescription history screen (as shown in FIGURE 7) to view the patient's prescription history. By highlighting a patient name on the patient list and hitting the "Allergy/Misc" button 306, the doctor proceeds to an allergy/miscellaneous medications screen (as shown in FIGURE 9) to view the patient's allergies and miscellaneous medications or treatments not prescribed by the present doctor.

Referring back to FIGURE 3, in another embodiment, a "detail" button (not shown) is also provided. Hitting the detail button allows the doctor to proceed to a detail screen with additional patient information, such as patient's weight, height, address, previous billing and payment information, health insurance co-pay amount, medical history, medical test results, family medical history, and so forth. Such information is typically downloaded from the local server 116 during the synchronization process, but can also be entered by the doctor using the point-of-care device 112 upon interviewing the patient.

If a patient has multiple health plans and multiple doctors, each doctor may access all of the patient's medical history, including treatment by the other doctors, and all of the health plan data and PBM data with each health plan. Because the doctor side components have access to the health plan databases 104 and PBM databases 106 for the multiple health plans, data from other doctors is available via the point-of-care device 112.

FIGURE 4 illustrates one embodiment of a patient queue screen 300 with a popped-up portion 402. The portion 402 is displayed on the PDA 112 when the "Doctor" selection 206 is hit. The portion includes a "Select a Printer" command, a "Change a Password" command, a "Settings" command, a "Sync" command, a "Favorites" command, and a "Patient Queue" command. When one of the commands is selected, the PDA 112 navigates to a particular screen. For example, when the "Favorites" command is selected, the PDA 112 navigates to a favorites management screen of FIGURE 5. When the "Settings" command is selected, the PDA 112 navigates to settings screen of FIGURE 6.

In some embodiments, when a command is selected, the PDA 112 does not navigate to a separate screen. For example, in one embodiment, when the "Sync" command is selected, the PDA 112 performs synchronization without entering a separate screen. In one embodiment, when the "Select a Printer" command is selected, another portion is popped up on the current screen, prompting the doctor to select from a list of printers.

In one embodiment, with the exception of "Select a Printer" and "Sync", the selection of any of the other commands will cause the doctor to lose all patient data that has been entered for any case currently open. Therefore, a warning preferably appears in the following form: "Leaving patient - uncompleted/unsent prescriptions will be abandoned." The doctor may then choose "OK" or "Cancel" as desired.

The "Sync" command activates the PDA's synchronization process with the local server 116. Synchronization is used to retrieve the daily patient schedule and corresponding prescribing history for the day's scheduled patients. This task is preferably automatically performed when a doctor logs in. A typical synchronization process may take several minutes. In one embodiment, the PDA 112 automatically synchronizes with the local server 116 every time a prescription is submitted or printed in order to capture any changes to the day's schedule, for example the adding or removing of scheduled patient visits.

FIGURE 5 illustrates one embodiment of a "Favorites Management" screen 500. Some doctors have favorite medications or treatments that they prescribe for certain situations. To facilitate the management of favorite prescriptions, the system allows the doctor to create and to use a list of "Favorites". The favorites are typically drugs which the doctor prescribes with high frequency, are effective, useful or affordable, or have any quality which the doctor deems appropriate for a "Favorite" drug. A "Favorite" drug need not be a drug that the doctor is personally fond of. It can simply be a drug that has been frequently prescribed by the doctor. In another embodiment, a "Favorite" drug can be a drug that the doctor's medical practice office or group considers appropriate or prescribes with high frequency. A doctor may also have access to multiple favorite lists, for example a favorite list of cold medicines, a favorite list of heart medicines, a favorite list of another doctor in the medical practice office or group, and so forth.

As shown in FIGURE 5, a doctor can use the "Add" button 502 to add a favorite prescription. A doctor can also highlight a prescription in the favorite prescriptions list 508, and then use the "Edit" button 504 or the "Delete" button 506 to edit or delete a favorite prescription. When the "Edit" button 504 is selected, the doctor can edit the specifics of a favorite prescription, such as its dosage strength, drug alias, and so forth.

In one embodiment, the doctor double-clicks a favorite prescription in the list 508 to select the prescription. In another embodiment, the screen 500 includes an additional "select" button. The doctor can hit the "select" button to select a favorite prescription. In yet another embodiment, the screen 500 includes a "submit" button. The doctor can hit the "submit" button to submit a favorite prescription to the local server 116 as a completed prescription for the patient.

After a favorite prescription is selected, the point-of-care device 112 navigates to the screen shown in FIGURE 17, where the doctor may edit the prescription. In another embodiment, after a favorite prescription is selected, the point-of-care device 112 navigates to the screen shown in FIGURE 18.

In one embodiment, a prescription can include a package of drugs or treatments. For example, a favorite prescription for congestive heart failure may consist of furosemide, digoxin, and captopril. A prescription as described below in connection with FIGURE 13 and FIGURE 17 may be a package of medications or treatments.

FIGURE 6 illustrates one embodiment of a "Settings" screen 600. The settings screen 600 enables the doctor to customize the PDA application with respect to selected functions to suit the doctor's preferences. A checkmark signifies that the specific function is activated and will apply during use. The settings should be selected prior to or after a prescribing session.

One of the editable settings is "Enable Drug Warnings". When activated, the point-of-care device 112 presents a warning message when the doctor selects a drug that is likely to cause drug-to-drug interactions for the patient, drug/allergy interactions, or is a duplicate therapy. In one embodiment, this setting is set to an enabled default value to present warnings. In one embodiment, in order to always present warnings, this setting is always set to enabled and cannot be turned off by a doctor.

When the doctor selects a drug, the point-of-care device 112 checks the selection against other drugs of the current prescription, drugs in prescription history and recently taken by the patient, and miscellaneous medications recently taken by the patient. The point-of-care device 112 checks the prescriptions against a stored collection of undesirable drug-to-drug interactions.

The point-of-care device 112 presents a warning to the doctor when the doctor selects a drug that may cause undesirable interactions with another drug currently prescribed to the patient, currently taken by the patient as miscellaneous medication, or in the prescription history of the patient and recently taken by the patient. The drug interaction warnings may also include an analysis of the patient's family history. For example, if a certain drug is not suggested for those with high risk of stroke, and a patient has a family history of stroke, then a warning may be presented to the doctor. The drug interaction warnings may also include an analysis of a patient's living habits, such as whether the patient smokes, drinks, or eats a certain type of diet.

Many drugs have very similar effects as one another, and may result in duplicate therapy if both are taken simultaneously. For example, prescriptions of amoxicillin and penicillin are both used for general antibiotic purposes. The point-of-care device presents a warning to the doctor when the doctor selects a drug that may cause duplication with another drug that is currently prescribed to the patient, currently taken by the patient as miscellaneous medication, or is in the prescription history of the patient and has been recently taken by the patient. Thus, when choosing a drug, the doctor will be forewarned and may alter the prescription based on the warning.

When the doctor selects a drug, the point-of-care device 112 also checks the allergies listed for the patient against a stored collection of drug-allergy interactions, and presents a warning to the doctor when the drug may trigger an allergy of the patient.

When the setting "Enable Suggested RxTablet Choices" is selected, the point-of-care device 112 activates an automatic filtering of the prescription writing choices, to be described below in connection with FIGURE 17. When the automatic filing setting is disabled, all of the prescription writing choices are made available to the doctor without filtering.

FIGURE 7 is one embodiment of a "Rx History" screen 700. The upper portion 702 displays prescriptions for the displayed patient that have been prescribed within a time period, for example within the last 6 months. The upper portion 702 also includes a "Details" button 706 and a "Renew" button 708. By highlighting a displayed prescription and hitting the details button 706, the doctor can view details of the prescription. By highlighting a displayed prescription and hitting the renew button 708, the doctor can quickly renew the prescription.

In a preferred embodiment, the displayed prescriptions in the upper portion 702 of FIGURE 7 include previous prescriptions written by other doctors of the patient. In another embodiment, the previous prescriptions written by the other doctors are displayed in the lower portion 704 as miscellaneous medications. The previous prescriptions of other doctors have been downloaded to the local server 116 from the health plan database 104 and the PBM database 106. If the prescription data of other doctors are not available from the health plan database 104 and the PBM database 106, they can be entered manually on the local server 116 or on the point-of-care device 112.

Because of legal regulations and privacy reasons, previous prescriptions of AIDS-related medications and specialized alcohol and substance abuse drugs are preferably not displayed unless the particular doctor has prescribed the drug to this patient. However drug interaction, allergy and duplication checking may still be performed. This technique may be extended to other privacy-sensitive treatment, such as anti-depression medication or treatment for mental illness.

The lower portion 702 displays miscellaneous medications taken by the patient within a time period. Miscellaneous medications may refer to over-the-counter drugs or herbal supplements the patient has reported taking. In one embodiment, miscellaneous medications may also include prescriptions written by other doctors of the patient. The lower portion 704 also includes a "Details" button 710 and a "Renew" button 712. By highlighting a displayed medication and hitting the "Details" button 710, the doctor can view details of the medication. By highlighting a displayed medication and hitting the "Renew" button 712, the doctor can renew the purchase order or prescription.

When the doctor hits the "Details" button 706 of FIGURE 7, a prescription history details screen 800 as shown in FIGURE 8 is displayed. This is a read only screen and cannot be edited. The prescription may also be renewed from this screen by hitting the "Renew" button. The point-of-care device 112 then navigates to the "Rx Tablet" screen of FIGURE 17.

FIGURE 9 illustrates the "Allergy/Misc. Meds" screen 900 which can be used for adding, deleting, and editing allergies or miscellaneous medications. The screen 900 includes an upper portion 902 listing the allergies of the patient and a lower portion 904 listing the miscellaneous medications or treatments of the patient.

The allergies listed in FIGURE 9 may include reactions to medications which are not typically classified as "allergies". For example, stomach upset or other side effects may be listed as allergies. The upper portion 902 "Allergy/Misc. Meds" displays all allergies or other reactions including those to medications, foods, insects, animals, plants, perfumes, latex, wool, nutraceuticals, and herbs for the chosen patient.

The screen 900 also allows the doctor to add, edit or delete allergies or miscellaneous medications of the patient using the respective buttons in the upper portion 902 and the lower portion 904. Such information can also be obtained and entered by a nurse. For example, prior to the doctor's session with the patient, a nurse may interview the patient or review a questionnaire filled out by the patient, and enter the patient's allergies or miscellaneous medications using the local server 116 or another point-of-care device 112.

FIGURE 10 illustrates one embodiment of a patient allergy/miscellaneous medications screen 900, with a popped-up portion of command list. When the doctor selects the patient command 208, a command list pops up on

the screen 900. The command list includes a "History" command, an "Allergy/Misc" command, a "New Rx" command, and a "Review Rx" command.

When the "History" command is selected, the PDA 112 proceeds to the screen of FIGURE 7 to display the prescription history of the patient. When the "Allergy/Misc" command is selected, the PDA 112 proceeds to the screen of FIGURE 9 to display the allergies and miscellaneous medications of the patient. When the "New Rx" command is selected, the PDA 112 proceeds to one of the screens of FIGURE 13 or the screen of FIGURE 17 to allow the doctor to write a new prescription for the patient. When the "Review Rx" command is selected, the PDA 112 proceeds to the screen of FIGURE 18 to display the prescriptions that the doctor has written for the patient in the present session.

FIGURE 11 illustrates one embodiment of a patient allergy edit screen 1100 of a point-of-care device. When the "Edit" button in the upper portion 902 of FIGURE 9 is selected, the PDA 112 proceeds to the screen 1100 to edit an allergy of the patient. As shown in FIGURE 11, the doctor can edit the name or comments of the allergy.

FIGURE 12 illustrates one embodiment of a patient miscellaneous medications edit screen 1200 of a point-of-care device. When the "Edit" button in the lower portion 904 of FIGURE 9 is selected, the PDA 112 proceeds to the screen 1200 to edit a miscellaneous medication of the patient. As shown in FIGURE 12, the doctor can edit the name or comments of the miscellaneous medication or treatment.

FIGURE 13 illustrates three drug search screens of one embodiment of a point-of-care device. The screen 1300 displays a list of drugs searched by name. The screen 1310 displays a list of drugs searched by therapeutic category. The screen 1320 displays a list of drugs searched by favorites. For each of the displayed drugs, the screens 1300, 1310 and 1320 may also display other information, such as whether the drug is a generic or brand name drug, whether the drug is in the formulary of the patient's PBM, whether the drug is recently added to or removed from the formulary, whether the drug is covered by the patient's health plan, whether the drug is a newly available drug, and so forth.

FIGURE 14 illustrates one embodiment of an off-formulary warning screen 1400. When the doctor identifies a drug from one of the screens of FIGURE 13 or from the screen of FIGURE 17, the PDA 112 checks whether the drug is in the formulary of the PBM of the patient. If it is not within the formulary, then the PDA 112 finds the alternative drugs that are within the formulary, and presents a warning message and the alternative drugs to the doctor in screen 1400. In one embodiment, the PDA 112 selects as alternative drugs all drugs within the formulary that are within the same category as identified drug, for example within the same category as treating digestive heart failure. This screen may also indicate the cost to the patient of the drug and the cost of its alternatives. In this way the doctor and the patient can make an informed decision about which drug to use.

The doctor can use the "Keep" button to keep the off-formulary drug as the prescription. To change to a formulary alternative in the list, the doctor highlights an alternative drug in the alternative list of screen 1400, and selects the "Change" button to change the prescription to the highlighted alternative. The doctor can also use the back selection 210 to return to the previous screen in FIGURE 13 or FIGURE 17 to identify another drug.

FIGURE 15 illustrates one embodiment of a coverage warning screen 1500. When the doctor identifies a drug from one of the screens of FIGURE 13 or from the screen of FIGURE 17, the PDA 112 checks whether the drug is a covered pharmacy benefit for the patient's health plan and PBM. If the drug is not a covered pharmacy benefit, then the PDA 112 displays a warning message to the doctor. For example, as shown in FIGURE 15, although RETIN-A may be permitted by the health plan if used for medical purposes, it is not a covered pharmacy benefit for cosmetic purposes. The doctor selects the "Keep" button to keep the prescription or selects the "Change" button to go back to the previous screen. The warning screen 1500 can be a separate screen as shown in FIGURE 15. It can also be a warning window displayed on one of the screens 1300, 1310, 1320 or 1700.

In one embodiment, when the doctor identifies a medication or treatment that requires prior authorization by the patient's health plan provider, for example, a drug that is off-formulary or is not a covered pharmacy benefit, the point-of-care device 112 warns the doctor that prior authorization is required. The point-of-care device 112 prompts the doctor to indicate whether to keep the drug as part of a prescription for the patient. In one arrangement, the point-of-care device 112 prompts the doctor to enter one or more authorization reasons or select from a list of authorization reasons.

After the doctor submits the drug as part of a prescription and synchronizes the point-of-care device 112 with the local server 116, the local server 116 prints out a prior authorization form on the printer 118. The prior authorization form may include the authorization reasons entered or selected by the doctor. The patient sends the printed prior authorization form to the health plan provider. In another arrangement, the local server 116 directly sends a prior authorization to the health plan database 104 for authorization.

FIGURE 16 illustrates one embodiment of a drug interaction/allergy/duplication warning screen 1600. When the doctor identifies a drug from one of the screens of FIGURE 13 or from the screen of FIGURE 17, the PDA 112 checks whether the drug may cause drug-to-drug interactions with other prescriptions or miscellaneous medication for the patient, whether the drug may cause drug/allergy interactions with allergies of the patient, and whether the drug may cause duplication with other prescriptions or miscellaneous medication for the patient.

If the PDA 112 finds any interaction or duplication, the PDA 112 displays a warning to the doctor in screen 1600. The doctor selects the "Keep" button to keep the prescription or selects the "Change" button to go back to the previous screen.

FIGURE 17 illustrates one embodiment of a prescription tablet screen 1700. This screen allows the doctor to write a prescription. Some of the fields of a prescription, such as its strength, action, dosage amount, and so forth, may be populated with a drug manufacturer's recommendations as default values. A doctor can then edit these fields to change the values.

In one embodiment, the doctor may select one of the following values for the dispense method field 1702: "Mail," "Starter," "Print Rx," and "Record Only." The doctor selects the "Mail" method when the prescription is to be filed by a mail service pharmacy. An email, electronic record or fax of the prescription is then sent to the mail service pharmacy from the point-of-care device 112 or from the local server 116 synchronized with the point-of-care device

112. The doctor selects the "Starter" method when the patient is to purchase a retail "starter" portion of the prescription with a retail quantity 1704 and to fill the mail portion with a mail order pharmacy. The doctor selects the "Print Rx" method to print out the prescription for the patient to physically take to or mail to a pharmacy. The doctor selects the "Record only" method to print out a chart copy only.

If the "Suggested Rx Table Choices" setting is enabled, then the point-of-care device 112 filters the selection choices for a given prescription field in screen 1700 to those recommended by the pharmacopoeia. For example, for a drug that is typically only taken orally, the point-of-care device 112 automatically filters choices to those recommended by the pharmacopoeia so that only the choice "orally" can be selected. If the automatic filtering setting is disabled, then the point-of-care device 112 presents all of the choices to the doctor. This may be of use when a drug is being prescribed for a non-typical reason or disease or if the patient is non-typical in any way. In another embodiment, the point-of-care device 112 makes available all the choices to the doctor, with the recommended (i.e., typical) choices displayed in highlight.

FIGURE 18 illustrates one embodiment of a prescription review screen 1800. The "Review Rx" screen 1800 allows the doctor to verify the list of prescriptions he or she has written for the patient in the current session. The doctor can use the "Add," "Edit" and "Delete" buttons to add, edit or delete a prescription in the prescription list. When the doctor confirms that the prescriptions are correct and complete, the doctor hits the "Submit" button to submit the prescriptions. The point-of-care device 112 synchronizes with the local server 116 at this time or at the end of the day to send the prescription submission to the local server 116. Paper copies such as a retail copy, a mail receipt and a chart copy may be printed on the printer 118. The point-of-care device 112 then navigates to the "Patient Queue" screen 300 of FIGURE 3 so that the doctor can review information and write prescriptions for the next patient.

FIGURE 19 is a flowchart illustrating an overview of one embodiment of a process using the disclosed system. Referring to FIGURE 19, the process starts at a start block 1902 and proceeds to a block 1904, where the local server 116 receives patient information such as patient's demographic data, symptoms and medical history. The patient information may be received from the employer database 102, the health plan database 104, the PBM database 106, the PPM database 120, or manually entered into the local server 116 by an office clerk, nurse, doctor or the patient.

From the block 1904, the process proceeds to a block 1906, where a doctor logs into a point-of-care device 112 connected by wire or wirelessly to the local server 116. The process proceeds to a block 1908, where the point-of-care device 112 synchronizes with the local server 116 to receive data from the local server 116. The point-of-care device 112 receives data such as a list of the current day's patients scheduled to visit the doctor, and their respective patient information. The point-of-care device 112 may also receive other information, such as drug price updates, health plan rule changes, and changes to drug interaction, allergy and duplication warning rules.

Still referring to FIGURE 19, the process proceeds to a block 1910, where the doctor reviews the patient queue displayed on the point-of-care device 112, and selects the visiting patient. The process proceeds to a block

1912, where the doctor reviews the patient's information on the point-of-care device 112. The doctor may also question the patient and enter additional patient information on the point-of-care device 112. The process proceeds to a block 1914, where the doctor enters a prescription for the patient.

The process proceeds from the block 1914 to a block 1916, where the point-of-care device 112 determines whether the selected prescription is within the formulary of the health plan of the patient. If the prescription is off formulary, the point-of-care device 112 displays a warning to the doctor, and permits the doctor to change to another prescription. The point-of-care device 112 also determines whether the prescription is a benefit covered by the patient's health plan. If not, the point-of-care device 112 displays a warning to the doctor, and permits the doctor to change to another prescription.

The process proceeds to a block 1918, where the point-of-care device 112 determines whether the selected prescription may cause drug interactions, allergies or duplications. If such a risk is detected, the point-of-care device 112 displays a warning to the doctor, and permits the doctor to change to another prescription.

Still referring to FIGURE 19, the process proceeds from the block 1918 to a block 1920, where the doctor completes writing prescriptions for the patient and submits the prescriptions as final results to the point-of-care device 112. The process proceeds to a block 1922, where the point-of-care device 112 synchronizes with the local server 116 and uploads the prescriptions to the local server 116. The local server 116 also receives from the point-of-care device 112 the additional patient information entered by the doctor.

The process proceeds to a block 1924, where the local server 116 prints the received prescriptions on a printer, so that the patient can take the prescriptions to a pharmacy. In another embodiment, the local server 116 sends the prescriptions to a mail order pharmacy. In yet another embodiment, the local server 116 sends the prescriptions electronically to a pharmacy, so that the pharmacy fills the prescription and waits for the patient to pick up the drugs. The local server 116 may also update a favorite prescriptions list of the doctor.

Unlike more traditional prescription writing and delivery systems, all of the appropriate formulary, PBM and allergy / interaction checking is performed locally to the point-of-care device itself. This produces a prescription which is much less likely to require a follow-up call or other confirmation on the part of the pharmacist or other pharmacy representative. By producing a prescription which is less likely to require any additional confirmation or instruction, the role of the pharmacist is simplified, and the number of confirming calls to a doctor's office may be reduced significantly.

This may be particularly advantageous when dealing with a pharmacy with which the patient may never have conducted business in the past. For instance, if a patient is travelling or otherwise away from their normal health care provider, but is being treated by a doctor covered under the patient's health plan, it is now possible for the doctor to perform all of the appropriate formulary, coverage and interaction checking such that the pharmacist need not. Because the local pharmacist may not have access to the complete history of the patient, this allows the prescription to be filled with a higher degree of confidence, even though the local pharmacist may never have met the patient before, or have any access to the medical history of the patient directly. The appropriate access was provided

at the doctor's office through the point-of-care device, thereby protecting the patient without increasing the workload on the pharmacy required to handle a one-time or non-local patient.

This technique is also of benefit for mail-order prescription filling. Because such a large fraction of dispensed prescriptions are for chronic medication, it is often possible to predict well in advance when a given prescription will be needed, and the appropriate order filled and shipped via mail order. This simplifies refilling for the patient and the pharmacy. However, taking and confirming mail order prescriptions is often complicated by the fact that mail order pharmacies may not be local to the particular patient or doctor, and may not have direct access to the appropriate databases needed to efficiently carry out the interaction and formulary checking processes described herein. However, if these processes are handled by the doctor via the point-of-care device, the number of confirmations and the amount of data access required by the mail order pharmacy are reduced, resulting in a more streamlined process. This not only simplifies the process for the parties involved, but makes mail order dispensing of medications a much more effective alternative.

As an additional service to the patient, the local server 116 searches the one or more pharmacy databases 110 to find the pharmacy chains or pharmacy stores that have the patient's prescribed drugs in inventory, and then prints out the pharmacy list to the patient. In one arrangement, the local server 116 finds the pharmacy stores located near the patient's address, and prints out the list to the patient. In another arrangement, the local server 116 prints out to the patient a list of favorite pharmacies. The favorite pharmacies can be the pharmacies most highly rated by patients in surveys, the pharmacies most frequently used by patients for prescriptions, and pharmacies that are selected using other factors. In yet another arrangement, based on the patient's claim history data, the local server 116 prints out to the patient a list of pharmacies most recently used by the patient.

Any of the above-described arrangements can be combined to produce a pharmacy list. For example, the local server 116 can produce a list of pharmacy stores that have the patient's prescribed drugs in inventory and are near the patient's address. The pharmacies on the list can be sorted by their listed prices for the patient's prescribed drugs.

In one embodiment, the local server 116 displays the pharmacy list to the patient and prompts the patient to select one of the pharmacies from the list. The patient may also select another pharmacy not on the list. The patient selects the pharmacy using the local server 116 directly or through a nurse operating the local server 116. The local server 116 then sends the patient's prescription request electronically to the selected pharmacy.

The process proceeds to a block 1926, where the local server 116 selects and prints any applicable coupons for the patient. In one embodiment, the local server 116 is connected to a coupon database via the doctor's office network 122, an Intranet or the Internet. The coupon database stores records of coupons, with each coupon associated with one or more medical conditions or prescriptions. For example, a coupon for a maternity store may be associated with an amniocentesis test in the coupon database, and a coupon for a new medication for lowering the blood glucose in patients with type II diabetes may be associated with a prescription for Glucophage. A marketing

agency, such as an association for retail stores or the marketing department of a sales organization, is typically responsible for updating the coupon records in the coupon database.

Coupons are typically discounts on purchases of products or services, but can also be advertisements for products, services or clinical studies. A coupon for a clinical study may include a printed enrollment number to facilitate the patient's enrollment. The local server 116 searches the coupon database for coupons associated with the patient's prescriptions or medical conditions. For example, if the prescriptions for the patient includes performing an amniocentesis, then the local server 116 finds and prints out coupons for a maternity store to present to the patient. In one embodiment, the local server 116 also performs a drug interaction/allergy/duplication check, to ensure that the coupons are not for drugs that will cause interaction or duplication with the prescriptions.

Such "permission based marketing" allows the patient to take advantage of offers which are based upon his or her medical condition, but does not require disclosure of the patient's information to third party marketing agencies. This protects the confidentiality of the patient while still providing a potential benefit to both patient and the organizations marketing their goods or services. From the block 1926, the process then proceeds to an end block 1928.

Although the process as described above and shown in FIGURE 19 is considered in a linear fashion, it will be apparent to those of skill in the art that the outcome of certain blocks in the process will lead to repeating other steps, or even jumping out of the flow entirely. For example, if in block 1916, any off-formulary warnings are found, the sequence described above and shown in FIGURES 14 and 15 will be followed before proceeding. Similarly, if a drug-drug interaction is found in block 1918, the appropriate process described above will be followed. The results of such operations may result in the doctor jumping back to an earlier portion of the illustrated flow (*e.g.*, selecting a new prescription for the patient by returning to block 1914), or taking appropriate actions such that the process may move forward to the step of submitting the prescription (block 1920):

Similarly, as described herein, once the prescription is submitted and the patient receives his receipt, the order may be sent out as described above in a manner appropriate to the dispensing technique selected on the point-of-care device. For example, if a mail-order prescription has been selected by the doctor in block 1914, the appropriate order and notification is sent to the mail order company and the prescription is filled and sent. If circumstances where the prescription is being filled by a local pharmacy and there is a co-payment or other transaction which must take place locally, these processes can be handled as is known in the art.

In particular, it should be noted that the system described herein can be used even in circumstances in which the patient may not be a member of any health plan or other coverage accepted by the particular doctor or health-care practitioner. In such cases, an ordinary payment via cash or other up-front payment may be made, and the remainder of the operation of the system may proceed accordingly. Since there may be no particular formulary or other coverage associated with this particular patient, the operation of certain functions will be altered, however, the majority of the functions, such as drug interactions, allergies, and pharmacy choice may all be carried out in the same manner as described above.

The disclosed system can also improve the communication between doctors and test facilities, and reduce the redundant data entry at test facilities. FIGURE 20 is a flowchart illustrating one embodiment of a process of conducting medical tests for a patient. As shown in FIGURE 20, a start block 2002 proceeds to a block 2004, where the doctor determines that a medical test is needed, and enters testing instructions on a point-of-care device 112. Some tests may be taken at the doctor's office by the doctor or a nurse. Other tests may be taken at a remote location such as a hospital radiology department or a medical laboratory. Where the patient needs to go to the test facility for the test, a paper copy of a tracking label with a test tracking number may be printed, so that the patient can take the copy to the test facility for identification purpose. The doctor enters on the point-of-care device 112 testing instructions to be read by the test facility or by the nurse. The doctor may also enter instructions on the point-of-care device 112 for the patient, such as "do not eat for 12 hours prior to the test" or "avoid operating heavy machinery or driving a vehicle for 3 hours after the test," and print out a paper copy for the patient.

If the test requires the doctor to take a test sample of the patient, then the process proceeds to an optional block 2006, when the doctor takes a test sample of the patient. The process then proceeds from the block 2006 to a block 2008. If the test does not require the doctor to take a sample, the doctor may simply direct the patient to go to a test facility such as a hospital radiology department for the test. The process then proceeds from the block 2004 to the block 2008.

At the block 2008, the doctor synchronizes the point-of-care device 112 with the local server 116. As a result the testing instructions entered by the doctor is loaded to the local server 116. Additional information, such as the patient's name, the doctor's name, the name of the medical test facility and billing data may accompany the testing instructions. The process proceeds to a block 2010, where the local server 116 sends the testing instructions to the test facility. If the doctor has taken a test sample of the patient, then the process proceeds to an optional block 2012, where the test sample is sent from the doctor's office to the test facility. The process then proceeds from the block 2012 to a block 2014. Otherwise the process proceeds from the block 2010 to the block 2014.

Still referring to FIGURE 20, at the block 2014, the test facility conducts the medical test according to received testing instructions. If a test sample is received, then the test facility conducts the test on the test sample. In one embodiment, the test facility also receives patient payment information from the local server 116. The test facility may receive the patient's insurance information from the local server 116, from the health plan database 104 or from the PBM database 106.

The process proceeds to a block 2016, where the test facility sends the test results to the local server 116. If the test results indicate a serious condition requiring immediate attention, the test facility sends a warning message regarding the test to the local server 116. In one embodiment, the warning message is displayed when a user logs into the local server 116. In another embodiment, the warning message is displayed when the doctor who ordered the test logs into a point-of-care device 112 and synchronizes with the local server 116. In yet another embodiment, the

warning message is sent via email to the patient, the doctor, or other health care workers. The process proceeds from the block 2016 to an end block 2018.

The disclosed system also allows the doctor to refer the patient to another doctor such as a specialist, and allows for the easy sharing of patient information among the doctors. For example, during an office visit with a patient, the doctor selects a specialist from a list of specialists on the point-of-care device 112. The doctor then synchronizes the point-of-care device 112 with the local server 116. The local server 116 sends a referral notice to the specialist, informing the specialist that the patient has been referred. The local server 116 may also send the patient information to the specialist, such as the patient's identification code, medical history, symptoms, current prescriptions, billing information, and so forth. In a preferred embodiment, the specialist's office also includes a local server and a point-of-care device, and the specialist's local server receives the referral notice and optionally the patient information from the local server 116 of the referring doctor.

Noncompliance with prescription is a common problem that causes poorer health and increased pain for patients. Noncompliance may be caused by purposeful actions such as fraud, or caused by human error or failed memory. Additional embodiments of the disclosed system allow for the verification that a patient is timely filling and refilling a prescription, allowing the physician, the health plan provider or the PBM to verify compliance.

For example, when a patient fills or refills a prescription at a pharmacy, the information is entered into the pharmacy database 110. A server 124 compares this information with the prescription of the patient. If the prescription is not filled or refilled at the appropriate time, for example if a prescription for 30 days has not be refilled after 40 days, or a prescription for 30 days has been refilled after 5 days, the server 124 sends a warning message to the local server 116. The doctor's office may contact the patient to remind the patient to refill prescriptions. The doctor who wrote the prescription may receive a warning message when he or she logs into the point-of-care device 112 and synchronizes with the local server 116.

The doctor, health plan provider or pharmacy can also send reminders to the patient. For example, when a doctor submits a prescription using the point-of-care device 112, the doctor selects a "daily telephone reminder" choice for the prescription using the point-of-care device 112. After the point-of-care device 112 is synchronized with the local server 116, the local server 116 automatically calls the patient every day reminding the patient to take the prescription. The local server 116 can also send an email or a fax to the patient, or prompt a nurse to contact the patient. The local server 116 can maintain a record of attempts to remind the patient. The local server 116 can also send periodic reminders to the patient to refill the prescription. Using the patient prescription data stored in the pharmacy database 110 or the health plan database 104, a pharmacy or a health plan provider can also send the reminders.

The disclosed system also allows for factoring the revenue stream associated with a particular doctor or office. A health plan provider can link the salary and payment information for its doctors to the patient visit records that are generated through the use of the point-of-care devices and local servers. For instance, using the data

generated with the point-of-care devices and local servers, a health plan provider can identify how many patients visited a doctor over a time period.

The patient visit data can be used by the health plan provider to verify whether the appropriate quotas were being met by the doctors, and payments to the doctor's office can be made accordingly to the payment arrangements between the health plan provider and the doctor's office. Because the patient visit data is tracked automatically and readily available, the doctor can opt to defer payment for particular work until a later time in exchange for consideration, such as interest, from the health plan provider.

For instance, if the normal arrangement between a doctor's office and a health plan provider is to receive a fixed fee per patient visit completed, the number of patient visits can be collected from the point-of-care devices 112 and the local server 116 in the doctor's office. If the health plan provider is willing to pay a premium at a later time to delay the making of a payment, the provider can offer the doctor a bonus in exchange for the delay. In one embodiment, during a session with a patient, a doctor can select on his or her point-of-care device 112 whether to either accrue the receivable immediately at one rate, or to accrue it at a later date at a higher per visit rate. In another embodiment, a doctor or administrator selects on the local server 116 whether to accrue the receivable for patients immediately or at a later time.

Multiple rates for various deferment schedules may be established. This can be of especial benefit to a doctor who has a particularly busy month, for example. After the doctor's office has reached a certain revenue goal for the month, the doctor may choose to defer the receipt of payment for any remaining patients seen during the month, in order to receive the payments plus bonus payments at a later time.

The health plan provider meanwhile gains the opportunity to reduce its payable in a particular month, and may then use that money to cover its own expenses in advance. By using such a system, the receivable schedule of individual doctor's offices may be tailored in real time to the needs of each office, while providing a benefit to the health plan provider of increased use of its financial reserves.

The various embodiments of the medical service and prescription management system described above thus provide a means to provide more efficient preparation and selection of prescriptions by a doctor, as well as means to collect and analyze information. By using this data to estimate the level of use of various formulary medications, as well as to simplify data entry, the system may allow for more cost effective service to patients, as well as better feedback to pharmaceutical companies and other medical industry organizations. The system also allows for the promotion of products and services to the patients who are likely to need such products and services. It also allows healthcare providers and doctors to negotiate flexible payment arrangements. It allows automated test instructions preparation and communication to test facilities.

Of course, it is to be understood that not necessarily all such objects or advantages may be achieved in accordance with any particular embodiment described herein. Thus, certain embodiments may be configured to operate in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objects or advantages as taught herein.

Although systems and methods have been disclosed in the context of certain preferred embodiments and examples, this invention may be embodied in other specific forms without departing from the essential characteristics as described herein. The embodiments described above are to be considered in all respects as illustrative only and not restrictive in any manner. The scope of the invention is indicated by the following claims and their equivalents.

Appendixes A, B, and C are included as part of the present application.

APPENDIX A

FIRST PROVISIONAL APPLICATION TITLED

“POINT OF CARE CLINICAL AND
ADMINISTRATIVE MANAGEMENT SYSTEM”

POINT OF CARE CLINICAL AND
ADMINISTRATIVE MANAGEMENT SYSTEM

Field of the Invention

The present invention relates generally to a healthcare management tool and, more particularly, to a portable point of care clinical and administrative management system for use by healthcare practitioners.

Background of the Invention

Traditionally, a healthcare practitioner's point of care service includes a medical examination, after which, based on the information gathered during the examination, the physician makes a diagnosis and prescribes a course of therapy. A disadvantage of traditional point of care systems is that the information available to the healthcare practitioner may be incomplete or inaccurate. For example, for an accurate diagnosis and treatment, the practitioner will need to know the patient's complete medical history, including present and past prescription therapies. Usually, the practitioner obtains information from either the patient's medical file or by interviewing the patient. However, if the patient has seen more than one doctor, the records may not be consolidated, and the particular file available to the practitioner may be incomplete. Reliance on a patient interview may also result in incomplete or inaccurate medical history as the patient may forget or otherwise fail to inform the practitioner of information relevant to diagnosis and treatment.

Accordingly, it is desirable to provide a convenient and fast method of providing a practitioner with the patient's

medical and prescription history including the patient's current medications and available refills.

To make a diagnosis and choose a course of treatment, the practitioner usually relies on his or her personal knowledge, memory and experience to identify an ailment and provide a course of therapy. If the practitioner needs to conduct additional research, the practitioner usually returns to his or her office to consult the Physician's Desk Reference or other reference materials, leaving the patient to wait. To provide an accurate diagnosis in a time-efficient manner, it is desirable to provide the practitioner with immediate access to reference materials at the point of care that can be used in diagnosing and treating patients.

Another problem with the traditional point of care systems is that sometimes the practitioner's prescribed medication is not in compliance with the patient's health plan formulary. If this occurs, the pharmacy or the pharmacy benefit management service providers contact the patient or the practitioner to inform them of the problem. Thereafter, the practitioner usually alters the prescription to a drug that is an approved formulary. This problem is exacerbated by frequent changes in health plan coverages requiring the practitioner to continuously rewrite prescriptions.

It would be desirable to provide the practitioner with an administrative management tool that would inform the practitioner of the health plan formulary requirements at the point of care to enable the practitioner to prescribe the appropriate drug that is approved by the patient's health plan.

Summary of the Preferred Embodiments

A comprehensive point of care clinical and administrative management system is disclosed involving computers, personal digital assistants, wireless networking and voice recognition

technology to permit healthcare providers to manage, both from a clinical and an administrative standpoint, the providing of healthcare services to patients at the patient point of care. The system involves the ability of the healthcare provider to have access to an enormous variety of information, including drugs, prescription information, patient histories, health plan information, charge capture and billing information, reference materials, and other materials that would facilitate the diagnosis and treatment of a patient at the point of care.

One of the advantages of the point of care management system of the present invention is that it provides the healthcare practitioner with knowledge that will aid in clinical decision-making by identifying the patient's current medications and drug history. Moreover, the system saves the practitioner time by identifying drug formularies provided by the patient's health plan and thus reducing the call backs from the pharmacy or the pharmacy benefit managers for an alternate prescribed medication that is covered by the health plan.

Other objects, features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It is to be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

Detailed Description of the Preferred Embodiments

The point of care clinical and administrative management system of the present invention provides a real time tool to

health care practitioners for obtaining the information necessary to make a more informed decision in patient care.

In a preferred embodiment of the invention, the point of care management system can be utilized with desktop and laptop computers, and more preferably with handheld personal digital assistants ("PDAs"). A PDA is used herein to refer to a portable computer device. Some common examples of PDAs include the Compaq iPAQ, Intermec, Palm Pilot, pager, cellular telephone and any other device that is capable to interface with digital processes. The present invention is not limited to the devices identified herein but can be configured to be used with any computer device, and more preferably, with the computer device preferred by the user. In a preferred embodiment of the invention, the PDA is portable and includes a wireless connection to a local area network server.

The PDA is preferably adaptable to the customization preferences of the user. Although the substantive information provided to the user remains the same, the user can customize the format and manner of delivery of the substantive information through the PDA.

In a preferred embodiment of the present invention, the point of care management system provides the user with a patient's medical history including a list of current medications prescribed to the patient. To assist the practitioner in choosing the appropriate medication, the point of care management system provides prescribing information for any drug marketed in the United States. In one embodiment of the invention, the practitioner can access the "Best Practice" and prescribing guidelines including drug treatment recommendations for common disease states. Moreover, the point of care management system informs the practitioner of the drug dosing recommendations based on age, sex and metabolic status (e.g., status of kidney and liver function). To facilitate the drug prescription process for

the practitioner, the point of care system preferably displays a list of the practitioner's most commonly prescribed medications so that the practitioner does not have to search for a drug that he or she prescribes on a regular basis. In a more preferred embodiment of the invention, the point of care system maintains a list of the practitioner's "favorite" medications in either alphabetical order or in the order of most prescribed medication to least prescribed medication.

In another preferred embodiment of the present invention, a frequently prescribed medication is automatically added to the favorites list. This feature is configurable to the user's preference and the user can define a "frequently prescribed medication" as medication that is prescribed a given number of times within a specified period of time. For example, the practitioner can define a "frequently prescribed medication" as any medication that is prescribed more than fifty times within a one week period. Any medication that falls within this definition will be added to the practitioner's favorites list. The favorites list is dynamic such that if the practitioner stops prescribing the medication more than fifty times within a week, the medication is removed from the practitioner's favorites list.

In a more preferred embodiment, the practitioner's favorites list identifies the medications that are on the formulary. The formulary medications preferably include a visual indicator that identifies the medication as part of the health plan formulary. Also, among the formulary medications of the same class, the favorites list preferably indicates the order of preference of the formulary drugs. Accordingly, when viewing the favorites list, the practitioner will be advised as to the drugs that are most preferred by the patient's health plan.

In yet another preferred embodiment of the present invention, the point of care management system includes a "logical favorites" features which enables the practitioner to identify and prescribe a "backpack" of medications that are regularly prescribed together. For example, when a patient complains of backache, the practitioner may regularly prescribe ibuprofen and codeine for the condition. The ibuprofen and codeine comprise a "backpack" for the condition of a backache. The point of care management system of the present invention preferably allows the practitioner to have a favorite list of backpacks that facilitate the prescription process by allowing the practitioner to prescribe multiple medications simultaneously. Backpacks can be prepared for any condition. Furthermore, there could be children's backpacks and adult backpacks. The backpacks preferably include the appropriate dosage and quantity of the drugs for the specified condition.

The point of care management system preferably includes a browser-based system that enables the practitioner to navigate the system and search for the desired information. The practitioner preferably is able to access and print patient medical information and drug information. The patient medical information and drug history information is updated regularly to provide the practitioner with the most recent information.

The point of care management system preferably includes a screening feature that reviews the patient's medical history and currently prescribed medication to determine if there exists a potential risk of adverse interaction with any previously prescribed medication or any adverse reaction to the newly prescribed medication. If such a risk exists, the system preferably alerts the prescriber of the potentially dangerous reaction or drug interaction. The screening feature preferably identifies the existing drug allergy or other

medical situation that may cause an adverse reaction. Similarly, the screening feature preferably identifies the specific drug in the patient's prescription history that may result in a dangerous interaction with the newly prescribed medication.

In addition to identifying potentially dangerous reactions and drug interactions, the system preferably checks for duplicate therapy. For example, if the practitioner prescribes amoxicillin and the patient is already taking penicillin for a different condition, the amoxicillin would be duplicative of the penicillin. Taking amoxicillin in addition to the penicillin effective results in double dosage of antibiotics. In such a dosage, the prescribed medication may cause an adverse reaction wherein no adverse reaction is present at a single dosage. By checking for duplicate therapy, the point of care management system eliminates the risk of such an adverse reaction.

The point of care management system of the present invention preferably includes compliance tools to ensure appropriate drug therapy for the patient. In one embodiment of the invention, the practitioner is able to track whether the patient is complying with the prescribed course of therapy by determining whether the patient has filled previous prescriptions. To assist the patients with drug compliance, the point of care management system preferably includes an outbound automated communication device that contacts the patient to remind the patient to take the prescribed dosage at a particular time. The communication device preferably contacts the patient by telephone or other messaging service, such as a pager, voice mail, web phone, PDA, web page, fax machine or any other type of digital computer device that can be configured to send a message.

This feature is especially helpful for patients who take numerous medications a day. The point of care management

system is programmable to call the patient at a given time, preferably at or near the time when the patient is scheduled to take a prescribed dosage of medication. The message can be customized to accommodate the patient's level of proficiency with medication. For example, a message for a patient that is not familiar with the medication names could include the following message: "Mrs. Jones, please take two blue pills and one white pill at 2 p.m." For a more proficient patient, the message can identify the medication by name. Patient outreach and compliancy.

The communication feature can also be used to check compliance with a course of therapy by providing refill notification. For example, the automated communication device would inquire from the patient as to the number of pills that the patient has left. By receiving this information, the practitioner can determine if the patient is complying with the prescribed therapy. If the patient has more pills than he or she is supposed to have, it cues the practitioner that the patient is not taking the pills.

Another preferred feature of the point of care management system is a disease management information program. If the patient is diagnosed with a particular disease, the point of care management system provides the practitioner with information pertaining to the management of the disease. The practitioner is also given the suggested courses of therapy for the disease. If there are clinical trials or disease management programs relating to the diagnosed condition, the point of care management system alerts the practitioner and provides the practitioner with the information necessary to determine if the patient is an eligible candidate for the program. If it is determined that the patient is eligible, the point of care management system enables the user to enroll in the program immediately.

This feature of the invention can also be used for preventative health care or health improvement programs, including but not limited to programs to help patients stop smoking, lose weight or have a healthy pregnancy. In a preferred embodiment of the invention, if the practitioner determines that a patient would benefit from such a program, the practitioner can use the point of care management system to identify the programs available to the patient and enroll the patient in the program. Moreover, in a preferred embodiment of the invention, the practitioner can monitor the patient's progress in the program by accessing the patient's electronic medical records.

In addition to providing clinical management tools, the point of care system of the present invention provides administrative management tools to resolve potential administrative problems at the point of service. The administrative management feature of the invention preferably includes access to the patient's health plan information, including the covered drug list, the preferred drugs within the formulary, and the specific formularies recommendations when a physician prescribes a medication outside of the formulary. One advantage of the present invention is that the practitioner will immediately know the drugs that are within the formulary. Moreover, even among the drugs within the same class of the formulary, the system provides the practitioner with the health plan's order of preference within the formulary.

To assist the patient in determining whether a prescribed medication is financially feasible, the point of care system provides the practitioner with the specific drug cost information and the health plan drug benefit copay information. In addition to prescribed medication, the point of care system provides the user with the health plan's recommendation for over the counter medication. The

information available from the health plan is not limited to drug information but can include the health plan's coverage of a medical procedure or other course of therapy.

The point of care management system provides the health plan's benefit maximums and applicable deductibles. By having this information at the point of care, the practitioner and the patient can discuss the health plan coverage of various medications and the patient's out of pocket expense to obtain the medications. The patient and the practitioner will be able to make an informed decision as to the course of therapy. One of the advantages of the point of care system of the present invention is that the practitioner will know the specifics of the health plan at the point of care, thus eliminating call backs from the pharmacy or the patient to rewrite a prescription for a drug that is covered by the patient's health plan.

In a preferred embodiment of the invention, the point of care system obtains electronic prior authorization from the pharmacy benefits management providers. When obtaining pre-authorization, the point of care system provides the pharmacy benefits management with patient identification information such as name, address, birthdate, phone number, and plan identification information, including group number, carrier identification, plan code and other identifying information. The point of care system also transmits information pertaining to the medication being prescribed including the name, dosage, number of refills, etc. The pharmacy benefits management providers, in real time, review the information provided, pre-adjudicate the claim, and inform the practitioner whether the claim is covered by the health plan. The term "real time" is used herein to refer to the immediate processing of the claim at the time the inquiry is made, as opposed to retroactive determination of the benefits after the medication has been prescribed or the prescription has been filled. A similar

pre-authorization feature can be added for medical procedures and other therapies wherein the provider will transmit a claim and the benefits managers with either pay or deny the claim with an explanation of the reasons for denial. The process of obtaining pre-authorization enables the practitioner to immediately determine if the prescription or course of therapy will need to be adjusted. Accordingly, the treatment process is quicker and more efficient.

When a prescription is up for renewal, the point of care system of the present invention preferably alerts the practitioner and provides the practitioner with the opportunity to renew the prescription. If the medication that is the subject of the renewal is a part of a long term, continuous therapy, the practitioner may renew the prescription immediately.

To comply with the requirements of healthcare regulatory bodies (such as HEDIS, NCQA, HIPAA, etc.), the point of care system preferably matches the prescribed medication with a diagnosis that would support the prescription.

If the practitioner needs to evaluate lab results in order to diagnose or monitor the progress of a patient, the point of care system includes a feature wherein the practitioner can order laboratory or radiology tests. The order is communicated to the appropriate facility and processed. The point of care system preferably is capable of capturing the results of the laboratory or radiology tests and displaying the results to the practitioner. Communication between the laboratory and the handheld device is preferably via wireless connectivity technology known to those skilled in the art.

In a preferred embodiment of the present invention, the point of care system includes a drug sampling and injectable medication order support feature that enables the practitioner to order drug samples and injectable medications for use in

the office. The point of care system of the present invention can preferably also communicate with the practitioner's vendors, and enables the practitioner to order medical supplies using the practitioner's handheld device.

The provider referral management feature of the point of care system enables the practitioner to refer the patient to a specialist by contacting the specialist and transmitting the patient information and medical history to the referred practitioner. The administrative management feature of the invention can be used in the referral process to ensure that the referred practitioner is approved by the health plan.

In a preferred embodiment of the present invention, the point of care system includes a dictation and transcription feature that enables the practitioner to dictate notes and observations for the medical file. For the convenience of the practitioner, the handheld device is preferably sized to fit in one hand and includes controls for facilitating the recording and the playback of the dictation.

The point of care system of the present invention includes an input feature that enables the practitioner to input information into the system. The input feature may include a keyboard for typing, or a writing area wherein the practitioner can hand write notes that are electronically translated into typed characters. Additionally, or in the alternative, the point of care system may include a browser based system that provides the practitioner with options and eliminates the need for typing or writing. In a more preferred embodiment, the input feature includes a voice activated feature wherein the point of care system is controlled by voice commands and information is inputted by receiving audible words. This feature eliminates the need for the practitioner to type or write anything into the system. The practitioner simply speaks into the point of care system.

Another preferred feature of the invention is a charge capture and billing management feature. In this embodiment, the practitioner is able to immediately record the charge for a particular service or product at the point of care. The charge is captured by the point of care system and used thereafter to provide a bill to the patient for the service or product. The charge capture feature can be used in conjunction with the pre-authorization feature to facilitate the billing process.

When the practitioner prescribes medication, the point of care system provides numerous options for filling the prescription. If the patient identifies a preferred pharmacy, the prescription can be sent electronically to the patient's pharmacy of choice. Alternately, the practitioner can print out the prescription and give the physical print out to the patient to take to a pharmacy. If the prescription has a number of refills, the practitioner can divert the prescription to a mail order prescription service that provides refills to the patient in the mail. For the convenience of the patient, the point of care system can combine the prescription refill methods. For example, one prescription can be transmitted to a pharmacy while the refills are transmitted to a mail order service.

In a preferred embodiment of the invention, the prescription is monetized. Specifically, the printed prescription includes a coupon portion that is detachable from the prescription. The coupon portion can be used to obtain a discount on a product or a service. The printed prescription preferably includes consultation information that alerts the patient of possible side effects and instructs the patient as to the proper usage of the medication. The consultation information preferably includes information from the Physician Desk Reference regarding the prescribed medication.

In another preferred embodiment of the invention, the prescription includes medical trial information that enables the patient to participate in a medical trial related to the diagnosed condition or the prescribed medication. The medical trial information preferably includes a list of questions, the response to which can be written in or selected from a list. The patient preferably can choose to participate in the clinical trial by anonymously submitting responses to the trial questions.

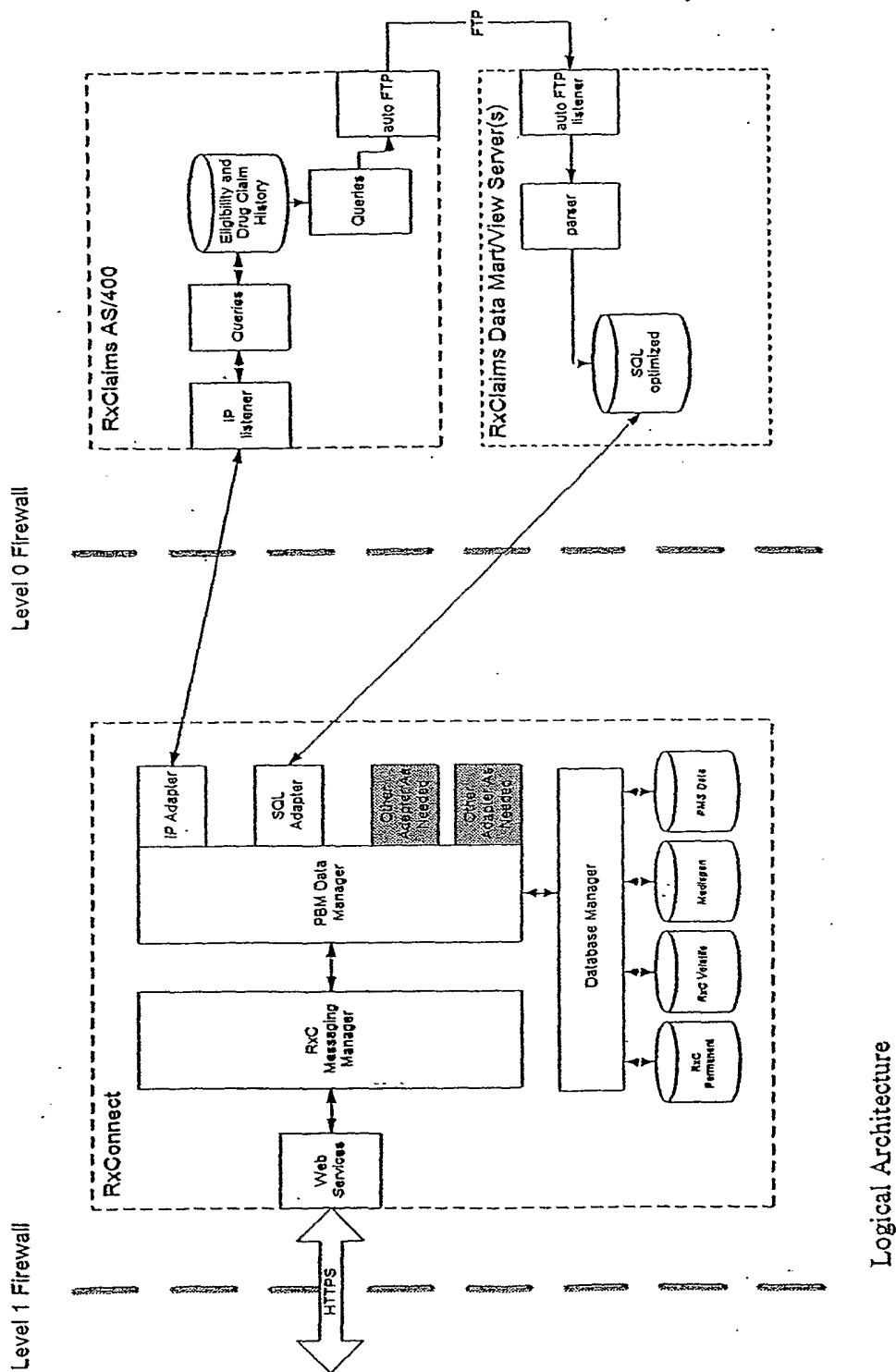
One advantage of the point of care management system of the present invention is that it provides information to aid the healthcare practitioner in clinical decision-making. As discussed above, the point of care system provides on-line patient specific information at the point of care including plan affiliation, eligibility confirmation, medication profile history and allergy information. The automated formulary verification for participating plans provides greater efficiency due to reduced call backs from pharmacies and pharmacy benefits management. Furthermore, pharmaceutical costs are reduced as a result of increased formulary compliance and generic prescribing.

The practitioner is assisted in that the point of care system automatically checks for adverse drug interactions. The practitioner is given the flexibility of writing or renewing a prescription from the office, hospital or home. Moreover, the practitioner can track patient compliance with the prescribed drug therapy.

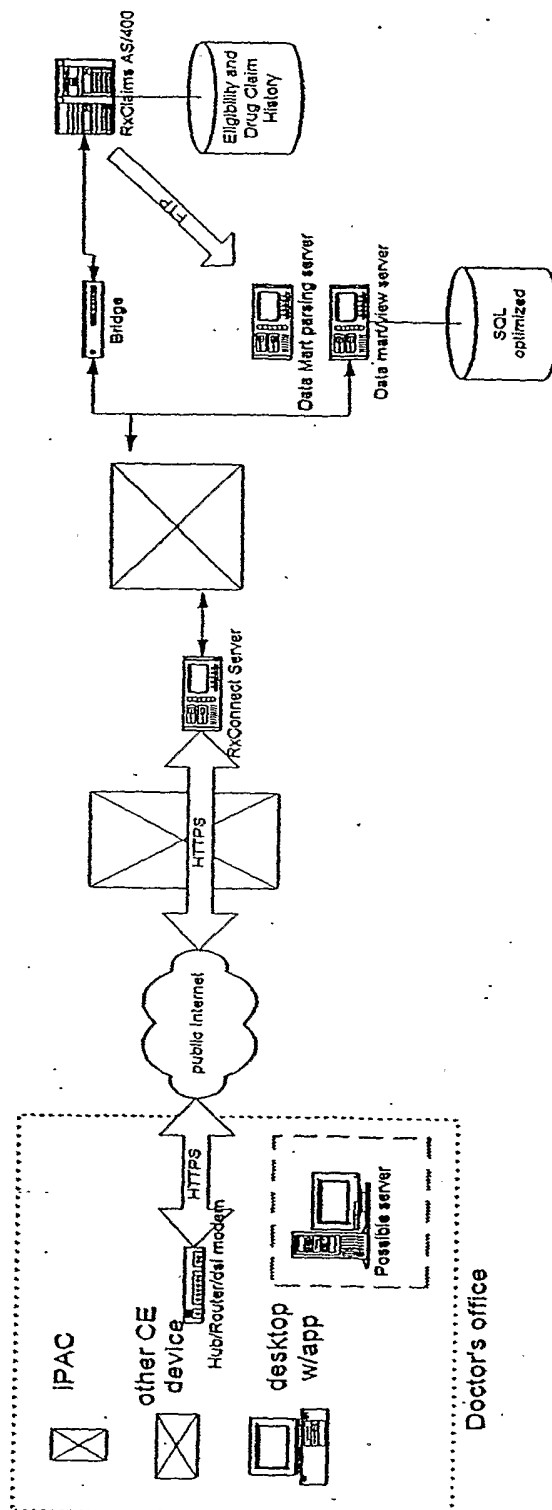
In a preferred embodiment of the invention, the handheld point of care management system preferably communicates with a local area network utilizing RF technology.

The embodiments described above are exemplary embodiments of a point of care clinical and administrative management system. Those skilled in the art may make numerous uses of, and departures from, the above-described embodiments

without departing from the inventive concepts disclosed
herein.



Marc Danziger
Data Connectivity
03/20/01
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Physical Architecture

APPENDIX B

SECOND PROVISIONAL APPLICATION TITLED

**“MEDICAL SERVICE AND PRESCRIPTION
MANAGEMENT SYSTEM”**

PACAR.001PR

PROVISIONAL PATENT

MEDICAL SERVICE AND PRESCRIPTION MANAGEMENT SYSTEMBackground of the InventionField of the Invention

This invention relates to techniques and systems for more effectively handling information related to patient care by a medical professional. More specifically, the present system is related to a system for automating and streamlining the process of writing prescriptions by medical professionals.

Description of the Related Art

As medicine has grown from a specialized profession into a full grown industry, the modern practice of medicine has evolved to include the interaction between a large number of individuals and organizations, each of which performs a separate role in patient care. Doctors and other medical professionals provide diagnosis and direct "hands-on" patient care. Pharmaceutical companies research and develop new pharmaceutical treatments. Pharmacies stock and dispense medications based upon doctor's prescriptions. Health plan providers package and resell the services of various medical and pharmaceutical professionals, as well as providing an insurance function. Employers select and pay for health plans for their employees. Pharmacy Benefit Management companies (PBM's) provide aggregation and management to health plan providers when interacting with pharmacies.

Due to the number of players and the high degree of compartmentalization involved in the medical industry, something as simple as treatment for a sore throat or sprained ankle may involve a half dozen organizations, each processing the patient's data independently, and often redundantly. Furthermore, many of these organizations, particularly the doctors and other direct health care providers, can greatly benefit from the availability of access to information regarding the portions of the industry which are beyond their own office.

Therefore, there is a continued need for improved systems to provide useful and appropriate information to doctors and other healthcare providers regarding the policies and process of the medical industry, especially regarding prescription drugs. In

addition, the pharmacies, pharmaceutical companies, health plan providers, and PBM's have a continued need for better compliance with and understanding of their rules and systems.

Brief Description of the Drawings

FIGURE 1 illustrates a schematic representation of the various components and interconnections therebetween for one preferred embodiment of the described prescription and medical service management system.

FIGURE 2 shows a typical login screen for a preferred embodiment of the system.

FIGURE 3 illustrates and explains how to change the User's password in a preferred embodiment.

FIGURE 4 illustrates and explains the commands that are available under the selection "Doctor" in the Toolbar of an embodiment of the invention.

FIGURE 5 illustrates and explains the commands which are available under the selection "Patient" in the Toolbar of an embodiment of the invention.

FIGURE 6 illustrates the screen for a typical patient queue that is displayed after selecting the command "Patient Queue" under the heading "Doctor" and explains the further commands which are available in an embodiment of the invention.

FIGURE 7 illustrates and explains the "Favorites Management" display that is displayed after selecting the command under the heading "Doctor" and explains the method of adding favorites in an embodiment of the invention.

FIGURE 8 illustrates and explains the "Settings" display shown after selecting the command under the heading "Doctor" in the Toolbar in an embodiment of the invention.

FIGURE 9 illustrates and explains the resulting display shown after selecting the command "Rx History" under the heading "Patient" and explains how to identify the status and view and renew prescriptions in an embodiment of the invention.

FIGURE 10 illustrates and explains the resulting display shown after selecting the command "Rx History Details" under the heading "Rx History" and explains how to renew prescriptions in an embodiment of the invention.

FIGURE 11 illustrates and explains the resulting display shown after selecting the command "Allergy/Misc. Meds" under the heading "Patient" and explains how to add or revise the information in an embodiment of the invention.

FIGURE 12 illustrates and explains the resulting display shown after selecting the command "Edit Allergy" and "Edit Medication" under the heading "Allergy/Misc. Meds" and explains how to add or revise the information in an embodiment of the invention.

FIGURE 13 illustrates and explains the resulting display shown after selecting "Drug Search" which may also be accessed via the "Patient" selection bottom command bar by selecting "New Rx", explains the display and the icons shown next to the drugs in an embodiment of the invention.

FIGURE 14 illustrates and explains the "Off Formulary Notification" screen which appears to notify the User that the selected drug is not on the patient's health plan carrier's formulary list and provides alternatives in an embodiment of the invention.

FIGURE 15 illustrates and explains the "Warning" screen which appears in response to the selection of a drug when a warning is necessary in an embodiment of the invention.

FIGURE 16 illustrates and explains the "Drug Warning" screen that appears in response to the selection of a drug when a warning is necessary in an embodiment of the invention.

FIGURE 17 illustrates and explains the "Rx Tablet" screen that can also be accessed via the "Patient" selection of the bottom command bar in an embodiment of the invention.

FIGURE 18 illustrates and explains the "Review Rx" screen that displays prescriptions before the final submission in an embodiment of the invention.

FIGURE 19 illustrates a Basic Prescription Writing Screen Flow as explained in Example 1, which describes an embodiment of the invention.

FIGURE 20 illustrates Other Non-prescription Functions in an embodiment of the system.

Description of Preferred Embodiments

The following description and Figures describing the preferred embodiment are made to demonstrate one configuration of a possible system in accordance with the current invention. It is not intended to limit the disclosed concepts to the specified embodiments. In addition, various systems will be described in the context of a computer-based system for carrying out the described techniques and methods. Those of skill in the art will recognize that the techniques described are neither limited to any particular type of computer, nor to the use of computers for every described aspect herein.

Throughout the description, reference will be made to various implementation-specific details. These details are provided to more fully illustrate a specific embodiment of the invention, and not to limit the scope of the invention. The various processes described herein are preferably performed by using software executed by one or more general-purpose computers. The processes could alternatively be embodied partially or entirely within special purpose hardware without altering the fundamental system described.

In particular, a "module", "system" or "component" as used herein, may refer to any combination of software, firmware, or hardware used to perform the specified function or functions. The systems described herein are preferably implemented as software modules which run on general purpose computers, but may be represented partially or entirely in hardware or firmware. It is contemplated that the systems may be integrated into a smaller number of systems than is described herein. One system may also be separated into multiple systems. The described systems may be implemented as hardware, software, firmware or any combination thereof. Additionally, the described systems may reside at different locations connected through a wired or wireless network, or the internet.

As will be recognized, the various methods set forth herein may be embodied within a wide range of different types of multi-user computer systems, including systems in which information is conveyed to users by synthesized voice or on wireless devices. Thus, it should be understood that the protocols and interfaces described herein, for

example, HTML Web site based implementations, illustrate just one type of system in which the inventive methods may be used.

OVERVIEW

A preferred embodiment of a medical service and prescription management system will now be described and illustrated in accordance with the system shown in Figure 1. The system described herein may provide a number of functions related to allowing a doctor or other direct health care provider (a "User" hereinafter) real-time access to information related to the rules and policies of pharmacies, health plans, and PBM's in order to assist the User in efficient and effective writing of prescriptions for medication.

The infrastructure of the system described below and shown in Figure 1 is one example of an architecture for such an information distribution system. Those of skill in the art will recognize that many of the components described herein may be replaced by equivalent components or in certain circumstances, their functions may be combined into a single component.

As shown in Figure 1, the main components of the system may be divided into three general groups of components in the preferred embodiment. The first group includes the "industry side" systems which form repositories for data for industry organizations such as PBM's, health plan providers, and pharmacies. These are shown on the right side of the Figure. The second group includes "doctor side" systems which may be located in a doctor's office or clinic and manage data related to a given doctor or medical group's daily practice. This forms the left side of the Figure. The third group includes "internet side" servers provided by a management system operator and occupies the middle portion of the Figure. Each of these will be discussed below.

INDUSTRY SIDE SYSTEMS

The illustrated industry side systems include the systems for storing data associated with the rules regarding the coverage and exclusions and other guidelines for those organizations that are setting up and managing various health plan systems

(employers, health plan providers and PBM's) as well as the pharmacies which fill prescriptions under the health plans and work with those setting up the guidelines.

The employer's rules and guidelines are negotiated with its health care provider(s) and these rules are made known to the employees of the company. These rules may include limitations on coverage such as a yearly limit on optical coverage, or a policy excluding certain types of treatment (e.g. chiropractic or massage therapy) from coverage at the employer's expense. In addition to storing the rules regarding coverage, the employer data may also include such information as the name of the covered individual, as well as the names of any other individuals covered under the same policy (e.g. spouse, children or other live-in dependents), and demographic / biographic data (address, phone number, age, gender). Data related to optional coverage available through the employer may also be stored here.

The employer data may be stored in a system which is managed directly by the employer himself, or this data may be made available through the health plan provider(s) selected by the employer (as will be described below). In either case, the health plan provider will desirably have access to this information in order to properly process claims made against any individual patient's health care plan. Although the employer data is shown schematically as independent from the health plan provider's data, those of skill in the art will recognize that this data may be stored within the same physical system, or within the same database as the health plan data without altering the nature of the described system.

The health plan provider data is generally stored in a system which is managed by the health plan provider itself, or by a company hired by the health plan provider specifically for the purpose of managing this data. This data includes any rules regarding coverage and exclusions specific to the health plan provider, as well as any aggregation related data which may be associated with the multiple employers fact that the plan provider serves. For instance, coverage rules may include the specific doctors that fall within the various terms of the health plan provider and how those doctors are treated (e.g. whether the doctor is part of the HMO coverage for the plan, a PPO for the plan, or whether the doctor is covered in some other way), as well as information relating to rules regarding referrals to specialists.

This information has a direct effect upon the way in which doctors will process patients, and is particularly desirable to be made available to doctors and other health care providers in a transparent manner. This information is also of use to PBM's who may be responsible for fulfilling the medication requirements of a variety of health plan providers within a particular category.

The PBM data includes information related to what coverage the PBM will provide to various health plan providers regarding prescription medication. In particular, the PBM data will include the formulary for the particular PBM. The formulary, which will be discussed in greater detail below, is a listing of which drugs, of all the prescription drugs available, are covered and to what degree (*i.e.* what portion of their cost) by the PBM when filling prescriptions for its member health plans.

The maintenance and management of the formulary is the prime responsibility of the PBM and the continual selection and updating of the approved drugs within the formulary, as well as the portion of the cost of those drugs which are covered is a time consuming and data intensive task. It is not only important for the PBM to have this data made available to any doctors or other Users who may be prescribing drugs using one of the PBM's member health plans, but it is also important for the PBM to make this data available as quickly as possible. Maintaining the maximum number of prescriptions on formulary when covered by the health plans is an important means of controlling expenses for the PBM.

The retail pharmacies, such as Savon, Rite Aid, and so forth, provide information such as availability and lead time information. Ideally, the inventory and ordering system of individual retail pharmacies may be made available, via the internet, to the system described herein, in order to expedite the ordering and fulfillment of prescriptions, as well as to provide important information regarding price and availability to doctors and patients.

Furthermore, as this information is of particular use to PBM's who are paying for covered prescription medication, PBM's will also desire access to inventory and order information related to the retail pharmacies. In particular, the PBM's and pharmacies may communicate using existing standards for data exchange between them,

such as NCPDP. This system provides a known universal interface for communication with retail pharmacies by PBM's.

Although Figure 1 shows the systems interconnected in a variety of ways, each system shown may simply be accessible directly via the internet in order to facilitate communication between any components described herein. Those of skill in the art will recognize that a variety of networking connections may be made that effectively allow the same process to take place, regardless of whether particular connections are made via local networks, the internet, or such other networking systems as are known in the art.

DOCTOR SIDE SYSTEMS

The illustrated doctor side systems are those systems which would be associated with individual doctors' offices, clinics, hospitals, or such other organizations that provide direct health care to patients (e.g. nursing homes). The doctor side systems comprise a server system (which may actually be a desktop computer) or other central computer upon which information regarding the doctors' practice is stored, as well as the mobile device carried by the doctor or other User, a wireless communications access point for connecting the mobile device to the server, a printer, and access to a physician practice management database.

The server is used to store and manage data regarding patient scheduling, payments, billing, patient records, and such other information as is normally stored and managed in the running of a clinical medical practice. This system, as noted above, may be a desktop computer, a server, or a series of desktop terminals which connect to a server of some kind.

The mobile device is a small, portable computer, PDA or other handheld device which the User carries as he works with patients. A variety of options exist for this device, but the device desirably is connectable to the doctor's server in order that the device has appropriate access to scheduling and other information for the doctor and his patients. The mobile device and its software modules are discussed in greater detail below.

In order for the mobile device to access the information upon the doctor's server as well as transmit information to the various other systems (as will be described below), the mobile device is desirably equipped with a wireless network card of some kind. In a preferred embodiment, the wireless network card is a wireless ethernet card conforming to the IEEE 802.11 wireless standard. This wireless network card operates to communicate with other 802.11 compliant hardware, which may include other wireless ethernet adaptors, or a wireless access point.

The wireless access point is connected to the desktop server or other networked devices of the doctor's office via a standard network connection, and provides a relay function for any wireless devices within range of the access point (typically a few hundred feet). Although Figure 1 shows only a single wireless access point and a single wireless device, it may be desirable in certain circumstances for multiple access points to be used in order that a large area has complete wireless network coverage. In these configurations, a given mobile unit is able to "roam" from the coverage zone of one access point to another. Additional access points are simply added to the network via traditional network connections. Multiple mobile devices can be supported simultaneously by a single access point.

A printer may be provided in order to print out prescriptions or other information for a patient or doctor. The printer may be a standard network capable printer that can be connected to either the server directly, or to the local network within the doctor's office.

The physician practice management (PPM) information represents data which is made available to doctors or other health care professionals in order to specify the coverage for various individuals. In particular, the PPM data specifies who is a client of which health plan, and which PBM provides formulary services for the patient. This information may be uploaded to a specific server accessible by the doctor, or may be read directly into the doctor's server periodically. This information is generally updated daily directly from the health plan information using standard protocols, such as FTP, in order to request and transmit the data to the doctor's server across the internet.

The interconnections between the various components on the doctor side are shown in the Figure as being made across a local area network (LAN). However, those

of skill in the art will recognize that the connections may be made using a wide area network (WAN), a virtual private network (VPN) which is mediated over the internet, or any of a variety of other network configurations that provide for intercommunication between the various doctor side components.

At least one of the doctor side components should have access to the internet in order to communicate with and transfer data from the various other systems described herein. In a preferred embodiment, the doctor side components are connected via a LAN, and the LAN is provided with a router or gateway which provides secure internet access to the various systems networked via the LAN.

INTERNET SIDE SYSTEMS

The internet side systems shown in Figure 1 include a plurality of servers handling data for the operator of the management system described herein. Also shown in this portion of the diagram is the internet itself. The internet is a global network of computers. The structure of the internet, which is well known to those of ordinary skill in the art, includes a network backbone with networks branching from the backbone. These branches, in turn, have networks branching from them, and so on. Routers move information packets between network levels, and then from network to network, until the packet reaches the neighborhood of its destination. From the destination, the destination network's host directs the information packet to the appropriate terminal, or node.

In one advantageous embodiment, the internet routing hubs comprise domain name system (DNS) servers, as is well known in the art. DNS is a Transfer Control Protocol/Internet protocol (TCP/IP) service that is called upon to translate domain names to and from Internet Protocol (IP) addresses. The routing hubs connect to one or more other routing hubs via high speed communication links.

The internet may be used in the described system to provide communication between any of the computers or components described herein. Access to the internet is standardized using TCP/IP and a variety of other protocols (such as File Transfer Protocol, Hypertext Transport Protocol, HTTP-Secure, Simple Object Application Protocol, and telnet) using files in a variety of standard formats (such as Hypertext Markup Language and Extended Markup Language) and security may be implemented in a variety of

standard manners, including but not limited to Secure Socket Layer (SSL) encryption, PGP encryption, firewalls, and such other techniques and systems as are known to those of skill in the art.

The internet may provide a means to connect the various components described herein together. Although it is possible to have direct network connections between some of the systems described above, it is also possible that all communications between each independent component of the described system are made across the internet (*e.g.* using VPN tunneling for security). Whenever information is described as being "submitted" or "sent" from one system to another herein, the information may be passed using any communications medium including the internet.

The management system servers (herein after web servers) provide an aggregation point and clearing house for the data which is used to provide the functions described below with respect to the operation of the system. These servers store data which is received from the various doctor's systems, for instance the data associated with the prescriptions which are being written by the Users of the system. These systems also handle the management of data which is being sent from the various PBM's to doctors who require that information regarding updates to the formularies or coverage policies, and also stores and manages databases of data related to the specific drugs available and their use and available dosages.

This information is located on these servers and may be made available upon appropriate request to the doctors using the system described herein. This information is available either directly to the User's mobile units upon request, or may be updated periodically to the doctor's server systems in some cases. These servers also can track the status of what updated information has been received by various doctor's systems in order to notify the doctor or other User when newer information is available.

A group of three web servers are shown in Figure 1, however any number of servers may be used as is appropriate to the application and the number of doctors and PBM's which are making use of the system. Those of skill in the art will recognize that the duties of the web servers may be broken out in a variety of ways. For instance, the servers may all store identical data and handle requests based upon which machine has the available processing power when the request is received, and then update the other

machines. Alternately, the servers may each perform separate parts of the server function, for instance one may store the online pharmacopoeia (described below), another may handle storage of prescription transactions, and a third may handle the updating and storage of the formularies for various PBM's.

Regardless of how the duties of the servers are broken down, the data which is available on the web servers is desirably never enough to reconstruct identifiable patient data directly. This is because the servers have only information related to individual transactions, and not the information related to the patient himself. By keeping this data separate, compliance with privacy regulations is maintained, and the patient's personal data remains secure. The personally identifiable information is kept separately from the transaction data.

This allows the full patient record to only be assembled in real time when requested, and not to be stored in a format which enables someone to get access to the patient's information by compromising a single system. This dynamically assembled virtual record is never stored as a complete record, and therefore, potential problems of maintaining patient confidentiality and preventing unauthorized access to highly sensitive personal information can be mitigated or avoided. This aspect avoids proliferation of a patient's confidential history and permits primary source data proprietors to act as exclusive wardens of their individual confidential data elements.

In addition to providing storage and transaction information, the web servers may provide statistical demographic information of interest to pharmaceutical companies, as well as aggregated performance data for various prescribed treatments for doctors. Other types of information which may be made available from the information held by the web servers may include patient transaction data, which may be made available directly to a patient, allowing the patient to update their own information and have it propagated to the appropriate places (for instance, entering in compliance information as discussed below, or updating their own list of allergies or medical history).

In addition, data may be generated for PBM's allowing them to more accurately identify the popularity and effectiveness of various drugs in their formularies. This can

allow the PBM to more efficiently manage their formulary and control the market share of various medications, which is of benefit to both doctors and health plans.

Beyond the benefits in handling of data that are described above, the use of the web servers also allows for Users to access their information across the internet from any location from which they may access the internet. The web servers may be used to set up secure, authenticated connections between a networked device which has access to the internet (such as a portable computer, a remote computer, a cellular phone, a pager, or a wireless PDA), and the appropriate portions of the system that a User would need to access to carry out various functions.

For instance, a doctor who is away from the office might wish to check on lab results for a patient or might receive a call requesting a refill for an expired prescription. By accessing the web servers via the internet and making a connection from the web server to his own office server, the doctor may perform the necessary functions without having to come into the office. In some embodiments, this function may even be carried out via voice recognition using VoiceXML and appropriate web server software.

RXCHANGE SERVERS

In addition to the systems described above, an additional component, the RxChange server, may be provided as shown in Figure 1 in order to help facilitate the operations of the management system described. The RxChange server is a computer that is responsible for mediating the various business and data relationships between the PBM's, pharmacies, doctor's offices, and health plans. The RxChange server may be a server process which is running on a server already in use by either the management system (described above) or by the PBM. Alternately, an RxChange server may be an independent server which is either managed by a PBM and located within the PBM's firewall as shown in Figure 1, or a server which is simply accessible by the appropriate PBM via the internet.

The RxChange server can handle particular functions (described above with respect to the web servers) which are specific to individual PBM's. These may include such functions as formulary updates and notification of new drugs or updated drug information. In addition, the RxChange servers allow the PBM to directly control the

reporting and data collection associated with any orders being made to pharmacies with which the PBM works. In essence, the RxChange server becomes a clearinghouse for all transactional data associated with a particular PBM.

This allows the PBM to customize reporting and data collection with a higher degree of control than would be possible if requests for information related to the PBM's transactions were simply requested from a web server, or had to be requested and collated from individual pharmacies or other independent transaction records. By centralizing the data interchange between the PBM's RxChange server and the web servers of the management company, the data flow is simplified, and the appropriate information is more readily available to the PBM.

Although only one PBM and one RxChange server are shown in Figure 1, those of skill in the art will recognize that multiple PBM's may connect to the web servers. In such cases, each PBM will desirably have their own RxChange server in order to keep their data separated from that associated with any other competing PBM. In particular, when the PBM's wish to directly control and secure their own RxChange server, it is not feasible for PBM's to share RxChange servers.

OPERATION

As illustrated in Figure 2, one embodiment of the present invention may comprise a small portable User interface device which can be used as a link to the internet prescription web servers of a preferred embodiment as well as the RxChange and health plan data as described above. The User interface to the system may be any physically compact, portable, user-interface devices such as small portable, user-interface devices such as small portable personal computers, tablets, and especially hand-held devices known as personal digital assistants (PDA).

The PDA may be any brand which can be connected to a network, for example, via a wireless ethernet adapter. These PDA's may include but are not limited to a Compaq iPaq, an HP Jornada, a Vadem Clio, a Palm handheld, a Handspring Visor, a Psion, or any other handheld system. These systems may operate on a variety of operating systems, including but not limited to Windows CE, PalmOS, EPOC or other systems as known to those of skill in the art. Within the preferred embodiment

described herein, the PDA which is used as a user interface to the system will be a Compaq iPaq running Windows CE from Microsoft.

As noted above, tablet computers or laptop computers may also be used in place of a handheld PDA device to access the system. Examples of such tablet computers include the Qbe from Aqcess Computers, the 6600 series of computers from Intermec, the Point and Stylistic series of computers from Fujitsu, and many other machines. In general, any portable computer which can be connected to a network wirelessly, for example with an 802.11b or other wireless ethernet card, may be an appropriate platform for accessing the system. These computers may operate using any of a variety of operating systems, including but not limited to, Windows CE, Linux, Unix, Windows 2000, Windows XP, BeOS, Windows 98, Windows ME, Apple System 9, Apple OS X, an embedded operating system, or another operating system known to those of skill in the art.

Those skilled in the art will understand that the system can readily be used on or adapted to other hardware platforms as well, for example, a physician's desktop computer, and that the system can use a variety of different software interfaces other than that shown. In particular, the interface may be configured to optimize performance when using different input devices, such as keyboards, touch pads or touch screens, voice input and the like.

The portable user interface allows the User (typically a doctor or other health care worker) to obtain prescription and patient information and also acts as a gateway to the patients health plan and retail information. In addition, the system may also optionally comprise a personal computer, a pager, and a cellular telephone. The type of information obtainable by the doctor includes but is not limited to: patient information (DOB, height, weight, address, etc), health, allergies, existing or past prescriptions, medical history, and symptoms as well as information about the patient's specific health plan such as eligibility, co-pay, and cost of the drug which is being prescribed. In addition, the User can obtain information about a drug with reference to drug interactions for that specific patient, information about optional drugs, and whether the selected drugs are covered by the patient's health plan. A list of doctor or group favorites, most prescribed drugs, any changes in formulary coverage, warnings about

drugs, and "treatment packs" (other treatments which typically go along with certain drugs) may also be made available via the user interface. The system may also provide access to a pharmacopoeia (directions for various drugs' use). The PDA and system may additionally be used for office management. Finally, the PDA and system may be used as a recording device. Other uses will be apparent in relation to the following description and examples.

The PDA or other user interface device equivalent may be synchronized with an available desktop server. This allows the daily patient scheduling and other information from the desktop server to be input into the system and contributes to the office management. The synchronization may occur upon activation of the PDA, alternatively the synchronization may occur upon selection of a heading or "key" on the screen of the PDA after login or activation. The synchronization may take up to 20 minutes or as little as a fraction of a second. Typically, the synchronization takes less than 15 minutes, including 12 minutes, 10 minutes, 8 minutes, 5 minutes, 3 minutes and 1 minute. The synchronization may also include any information which has been produced about prescriptions for any patients previous to activation of the system. This desktop server may be a local machine within the doctor's office in a preferred embodiment. However, in certain cases, particularly for medical practice groups which are physically distributed between several building or office sites, the desktop server may be located remotely from the doctor's office and accessed across the internet as described above, using any of a variety of secure protocols.

The PDA or equivalent may allow printing of any information obtained or produced during use. Typically, the PDA or equivalent allows printing from an office printer. One embodiment is a print-out which contains, in addition to the prescription information typically found on a prescription (cost, name, directions for use, side effects, etc.), coupons, advertisements, and information about clinical studies. This additional information may be targeted to the pharmacy at which the patient will be filling the prescription. Alternatively, the information may be targeted to the drug and/or the illness which the drug is treating. For example, if the drug is a treatment for inflammation due to overuse, the coupons, advertisements, and/or clinical studies may

be targeted to a person who exercises, such as a coupon from SPORT CHALET and information about a clinical study to test a new anti-inflammatory.

In addition, the receipt or prescription may also include information about clinical trials and may include an "enrollment number" specific to that patient. In this way the patient can enroll for the clinical study and by using the "enrollment number" the enrollment may be linked to the advertisement. The print-out may also include pharmacy consults, including but not limited to, specific information about possible interactions with other drugs, whether the present drug may make the patient sensitive to UV light, whether the drug may reduce the effectiveness of another drug the patient is taking (such as birth control pills), instructions on how to take the drug, whether the drug should be taken with food, with water, how many times a day and in what quantity, which foods or whether alcohol should not be taken with the drug, and whether heavy machinery should be operated. The receipt or print-out may contain any information the patient would typically receive from the pharmacist. Other print outs include receipts, chart copies, and scripts.

Such "permission based marketing" allows the patient to take advantage of offers which are based upon his profile, but do not require disclosure of the patient's status to anyone other than the doctor or patient. This protects the confidentiality of the patient while still providing a potential benefit to both patient and the organization marketing their goods.

As used herein "User" refers to anyone who uses the system. Typically the User will be a physician or a doctor or another type of health care worker in an office, hospital, or emergency room. The User will only be able to access the system and information by logging in. In one embodiment, this requires the input of a location, name and a password. However, the login may be any series of information and/or password. Alternatively, the login may require voice recognition, fingerprint recognition, retinal recognition, or any other method which ensures security.

The system allows for data entry and navigation throughout the system using menus, function keys, and drop-down menus for selection and entry of information. However, the system also allows the addition of information by selecting the keyboard and "typing" in any information the User believes pertinent. This allows for ease of use

and quickness in addition to the flexibility to still allow the User to incorporate his or her own comments, suggestions, or notes. The screens shown in Figures 2-20 employ user-friendly data selection and data entry techniques such as are familiar to many computer users. For example these may include without limitation: activatable buttons, pointers, scroll bars, icons, arrow keys, drop-down menus, windows and other screen symbols designed for actuation by a pointing device, for example, a mouse, trackball, pen or stylus.

Because there are presently at least 70,000 drugs available in the US and other countries in a variety of doses and new drugs are being developed daily, the process of choosing the best drug for a patient becomes extremely difficult for a doctor in the setting of an office visit, particularly if the doctor or healthcare worker has only a short period of time, often as little as 15 minutes per patient, and must make the decision of which drug to prescribe within a single session. The existence of nutraceuticals, herbs and other non-prescription treatments makes the process even more difficult. A thorough researching of the appropriate drugs including identifying new drugs, interactions with other drugs and coverage of the drug by the patient's Provider may be a very time consuming task.

Thus, to increase efficiency and ease for the healthcare worker, the described system makes available information about drugs, other drugs of the same type, and dosage information. In addition, the system analyzes drug interactions, such as whether the patient is currently taking a drug of the same type, a drug that interacts badly, or is allergic. This process occurs in a fraction of the time which might be needed by the health care worker to perform these tasks manually. In addition, the system may include messages which apprise the healthcare worker of new drugs which have become available. These messages may allow the healthcare worker or other User to read about the new drug and may be used for continuing education purposes. In addition, the system may include messages about drugs which have been removed from a health care provider's formulary, drugs which have produced side effects which may not be acceptable, or other information which may be of use or interest to the User.

The prescription writing system described herein may incorporate information about the formulary of the specific patient's healthcare provider. This allows the doctor

and patient to decide on a treatment based on cost and availability. A formulary is a list of those drugs which are authorized for use by a healthcare provider. The drugs may be chosen based upon analysis of the side effects and risks, cost, popularity by health care professionals, availability, and refunds or other bulk purchase discounts which may be provided to the healthcare provider. The formulary allows a User to choose drugs that are already authorized by the healthcare plan provider. However, it is envisioned that the User may choose to prescribe a drug which is not a part of the formulary in certain circumstances.

The prescription writing system described herein also includes updates which keep a physician apprised of changes in formularies for various health care providers, dosages for pregnant patients, elderly patients, children or other patients requiring altered dosages, and side effects which occur only in certain cases or to certain age groups. The updates may also educate the User about the most prescribed drugs for a given symptom or disease. In addition, as the User prescribes drugs, that information may be used by the healthcare provider to analyze which drugs are being used most in order to update their formulary to better serve both doctors and patients.

The operation a preferred embodiment of the system will now be described with reference to Figures 2 to 20. Note that much of what will be described below is specific to the user interface as implemented on a particular PDA for the analysis and writing of prescriptions. However, those of skill in the art will recognize that a system as described below in accordance with the preferred embodiment, can include without limitation: information about tests, diagnoses, previous treatments, family history, and other information relating to the patient. The system may also be used to order and analyze clinical tests or X-rays, to produce referrals to specialists, and to order treatments such as radiotherapy or physical therapy.

In addition, the system presents the User with specific choices for data analysis and retrieval. It is to be understood that choices, function buttons, and pages may be added, including without limitation, further choices under the heading "Patient" such as "Family History", "Blood Tests", "Clinical Tests", "X-rays", and "Health History". In addition, the User may input information including but not limited to the User's diagnosis and the results of treatments or tests performed.

Many patients end up in the emergency room unnecessarily due to noncompliance with a prescribed treatment. This noncompliance may be purposeful or may simply be due to human error, aging memory, or because the patient is taking such a large number of prescription medications that it is difficult to comply. This costs the health care provider and patient in increased expenses and wasted time, and the patient suffers poorer health and increased pain. Thus, the system herein allows for the verification that a patient is ordering refills of a drug, allowing the physician to verify compliance. For example, when a prescription refill is ordered at the pharmacy, the pharmacy inputs this information and a record is kept. If the prescription is not ordered at the appropriate time a message may appear upon logging into the PDA. For example, a red light may blink when there is a message for the doctor warning of noncompliance.

The system may also be used to help an elderly patient with compliance. A telephonic message may be input into the system by the Office or by the health insurance PBM. The message may be configured to occur at a certain time of day reminding the patient to take a medication. Alternatively, the prescription may be presented as a packet with the times and dates included within or on the packet. For example, the pills may be part of a bubble wrap or other compartmental packaging which includes information about the time and day to take each dosage under each pill. In this way a patient will know when a pill was missed.

The system will now be described with reference to an embodiment in which prescriptions may be analyzed and ordered. Figure 2 shows a screen which may be accessed. The screen typically includes the active page which is being used or accessed as well as the Toolbar, typically at the bottom of the screen. In this embodiment, the Toolbar includes the following selections: a "Doctor", "Patient", "<<" "Logout", and Keyboard icon.

Figure 2 illustrates the login screen which is initially produced upon activation of the system. The login includes a pull-down menu which allows the selection of a location. Optionally, a location may be input using the keypad which will either automatically appear or may be accessed by choosing the icon in the toolbar located at the bottom of the screen. The User name may be selected from a pull-down menu or may be input using the keyboard. The embodiment herein includes the first initial and

the last name of the User without spaces. The password is case sensitive, expires every 120 days, is alphanumeric and must be at least 4 characters. After completing the login, the "login" function button is selected and the "Patient Queue" screen automatically loads.

This embodiment allows for automatic movement from one screen to the appropriate next screen. However, the User may also choose to go to a different screen by making the appropriate selection from the Toolbar. Thus, many screens may be accessed in a variety of ways.

If the password has expired or if the User desires to change the password, the "Change Password" screen allows this function (see Figure 3). This screen can be accessed via the "Doctor" selection in the Toolbar or alternatively, the screen will appear after a given password has been used for 120 days. The name of the User appears at the top of the screen. The appropriate information, including the old password must be entered in the correct case. The new password should be at least 4 characters and should be entered in the "New Password" field and identically in the "Verify New Password" field. Selection of the "Submit" function allows for the change to be processed and automatically proceeds to the "Patient Queue" screen.

As an alternate means to authenticate a User to the PDA, various techniques other than passwords may be used. These may include but are not limited to biometric systems for identifying a User based upon such identifying characteristics as fingerprints, handwriting, signature, voice, face or retinal scans. Although not every one of these systems may be available for use with current PDA's and mobile devices, in the future these methods may be an important addition to ensure confidentiality and security of the system.

Figure 4 illustrates the commands which can be selected under the "Doctor" selection on the Toolbar, including "Select a Printer", "Change a Password", "Settings", "Sync", "Favorites", and "Patient Queue". With the exception of "Select a Printer" and "Sync", the selection of any of the other choices will cause the User to lose all patient data that has been entered for any case currently open. However, a warning will appear in the following form: "Leaving patient - uncompleted/unsent prescriptions will be abandoned." The User may then choose "OK" or "Cancel" as desired. In addition, any

of the choices under the "Doctor" selection will automatically take the User to the designated screen with the exception of "Select a Printer" and "Sync" which have no application function screens.

The "Sync" function manually activates the PDA's synchronization process with the local desktop server. Synchronization is used in order to retrieve the daily patient schedule and corresponding prescribing history for the day's scheduled patients. This is a task which should be effected upon starting the application and will be automatically prompted by the application. It may take up to 15 minutes. Moreover, the system automatically synchronizes "behind the scenes" with the local server every time a prescription is submitted/printed in order to capture any additions/changes to the day's schedule.

Figure 5 illustrates the commands which can be selected under the "Patient" selection of the Toolbar, including "History", "Allergy/Misc", "New Rx", and "Review Rx". Selection of any of these navigational choices automatically takes the User to the designated screen.

The Toolbar also includes the "<<" function which may also be referred to as the "back" function and takes the User backwards to the last screen that was accessed prior to the current screen. The function "Logout" may be used to log the User out and return him/her to the "Login" screen. In particular, if a number of devices are kept on hand within a particular clinic or doctor's office and are shared by whatever healthcare professionals are on duty at the time, it will be necessary for a given User to logout when returning the device to the pool of available devices. This may prevent a new User from picking up a device and prescribing medication for a patient under another User's name, as well as ensuring that each User is presented with his or her own schedule of patients and not the schedule of another User.

Figure 6 illustrates the "Patient Queue" screen which allows for the selection of a specific patient scheduled for an appointment that day. Note that a new patient may be added to the queue at any time, but may require resynchronization of the PDA with the desktop server. To select a patient, the appropriate patient name is highlighted and then the desired function button is chosen. The function buttons shown include "New Rx", "Rx History", and "Allergy/Misc". It should be noted that although patients may have a

variety of health care providers, the access to the various web servers and health plan data allows for all of the information about that patient to be accessible and to be up-to-date. Thus, a patient's history may be accessed to analyze, input, and process a prescription. To proceed with prescription writing, the "New Rx" function is chosen. To view the patient's medication history, the "Rx History" function may be selected. To view or add/edit the patient's allergies and miscellaneous medications not prescribed by the present doctor, the "Allergy/Misc" function is chosen.

Because Doctors and other health care workers who typically prescribe drugs tend to have favorites, the system allows the User to create and use a list of "Favorites". The favorites are typically drugs which the health care worker or Group prescribes with high frequency, are very effective, are very useful, or have any quality which the User deems appropriate for a "Favorite" drug. Figure 7 describes and illustrates the addition, editing, and deleting to the "Favorites" menu. The User may include within the system a list of personal favorite medications. These personal favorites are all medications that the Provider or User has established as a personal "favorite" medication to prescribe. The "Favorites Management" screen allows for the User to add a favorite, edit specifics of an existing favorite, and delete a previously established favorite. An alias may also be created for the drug by tapping and holding for a few seconds the drug name in order to "pop" up a keyboard for the User to "type" a chosen alias. The screen includes the choices "Add", "Edit", and "Delete". By tapping on or "choosing" a drug on the list, the appropriate function may be selected and performed.

The "Settings" function enables the User to customize the application with respect to select functions to suit their prescribing or using needs. See Figure 8 for an illustration of the "Settings" screen and functions. A checkmark signifies that the specific function will be "turned on" in the system and will apply when appropriate during use. The settings should be selected prior to or after a prescribing session. In order for any changes to be saved, the "OK" button is chosen before selecting a new screen. Some of the settings which may be selected include: "Enable Drug Warnings". This allows a message or some other indication to "warn" the User that a chosen drug has drug/drug interactions for the patient, drug/allergy interactions, or is a duplicate therapy. By duplicate therapy, the drug may be of a duplicate type, such as an antibiotic.

Thus, when choosing a drug, the User will be forewarned of any problems and may alter the prescription based on the information obtained.

"Enable Off-Formulary Notification" in Figure 8 refers to the messaging displayed after a drug has been selected. There will still be "passive" formulary information presented via icons in the search results display window which may be accessed before selecting a drug. However, if the drug which is selected is not included in the specific patient's healthcare provides formulary, the "Off-Formulary Notification" will appear.

"Enable Suggested RxTablet Choices" in Figure 8 refers to the automatic filtering of the RxTablet dropdown choices so the only choices displayed to select from are those applicable to the specific drug and chosen route of administration. Disabling this selection will present all of the dropdown choices for each of the RxTablet fields through which the User may scroll even if they are not applicable to the drug being prescribed or the route of administration. This may be of use when a drug is being prescribed for a non-typical reason or disease or if the patient is non-typical in any way.

The screen "Rx History" in Figure 10 can be chosen from the "Patient Queue" page and can be used to view and renew prescriptions for the displayed patient that have been either filled or prescribed within the last 6 months. It should be noted that because of legal regulations and privacy reasons, AIDS-related medications and specialized alcohol and substance abuse drugs are not displayed unless the User prescribed the particular drug to this patient. An icon which looks like a tablet signifies those medications prescribed through the Rx-Connect system at the Group's location level. A red checkmark in the icon indicates that the prescription is fulfilled. A mortar and pestle indicates that the miscellaneous medication was entered using the drug search functionality and signifies that the drug can be renewed using the renew button. The medications are sorted by default from the most recent medication to the oldest. However, any column may be resorted by tapping on the respective column and can also be resized to view the contents better. This screen may also be accessed via the "Patient" selection of the bottom command bar. In addition, the User may use the "Details" and "Renew" buttons to review details about the prescription or to renew any drug prescribed.

In Figure 10, the screen which is shown upon selection of the "Rx History Details" command is shown. The screen displays the specifics of the selected medication of interest. This is a read only screen and cannot be edited. The prescription may also be renewed from this screen by tapping the "Renew" button. This moves the User to the "Rx Tablet" screen. Alternatively, the User may tap the "OK" button at the top of the screen to return to the "Rx History" screen.

Figure 11 illustrates the "Allergy/Misc. Meds" screen which can be used for adding, deleting, and editing allergies to miscellaneous medications. Further information may also be included about reactions to medications which are not classified as "allergies". For example, stomach upset or other side effects may be noted here. The screen for "Allergy/Misc. Meds" displays all allergies or other reactions including those to medications, foods, insects, animals, plants, perfumes, latex, wool, nutriceuticals, and herbs that have been documented for the chosen patient. Miscellaneous medications refers to over-the-counter drugs or herbal supplements the patient has reported taking as well as other medications, possibly prescribed by other providers. This allows clinical record-keeping and may be used to analyze new drugs and interactions. The page also allows the User to add, delete, and otherwise edit the information presented by choosing the appropriate function button. The mortar and pestle indicates that the medication was entered using the Drug Search functionality and signifies that the drug will have interaction checking applied. This screen may also be accessed via the "Patient" selection of the bottom command bar.

Figure 12 shows the screen which is produced upon choosing the drug "Sulfonyureas" and then the function button "Edit" on the "Allergy/Misc. Meds" page. If the function button "Add" was chosen, the screen would read "Add Allergy" or "Add Medication". The screens allow the User to document allergies, or reactions to drugs and to detail what the symptoms of those reactions or allergies were. Most of the allergies and medications will be included in the automated drug-drug and allergy interaction checking as well as the duplicate therapy check (Exceptions may include non-drug allergies and any miscellaneous medications that are manually "typed" in versus using the Drug Search functionality). Thus the User can search for the appropriate allergy/medication to document by either tapping the dropdown arrow to see

the most common drugs offered from the dropdown list or by tapping the "Search" function button to do a more extensive search using the "Drug Search" screen. The "Save" button allows for the input of the information and will return the User to the "Allergy/Misc. Meds" screen.

If the User wants to do a drug search, the "Drug Search" screen (see Figure 13) may be accessed via the "Patient" selection of the bottom command bar by selecting "New Rx". The "Drug Search" screen may be used to search for a drug to prescribe to the patient displayed. There are three available ways to search: from a predetermined "favorites" list; by therapeutic class (drug category); or by drug name. The User may search the patient's carrier's specific formulary or may search a full database of medications. The resulting list includes icons to the left of the drug in the form of a colored circle or square with or without a letter inside. The green indicates a drug which is a part of the formulary for the patient's health plan and red indicates a drug which is not. The "G" represents the drug dispensed as a generic. The "B" represents the drug dispensed as a brand. A yellow square around a green diamond indicates that the drug is "Preferred" within the formulary. A red circle represents a non-formulary drug. A red diamond with a yellow square around it represents that the Drug is Preferred. When, upon using any of the searches, the User finds a drug which he/she wants to prescribe, the User taps the "Select" function button after highlighting the drug of choice. This then takes the User to the "Rx Tablet" screen.

When searching by "Favorites", the User may choose to search "Personal Favorites", "Group Favorites" (previously established for the Group's practice and setup via the desktop application), or "All" which includes both personal and Group favorites.

When searching by "Therapeutic Category", the User may select an appropriate subcategory from the choices displayed.

When searching by "Drug Name", the User may choose a drug available in the dropdown menu or may tap the field box below the "Search by" field, and a keyboard will automatically pop-up allowing the User to "type" in the first 3 or more characters of the drug name. By tapping the "Go" function, the search is activated.

If the User decides to select an off-formulary drug, the "Off Formulary Notification" screen may be activated, depending upon the setting for this User (see

Figure 14). This screen is used to notify the User that the selected drug is not covered by the patient's health plan and provides drug alternatives which are available within the patient's health plan formulary (smart formulary alternatives). This screen may also indicate the cost to the patient of the drug and its alternatives. In this way the healthcare worker and the patient can make an informed decision about which drug to use. The alternatives displayed will be the drugs on the formulary that are in the same drug subcategory as the selected off-formulary drug. This page allows the User to select a function button to "Change" the prescription, or to "Keep" the prescription. However, regardless of the choice, the outcome is that the patient will not be surprised by an unexpected bill at the retail establishment when picking up the prescription.

If the User chooses a drug which may have restricted usage, is not covered by the health plan, has produced an allergy or adverse reaction in the patient in the past, or has been removed from the formulary, the "Warning" page will appear upon selection of the drug. The "Warning Page" is illustrated as Figure 15 and appears over the "Drug Search" screen. The "Cancel" function takes the User back to the "Drug Search" screen.

Alternatively, the "Drug Warnings" screen may appear and notify the User of any possible warnings related to prescribing the selected drug given the patient's currently "active" prescription record. This screen includes the following: Drug/Drug interactions, Drug/Allergy interactions and Duplicate therapies. The Drug/Drug interactions factor in the drugs which have been prescribed within the last 90 days and includes all drugs, even those which were not prescribed by the User. These may be brought in from the PBM's claims history for the patient. The Drug/Allergy interactions factors drugs being prescribed in the current prescribing session against any allergies documented in the Rx-Connect system. Once documented, allergies will always be checked against unless they are deleted from the system.

The Duplicate therapy checking automatically review the medications prescribed or fulfilled within the last 20 days and alerts the User if there is an exact drug or a therapeutic duplicate in the system's history. A time of 20 days was chosen to reduce inappropriate messaging. However, this time limit may be adjusted as necessary by the User depending upon the needs of the patient. For instance, if a patient takes a drug which is renewed every 45 days, it may be desirable to increase the sensitivity to check

for any refill or prescription from the last 45 days in order to make sure that the long term prescription is always checked against.

After reviewing the message, the User may choose the "Acknowledge" function button to proceed to the "Rx Tablet" screen. Alternatively, the User may choose the "Go back" function button in order to return to the "Drug Search" screen to choose an alternative drug.

The "Rx Tablet" screen may be accessed in a variety of ways. This screen as shown in Figure 17 enables the User to "write" the prescription as it should be dispensed for the drug listed. The "Suggested SIGS" are the drug manufacturer's recommendations and may pre-populate the field values but may be easily modified by the User if desired. The fields which need to be completed for a prescription to be accepted include, "Strength", "Quantity", "Refill" and "Dispense Method" if the drug is "As Directed". An "As Directed" drug may be indicated by checking the appropriate box in the upper righthand screen section. If the drug is not written as an "As Directed" drug: the fields which need to be completed include "Strength", "Dose Amount", "Frequency", "Quantity", "Refill", and "Dispense Method". This acts as a means to ensure that a complete prescription will be dispensed to the patient and will not require follow-up by the pharmacy. The page provides considerable means for the User, Doctor or Healthcare worker to personalize the prescription, including dropdown menus as well as the option to "type" the information in using the keyboard option. In addition, the User may add the drug and directions to his or her "Favorites" list.

When completed, the User submits the prescription by choosing the "Continue" function which will proceed to the "Review Rx" screen. For some of the top pediatric drugs, basic dosing guidelines are available. Thus, if the "Check Ped Dosing" button located at the bottom righthand corner of the "Rx Tablet" screen is enabled, the User can display a message box with the relevant reference text for view. "Mail" should be selected when the prescription is to be filled by the health plan carrier's designated mail service pharmacy. This selection will automatically fax the prescription to the appropriate mail service pharmacy and generate a printed patient receipt and chart copy. This saves the patient, pharmacy, and doctor time, energy and money. If the prescription and/or patient is new, the "Starter" function button may be selected. This is

particularly useful for maintenance medications or medications which will be continued for a long period of time or may be lifelong.

Maintenance medications may also be medications which the patient desires to have continued refills processed by the designated mail service pharmacy. However, if the User desires to keep track of patient compliance in using the drug, he or she may decide not to use the function. The "Retail Quantity" field allows the User to "write" the mail portion of the prescription on the tablet (i.e. the "starter" amount). This enables the prescriber to assess the drug's effectiveness and to confirm that there are no adverse side effects before continuing the patient on the drug for an extended time period. Once the prescriber and the patient are confident that the drug should be continued, the remaining refills have already been ordered.

"Print Rx" should be selected when the prescription is to be given to the patient to take to the pharmacy of choice for fulfillment or mailed in by the patient. This selection will print an original prescription for the patient to take to retail and a chart copy. No receipt is generated in this case. The "Record only" function is used to document prescriptions in a system when only a chart copy needs to be generated. Examples may include: when the office calls into the retail pharmacy a prescription/refill but wants a chart copy to keep the patient's chart current, when controlled prescription drugs are prescribed for a patient which require a written triplicate script and thereby cannot use a Rx-Connect generated script, and when medication samples are given to a patient and need to be recorded in order to properly document the patient's chart.

When arriving at the "Rx Tablet" screen in order to process a renewal prescription, the field values of the screen will be pre-populated with the SIG information retained in the history for the former script of the drug if available. The User may verify the information or optionally edit the information as desired.

After submitting a prescription, the "Review Rx" screen appears as in Figure 18. The "Review Rx" screen allows the User to verify the information which will appear on the receipt, chart copy, and/or prescription. This screen displays the prescription(s) for review before final submission and allows additions, deletions, or edits to any drug displayed on the prescription list. "Starter" prescriptions are displayed as separate lines

detailing the respective Mail and Print Rx (for taking to the retail) components. This screen may also be accessed via the "Patient" selection of the bottom command bar (the Toolbar). The User reviews the drug list displayed by name, strength, method, and SIG. Changes may be effected using the function buttons. Alternatively, if no changes are needed, the "Submit" function is chosen and the entire drug list is submitted. A hardcopy including a retail copy, a mail receipt, and/or a chart copy will be generated. The application will return the User to the "Patient Queue" screen in readiness for the next patient.

It is envisioned that once a patient is selected, a variety of other information may be obtained using the system herein. For example, in addition to the "New Rx", "Rx History", and "Allergy/Misc", the patient's medical history, family medical history, height/weight, health, blood test, X-ray, or other medical test information may be accessed. In addition, it is envisioned that any information which should be legally accessible to the User may be accessed.

It is envisioned that Drug Warnings may also include interactions specific to the age or sex of the patient, any interactions which may be specific to patients with a chronic disease or who use alcohol, cigarettes, and/or eat a certain type of diet. In addition, the Drug Warning may include an analysis of the patient's family history and any risks apparent therein. For example, if a certain drug is not suggested for those who are at high risk for stroke, the occurrence of a high incidence of stroke in the family history of the patient may produce a warning.

The system and PDA will now be described with reference to specific examples.

EXAMPLES

EXAMPLE 1

A Basic Prescription Writing Screen Flow using the PDA of the Preferred Embodiment

A patient enters Doctor T. Trueblood's office requiring a prescription. The doctor discusses the reason for the prescription and uses the PDA to decide on an appropriate drug therapy as follows: In Figure 19a the Doctor logs in by choosing the location "Gateway 710 Office" from the pulldown menu, inputting the User name

"TTrueblood" using the keyboard, and entering the Password using the keyboard. The Doctor selects "Login" and the application proceeds to the "Patient Queue" page (19b). The doctor then selects the patient "McDaniel, Tracy" and the "New Rx" function button. The "Drug Search" screen appears as shown in Figures 19c-e. The doctor searches by any or all of "Name" as in 19c, "Therapeutic Category" as in 19d, and "Favorites" as in 19e. If the doctor chooses to search by "Name", he chooses "Name" from the pulldown menu and "types" in at least 3 letters of the drug, "VIO". The 7 choices generated by the search appear with the "Drug Name", the icon designating whether the drug is formulary, the cost, and the typical form which is dispensed (caps, tabs, pack, suspension and number) as in Figure 19c. The doctor may choose one of these or go back to the "Drug Search" screen and search by an alternative method. In Figure 19d the doctor searches by "Therapeutic Category" by choosing the search from the dropdown menu, choosing the subcategories from the dropdown menu, and choosing to search all drugs (rather than only those on the formulary). The doctor may then choose from the list generated which provides the "Brand name" (including the form which is dispensed), the "Generic Name", and the "cost". The doctor may choose one of these or go back to the "Drug Search" screen and search by "Favorites" as in Figure 19e. In Figure 19e, the doctor chooses "Favorites" from the dropdown menu and "Personal Favorites" from a second dropdown menu (rather than Group favorites or both), and a list is generated. The doctor may choose one of the listed drugs or may go back to the "Drug Search" screen and choose one of the other drugs. In this example, the Doctor chooses the drug "Vioxx OR TABS" and the screen shown in Figure 19f appears over the "Drug Strength" screen. This screen shows the chosen drug, and provides a list of strengths which may be prescribed. The doctor may "Cancel" or choose a given drug strength and tap "Select".

At this point, if the physician selects a non-formulary drug, the message shown in Figure 19g appears and presents a variety of formulary alternatives. The physician may select the appropriate function button to "Change" the non-formulary drug to one of those listed or alternatively, the physician may choose to "Keep" the non-formulary drug by choosing that function button.

If the drug is not covered by the patient's Provider, the screen shown in Figure 19h appears. In this case the physician chose Retin A and the warning came up with the message that "Retin-A for cosmetic purposes is not a covered pharmacy benefit".

Finally, the "Drug Warnings" page may appear as in Figure 19i showing that the chosen drug has "(0) DRUG-DRUG interactions, (0) DRUG ALLERGIES, AND (2) DUPLICATE THERAPIES. The screen then provides a list of the Duplicate therapies. The physician may choose to "go back" and reselect a drug, or may choose to "acknowledge" the interactions and submit the prescription anyway.

The physician then chooses an alternative drug (glucophage OR TABS) and the "Rx Tablet" page (see Figure 19j) allows the physician to designate the strength, dose, quantity, refills, and any other information the doctor believes relevant to the patient. In addition, the doctor may choose "Starter" from the pull-down menu to designate that the prescription is being used for the first time. When the physician chooses the "Continue" function, the "Review Rx" page appears, allowing the physician to verify the information that will be printed onto a prescription or receipt (see Figure 19k).

Thus, the doctor is able to identify a drug, analyze the drug's applicability to a specific patient in terms of whether that drug is covered by the patient's provider, whether it will interact badly with any other drugs the patient is taking, and whether there are any appropriate alternatives to the drug. In addition, the doctor may submit a prescription and provide the patient with a print-out or receipt, saving the patient the time required to take the prescription to the drug store and have it verified as being covered by insurance. Alternatively, the doctor may print the prescription, providing the patient with a legible prescription which has been "checked" to ensure that it contains all of the necessary information. This saves the patient (and the pharmacy) the trouble of verifying or having to include information which was mistakenly left off by the doctor.

EXAMPLE 2

Analysis and Editing of Allergies by a Doctor

The patient in Example 1, Tracy McDaniel returns in 2 weeks having experienced a reaction to the drug prescribed by the doctor as well as a reaction to an off-the-counter drug.

Before seeing the first patient of the day, the Doctor opens and synchronizes the PDA. With reference to Figure 20, the Doctor logs on as in Example 1 (see Figure 20a). However, in this case, the password has expired so the "Change Password" screen, Figure 20b appears, thus, the doctor submits a new password. From the resulting "Patient Queue" page the doctor may perform the following functions to prepare for the day.

The doctor reviews the "Settings" by choosing the "Settings" heading under the "Doctor" function on the Toolbar. The "Settings" screen allows the doctor to enable the drug warnings, off-formulary notifications, and suggested Rx Tablet choices (Figure 2c). The doctor then goes on to review the "Favorites Management page (see Figure 20d).

During the appointment with Tracy McDaniel, the doctor is informed of a bad reaction she had to a drug the doctor prescribed previously. She reminds him that when she was taking sulfonyureas she experienced hives, itching, and a bright red rash on her back. The doctor reviews the allergies by selecting the "Allergy/Misc. Meds" from the "Patient" toolbar option. He then chooses the "Edit" button under Allergies and inputs the additional information that the drug produced "a red rash on the patient's back". She then reminds him that she had a very strong reaction to St. John's wort, experiencing intense nausea and stomach pain. The Doctor chooses the "Edit" button under "Misc. Meds" and adds the information for St. John's wort. Upon submission of the changes, Tracy asks for a refill of the Glucophage OR TABS she has been taking. The doctor goes back to the "Rx History" page from the "Patient Queue" page and chooses the drug. He then chooses "Renew" and the "Rx History Details" are shown (see Figure 20j). The Doctor verifies the prescription information and submits the prescription. The information is submitted to a mail order pharmacy and Tracy receives a receipt containing, in addition to the information on the Glucophage, an advertisement for a clinical trial for a new medication which helps to lower the blood glucose in patients with type II diabetes. She also receives a coupon for \$1 off glucose test strips at her pharmacy.

ADDITIONAL FEATURES

In addition to those features described above, alternate embodiments of the described system may also include additional features. One of these is the ability to order laboratory results and to preload the data associated with the lab results. This will be described below.

In an alternate embodiment with lab test ordering functionality, the doctor or other User may select a laboratory test to be performed from one of the screens of the user interface. The test may be a part of a treatment group which includes the test. For instance, a treatment group for flu symptoms may include medication to treat the flu symptoms (fever, runny nose, etc.) and also a blood test or throat culture to determine the cause of the symptoms.

Once the lab test is selected, there are generally two possibilities as to how the test will be conducted. For many lab tests, such as throat cultures or chemical blood analyses, a sample to be tested may be taken directly at the point of prescription by the doctor or other User. For other lab tests, such as amniocentesis or ultrasound tests, the test may be conducted at a hospital or medical laboratory.

In cases where the sample may be taken on site by the doctor or other User, the lab test selection will allow the User to prepare a tracking label and an instruction sheet that may be sent with the sample to the lab for testing. Simultaneously, the mobile system may submit an electronic request to the lab which indicates what testing will be required, as well as the relevant patient, doctor, and billing data. In this way, when the sample is received by the lab, the data entry associated with the patient and doctor may already be complete because they were received electronically, and the sample may simply be tested, and the results generated. The tracking label upon the sample is used to ensure that the correct sample is attached to the correct patient.

The test results may then either be sent to the patient or doctor using traditional means such as mail, or may be uploaded back into the data systems described above, such as the web server and doctor's server, for immediate access by the appropriate medical personnel and inclusion in the patient's medical record. If the results indicate a serious condition requiring immediate attention, an appropriate pop-up warning may appear on the doctor's mobile unit or on his desktop unit to gain his attention.

In the case where the test sample is not taken at the point of prescription, the request and instructions are generated and electronically uploaded to the lab, as well as a copy being given to the client to bring with them. In this way, when the patient arrives at the lab, the tracking number may be scanned or typed in, allowing the proper instructions and test requests to automatically be called up by the laboratory. Results may be sent in the same manners as described above.

In either case, a receipt including the tracking number, as well as any instructions which should be followed related to the test, may be provided to the patient. This may be done using the same general systems described above regarding receipts for prescriptions. For instance, the instructions may include directed marketing, if relevant, such as a coupon for a maternity store if an amniocentesis were being performed. Additionally, instructions regarding how to prepare for the test, or possible side effects of the test might also be included (*e.g.* 'do not eat for 12 hours prior to the test', or 'avoid operating heavy machinery or driving a vehicle for 3 hours after the test').

In addition to providing a savings in data entry by allowing the lab to get an electronic copy of the information associated with the patient and the desired tests, this system may also provide a more effective payment path for the laboratory. Because the lab will require payment information, it may either be entered directly by the patient or doctor, either on the mobile device (if appropriate) or via a terminal which provides the appropriate access to the internet. This payment transaction or transfer of payment information (if covered by insurance, for instance) may be mediated through the web servers described above. This allows the transaction to proceed as quickly as possible, and continues to protect the confidentiality of the patient's information by separating any financial information, such as a credit card or insurance number, from his actual medical history data.

Another feature which may be provided in alternate embodiments of the system may include the ability to factor the revenue stream associate with a particular doctor or office on an individual basis. Because patient records are driven through the operation of the various user interface devices or PDA's, it is possible that the health care plan may choose to link its salary and payment information for its doctors and other health care practitioners to the records that are generated through the use of the PDA and the

above-described interface. For instance, it becomes easy to identify how many patients were seen over what time period, and how many of those doctor-patient transactions are complete based upon the transactional data recorded through the use of the PDA.

This data could be used in the ordinary manner to simply verify the appropriate quotas were being met by the medical personnel, and payments to the doctor's office could be made accordingly through whatever payment arrangement exists between the health plan provider and the doctor's office. However, because the data is tracked automatically and available in real time, an opportunity exists to have the doctor indicate his willingness to defer payment for particular work until a later time in exchange for consideration, such as interest, from the health plan provider.

For instance, if the normal arrangement between a doctor's office and a health care plan is normally to receive a fixed fee per patient visit completed, this data could be tabulated directly from the PDA records. However, if the health plan were willing to pay a premium in order to delay the date on which they made payment for that patient visit, they could offer the doctor a bonus in exchange for defer the date at which the payment to the doctor becomes due from the health plan provider. In this way, the doctor could be given the option to select in real time for each patient visit to either accrue the receivable immediately at one rate, or to accrue it at a later date at a higher per visit rate.

Multiple rates for various deferment schedules may be established. This can be of especial benefit to a doctor who has a particularly busy month, for example. After his office has reached its break even revenue for the month, the doctor may choose to defer the receipt of payment for any remaining patients seen during the month. This increases the overall profit of the office.

The health plan provider meanwhile gains the opportunity to reduce its payable in a particular month, and may then use that money to cover its own expenses in advance. By using such a system, the receivable schedule of individual offices may be tailored in real time to the needs of each office, while providing a benefit to the health plan provider of increased use of its financial reserves.

Another additional embodiment of the described system is for emergency room use. It is envisioned that the PDA and system would be used comparably to the use in a

doctor's office. However, the method of entering the patient information could be handled in a different way. For instance, a patient card may be input directly into the PDA or alternately, may be input into the office terminal and synchronized with the PDA. This input can be made either by the entry of the data off of the card using the stylus or typing, or via a card swipe system if such an interface is available.

The system would allow the emergency room workers to immediately access records about allergies, medications, and the patient's health and medical history as well as add treatments and medications. In a further embodiment, the information may be accessed after the receptionist has input the patient's information via the office terminal. The ER doctor may then synchronize his or her PDA prior to meeting with the patient and use the system as a doctor at an office would use the system. It is envisioned that this would allow for savings of time, expense, and possibly save lives because the ER worker would be able to access the patient information more quickly. In addition, if the result of the emergency room visit is an additional allergy or a prescription, the system allows for the emergency room worker to use the prescription service by mail resulting in a receipt for the patient or by producing a hard copy prescription for the patient.

The various embodiments of the medical service and prescription management system described above in accordance with the present invention thus provide a means to provide more efficient preparation and selection of prescriptions by a doctor, as well as means to track this information for demographic purposes. By using this data to estimate the level of use of various formulary medications, as well as to simplify data entry, the system may allow for more cost effective service to patients, as well as better feedback to pharmaceutical companies and other medical industry organizations.

Of course, it is to be understood that not necessarily all such objects or advantages may be achieved in accordance with any particular embodiment of the system described herein. Thus, for example, those skilled in the art will recognize that certain embodiments may be configured to operate in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objects or advantages as may be taught or suggested herein.

Furthermore, the skilled artisan will recognize the interchangeability of various features from different embodiments. For example, the lab test automation process described herein need not be implemented in a system which makes use of an RxChange server. Similarly, the lack of an RxChange server in a particular embodiment that provides for custom directed advertising on prescription receipts does not place the system outside the included disclosure. In addition to the variations described herein, other known equivalents for each feature can be mixed and matched by one of ordinary skill in this art to construct medical service and prescription systems in accordance with principles of the described system.

Although the systems and techniques above have been disclosed in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that these techniques and systems extend beyond the specifically disclosed embodiments to other alternative embodiments and/or uses, including obvious modifications and equivalents thereof.

Included hereafter is an Appendix entitled RxConnect Phase 1.0 which includes additional technical specifications for the software and systems described above.

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APPENDIX C

RX-CONNECT POINT-OF-CARE PRESCRIBING TOOLS AND PHYSICIAN CONNECTIVITY

SYSTEMS REQUIREMENTS SPECIFICATION

2. Introduction

Rx-Connect is a technology "startup" within PacifiCare Health Systems (PHS), an \$11 billion health and consumer services company. PHS operates in eight states and serves more than 4 million members through its various health plan and health services offerings. Rx-Connect, which was acquired by PHS in January 2001, is initially focused on providing pharmaceutical prescribing tools for PHS-affiliated clinical care providers at the point-of-care (i.e., during a patient encounter in the physician's office) through a hand-held device to enable physician connectivity and productivity using wireless technologies.

2.1. Purpose

This System Requirements Specification (SRS) is intended to provide a baseline set of requirements for development of the Phase 1.0 Rx-Connect system, relating to the Statement of Work executed by Rx-Connect and KORE Partners, Inc. on March 29, 2001 (contract 01-RXCO-0730). This deliverable will form the basis for all subsequent project planning, design, and software development, and will define a documented agreement about the Rx-Connect system by specifically identifying system features, functionality, and user behaviors.

2.2. Document Conventions

This document seeks to identify and describe the user, business and system requirements for the Rx-Connect system. The goal of this document is to capture the requirements of the Rx-Connect system, creating a documented agreement about the solution to be developed.

Requirements will be identified by the use of the words "shall." These are items that the client has identified as mandatory to the operation of the Rx-Connect system.

When discussing the priority of features for development, it is to be understood that KORE will analyze requirements for all functionality described herein, unless specifically otherwise stated. Priority is meant to indicate the relative important of these features.

2.3. Intended Audience and Reading Suggestions

This document is intended to serve as the focal point and aggregation of the requirements gathering process. The document will contain all the requirements elicited from, and approved by, the client for this phase of the project.

From this document, it is expected that the Rx-Connect/KORE team should be able to design a solution that meets all client and KORE requirements in the most efficient manner.

2.4. Product Scope

The scope of the Phase 1.0 Rx-Connect system development effort consists of custom software and web-enabled services to support the following Rx-Connect business objectives:

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- Increase PHS mail order drug penetration through Rx-Solutions, its affiliated Pharmacy Benefits Manager (PBM), and increase PBM efficiencies through higher formulary compliance
- Improve patient care and reduce medication errors by providing accurate and timely information to physicians.
- Automate the manual prescription writing process and streamline physician's workflow, eliminating illegible handwritten prescriptions and time spent fielding calls from pharmacists, thereby increasing the time a physician is able to spend caring for patients

The scope of the Rx-Connect system is illustrated in Appendix A, which visualizes the Rx-Connect system and its external interfaces in a "context diagram."

These specific solution components of the Rx-Connect system are illustrated in Appendix B, "Rx-Connect Component Architecture." Descriptions, detailed features and requirements for these components will define the design of the Rx-Connect system, and constitute vast majority of this document.

3. Overall Description

KORE has been engaged by Rx-Connect to develop a functional and technical specification for development of a highly engineered, scalable, production-version point-of-care prescription writing and clinical decision-support system. The Rx-Connect system will be designed to automate the current, largely manual prescription writing process using wireless hand-held and Internet technologies. With Rx-Connect, physicians will be able to electronically prescribe medications through a hand-held device. The Rx-Connect mobile application residing on the hand-held device will be the first of a suite of functionality and services to be offered at the point-of-care. These services will begin with prescriptions and will extend to encompass broader healthcare services in the future.

For the Phase 1.0 Rx-Connect system, physicians will be able to print prescriptions on a printer in their own medical office setting, FAX prescriptions to a destination pharmacy, and/or will be able to route prescriptions directly to Rx-Solutions for fulfillment by mail order.

3.1. Product Perspective

Development efforts for the Phase 1.0 Rx-Connect system are bolstered by several key factors: intense early stage market competition in the e-prescription space, and active development of an Rx-Connect Phase 1.5 Pre-Production Pilot.

According to recent studies, the handheld electronic clinical services market, which includes "e-Prescribing", could be a \$5 billion market over the next several years.¹ Moreover, only a very small percentage of U.S. physicians are currently

¹"The Cure Is In Hand: Bringing Information Technology To Patient Care", WRHAMBRECHT+CO, October 2000.

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using handheld devices for e-prescribing, and a large number of companies populate the handheld landscape with aspirations for accelerating the rate of physician adoption and capturing early market share. Rx-Connect, by virtue of its PHS health plan, provider, and PBM relationships, is poised to compete in the e-prescribing space by developing its application and evolving to offer associated web and data "middleware" connection services forward into the physician's clinical practice setting and backward to other PBMs, health plans, and data providers.

3.2. Product Functions

The functions of the Phase 1.0 Rx-Connect system can be broken down into a number of discrete areas that are further defined by specific system features, programmatic logic, user interfaces, and other solution components. These areas are:

- **System Setup** – Preparing the Rx-Connect system for use, culminating with installation of the Rx-Connect application on a host machine at a medical office location.
- **Security** – Securing the Rx-Connect system for access and use by recognized and expressly authorized parties.
- **Patient Data and Queue Management (Non-Clinical)** – Preparing patients for an encounter with a medical professional, including the capture of key insurance, demographic, and appointment information and management of this information in the context of an appointment "queue."
- **Clinical Patient and Data Management** – The material portion of a patient's encounter with medical caregivers in a physician-office setting, utilizing the decision-support capabilities of the Rx-Connect system, culminating with the physician's ability to electronically prescribe medication(s) and other therapeutic agents through a handheld mobile device.
- **Physician Office User Management and Administration** – The collective set of tools, processes and tasks associated with effectively initializing and managing medical professionals using the Rx-Connect system in a physician office setting.
- **Rx-Connect User Management and Administration** – The collective set of tools, processes and tasks associated with effectively managing Rx-Connect staff and facilitating the Rx-Connect staff's ability to manage, track, and service their medical group office customers.

3.3. User Classes and Characteristics

User classes are defined as all human users of the Rx-Connect system and its features. There are also other applications or hardware components with which the Rx-Connect system interacts; these components are described in detail below. The following user classes (and associated sub-classes) have been identified:

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- Prescriber
 - Physician, Nurse Practitioner, Physician Assistant, and other health care professionals with prescribing privileges
- Non-Prescriber
 - Physician Office Staff, System Administrator,
- Local Administrator
- Rx-Connect Staff
 - Rx-Connect Administrator
 - Rx-Connect Data Librarian
- Rx-Solutions Staff
 - Rx-Express, Rx-Claims
- Pharmacist
- Patient

3.4. Assumptions

Assumed factors to clarify scope and to ensure successful development of the Phase 1.0 Rx-Connect system are as follows:

- Network design and deployment, hardware security deployment, desktop application deployment, mobile CE device acquisition and deployment, and all other hardware-related equipment and infrastructure deployment are the responsibility of Rx-Connect.
- The desktop application will be developed for Windows 2000 Professional Edition. Future development phases may define requirements to support alternative operating systems such as Win 95/98.
- The mobile application will be developed for initial use on Compaq iPAQ 3650/3670 and for subsequent use on Intermecc 6651 handheld devices.
- Handheld devices will be connected via wireless LAN.
- System maintenance, back-up routines, data recovery routines, and disaster recovery procedures relating to infrastructure development, are the responsibility of Rx-Connect.
- Compliance with all relevant patient privacy regulations and standards for electronic transfer of clinical and administrative healthcare data are the responsibility of Rx-Connect.
- Preparation and delivery of all forms of training to prescribers and physician-office users of the Rx-Connect system is the sole responsibility of Rx-Connect.
- Integration with physician practice management systems (PPM) will be the responsibility of Rx-Connect.
- Automatic mail order renewals will not be part of Phase 1.0 functionality.

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- Advertising, promotional and personalized physician messaging and notification services will not be part of Phase 1.0 functionality.
- Charge capture and point-of-service collection tracking will not be part of Phase 1.0 functionality.
- The Phase 1.0 Rx-Connect system will not check mail order stock.
- The Phase 1.0 Rx-Connect system will not be used to pre-adjudicate prescription claims.

3.5. Dependencies and Risks

Project dependencies and risks are listed below:

- Successful connectivity with Rx-Solutions AS/400 systems.
- Reliance on Rx-Connect internally developed Formulary Management System data structure
- Size limitations of the CE device could potentially constrain the full functionality of First DataBank drug reference data and interaction logic, which in turn could significantly impede the CE device's ability to function as required in a disconnected state.
- Formulary and drug data structures will be designed by KORE, with the assistance of Rx-Connect.

4. System Components and Features

This section describes the functional system components and associated features that comprise the Rx-Connect system.

4.1. Physician's Office**4.1.1. Desktop Application****4.1.1.1. Description and Priority**

The desktop application is the "physician's office application for point-of-care prescribing. Specifically, the desktop enables the following functionality, including: add new patients to the Rx-Connect system, select and manage a patient within the context of a prescriber queue, prescribe a drug(s), submit and appropriately direct a prescription(s). In addition, the desktop application allows a Prescriber or Non-Prescriber to register and administer users of the Rx-Connect system within a specific physician's office.

The desktop application houses key functionality of the Rx-Connect system. As such, the highest priority is assigned to all desktop application features and associated requirements.

4.1.1.2. Stimulus/Response Sequences

Refer to Appendix C, Sections 1, 2, and 3 for use cases and process flows that describe the various interactions between Prescribers, Non-Prescribers, and the Rx-Connect system via the desktop application.

4.1.1.3. Functional Requirements**4.1.1.3.1. System Setup**

Users shall install and activate the Rx-Connect application on a pre-determined and specifically designated host computer.

4.1.1.3.2. Security

To login to the desktop application, users shall provide the system with a unique Location Name, Username, and Password.

Desktop application users shall be able to change their password.

Users shall establish a single common password for the desktop application, mobile application, and Rx-Connect Extranet.

All password changes initiated on the desktop application shall be reflected on the mobile application and Rx-Connect Extranet.

4.1.1.3.3. Patient Data and Queue Management (Non-Clinical)

Desktop application functionality shall allow users to add a new patient to the Rx-Connect system.

Desktop application functionality shall allow users to search for a patient that has been added to the Rx-Connect system.

Desktop application functionality shall allow users to select a patient that has been added to the Rx-Connect system.

Desktop application functionality shall allow users to edit information relating to a selected patient, including scheduling a patient appointment time.

Desktop application functionality shall allow users to inactivate a selected patient.

The default status of a patient that has been added to the Rx-Connect system shall be "active."

Desktop application functionality shall allow users to add an active patient to the prescriber queue.

Desktop application functionality shall allow users to select a patient from the prescriber queue.

Desktop application functionality shall allow users to remove a patient from the prescriber queue.

4.1.1.3.4. Clinical Patient and Data Management

Desktop application functionality shall allow users to select and associate an allergy with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to edit text-based comments related to allergies that have been associated with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to remove allergies and corresponding text-based comments that have been associated with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to search for a specific miscellaneous/OTC medication.

Desktop application functionality shall allow users to associate miscellaneous/OTC medications and corresponding text-based comments with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to edit miscellaneous/OTC medications and corresponding text-based comments that have associated with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to remove miscellaneous/OTC medications and corresponding text-based comments that have been associated with a patient in the Rx-Connect system.

Desktop application functionality shall allow users to review a patient's prescription history.

Desktop application functionality shall allow users to renew a patient's prescription for one or more drugs in that patient's prescription history.

Desktop application functionality shall allow users to search for a specific drug by means of a free-text search.

Desktop application functionality shall allow users to select a drug from a (free-text) search result set, including therapeutic and generic equivalents for that selected drug.

Desktop application functionality shall allow users to view all context sensitive mail order notifications when a specific drug is selected.

Desktop application functionality shall allow users to create a prescription by entering or modifying various prescription parameters.

Desktop application functionality shall allow users to define, add, edit, and delete favorite drugs at the medical group location and individual user levels.

Desktop application functionality shall allow users to review prescription details for a prescription that has been created.

When reviewing a prescription, desktop application users shall be able to add, edit, or remove individual line items in a prescription.

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When reviewing a prescription, desktop application users shall be able to cancel a prescription in its entirety, removing all individual line items in a prescription at once.

Desktop application functionality shall allow users to validate and edit patient-specific information that has been sent to the desktop application for resolution by the mobile application.

Desktop application functionality shall allow users to submit a prescription upon review via one of the following transmission methods: Print, Select Mail Service, Save.

A patient receipt shall be printed when a mail order prescription is finalized.

4.1.1.3.5. Physician Office User Management and Administration

Desktop application functionality shall allow users to register and activate prescribers on the Rx-Connect system.

A root-level physician office location administrator shall be designated to register prescribers and to manage users.

Prescribers shall have access to the full set of desktop application functionality.

Non-prescriber physician office staff shall inherit permissions roles from prescribers.

Authorized desktop application users shall be able to create and add users within a physician office location, including assigning rights/permission, creating user associations, and defining other user preferences, including password parameter settings, drug history display settings, warning message display settings, prescriber-specific information display settings for printing, and overall user preference display status.

Authorized desktop application users shall be able to select, view, and edit user information within a physician office location.

Authorized desktop application users shall be able to delete/inactivate users within a physician office location.

Authorized desktop application users shall be able to select printers for use within a physician office location.

4.1.2. Desktop Database**4.1.2.1. Description**

The physician's office desktop database shall serve as the main repository of information for the locally installed, office specific desktop application and accompanying mobile devices. The database shall capture and provide information such as: formulary structure information; usage and transaction information related to the prescription completion process; local office administrative staff and general user registration and usage information; plan affiliated member information and detailed prescription transaction history; and supporting referential data such as First DataBank drug information, and

NCPDP/NABP pharmacy location and contact information. The updating, syncing to Rx-Connect central database, and management of these data will be performed both automatically by locally controlled services located within the application and manually by local Prescriber and Non-Prescriber staff.

4.1.2.2.Functional Requirements

Please refer to Appendix E, Section 1 for detailed data structure information regarding the Physician's Office Desktop Application Database.

4.1.3. Desktop Services

4.1.3.1.Description and Priority

The Desktop Services COM object / NT Service enables communication between the Mobile Application and the Desktop Database, the Desktop Application and the Desktop Database, and between the Desktop Database and the Rx Connect Web Services and all databases that it serves.

4.1.3.2.Functional Requirements

When the Mobile Application needs data that is not on the Mobile Database, it queries the Desktop Service, which in turn, queries the desktop database. Also, when the Mobile Application calls the Mobile Service to perform actions that change the Mobile Database – the Mobile Service also makes sure to use the Desktop Service to update that information to the Desktop. Such data and functionality includes (but is not limited to):

- Patient searching
- Syncing the mobile database with the desktop database
- Loading the patient queue from the desktop
- Forwarding / Printing prescription information
- Updating the patient queue and any other data that can change during the day

The Desktop Application uses the Desktop Service to retrieve all data that it needs from the Desktop Database. This data and functionality includes (but is not limited to):

- Add/Edit/Delete patients (demographics, billing info, plan info, OTC meds and allergies)
- Create/Renew/Review Prescriptions
- Searching for drugs
- Selecting Printing, Mail Order, or Save
- Add/Edit/Delete appointments
- Add/Edit/Delete users (permissions, details)
- Add/Edit/Delete group location favorites

- Modifying preferences

The Desktop Application communicates with the Rx-Connect Web Services to retrieve all data that is not on the desktop database. This data and functionality includes (but is not limited to):

- Syncing the desktop database with the data on the Rx-Connect database
- Submitting prescriptions
- Updating user information and prescriptions to Rx-Connect
- Loading user information from other locations in the same medical group
- Retrieving member prescription history

4.1.4. Mobile Application

4.1.4.1. Description and Priority

The mobile application is the handheld device and accompanying software application for point-of-care prescribing. Specifically, the mobile application allows Prescribers and Non-Prescribers to search/find a patient, select a patient from a prescriber queue, prescribe a drug(s), and submit and appropriately direct a prescription(s).

The functionality of the mobile application represents the "heart" of the Rx-Connect system. As such, the highest priority is assigned to all mobile application features and associated requirements.

4.1.4.2. Stimulus/Response Sequences

Refer to Appendix C, Section 2 for use cases and process flows that describe the various interactions between Prescribers, Non-Prescribers, and the Rx-Connect system via the mobile application.

4.1.4.3. Functional Requirements

4.1.4.3.1. Security

To login to the mobile application, users shall provide the system with a unique Location Name, Username, and Password.

Mobile application users shall be able to change their password.

All password changes initiated on the mobile application shall be reflected on the desktop application and Rx-Connect Extranet.

4.1.4.3.2. Patient Data and Queue Management (Non-Clinical)

Mobile application functionality shall allow users to search for a patient that has been added to the Rx-Connect system via the desktop application.

Mobile application functionality shall allow users to select a patient that has been added to the Rx-Connect system via the desktop application.

Mobile application functionality shall allow users to select a patient from the prescriber queue.

4.1.4.3.3. Clinical Patient and Data Management

Mobile application functionality shall allow users to associate allergies and corresponding text-based comments with a patient in the Rx-Connect system.

Mobile application functionality shall allow users to edit text-based comments related to allergies that have been associated with a patient in the Rx-Connect system.

Mobile application functionality shall allow users to remove allergies and corresponding text-based comments that have been associated with a patient in the Rx-Connect system. Mobile application functionality shall allow users to associate miscellaneous medications and corresponding text-based comments with a patient in the Rx-Connect system.

Mobile application functionality shall allow users to edit miscellaneous medications and corresponding text-based comments that have associated with a patient in the Rx-Connect system.

Mobile application functionality shall allow users to remove miscellaneous medications and corresponding text-based comments that have been associated with a patient in the Rx-Connect system.

All additions or changes to patient-specific information will be captured.

Mobile application functionality shall allow to review a patient's prescription history.

Mobile application functionality shall allow users to renew a patient's prescription for one or more drugs in that patient's prescription history.

Mobile application functionality shall allow users to search for a specific drug by means of a free-text search.

Mobile application functionality shall allow users to search for a specific drug by therapeutic category.

Mobile application functionality shall allow users to search for a specific drug from a list of previously defined favorite drugs.

Mobile application functionality shall allow users to select a drug from a search result set.

Mobile application functionality shall allow users to view all context sensitive drug-drug, drug-allergy, and duplicate therapy warnings when a specific drug is selected.

Mobile application functionality shall allow users to accept acknowledgement of all context sensitive drug-drug, drug-allergy, and duplicate therapy warnings, and these acknowledgements shall be logged and stored.

Mobile application functionality shall allow users to view all context sensitive formulary notifications when a specific drug is selected.

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Mobile application functionality shall allow users to view all context sensitive mail order notifications when a specific drug is selected.

Mobile application functionality shall allow users to create a prescription by entering or modifying various prescription parameters.

Mobile application functionality shall allow users to add a specific drug or drugs to a personal favorites list.

Mobile application functionality shall allow users to edit a specific drug or drugs in a personal favorites list.

Mobile application functionality shall allow users to delete a specific drug or drugs from a personal favorites list.

Mobile application functionality shall allow users to name, create, and delete user-defined categories for favorite drugs.

Mobile application functionality shall allow users to associate one or more drugs with a named favorite.

Mobile application functionality shall allow users to review prescription details for a prescription that has been created.

When reviewing a prescription, mobile application users shall be able to add, edit, or remove individual line items in a prescription.

When reviewing a prescription, mobile application users shall be able to cancel a prescription in its entirety, removing all individual line items in a prescription at once.

Mobile application functionality shall allow users to submit a prescription upon review via one of the following transmission methods: Print, Mail Services, Send to Front Desk, Save.

A patient receipt shall be printed when a mail order prescription is finalized.

Mobile application functionality shall allow users to select network printers that are managed by the operating system and existing OS functionality on the desktop server.

4.1.4.3.4. Functionality In A Disconnected State (no Internet Service)

The functionality of the mobile application when no Internet service (i.e., DSL) is available shall be identical to that of the mobile application in a connected state, with the exception of: searching for patient information not already contained in the "local" mobile prescriber queue (e.g., eligibility, drug claim history).

4.1.4.3.5. Functionality In A Disconnected State (no LAN Service)

The functionality of the mobile application when no LAN service is available in a physician's office shall be identical to that of the mobile application in a connected state, with the exception of: searching for patient information not already contained in the "local" mobile prescriber queue, drug-drug, drug-allergy, and duplicate therapy logic and associated notifications.

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The mobile application shall passively notify the user when it is in a disconnected LAN state (e.g., by means of a red light on the CE device).

4.1.4.3.6. Functionality In A Disconnected State (no Office Server)

The functionality of the mobile application when no Office Server is available shall be identical to that of the mobile application in a connected state, with the exception of: searching for patient information not already contained in the "local" mobile prescriber queue, drug-drug, drug-allergy, and duplicate therapy logic and associated notifications.

The mobile application shall passively notify the user when no Office Server is available (e.g., by means of a red light on the CE device).

4.1.5. Mobile Database

Description The Mobile Application Database shall serve as a limited version of the Desktop Application Database that will allow the device to function in a disconnected state. The database shall capture and provide a limited set of information such as: formulary structure information; plan affiliated member information and limited prescription history; and a limited version of supporting referential data such as First DataBank drug information. The updating, syncing to the desktop database, and management of these data will be performed either automatically by locally controlled services located within the application, or manually by the device user. Furthermore, the database will provide caching functionality that will satisfy the requirements of a disconnected state.

4.1.5.1. Functional Requirements

Please refer to Appendix E, Section 2 for detailed data structure information.

4.1.6. Mobile Service**4.1.6.1. Description and Priority**

The Mobile Services COM object enables communication between the Mobile Application and the Mobile Database.

4.1.6.2. Functional Requirements

This underlying functionality of the mobile service includes (but is not limited to):

- Add/Edit/Delete patients info (OTC meds and allergies)
- Create/Renew/Review Prescriptions
- Searching for drugs
- Select Printing, Mail Order, or Save
- Add/Edit/Delete appointments
- Add/Edit/Delete users (permissions, details)
- Add/Edit/Delete group and doctor favorites

4.2. Rx-Connect

4.2.1. Rx-Connect Web Services

4.2.1.1. Description and Requirements

The Rx-Connect Central Web Services shall function as the primary mechanism for communication between the Rx-Connect Central Systems (Data Stores, Member Services, and Delivery Services) and external interfaces such as the Physician's Office Desktop Services, Rx-Connect Extranet, and Rx-Connect Intranet. These secure services shall manage all external connectivity functions including user login, user data access, secure connectivity, data request brokering, and packet transmission. Furthermore, due to the nature of the data, the services shall be designed with an emphasis on security. The Rx-Connect Central Database shall serve as the main repository of information for the Web Services.

4.2.2. Rx-Connect Member Data Services

4.2.2.1. Description and Requirements

Rx-Connect Member Data Services shall function as the primary mechanism of communication between Rx-Connect Central and appropriate backend Healthcare Entities. The information captured will represent such data as member information, member eligibility, member drug prescription history, plan specific formulary structure, and other member specific information. Furthermore, these services shall include multiple communication and import options such as TCP/IP and FTP for secure data request, transmission, and transfer of information. Due to the disparate nature of data structures and communication standards, these Member Data Services must be capable of simultaneously interfacing with a wide variety of data systems and structures, including direct connectivity, file download and parsing, tape and other forms of data storage. The Rx-Connect Central Database shall serve as the main repository of information for the Member Data Services. Rx-Connect Member Data Services shall also be able to switch from primary to secondary data sources based upon automatic or manually controlled triggers.

4.2.3. Rx-Connect Database

4.2.3.1. Description

The Rx-Connect Central Database shall serve as the main repository of information that will exchange relevant data with both the Physician's desktop and mobile applications, as well as backend data providers. The central database shall capture and provide information such as: formulary structure information; usage and transaction information related to the prescription completion process; internal Rx-Connect administrative staff and general user registration and usage information; external prescriber registration and usage information; plan affiliated member information

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and detailed prescription transaction history; and supporting referential data such as First DataBank drug information, DEA registration data, NCPDP pharmacy location and contact information. Depending on the type of information, the updating and management of these data will be performed either automatically by centrally controlled services located at the Rx-Connect Central Location, or manually by Rx-Connect staff.

4.2.3.2. Functional Requirements

Please refer to Appendix E, Section 3 for detailed data structure information regarding the Rx-Connect Central Database.

4.2.4. Formulary Management System Database**4.2.4.1. Description**

Formulary Management System - The Formulary Management System shall serve as the primary repository of formulary and related information. The system shall be designed to consolidate information that shall include the following: First DataBank drug information; insurance carrier specific formulary and co-pay information; general formulary drug lists and exclusion rules; therapeutic category, drug indication, and associative information; pharmacy location and contact information (NCPDP code); and practitioner credential information. This information shall be used by the Physician's Office Desktop Application as well as the Physician's Office Mobile Device for the prescription completion process to validate member formulary and related eligibility. This database system shall be designed (with the assistance of KORE) and managed by Rx-Connect staff, and exist at the Rx-Connect Central Server Location.

4.2.4.2. Functional Requirements

Please refer to Appendix E, Section 4 for detailed data structure information regarding the Formulary Management System Database, as well as the accompanying Formulary Data Dictionary Documentation generated by Rx-Connect Staff.

4.2.5. Prescription Delivery Service**4.2.5.1. Description and Requirements**

The Rx-Connect Central Prescription Delivery Services shall function as the primary mechanism by which Rx-Connect will electronically deliver a prescription to external destination pharmacies. For this first development phase, the service shall only transmit a fax to Mail Services.

4.2.6. Rx-Connect Extranet**4.2.6.1. Description and Priority**

The Rx-Connect Extranet is the collective set of features and mechanisms that allows Prescribers and Non-Prescribers browser-based access to a limited subset of Rx-Connect system functionality. Specifically, the

limited functionality of the Extranet allows Prescribers and Non-Prescribers to access Rx-Solutions legacy systems to view activity reports and access help information related to the Rx-Connect system.

Given the importance of this web-accessible functionality, a taking into account the fact that core system functionality is embedded in the Rx-Connect desktop and mobile applications, a moderate priority is assigned to all Extranet features.

4.2.6.2.Stimulus/Response Sequences

Refer to Appendix C, Sections 2 and 3 for use cases and process flows that describe the various interactions between Prescribers, Non-Prescribers, and the Rx-Connect Extranet.

4.2.6.3.Functional Requirements

4.2.6.3.1. Security

To login to the Rx-Connect Extranet, users shall provide a unique Username and Password.

4.2.6.3.2. Physician Office User Management and Administration

Rx-Connect Extranet users shall be able to view (read-only) specifically defined customer activity reports.

Rx-Connect Extranet users shall be able to view, access, and download help information and documentation related to the Rx-Connect system.

4.2.7. Rx-Connect Intranet

4.2.7.1.Description and Priority

The Rx-Connect Intranet is the collective set of mechanisms and functionality that allow Rx-Connect staff to administer and manage the Rx-Connect system via a web browser. Specifically, the Intranet allows Rx-Connect staff to manage internal (Rx-Connect) users, manage external customers, and view Rx-Connect customer activity reports.

Given the importance of these management functions, particularly the long-term value of accurate reporting to Rx-Connect's transaction-based revenue model, a high priority is assigned to all Intranet features.

4.2.7.2.Stimulus/Response Sequences

Refer to Appendix C, Section 4 for use cases and process flows that describe the various interactions between Rx-Connect staff and the Rx-Connect Intranet.

4.2.7.3.Functional Requirements

4.2.7.3.1. Security

To login to the Rx-Connect Intranet, users shall provide the system with a unique Username and Password.

Rx-Connect Intranet users shall be able to change their password.

4.2.7.3.2. Rx-Connect User Management and Administration

Rx-Connect staff shall administer and manage the Rx-Connect system via a set of menu options from an Intranet home page.

Specifically designated Rx-Connect staff shall manage Rx-Connect system access, user permissions, and user profile information for all (internal) Rx-Connect staff.

A root-level Rx-Connect system administrator shall have access to the full set of Intranet functionality, and shall define and designate permissions for all other Rx-Connect staff.

Authorized Rx-Connect Intranet users shall be able to create/add user permissions and attributes for new Rx-Connect staff.

Authorized Rx-Connect Intranet users shall be able to edit Rx-Connect staff user permissions and user attributes.

Authorized Rx-Connect Intranet users shall be able to delete/inactivate Rx-Connect system users.

Specifically designated Rx-Connect staff shall manage external Rx-Connect customers and customer information.

Authorized Rx-Connect Intranet users shall be able to register new Rx-Connect external customers.

Authorized Rx-Connect Intranet users shall be able to manage Rx-Connect Extranet users.

Authorized Rx-Connect Intranet users shall be able to edit/modify Rx-Connect customer information.

Authorized Rx-Connect Intranet users shall be able to inactivate Rx-Connect customers.

Authorized Rx-Connect Intranet users shall be able to view (read-only) specifically defined customer activity reports.

4.3. Third-Party Data Providers

4.3.1. First Databank Data

4.3.1.1. Description

First DataBank - First DataBank produces a comprehensive drug information list (National Drug Data File - NDDF) and an accompanying database and application that allow easy access to the healthcare industry's standard source of drug information, that includes clinical, descriptive and pricing information for every drug product approved by the FDA. Features include: drug-drug interaction screening; allergy, duplicate therapy, contraindication and potential side effects screening; maintenance of patient-specific medical conditions and drug allergies; drug specific pediatric, geriatric, pregnancy and lactation precautions; and screen for possible drug-induced side effects.

Source: <http://www.firstdatabank.com/>

4.3.1.2. Data Requirements

Please refer to Appendix E, Section 5 for detailed data structure information regarding the First DataBank System, as well as to the First DataBank documentation (Framework v1.1 Documentation.pdf).

4.3.2. DEA Data

4.3.2.1. Description

Drug Enforcement Administration (DEA) database contains the complete official list of persons and organizations certified to handle controlled substances under the Controlled Substances Act. These data shall be used to identify credentialed practitioners.

Source: <http://deanumber.com>

4.3.2.2. Data Requirements

Please refer to Appendix E, Section 6 for detailed data structure information regarding DEA Data.

4.3.3. Formulary and Health Plan Data

4.3.3.1. Description

Formulary information represents a list of prescribable drugs that are covered by a given healthcare benefits plan. This list is managed by healthcare providers, and for the existing development phase, PacifiCare's formulary data shall serve as the first example of formulary information structure. In subsequent development phases, additional formulary data will be available that represent non-PacifiCare healthcare benefit plans. This information shall be used by the Physician's Office Desktop Application as well as the Physician's Office Mobile Device for the prescription completion process.

4.3.3.2. Data Requirements

Please refer to Appendix E, Section 7 for detailed data structure information regarding Formulary Information.

4.3.4. NCPDP/NABP Data

4.3.4.1. Description

NCPDP/NABP Provider Identification Number - (National Council for Prescription Drug Programs/National Association of Boards of Pharmacy) The NCPDP Provider Identification Number provides pharmacies with a unique, national identifying number that assists pharmacies to interact with federal agencies and third party providers. The NCPDP Provider Identification Number, formerly known as the NCPDP/NABP pharmacy numbering list, contains over 70,000 pharmacies and shall be used to validate pharmacy location and contact information.

Connect Phase 1.0

Systems Requirements
Specification

Source: <http://www.ncpdp.org/>

4.3.4.2. Data Requirements

Please refer to Appendix E, section 8 for detailed data structure information regarding the NCPDP/NABP information.

4.3.5. Network Pharmacies**4.3.5.1. Description**

The Networked Pharmacy list represents a list of pharmacies that are within the PacifiCare Preferred Pharmacy Network. This information shall be used to validate pharmacy location and contact information.

4.3.5.2. Data Requirements

Please refer to Appendix E, Section 9 for detailed data structure information regarding Networked Pharmacy Information.

4.3.6. Mail Order Eligible Drug List (Mail Services)**4.3.6.1. Description**

Mail Order Eligible Drug List - The mail order eligibility list created by Rx-Express, PacifiCare's mail order prescription service, lists the drugs that are available for mail order service. The information shall be used, during the prescription process, to validate if a drug is mail order service eligible.

4.3.6.2. Data Requirements

Please refer to Appendix E, Section 10 for detailed data structure information regarding Mail Order Eligible Drug Information.

4.4. Rx-Solutions Interfaces**4.4.1. Rx-Claims Member Data Interface and Data Structure****4.4.1.1. Description**

Rx-Claims Interface - Rx-Claims is Rx-Solutions' claims processing unit. The Rx-Claims plan and member information shall be accessed by the Rx-Connect Central Member Data Services for the retrieval and validation of PacifiCare plan information as well as PacifiCare member eligibility and drug prescription history. This information shall be used by the Physician's Office Desktop Application as well as the Physician's Office Mobile Device for the prescription completion process. To satisfy fail-over compliance, there should be two alternate methods of data retrieval. The primary mechanism shall access "snap-shot" data records stored centrally at Rx-Connect Central Data Warehouse, and the secondary mechanism shall access real time data records using the TCP/IP Transaction Services designed by Rx-Solutions Staff Members.

Connect Phase 1.0

Systems Requirements
Specification

Information available from Rx-Claims includes PacifiCare plan information; PacifiCare member information includes member eligibility, plan affiliation, and drug prescription history. The information is captured and stored on an AS/400 legacy system.

4.4.1.2. Data Requirements

Please refer to Appendix E, Section 11 for detailed data structure information, and accompanying TCP/IP Transaction Services Architect v4.3 Documentation.

4.4.2. Rx-Express Interface and Data Structure**4.4.2.1. Description**

Rx-Express Interface - Rx-Express is Rx-Solutions' mail order prescription service. The Rx-Express member information shall be accessed by the Rx-Connect Central Member Data Services for the validation of mail order member eligibility and shipping information. This information shall be used by the Physician's Office Desktop Application as well as the Physician's Office Mobile Device for the prescription completion process. To satisfy fail-over compliance, there should be two alternate methods of data retrieval. The primary mechanism shall access "snap-shot" data records stored centrally at Rx-Connect Central Data Warehouse, and the secondary mechanism shall access real time data records using the TCP/IP Transaction Services designed by Rx-Solutions Staff Members.

4.4.2.2. Information available from Rx-Express includes mail service member enrollment information and mail order history. Data Requirements

Please refer to Appendix E, Section 12 for detailed data structure information, and accompanying Rx-Express Transactions.doc Documentation.

5. Other Functional and Non-Functional Requirements

This section describes requirements of the Rx-Connect system that not related to specific features.

5.1. Performance Requirements

Prescribers shall be able to complete a prescription in between 5-15 seconds.

Connect Phase 1.0

Systems Requirements
Specification

The Rx-Connect system will be designed to support the following demand requirements:

| Metric | 2001 | 2002 |
|--|--------|---------|
| Number of Targeted Prescribers | 1,000 | 4,000 |
| Daily Prescription Transaction Volume* | 60,000 | 240,000 |
| Number of Concurrent Prescriber Users | 1,000 | 4,000 |

*Assumes the average prescriber writes 60 prescriptions/day.

5.2. Security Requirements

Security - The complete Rx-Connect System, which includes connectivity between several physical locations as well as a multitude of application level processes, shall have multiple layers of security that will span across both network and application systems. Due to the sensitive nature of the data, both hardware and software security solutions shall be used. However, information relating to PHS security standards, requirements, and policies that will impact the design and management of the Rx-Connect System has yet to be delivered to KORE. Therefore, requirements and functionality listed below can only address a subset of all the application components within the entire Rx-Connect System.

5.2.1. Network Security

The secure communication between the co-location facility systems and PacifiCare systems shall be managed by centrally controlled firewalls.

The secure communication between the co-location facility systems and the Physician's office shall be managed by centrally controlled firewalls.

It is KORE's assumption that PHS' internal network connectivity between facilities is currently supported by a private frame relay network.

Depending on the security needs, virtual private networks (VPN) can be established between the Physician's office and the co-location facility.

Internal systems within the co-location facility shall be protected by both firewall security and network protocol standards. Internal systems within PHS currently have security measures in place.

5.2.2. Application Security

Standard secure user authentication methods, permissions control, and restriction control shall be implemented on all application systems

Connect Phase 1.0

Systems Requirements
Specification

including application servers, web servers, database servers, and hardware appliances.

Database servers located at the co-location facility will have restricted points of entry for both users and applications.

Web server administration will only be available locally or through VPN.

Communication packets between the Physician's office and Rx-Connect Central can be encrypted.

Selected, pre-determined data elements shall be stored in an encrypted form.

Internet communication between the Physician's Office Desktop Service and the Rx-Connect Web Service can also be handled via HTTPS (SSL).

User logins to all applications, including failed attempts and errors, shall be logged and monitored. Persistent failed attempts (3) will require administration intervention.

Password and User ID shall be configurable.

Password expiration shall be configurable.

Persistent failed login attempts on the mobile application shall require system administration intervention and require re-syncing with the desktop application for patient data recovery.

5.3. User Documentation

During the development phase, KORE will provide a final set of site maps for the web-based components of the Rx-Connect System (i.e., Rx-Connect Extranet and Intranet) for Rx-Connect staff review and signoff.

6. KORE Software Build Procedures

KORE has a standard set of build procedures that will be followed in an attempt to catch bugs as early in the development process as possible - as well as eliminate false bugs that are caused by the lack of a build process. Also, there will be duplicates of the build environments in an attempt to have separate development, testing, and staging builds. It may be necessary to acquire more IPAQ and Intermec machines for these purposes. The machine that emulates Rx-Connect server machines in these environments will be supplied by KORE.

As early as possible, builds of the entire project will be performed every day. These builds will be performed with code that comes completely from a source control system to make sure that there are no issues with any out-of-date code. Also, daily builds allow us to view the initial framework of the applications and fill in the features piece-by-piece. KORE anticipates improvements in the code every day - with the additional goal of being always able to have a testable build that QA can test the incremental improvements as they are made.

Once the build is complete and working, the code will then be labeled, which will allow us to go back to previous versions if necessary. Everything will be

buildable from source control, including code, databases, stored procedures, install applications, and test applications.

Build reports will go out internally with a summary of the changes that have been made, and a list of where to get/test the current build, and how to access the pieces that were built by the current build. The list of changes that go out will be compiled from a document that engineers modify when they check in changes. It includes new features and bug fixes. This document and build report can be exposed to Rx-Connect if it is deemed necessary.

KORE will attempt to make the build process a simple and as easy to duplicate as possible. The goal is to produce a "1-click" build, but timing and certain programming difficulties make this an unlikely goal. Most likely, we will be able to get out of the source control and build directly from a script, but the actual installation will be a manual (but simple) process. This process will be documented in order to make whatever the next phase of this application as simple as possible, whether it is implemented by KORE, Rx-Connect, or another third party.

KORE will also make an install process for actually installing the product at the desktop level and on the Mobile Application. This process will be a "1-click" process - in the sense that an installer program will be written that takes whatever inputs are necessary and installs the appropriate applications and COM objects. It will also have an uninstaller process. The installer will assume, however, that the OS has been properly installed already, as well as the DSL line. If a fax line is installed, it can be used by the application.

7. KORE Quality Assurance Procedures

The KORE Quality Assurance (QA) department has been, and will continue to be, involved in the Rx-Connect project. This provides them with the opportunity to understand the project as a whole at an early stage, and allows them to start developing test cases before any code has actually been written. The QA department will deliver a QA plan at the start of the project, which will document a high level set of objectives for the project. After reviewing this plan with the rest of the project team, QA will then begin a more detailed test plan, which will describe the many requirements and expectations that QA has in order to effectively accomplish their task. It will also describe the test process specifically, including what areas QA will and won't test, the methodology used for those tests, and the way defects will be handled. After this document is reviewed and agreed upon by the rest of the project team, the QA department will begin to create test cases and will actively test the areas of the project that have been developed. This process will continue to expand as the daily builds encompass larger and larger areas of functionality, and where possible, QA will attempt to automate the testing process. It is expected that at the time of delivery, QA will have identified 95-100% of all defects to be found within the project, and can provide a detailed list of these bugs and how they were repaired or otherwise dealt with. The specific details of all of these processes will be available in the

aforementioned test plan for those interested in further details of the QA methodology.

8. Addendum: Future Enhancements

This addendum lists, and in some cases briefly describes, future enhancements and functionality that are outside the scope of this SRS document or related contract (01-RXCO-0730). These listed enhancements and functionality will **not** be part of KORE's subsequent development effort.

The following enhancements and functionality are captured here to promote discussion for future Rx-Connect product releases and initiatives.

8.1. Physician's Office

8.1.1. Activity and Charge Capture

8.1.2. Advertising, Promotional, and Personalized Text-Based Messaging and Notification Services

8.1.3. Clinical Guidelines Decision Support

8.1.4. Real Time Claim Adjudication

8.1.5. Automated Add-to Favorites List

A drug shall be automatically added to a favorites list if it is prescribed more than some threshold level (e.g., x times per period). Business rules and specific threshold parameters have as yet to be determined.

8.1.6. Coupon Templates

8.1.7. PPM Integration

8.1.8. Automated Renewal Notification

8.1.9. Automatic Mail Order Renewals

8.1.10. Customization of Personal Preferences and User Settings

Features, requirements, and business rules have yet to be defined and provided by Rx-Connect.

8.2. Rx-Connect

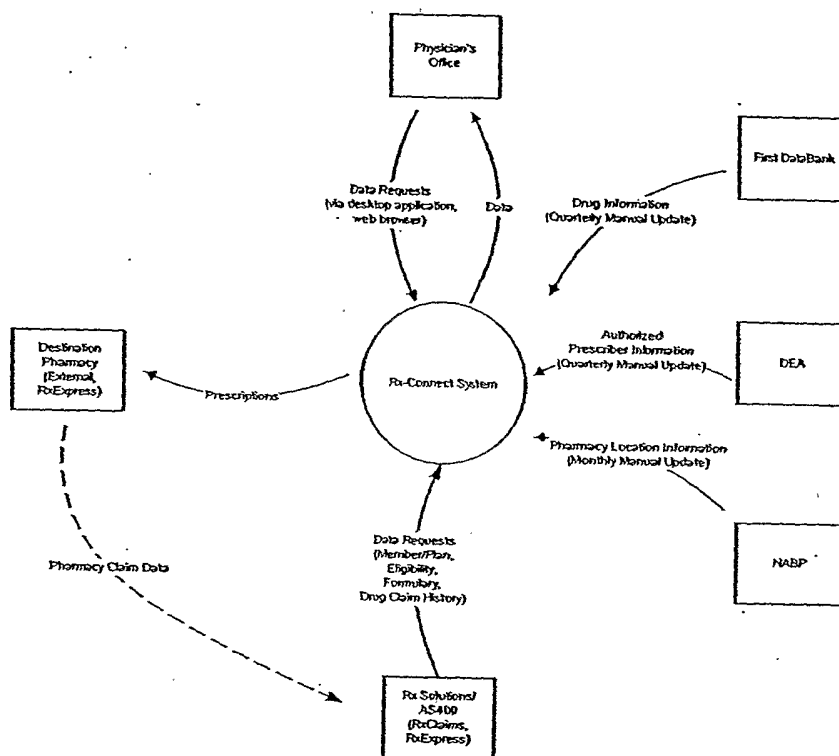
8.2.1. Rx-Connect Web Site

Specification of requirements and functionality for development of a web site to establish a formal online presence for Rx-Connect as a discrete business entity.

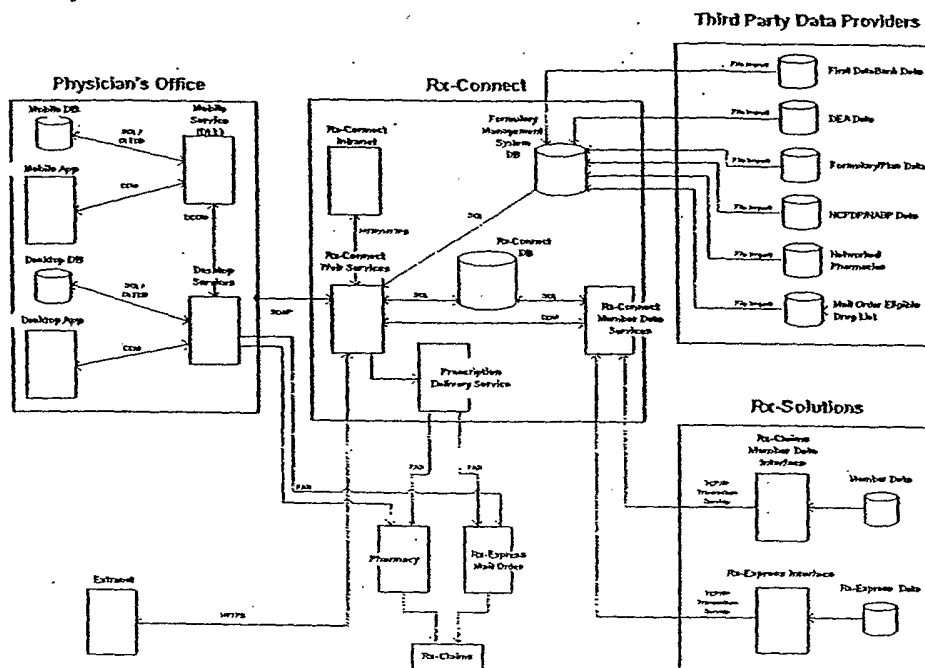
Connect Phase 1.0

Systems Requirements
Specification

Appendix A: Context Diagram

Rx-Connect **Rx-Connect
Version 1.0
Context Diagram**

Connect Phase 1.0

Systems Requirements
Specification**Appendix B: Rx-Connect Component Architecture**
Component Architecture

Connect Phase 1.0

Systems Requirements
Specification

Appendix C: Use Cases and Process Flows

Section 1: System Setup

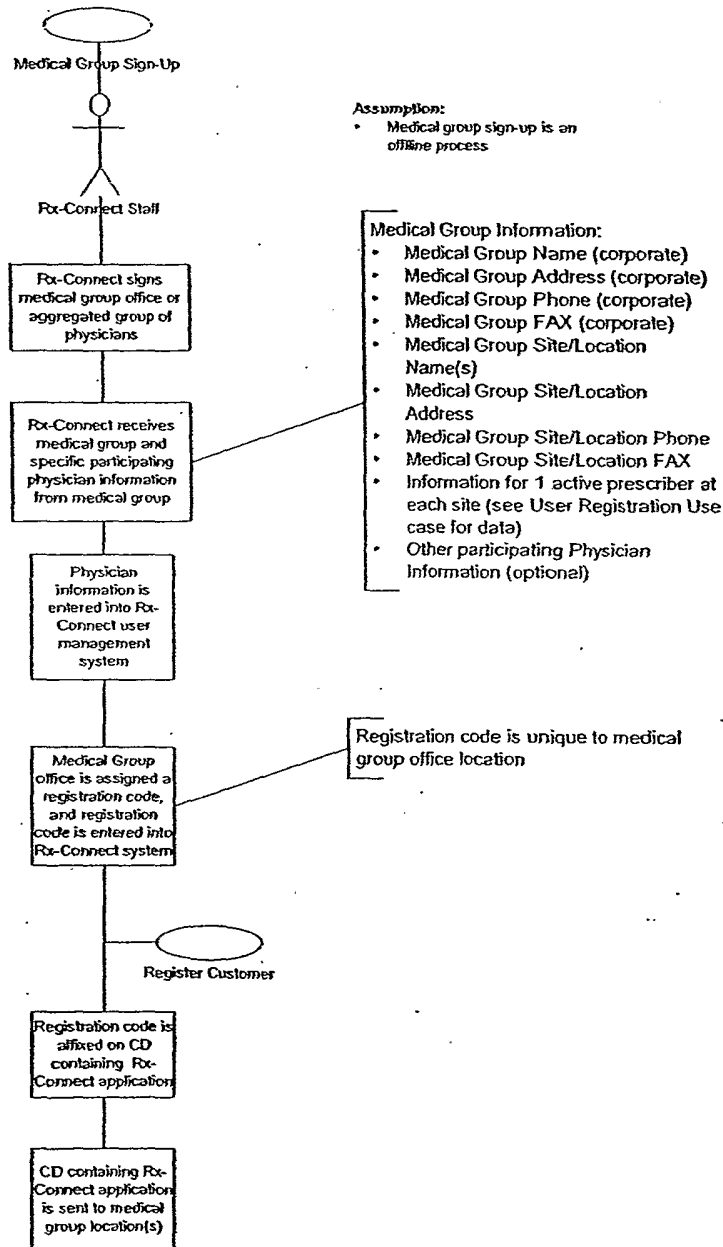
Need use case for printer script template and message auth.

Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows

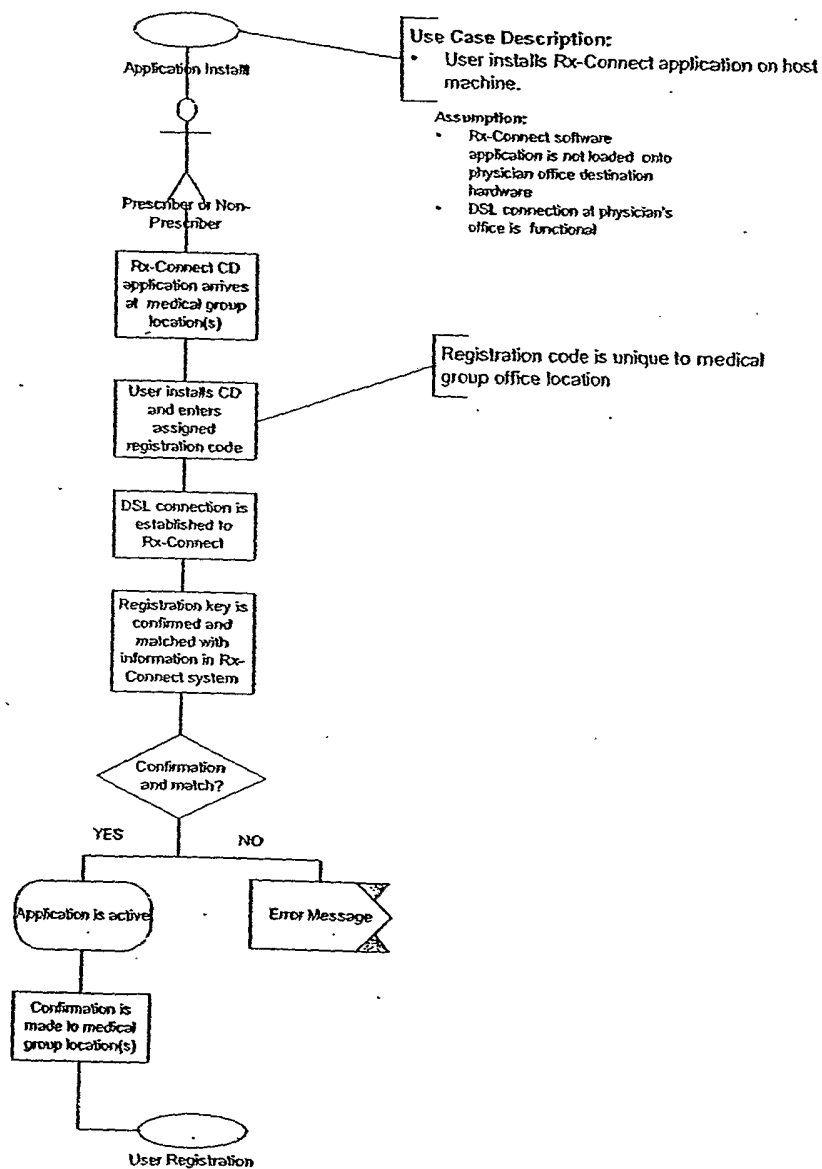
System Setup



Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows System Setup

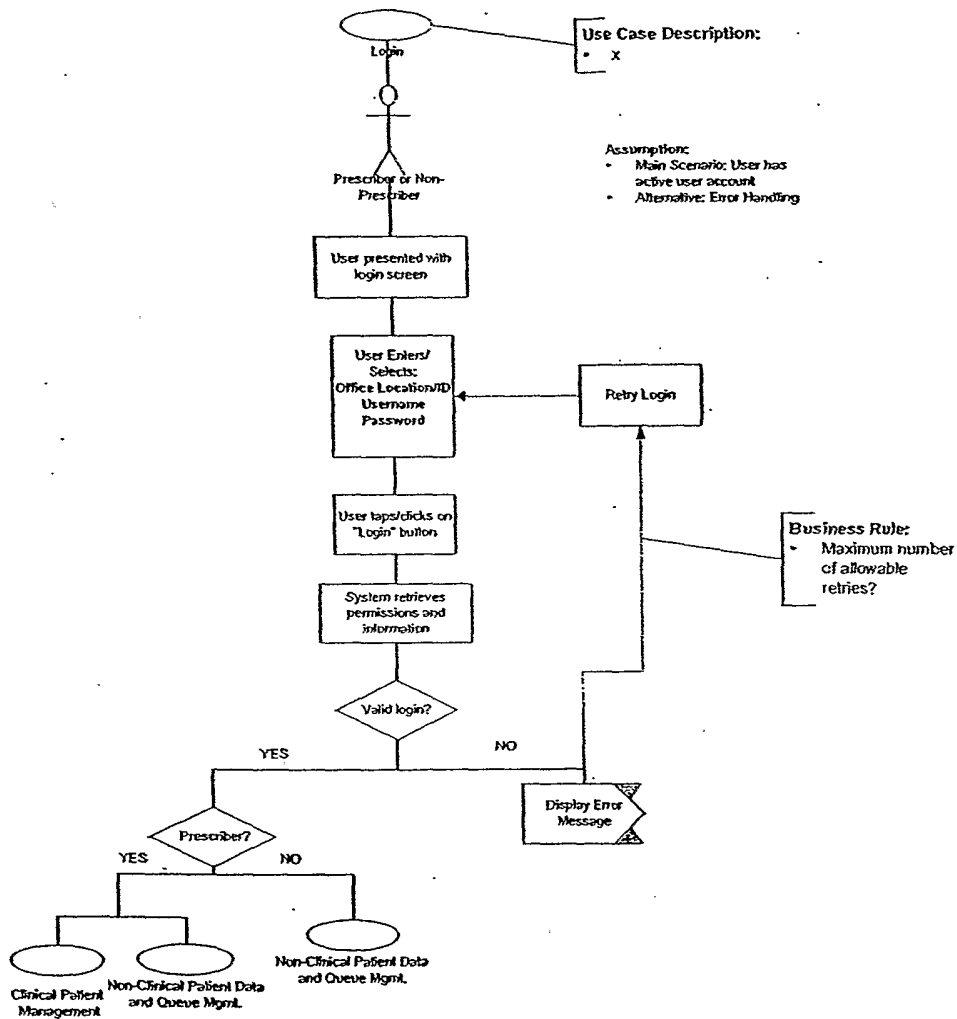


Connect Phase 1.0

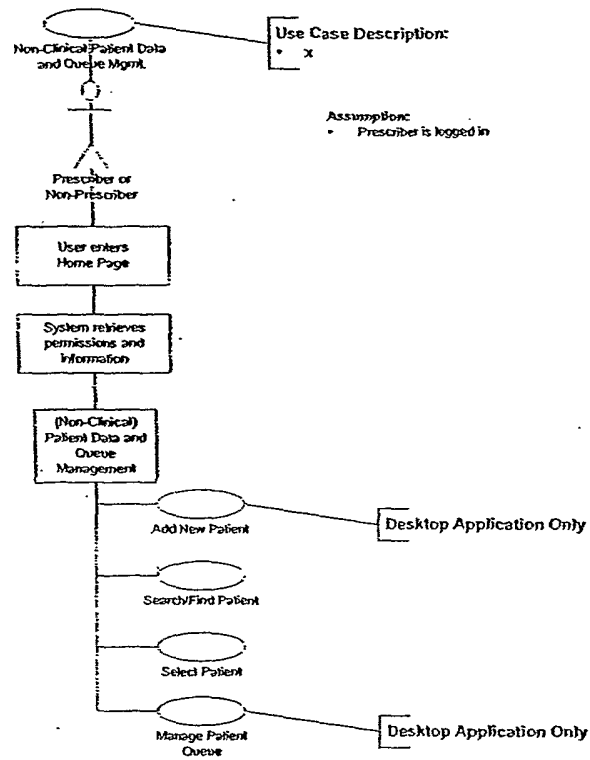
Systems Requirements
Specification

Section 2: Non-Clinical and Clinical Patient Management

Connect Phase 1.0

Systems Requirements
Specification**Use Cases and Process Flows
Non-Clinical and Clinical Patient Management**

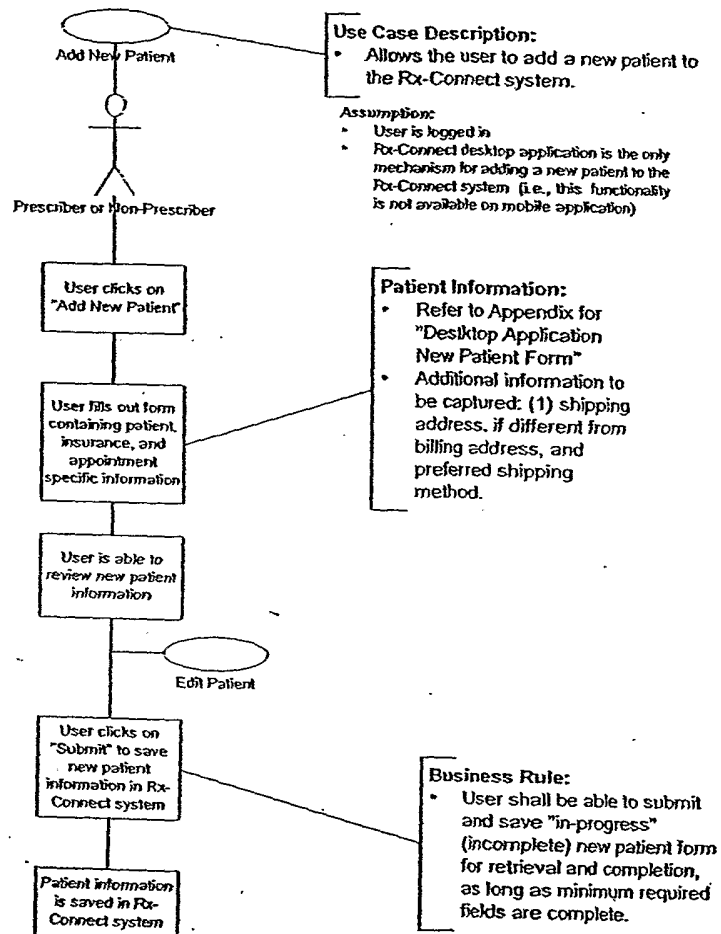
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

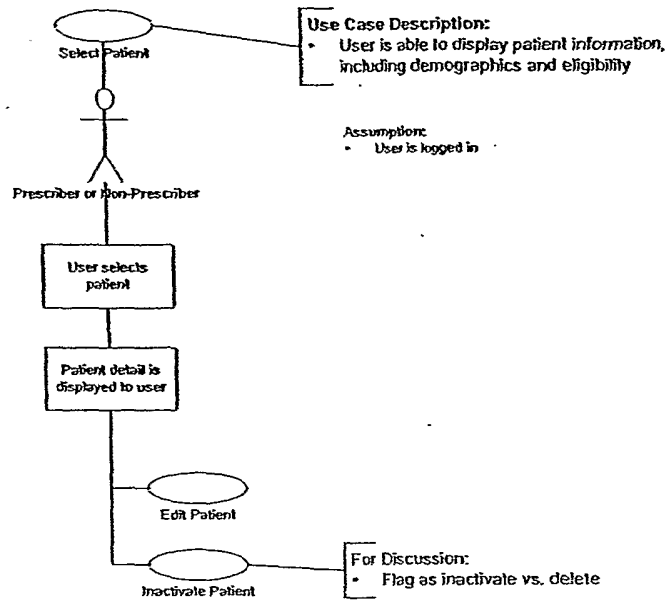
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

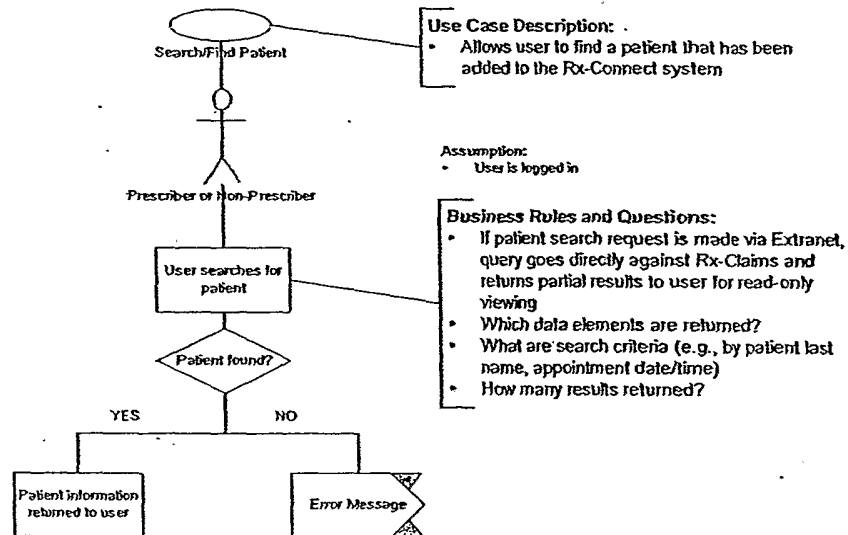
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

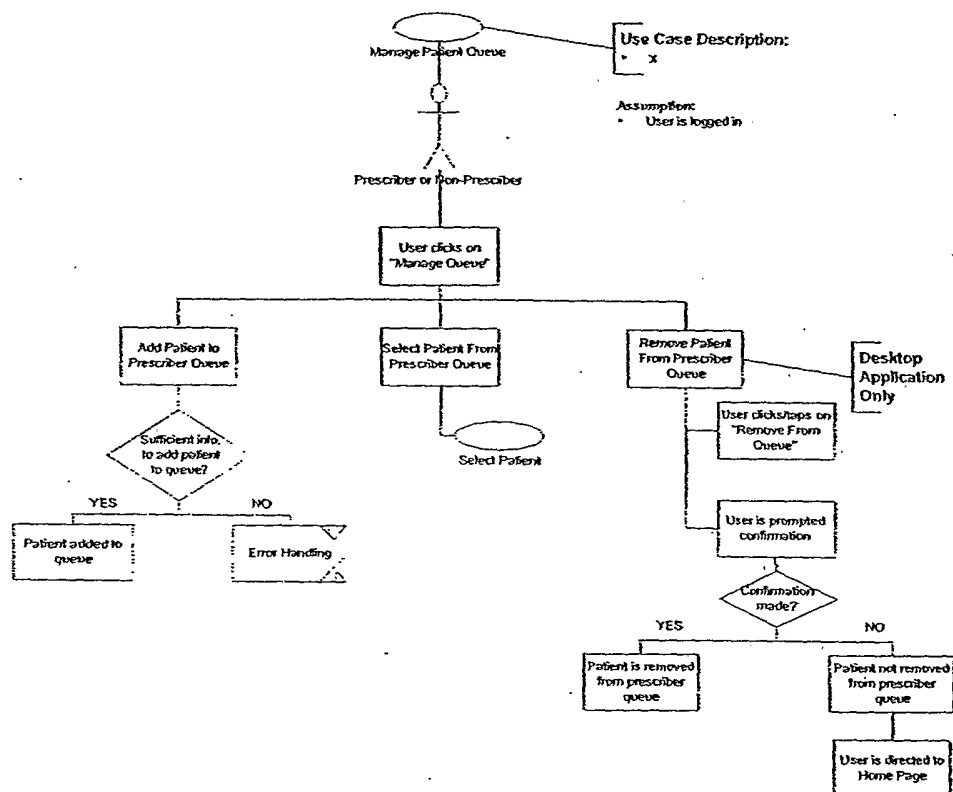
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

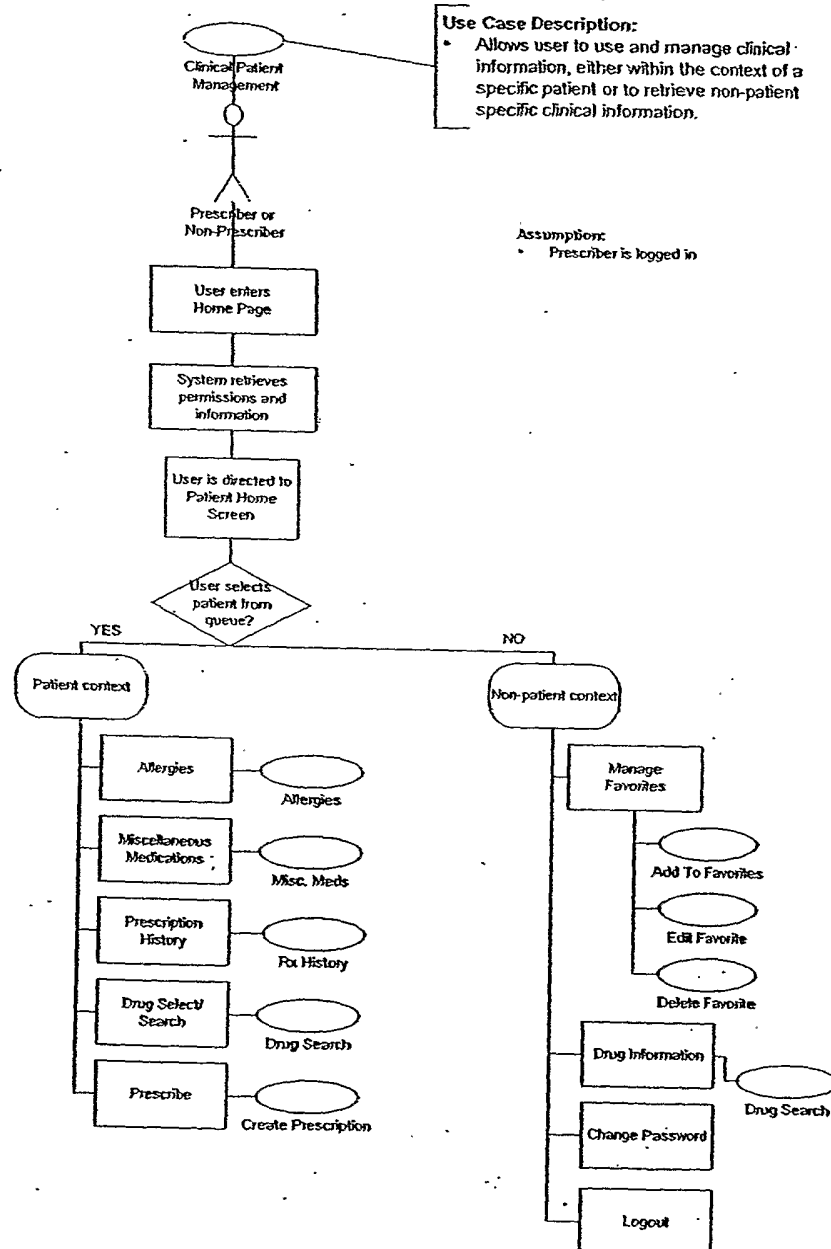
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

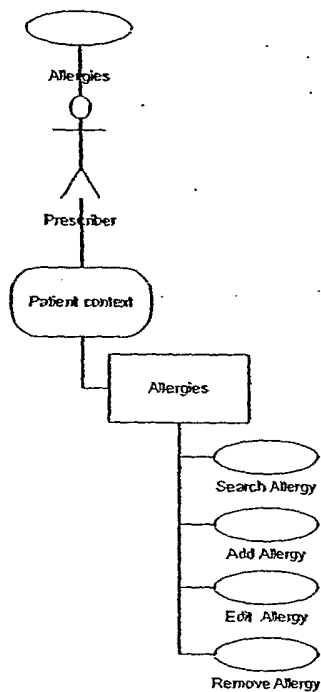
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Non-Clinical and Clinical Patient Management



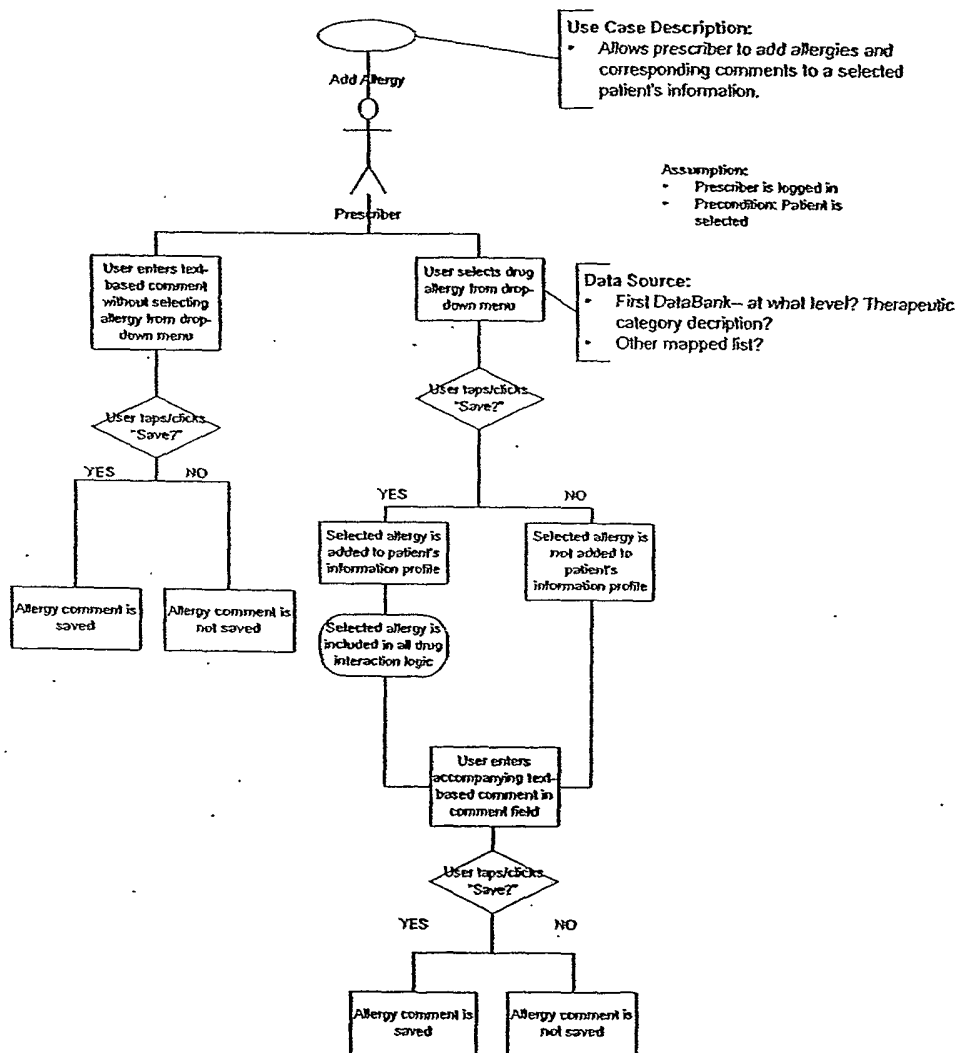
Assumption:

- Prescriber is logged in
- Precondition: Patient is selected

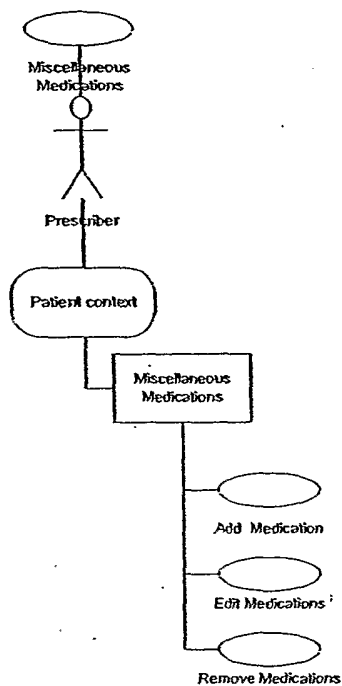
Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Use Cases and Process Flows Non-Clinical and Clinical Patient Management



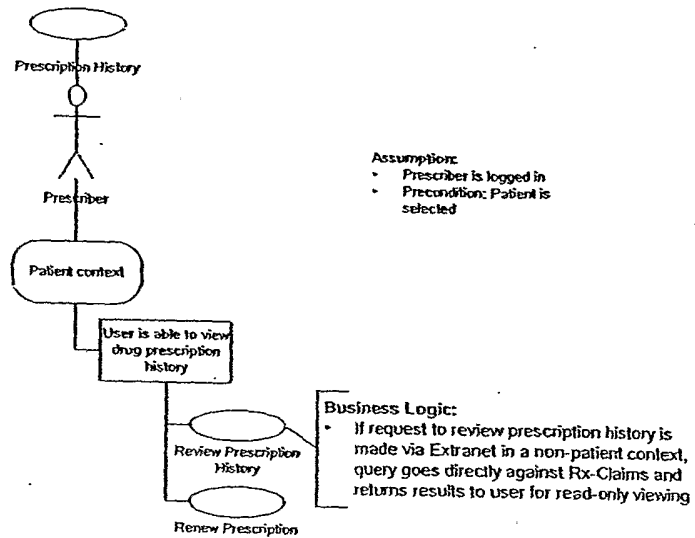
Assumptions:

- Prescriber is logged in
- Precondition: Patient is selected

Connect Phase 1.0

Systems Requirements
Specification

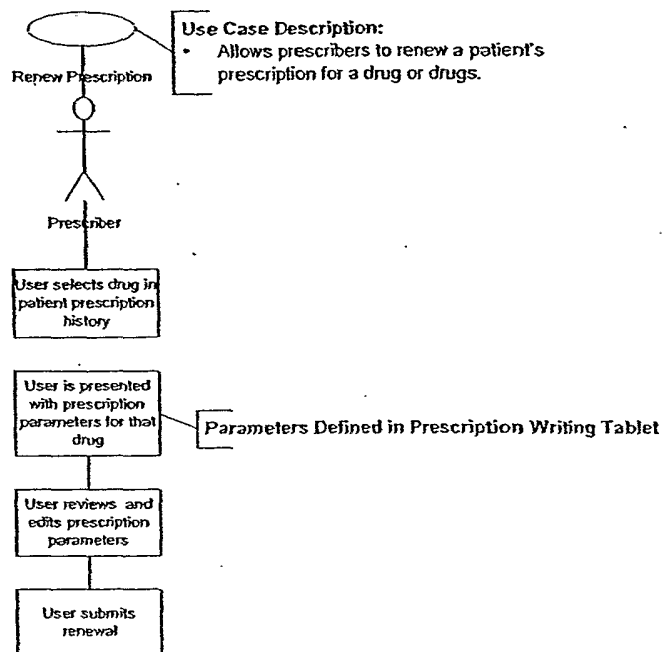
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

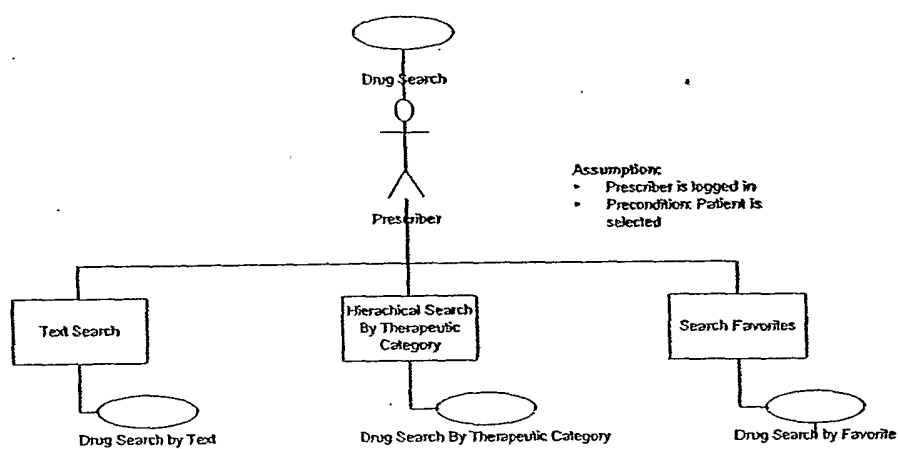
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Non-Clinical and Clinical Patient Management



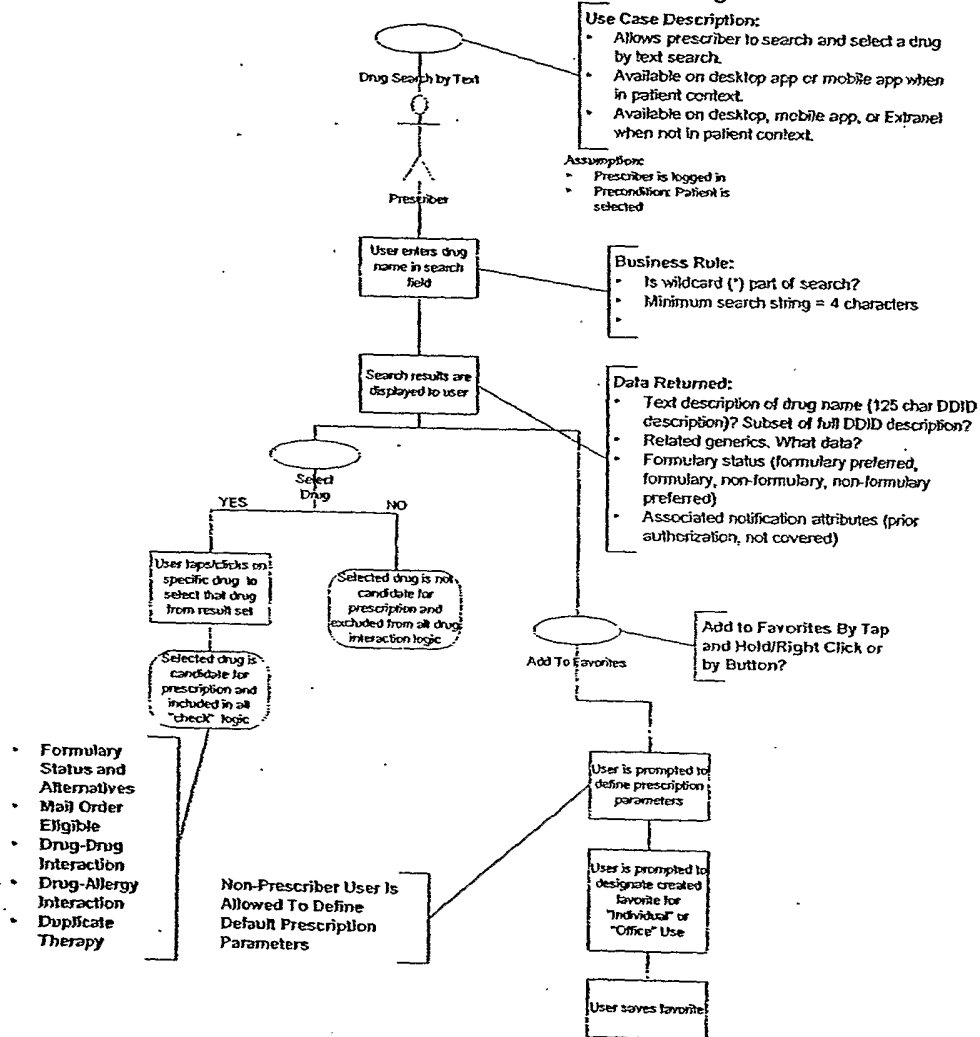
Connect Phase 1.0

Systems Requirements
Specification

Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Non-Clinical and Clinical Patient Management

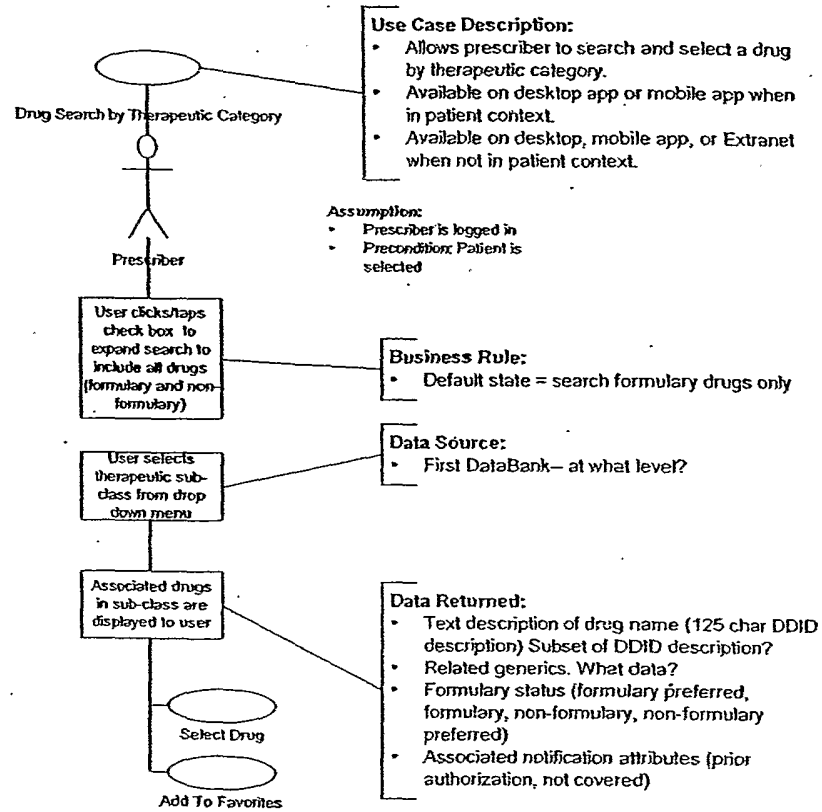


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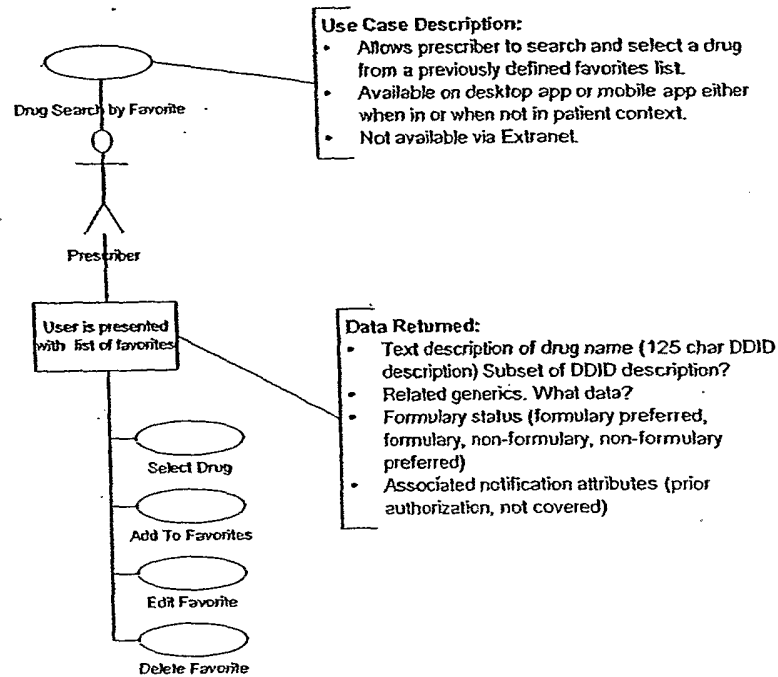
Systems Requirements
Specification

Use Cases and Process Flows

Non-Clinical and Clinical Patient Management



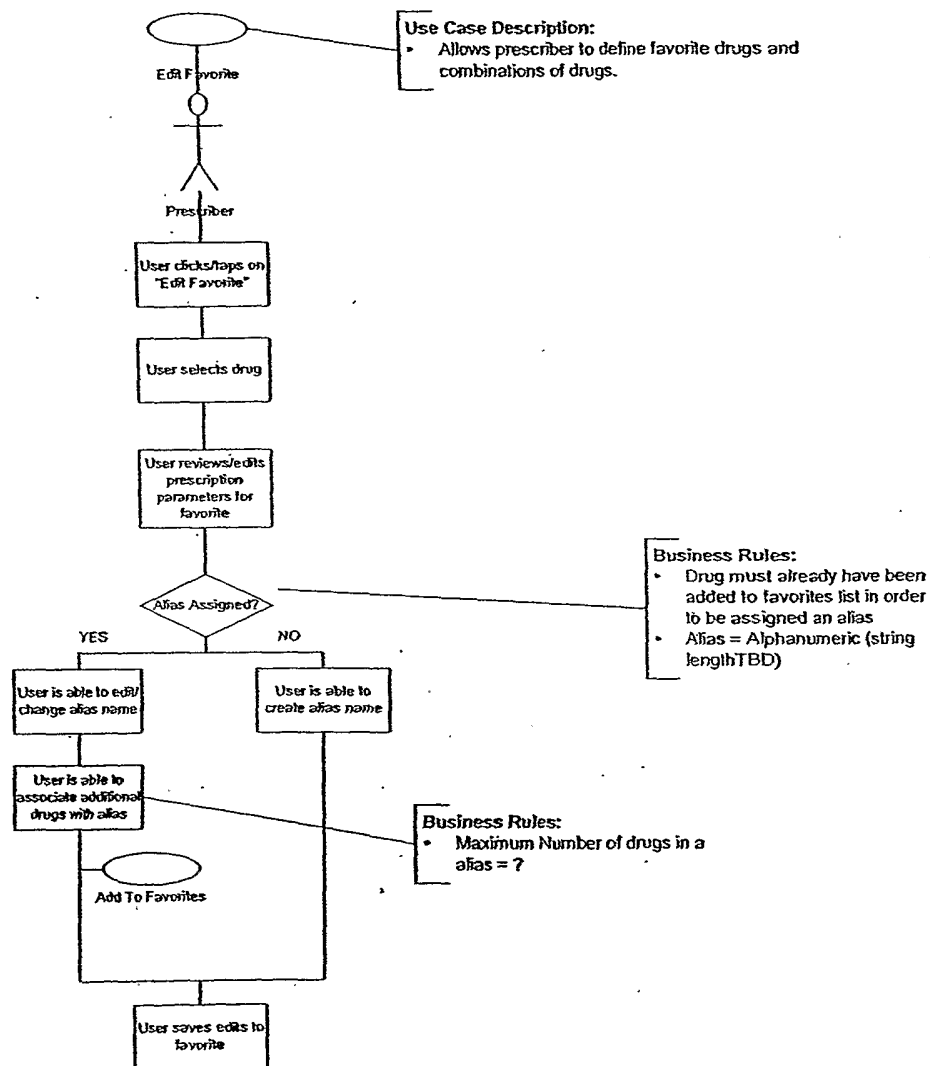
Use Cases and Process Flows Non-Clinical and Clinical Patient Management



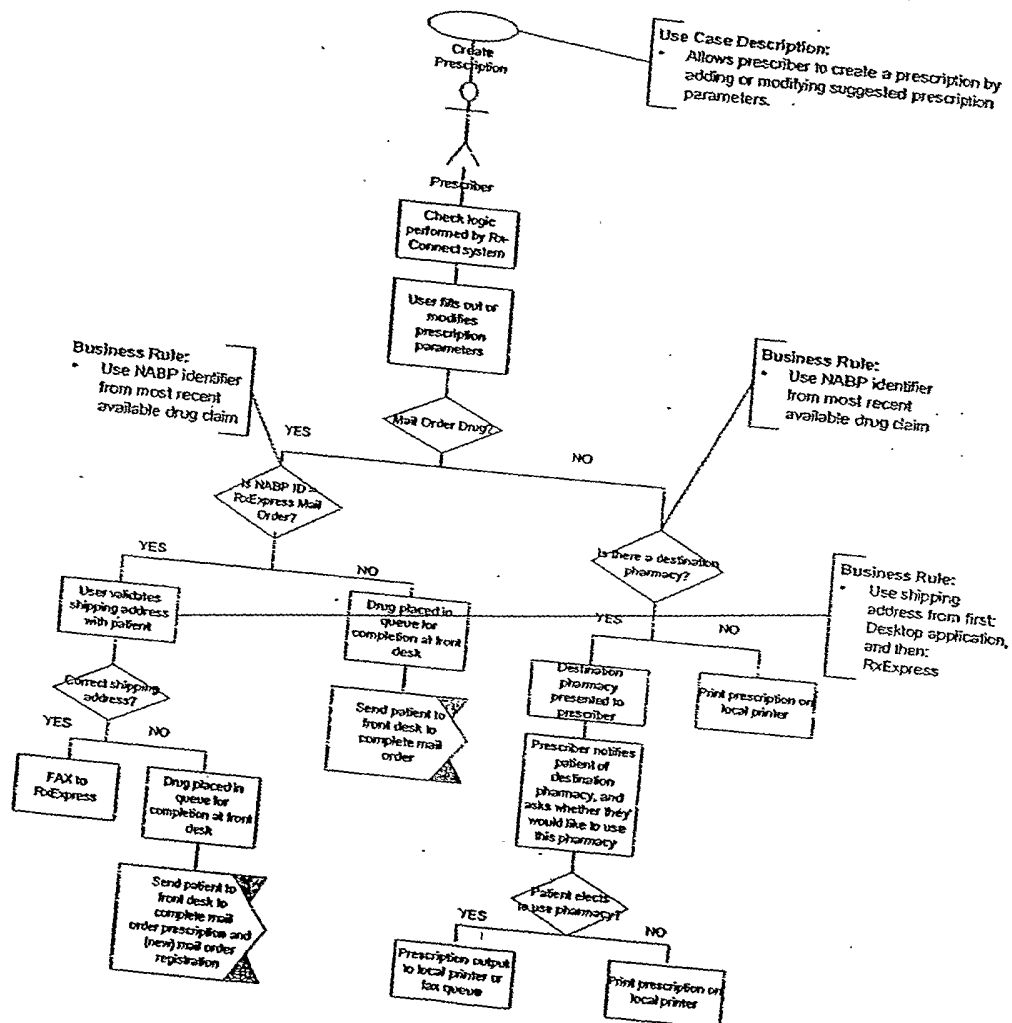
Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Non-Clinical and Clinical Patient Management



Connect Phase 1.0

Systems Requirements
SpecificationUse Cases and Process Flows
Non-Clinical and Clinical Patient Management

Connect Phase 1.0

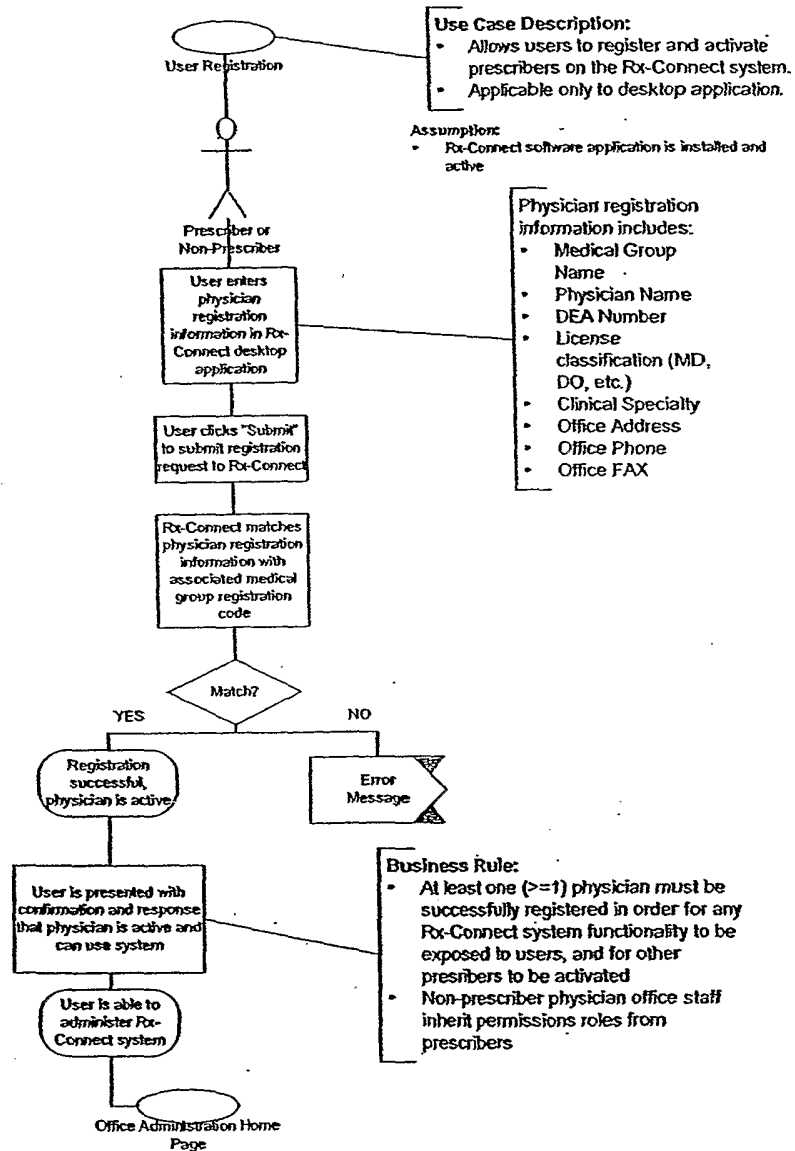
Systems Requirements
Specification

Section 3: Physician Office User Management and Administration

Connect Phase 1.0

Systems Requirements
Specification

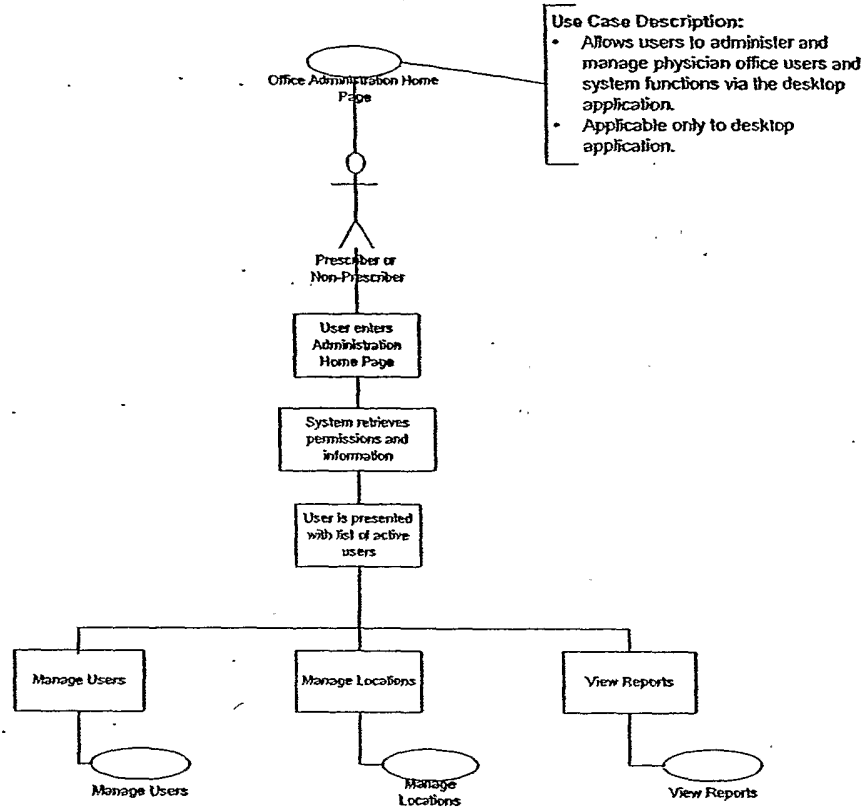
Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

Systems Requirements
Specification

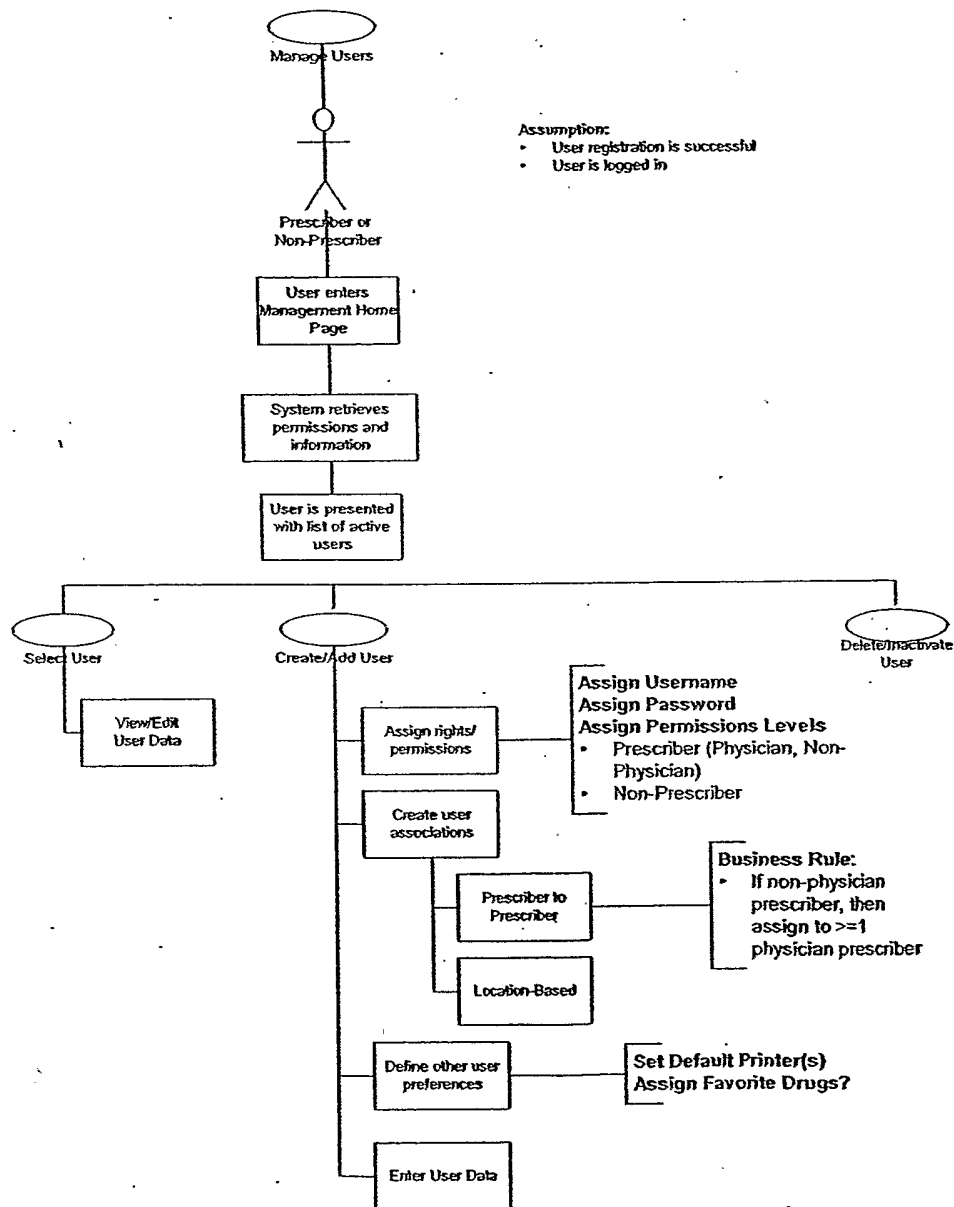
Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

Systems Requirements
Specification

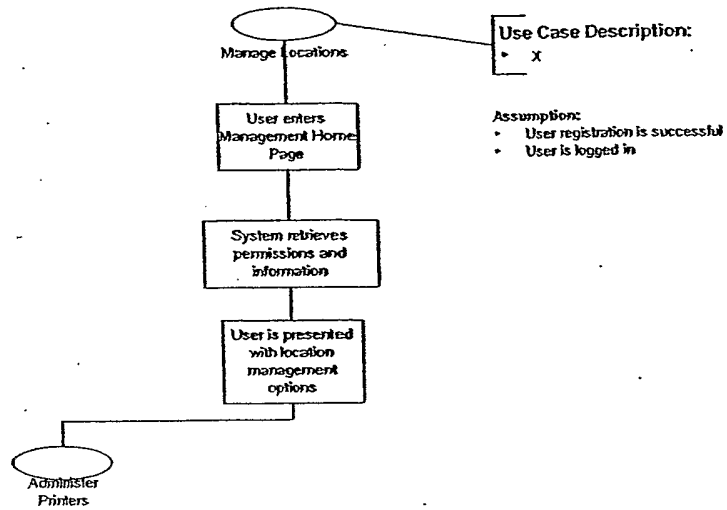
Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

Systems Requirements
Specification

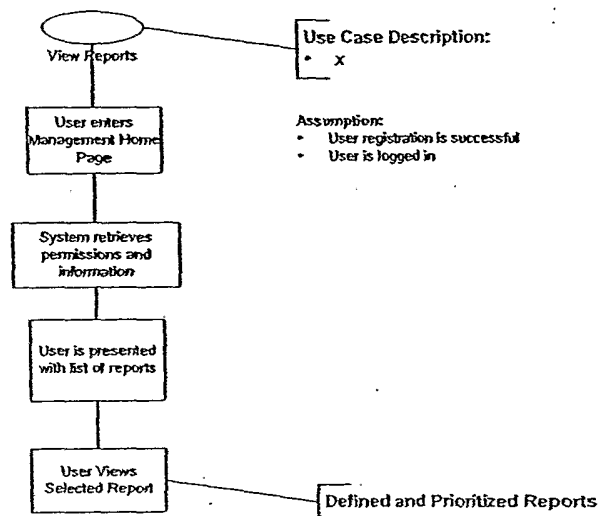
Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

Systems Requirements
Specification

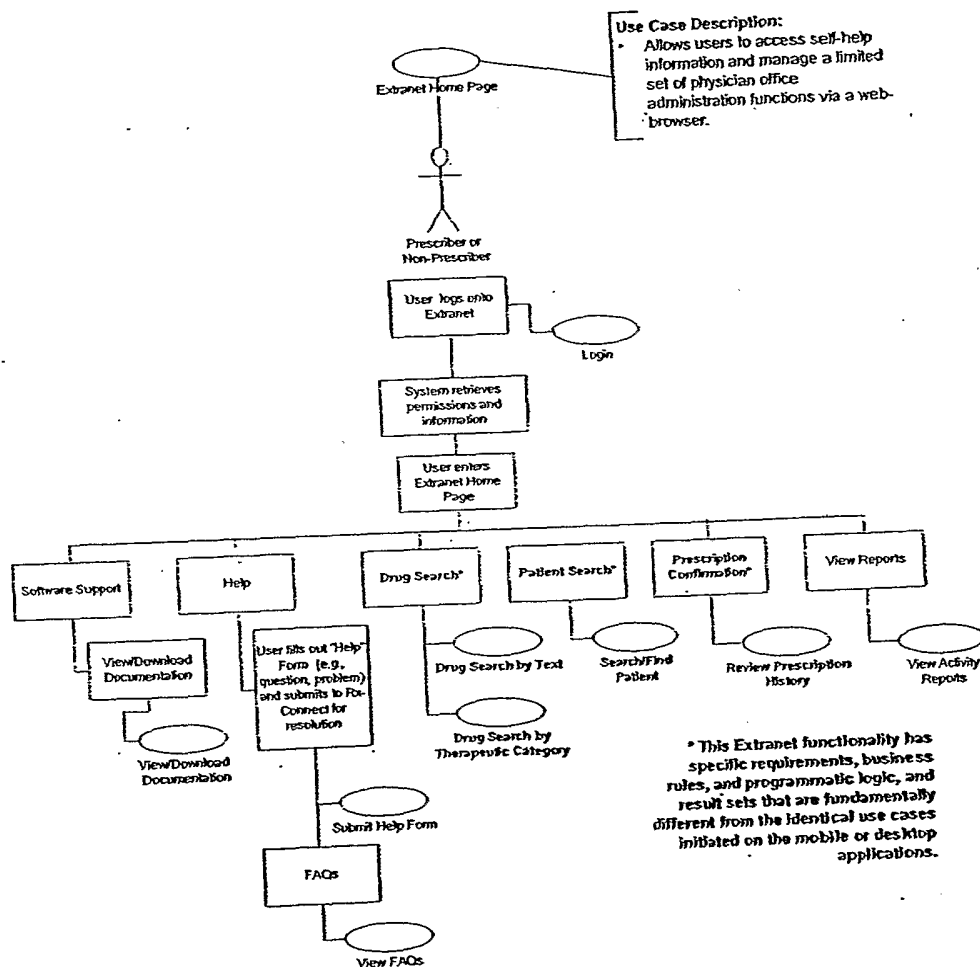
Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Physician Office User Management & System Administration



Connect Phase 1.0

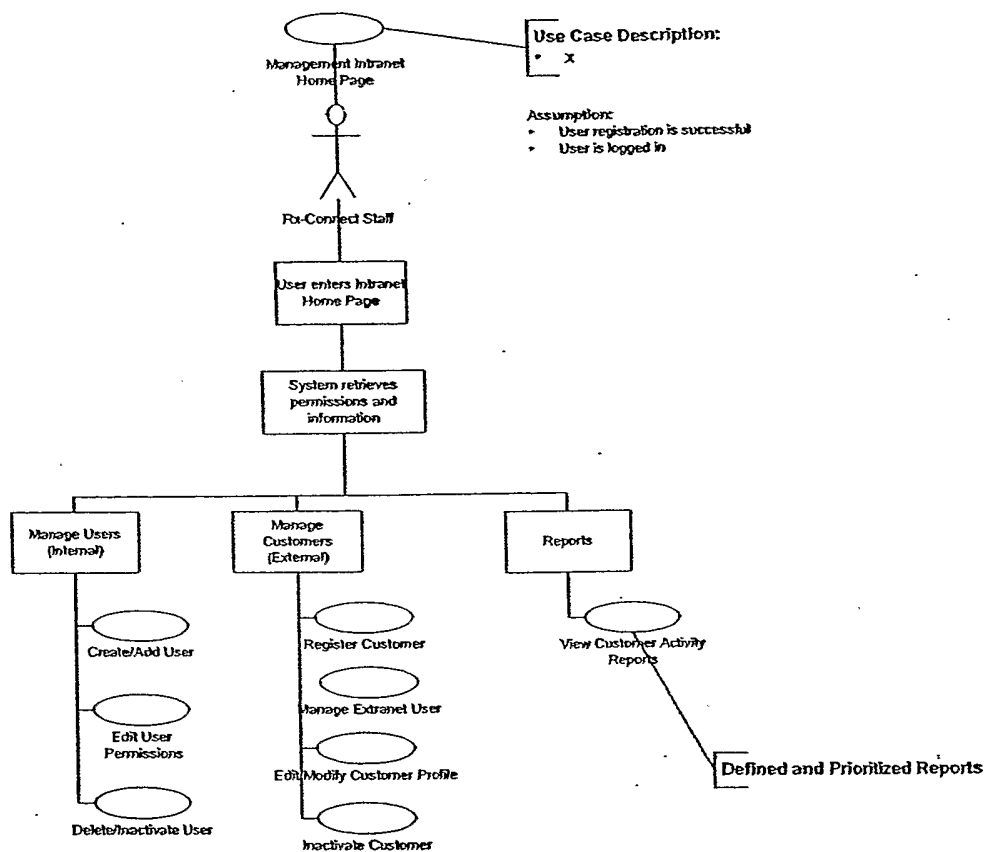
Systems Requirements
Specification

Section 4: Rx-Connect User Management and Administration (Intranet)

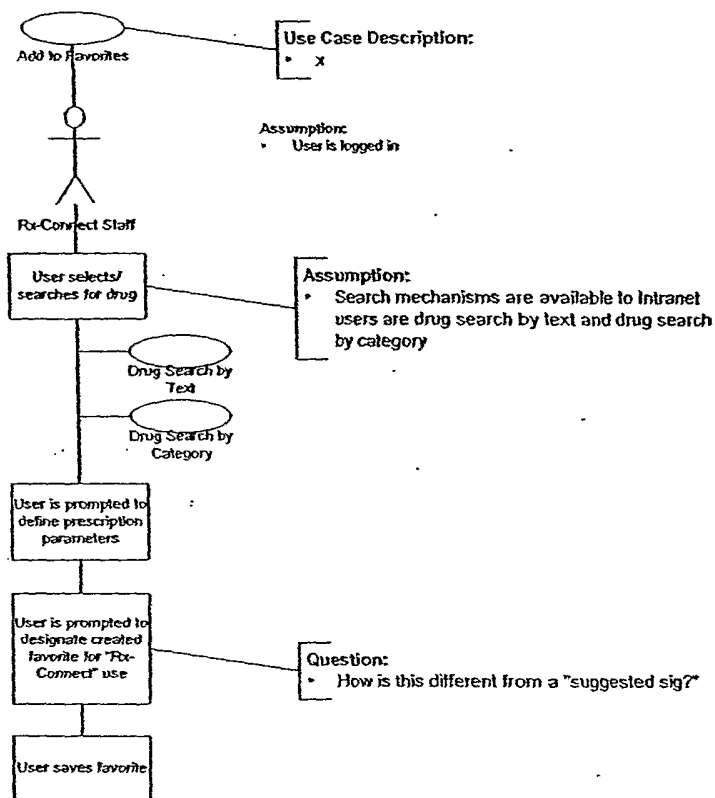
Connect Phase 1.0

Systems Requirements
Specification

Use Cases and Process Flows Rx-Connect User Management & System Administration



Use Cases and Process Flows Rx-Connect User Management & System Administration

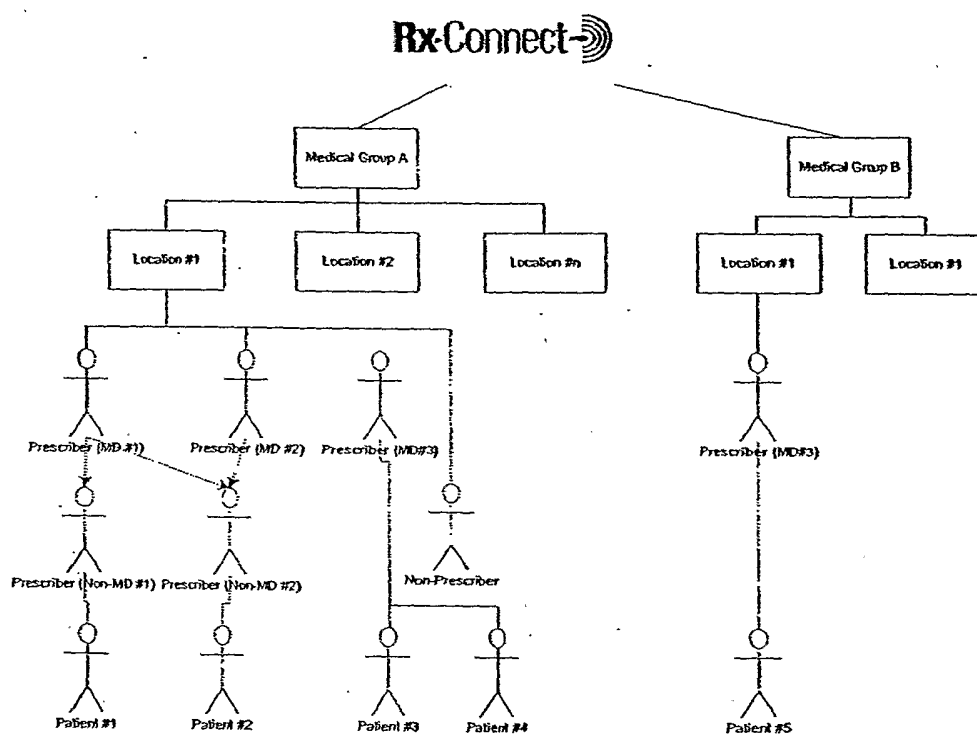


Connect Phase 1.0

Systems Requirements
Specification

Section 5: Physician's Office User Class Relationships & Permissions Hierarchy

Connect Phase 1.0

Systems Requirements
Specification**User Class Relationships and Permissions Hierarchy
Physician's Office**

Connect Phase 1.0

Systems Requirements
Specification

Appendix D: Network Topology

A detailed network topology will be provided upon a complete understanding and document delivery of the PHS network and accompanying location networks such as the co-location facility and physician's office. Outstanding documentation include network configuration of the co-location facility, connectivity between the co-location facility and PHS, firewall locations and policies, physician's office network hardware, and network connectivity points for future back-end data providers

Also, we may encounter IPX/SPX, net Bios, Net BOUI and SNA/SAA protocols for existing LANS prescription we are flexible

Connect Phase 1.0

Systems Requirements
Specification**Appendix E: Data Elements****Section 1: Physician's Office Desktop Application Database**

The following information shall be captured at the Physician's Office Desktop Application Database:

Prescriber Registration

| Data Element | | Comments |
|---------------|--|-------------------|
| Prescriber ID | | |
| Password | | |
| User Type | | |
| DEA | | |
| UPIN ??? | | |
| State License | | |
| Last | | |
| First | | |
| Middle | | |
| Degree | | |
| UIPA | | (Prescriber Type) |
| Sex | | |
| Address | | |
| City | | |
| State | | |
| Phone | | |
| Fax | | |
| e-mail | | |
| Date of Birth | | |
| GroupID | | PRIMARY |
| Location ID | | |
| Active | | |
| Date | | |
| Inactive Date | | |

Non-Prescriber

| Date | Comment |
|-------------------|---------|
| Non-Prescriber ID | |
| Password | |
| User Type | |
| Last | |
| First | |
| Middle | |
| Address | |
| City | |
| State | |
| Phone | |
| Group ID | |
| Location ID | |
| Active | |
| Date | |
| Inactive Date | |

Group Registration

| Date | Comment |
|-----------------------------|----------------------|
| Group ID | Group ID, station ID |
| Location ID | |
| Group Name | |
| Group Address | |
| Active | |
| Date | |
| Inactive Date | |
| Rx-Connect Registration Key | |
| Rx-Connect Registration ID | |

Location Registration

| Date | Comment |
|------------------|---------|
| Location ID | |
| Location Address | |
| Active | |
| Date | |
| Inactive Date | |

User Role

| Date | Comment |
|-----------------|---------|
| User ID | |
| User Type | |
| User Privileges | |

Connect Phase 1.0

Systems Requirements
Specification

Patient (Most member data will be retrieved from Rx-Claims using MemberID)
Group ID Carrier ID –Composition Key

| Data | Comments |
|---------------------------|-------------------|
| Patient ID | |
| FirstName | |
| LastName | |
| Middle | |
| Email | |
| Insured Name | |
| Insured Information | |
| Billing Address | |
| Shipping Address | |
| PlanID see right corner | |
| MemberID | |
| Sex | |
| Date of Birth | |
| Primary Care Physician | |
| Health Plan CODE | |
| Health Plan Code Option | |
| Current History | (Active/Inactive) |
| SSN | |
| Home Phone | |
| Work Phone | |
| Email | |
| Copay 1 - Brand | |
| Copay 2 - Generic | |
| Copay 3 - Non-formulary | |
| Copay 4 - other | |
| Preferred Pharmacy | (NABP) |
| Preferred Shipping Method | |
| Prescription History | |
| Credit Card Type | |
| Exp Date | |
| Credit Card Number | |

Patient Queue Do we need education?

| Data | Comments |
|------------------|----------|
| Patient ID | |
| Member ID | |
| Appointment Time | |
| Appointment Date | |
| Prescriber ID | |
| User ID | |
| Creation Date | |
| Active | |

Connect Phase 1.0

Systems Requirements
Specification**Prescription Printed Retail
RX (drug details , patient, doc.)**

| Field | Comments |
|------------------------------|--|
| Script ID | |
| Prescription ID | |
| Patient ID | |
| Health Plan ID | |
| Physician ID | |
| Group ID | |
| Location ID | |
| Appointment Type | (walkin/scheduled) |
| Appointment Date | |
| Appointment Time | |
| Issue Date | |
| Issue Time | |
| Status | (sampled from Rx-Claims automatically) |
| Completion Date | |
| DDID | |
| QTY Dispensed | |
| Day Supply | |
| Refills | |
| SIG | |
| Strength | |
| Diagnosis* | (Diabetes, Thyroid, Glaucoma, High Blood Pressure, Intestinal Disorder, Heart Condition, Lung Condition) |
| Allergy | (FK to allergies table) |
| Drug interaction | (FK to Drug interaction table) |
| Comments | |
| Warnings | (Y/N) – Need to define warning types |
| Warning Override | (Y/N) |
| Do Not Override for Pharmacy | DAW |
| As Directed | |
| Pharmacy | (NABP) |
| Billing Address | |
| Shipping Address | |
| Phone | |
| Shipping Method Request | (i.e. UPS) |
| Transmission Type | (FAX local, Fax remote, Print, Mail Services, Save, Other) |

Patient Allergies

| Field | Comments |
|------------|----------|
| Allergy ID | |
| Patient ID | |
| Comments | |

Connect Phase 1.0

Systems Requirements
Specification**Allergy**

| Data | | Comment | |
|--------------|--|---------|--|
| Allergy ID | | | |
| Allergy Name | | | |
| Description | | | |

Patient Misc. Medications

| Data | | Comment | |
|------------|--|---------|--|
| Patient ID | | | |
| DDID | | | |
| Comments | | | |

Member Information and Eligibility

| Data | | Comment | |
|-----------------------------------|--|---|--|
| Member ID | | | |
| NCPDP Eligibility Response Status | | <A = (Eligible) R = (Member not eligible for date requested) N = (Not found)> | |
| Plan Code from the group file | | | |
| Carrier ID | | | |
| Account ID | | | |
| Group | | | |
| Last Name | | | |
| First Name | | | |
| Middle Initial | | | |
| Sex | | | |
| Date of Birth | | CCYYMMDD | |
| Address1 | | | |
| Address2 | | | |
| City | | | |
| State | | | |
| Zip | | | |
| Phone | | | |
| Co-pay Brand | | Value \$999.99 | |
| Co-pay Generic | | Value \$999.99 | |
| Co-pay 3 (Non-formulary) | | Value \$999.99 | |
| Co-pay 4 | | Value \$999.99 | |
| Benefit Remaining | | Value \$9999999.99 | |

Connect Phase 1.0

Systems Requirements
Specification**Rx-Claims Drug History**

| Data | Comment |
|----------------------------|--|
| Member ID | |
| ? Continuation Key | Populated when there is at least one more drug |
| Drug Count | Number of drug records to follow |
| DM Labeler Code | (1st of 3 for NDC) |
| DM NDC Product Code | (2nd of 3 for NDC) |
| DM NDC Package Code | (3rd of 3 NDC) |
| TCD Sbm Dte Filled | CCYYMMDD |
| TCD Sbm Metric Qty | |
| Days Supply | Value 999 |
| Approved Co-pay | Value \$99999.99 |
| 39 additional drug records | additional sets of drug records |

Appointment

| Data | Comment |
|------------------|---------------------|
| Time | |
| Date | |
| Patient ID | |
| Physician ID | |
| Office/Group | |
| Appointment Type | (walk-in/scheduled) |

Insurance Carrier

| Data | Comment |
|------------------------|---------|
| Carrier ID | |
| Name | |
| Insurance Carrier Code | |
| Address 1 | |
| Address 2 | |
| City | |
| State | |
| ZIP | |
| Phone | |
| Fax | |
| Contact | |

Connect Phase 1.0

Systems Requirements
Specification**Insurance Carrier Formulary**

| Data | Comment |
|--|----------------|
| Formulary ID | |
| Plan name | |
| Plan code | |
| Carrier ID | |
| Relative Cost or Average Whole Price Indicator | (0/1) |
| Cost Display Indicator | (symbol/value) |
| Cost Display Symbol | |
| Benefit Cap | |
| Deductible | |

Insurance Carrier Co-pay

| Data | Comment |
|--------------|---------|
| Formulary ID | |
| Co-pay Tier | |
| Amount | |

Authorization Rule

| Data | Comment |
|--------------|---------|
| Formulary ID | |
| Rule ID | |
| Rule text | |

Formulary Drug

| Data | Comment |
|---------------------|--|
| Formulary ID | |
| DDID | |
| Coverage Indicator | indicates what type of drug is covered, i.e. Brand vs. Generic |
| Preferred Indicator | indicates if the drug is on formulary |
| Relative Cost | |
| Rule ID | authorization rule |
| Co-pay Tier | |

Formulary Exclusion

| Data | Comment |
|--------------|---------|
| Formulary ID | |
| DDID | |

Therapeutic Category

| Data | Comment |
|----------------------|---------|
| Category ID | |
| Category Description | |

Connect Phase 1.0

Systems Requirements
Specification**Sub-Therapeutic Category Information**

| Sub-Therapeutic Category Information | |
|--------------------------------------|--|
| Sub-Category ID | |
| Sub-Category Description | |
| Category Code | |

Therapeutic Drugs

| Therapeutic Drugs | |
|-------------------|--|
| Sub-Category ID | |
| DDID | |

Drug Indicators

| Drug Indicators | |
|---------------------|--|
| DDID | |
| Formulary exclusion | |
| Full exclusion | |

Connect Phase 1.0

Systems Requirements
Specification**NCPDP Information**

| Data | Comments |
|--------------------------------|--|
| NCPDP Provider Number | |
| Name | The DBA Name of the Provider |
| Store Number | The store number (usually assigned by parent company) associated with the provider |
| Address 1 | |
| Address 2 | |
| City | |
| State Code | |
| Zip Code | |
| Mailing Address 1 | |
| Mailing Address 2 | |
| Mailing Address City | |
| Mailing Address State Code | |
| Mailing Address ZIP Code | |
| Dispenser Class Code | |
| Dispenser Type Code | |
| Affiliation Code | |
| Affiliation Effective Date | |
| Payment Center Code | |
| Payment Center Effective Date | |
| Federal License Number | |
| Federal Tax ID | |
| State License Number | |
| State Tax ID | |
| Medical ID | |
| Always Open Flag | |
| Provider Hours | |
| Electronic Fund Transfer Route | |
| Transaction Code | |
| Transaction Date | |

Need to get Richard on NCPDP and stay close or define! New pre-check standard and patent method.

Connect Phase 1.0

Systems Requirements
Specification**Rx-Solutions Formulary Needs to be able
to handle other formularies**

| Data | Comment |
|--------------------------|---------|
| Formulary ID | |
| Brand Name | |
| Generic Name | |
| Plan ID | |
| Therapeutic Class | |
| Sub Class | |
| Relative Class | |
| Notes | |
| pkeyfield | |
| Cover Flag | |
| HCFA Chemo | |
| StateCode | |
| Low Copay 2 | |
| Therapeutic Class Member | |
| Sub Class Member | |
| Notes Member | |
| ProviderFlag | |
| NotForElderlyFlag | |

Rx-Solutions Plan

| Data | Comment |
|-----------------|---------|
| Plan ID | |
| Plan Name | |
| Date Data Moved | |
| Display Order | |
| State Code | |
| Active | |

Rx-Solutions Plan to Pharmacy

| Data | Comment |
|-------------|---------|
| Plan ID | |
| NABP | |
| Last Update | |

Connect Phase 1.0

Systems Requirements
Specification**Preferred Pharmacies**

| Data | Comment |
|-------------|---------|
| Pharmacy ID | |
| NABP | |
| Class Code | |
| Name | |
| Address | |
| City | |
| State | |
| Zip | |
| Phone | |

Mail Order Eligibility

| Data | Comment |
|------------------------|---|
| DDID | |
| Label Name | DDID Description |
| GPI Code | |
| Daily Frequency Factor | Quantity X Refill; strength is independent |
| Dosage Form | (TA,SJ,CA,TS,TR,PA,KA,AS,CC,SR,ZA,CE) need full list |

User Favorites

| Data | Comment |
|-----------------|---------|
| Favorite ID | |
| Prescriber ID | |
| Comments | |
| DDID | |
| Daily Amount | |
| Dosage | |
| Route | |
| Frequency | |
| Days | |
| Refills | |
| Comments | |
| Total Quantity | |
| Unit | |
| Action | |
| Modifier | |
| Special | |
| Unit of Measure | |
| Creation date | |
| Active | |

Connect Phase 1.0

Systems Requirements
Specification**Group Favorites**

| Data | Comment |
|---------------|---------|
| Group ID | |
| Favorite ID | |
| Category Name | |
| Comment | |

User Login Tracking

| Data | Comment |
|-----------------|---------|
| User ID | |
| User login Date | |
| User Login Time | |
| Error Type | |
| Active | |
| Inactive Date | |
| Inactive Time | |

First DataBank (Please refer to First DataBank Documentation, Framework v1.1 Documentation.pdf, for detailed description)

| Data | Comment |
|---|---|
| Brand and Generic Designations | |
| Generic Cross Reference | |
| Therapeutic Classifications | |
| Dosage Form | |
| Direct and Net Wholesale Prices and Effective Dates | |
| Historical Pricing | |
| Drug-Drug Interactions | |
| Drug-Disease Conflicts | |
| Counseling Messages | |
| Dosage Range Check | |
| Min/Max Daily Dose | Adult, Geriatric and Pediatric For a child, can we handle dosing issue by calculation from age? If age is child, the display an extra text message or field until we get to capture vitals. |
| BestDose | |
| Drug Allergy Alerts | |
| Side Effects | |
| Duplicate Therapy Checking | |
| Pediatric and Geriatric Precautions | |
| Pregnancy and Lactation Precautions | |
| Duration of Therapy | |
| Indications | |

Section 2: Physician's Office Mobile Device Database

The following information shall be captured at the Physician's Office Mobile Application Database:

Prescriber

| Data | Comment |
|---------------|---------|
| Prescriber ID | |
| Password | |
| Active | |
| Date | |
| Inactive Date | |

Non-Prescriber

| Data | Comment |
|-------------------|---------|
| Non-Prescriber ID | |
| Password | |
| Active | |
| Date | |
| Inactive Date | |

Group Registration

| Data | Comment |
|---------------|---------|
| Group ID | |
| Location ID | |
| Group Name | |
| Group Address | |
| Active | |
| Date | |
| Inactive Date | |

Location Registration

| Data | Comment |
|------------------|---------|
| Location ID | |
| Location Address | |
| Active | |
| Date | |
| Inactive Date | |

User Role

| Data | Comment |
|-----------------|---------|
| User ID | |
| User Type | |
| User Privileges | |

Patient

Connect Phase 1.0

Systems Requirements
Specification

| Patient | |
|--------------------|--------|
| Patient ID | |
| FirstName | |
| LastName | |
| Middle | |
| PlanID | |
| MemberID | |
| Preferred Pharmacy | (NABP) |

Patient Queue

| Patient Queue | |
|------------------|--|
| Patient ID | |
| Member ID | |
| Appointment Time | |
| Appointment Date | |
| Prescriber ID | |
| User ID | |
| Creation Date | |
| Active | |

See page 85

Connect Phase 1.0

Systems Requirements
Specification**Prescription**

| Field | Comments |
|------------------------------|--|
| Script ID | |
| Prescription ID | |
| Patient ID | |
| Health Plan ID | |
| Physician ID | |
| Group ID | |
| Location ID | |
| Appointment Type | (walk-in/scheduled) |
| Appointment Date | |
| Appointment Time | |
| Issue Date | |
| Issue Time | |
| Status | (sampled from Rx-Claims automatically) |
| Completion Date | |
| DDID | |
| QTY Dispensed | |
| Day Supply | |
| Refills | |
| SIG | |
| Strength | |
| Diagnosis* | (Diabetes, Thyroid, Glaucoma, High Blood Pressure, Intestinal Disorder, Heart Condition, Lung Condition) |
| Allergy | (FK to allergies table) |
| Drug interaction | (FK to Drug interaction table) |
| Comments | |
| Warnings | (Y/N) |
| Warning Override | (Y/N) |
| Do Not Override for Pharmacy | |
| As Directed | |
| Pharmacy | (NABP) |
| Billing Address | |
| Shipping Address | |
| Phone | |
| Shipping Method Request | (i.e. UPS) |
| Transmission Type | (FAX local, Fax remote, Print, Mail Services, Save, Other) |

Connect Phase 1.0

Systems Requirements
Specification**Patient Allergies**

| Data | Comment |
|------------|---------|
| Allergy ID | |
| Patient ID | |
| Comments | |

Allergy

| Data | Comment |
|--------------|---------|
| Allergy ID | |
| Allergy Name | |
| Description | |

Patient Misc. Medications

| Data | Comment |
|------------|---------|
| Patient ID | |
| DDID | |
| Comments | |

Rx-Claims Member and Eligibility

| Data | Comment |
|-----------------------------------|---|
| Member ID | |
| NCPDP Eligibility Response Status | A = (Eligible) R = (Member not eligible for date requested) N = (Not found) |
| Plan Code from the group file | |
| Carrier ID | |
| Account ID | |
| Group | |
| Co-pay Brand | Value \$999.99 |
| Co-pay Generic | Value \$999.99 |
| Co-pay 3 (Non-formulary) | Value \$999.99 |
| Co-pay 4 | Value \$999.99 |

Connect Phase 1.0

Systems Requirements
Specification**Rx-Claims Drug History**

| Field | Comment |
|----------------------------|--|
| Member ID | |
| Continuation Key | Populated when there is at least one more drug |
| Drug Count | Number of drug records to follow |
| DM Labeler Code | (1st of 3 for NDC) |
| DM NDC Product Code | (2nd of 3 for NDC) |
| DM NDC Package Code | (3rd of 3 NDC) |
| TCD Sbm Dte Filled | CCYYMMDD |
| TCD Sbm Metric Qty | |
| Days Supply | Value 999 |
| Approved Co-pay | Value \$99999.99 |
| 39 additional drug records | additional sets of drug records |

Insurance Carrier Formulary

| Field | Comment |
|--|----------------|
| Formulary ID | |
| Plan name | |
| Plan code | |
| Carrier ID | |
| Relative Cost or Average Whole Price Indicator | (0/1) |
| Cost Display Indicator | (symbol/value) |
| Cost Display Symbol | |
| Benefit Cap | |
| Deductible | |

Insurance Carrier Co-pay

| Field | Comment |
|--------------|---------|
| Formulary ID | |
| Co-pay Tier | |
| Amount | |

Authorization Rule

| Field | Comment |
|--------------|---------|
| Formulary ID | |
| Rule ID | |
| Rule text | |

Connect Phase 1.0

Systems Requirements
Specification**Formulary Drug Need to be sure that we
can resolve this with other PBMs**

| Data | Comment |
|---------------------|---|
| Formulary ID | |
| DDID | |
| Coverage Indicator | Indicates what type of drug is covered, i.e. Brand vs. Generic |
| Preferred Indicator | Indicates if the drug is on formulary |
| Relative Cost | |
| Rule ID | authorization rule |
| Co-pay Tier | |

Formulary Exclusion

| Data | Comment |
|--------------|---------|
| Formulary ID | |
| DDID | |

Therapeutic Category

| Data | Comment |
|----------------------|---------|
| Category ID | |
| Category Description | |

Sub-Therapeutic Category Information

| Data | Comment |
|--------------------------|---------|
| Sub-Category ID | |
| Sub-Category Description | |
| Category Code | |

Therapeutic Drugs

| Data | Comment |
|-----------------|---------|
| Sub-Category ID | |
| DDID | |

Drug Indicators

| Data | Comment |
|---------------------|---------|
| DDID | |
| Formulary exclusion | |
| Full exclusion | |

Connect Phase 1.0

Systems Requirements
Specification**Rx-Solutions Formulary PBM Generic**

| Data | Comment |
|-------------------------------|---------|
| Formulary ID | |
| Brand Name | |
| Generic Name | |
| Plan ID | |
| Therapeutic Class | |
| Sub Class | |
| Relative Class | |
| Notes | |
| pkeyfield | |
| Cover Flag | |
| HCFA Chemo | |
| State Code | |
| Low Co-pay 2 | |
| Therapeutic Class Member | |
| Sub Class Member | |
| Notes Member | |
| Provider Flag | |
| NotForElderlyFlag ? Age Flag? | |

Rx-Solutions Plan

| Data | Comment |
|-----------------|---------|
| Plan ID | |
| Plan Name | |
| Date Data Moved | |
| Display Order | |
| State Code | |
| Active | |

Preferred Pharmacies

| Data | Comment |
|-------------|---------|
| Pharmacy ID | |
| NABP | |
| Class Code | |
| Name | |
| Address | |
| City | |
| State | |
| Zip | |
| Phone | |
| Fax | |

Connect Phase 1.0

Systems Requirements
Specification**Mail Order Eligibility**

| Mail Order Eligibility | |
|------------------------|---|
| DDID | |
| Label Name | DDID Description |
| GPI Code | |
| Daily Frequency Factor | Quantity X Refill; strength is independent |
| Dosage Form | (TA,SJ,CA,TS,TR,PA,KA,AS,CC,SR,ZA,CE) need full list |

User Favorites

| User Favorites | |
|-----------------|--|
| Favorite ID | |
| Prescriber ID | |
| Comments | |
| DDID | |
| Daily Amount | |
| Dosage | |
| Route | |
| Frequency | |
| Days | |
| Refills | |
| Comments | |
| Total Quantity | |
| Unit | |
| Action | |
| Modifier | |
| Special | |
| Unit of Measure | |
| Creation date | |
| Active | |

Group Favorites

| Group Favorites | |
|-----------------|--|
| Group ID | |
| Favorite ID | |
| Category Name | |
| Comment | |

Connect Phase 1.0

Systems Requirements
Specification

First DataBank (Please refer to First DataBank Documentation, Framework v1.1 Documentation.pdf, for detailed description)

| Brand and Generic Designations | |
|--|--|
| Generic Cross Reference | |
| Therapeutic Classifications | |
| Dosage Form | |
| Direct and Net Wholesale Prices and Effective Dates | |
| Historical Pricing | |
| Drug-Drug Interactions | |
| Drug-Disease Conflicts | |
| Counseling Messages | |
| Dosage Range Check | |
| Min/Max Daily Dose -- Adult, Geriatric and Pediatric | |
| Best Dose | |
| Drug Allergy Alerts | |
| Side Effects | |
| Duplicate Therapy Checking | |
| Pediatric and Geriatric Precautions | |
| Pregnancy and Lactation Precautions | |
| Duration of Therapy | |
| Indications | |

Section 3: Rx-Connect Central Database

The following information shall be captured at the Rx-Connect Central Database

Internal User Administration

| Internal User Administration | |
|------------------------------|--|
| User ID | |
| Password | |
| Permissions | |
| Last | |
| First | |
| Middle | |
| Affiliation/Location | |
| Phone | |
| Active | |
| Start Date | |
| Inactive Date | |

Connect Phase 1.0

Systems Requirements
Specification

**Patient (Most member data will be retrieved from Rx-Claims using Member ID)
Or PPM in the future**

| Data Element | |
|---------------------------|-------------------|
| Patient ID | |
| First Name | |
| Last Name | |
| Middle | |
| Email | |
| Insured Name | |
| Insured Information | |
| Billing Address | |
| Shipping Address | |
| Plan ID | |
| Member ID | |
| Sex | |
| Date of Birth | |
| Primary Care Physician | (DEA) |
| Health Plan CODE | |
| Health Plan Code Option | |
| Current History | (Active/Inactive) |
| SSN | |
| Home Phone | |
| Work Phone | |
| Email | |
| Co-pay 1 - Brand | |
| Co-pay 2 - Generic | |
| Co-pay 3 - Non-formulary | |
| Co-pay 4 - other | |
| Preferred Pharmacy | (NABP) |
| Preferred Shipping Method | |
| Prescription History | |
| Credit Card Type | |
| Exp Date | |
| Credit Card Number | |

Connect Phase 1.0

Systems Requirements
Specification**Prescriber Registration**

| Data | Comments |
|---------------|-------------------|
| Prescriber ID | |
| Password | |
| User Type | |
| DEA | |
| UPIN | |
| State License | |
| Last | |
| First | |
| Middle | |
| Degree | |
| UIPA | (Prescriber Type) |
| Sex | |
| Address | |
| City | |
| State | |
| Phone | |
| Fax | |
| e-mail | |
| Date of Birth | |
| Group ID | |
| Location ID | |
| Active | |
| Date | |
| Inactive Date | |

Group Registration

| Data | Comments |
|-----------------------------|----------|
| Group ID | |
| Location ID | |
| Group Name | |
| Group Address | |
| Active | |
| Date | |
| Inactive Date | |
| Rx-Connect Registration Key | |
| Rx-Connect Registration ID | |

Connect Phase 1.0

Systems Requirements
Specification**Location Registration**

| Location ID | |
|------------------|--|
| Location Address | |
| Active | |
| Date | |
| Inactive Date | |

Prescription

| Script ID | |
|------------------------------|--|
| Prescription ID | |
| Patient ID | |
| Health Plan ID | |
| Physician ID | |
| Group ID | |
| Location ID | |
| Appointment Type | (walk-in/scheduled) |
| Appointment Date | |
| Appointment Time | |
| Issue Date | |
| Issue Time | |
| Status | (sampled from Rx-Claims automatically) |
| Completion Date | |
| DDID | |
| QTY Dispensed | |
| Day Supply | |
| Refills | |
| SIG | |
| Strength | |
| Diagnosis* | (Diabetes, Thyroid, Glaucoma, High Blood Pressure, Intestinal Disorder, Heart Condition, Lung Condition) |
| Allergy | (FK to allergies table) |
| Drug interaction | (FK to Drug interaction table) |
| Comments | |
| Warnings | (Y/N) |
| Warning Override | (Y/N) |
| Do Not Override for Pharmacy | |
| As Directed | |
| Pharmacy | (NABP) |
| Billing Address | |
| Shipping Address | |
| Phone | |
| Shipping Method Request | (i.e. UPS) |
| Transmission Type | (FAX local, Fax remote, Print, Mail Services, Save, Other) |

Connect Phase 1.0

Systems Requirements
Specification**Patient Allergies**

| Data | Comment |
|------------|---------|
| Allergy ID | |
| Patient ID | |
| Comments | |

Allergy

| Data | Comment |
|--------------|---------|
| Allergy ID | |
| Allergy Name | |
| Description | |

Patient Misc. Medications

| Data | Comment |
|------------|---------|
| Patient ID | |
| DDID | |
| Comments | |

Intranet Login Tracking

| Data | Comment |
|-----------------|---------|
| User ID | |
| User Login Date | |
| User Login Time | |
| Error Type | |
| Active | |
| Inactive Date | |
| Inactive Time | |

Registered Extranet User Information

| Data | Comment |
|------------------|---------|
| Extranet User ID | |
| Password | |
| Prescriber ID | |

Connect Phase 1.0

Systems Requirements
Specification**Extranet Usage Tracking**

| Extranet User ID | |
|------------------|--|
| Time | |
| Date | |
| Location | |
| Error | |
| Active | |
| Inactive Date | |
| Inactive Time | |

Suggested SIGS Table (this information is captured at the GPI level)

| Sig ID | |
|---------------|--------------------------|
| GPI | |
| Brand Name | |
| Dosage form | |
| axn | how to take instructions |
| Dose Amt | |
| Unit | |
| Route | |
| Freq | |
| Modifier | |
| Duration/misc | |
| Disp amt | |
| Unit | |

Connect Phase 1.0

Systems Requirements
Specification**NCPDP**

| Date | Comment |
|--------------------------------|--|
| NCPDP Provider Number | |
| Name | The DBA Name of the Provider |
| Store Number | The store number (usually assigned by parent company) associated with the provider |
| Address 1 | |
| Address 2 | |
| City | |
| State Code | |
| Zip Code | |
| Mailing Address 1 | |
| Mailing Address 2 | |
| Mailing Address City | |
| Mailing Address State Code | |
| Mailing Address ZIP Code | |
| Dispenser Class Code | |
| Dispenser Type Code | |
| Affiliation Code | |
| Affiliation Effective Date | |
| Payment Center Code | |
| Payment Center Effective Date | |
| Federal License Number | |
| Federal Tax ID | |
| State License Number | |
| State Tax ID | |
| Medical ID | |
| Always Open Flag | |
| Provider Hours | |
| Electronic Fund Transfer Route | |

DEA

| Date | Comment |
|-------------------------|-------------------------------|
| DEA Registration Number | |
| BAC | Business Activity Code* |
| Drug Schedules | |
| Expiration Date | |
| Company Name | Name of Company or Individual |
| Address 1 | |
| Address 2 | |
| Address 3 | |
| Address 4 | |
| State | |
| Zip Code | |

Connect Phase 1.0

Systems Requirements
Specification

*Every record is assigned one of the following Business Activity Codes:

| | |
|--|--|
| A - Pharmacy | |
| B - Hospital/Clinic | |
| C - Practitioner | |
| D - Teaching Institution | |
| E - Manufacturer | |
| F - Distributor | |
| G - Researcher | |
| H - Analytical Lab | |
| J - Importer | |
| K - Exporter | |
| M - Mid-Level Practitioner | |
| N, P, R, S, T, U - Narcotic Treatment Programs | |

Rx-Solutions Formulary

| | |
|--------------------------|--|
| Formulary ID | |
| Brand Name | |
| Generic Name | |
| Plan ID | |
| Therapeutic Class | |
| Sub Class | |
| Relative Class | |
| Notes | |
| pkeyfield | |
| Cover Flag | |
| HCFA Chemo | |
| State Code | |
| Low Co-pay 2 | |
| Therapeutic Class Member | |
| Sub Class Member | |
| Notes Member | |
| Provider Flag | |
| NotForElderlyFlag | |

Rx-Solutions Plan

| | |
|-----------------|--|
| Plan ID | |
| Plan Name | |
| Date Data Moved | |
| Display Order | |
| State Code | |
| Active | |

Connect Phase 1.0

Systems Requirements
Specification**Rx-Solutions Plan to Pharmacy**

| Field | Comment |
|-------------|---------|
| Plan ID | |
| NABP | |
| Last Update | |

Preferred Pharmacies

| Field | Comment |
|-------------|---------|
| Pharmacy ID | |
| NABP | |
| Class Code | |
| Name | |
| Address | |
| City | |
| State | |
| Zip | |
| Phone | |

Mail Order Eligibility

| Field | Comment |
|------------------------|---|
| DDID | |
| Label Name | DDID Description |
| GPI Code | |
| Daily Frequency Factor | Quantity X Refill; strength is independent |
| Dosage Form | (TA,SJ,CA,TS,TR,PA,KA,AS,CC,SR,ZA,CE) need full list |

Connect Phase 1.0

Systems Requirements
Specification

First DataBank (Please refer to First DataBank Documentation, Framework v1.1 Documentation.pdf, for detailed description)

| Brand and Generic Designations | |
|--|--|
| Generic Cross Reference | |
| Therapeutic Classifications | |
| Dosage Form | |
| Direct and Net Wholesale Prices and Effective Dates | |
| Historical Pricing | |
| Drug-Drug Interactions | |
| Drug-Disease Conflicts | |
| Counseling Messages | |
| Dosage Range Check | |
| Min/Max Daily Dose -- Adult, Geriatric and Pediatric | |
| Best Dose | |
| Drug Allergy Alerts | |
| Side Effects | |
| Duplicate Therapy Checking | |
| Pediatric and Geriatric Precautions | |
| Pregnancy and Lactation Precautions | |
| Duration of Therapy | |
| Indications | |

Section 4: Formulary Management System Database

The following information shall be captured in the Formulary Management System:

Insurance Carrier

| Data | Comment |
|------------------------|---------|
| Carrier ID | |
| Name | |
| Insurance Carrier Code | |
| Address 1 | |
| Address 2 | |
| City | |
| State | |
| ZIP | |
| Phone | |
| Fax | |
| Contact | |

Insurance Carrier Formulary

| Data | Comment |
|--|----------------|
| Formulary ID | |
| Plan name | |
| Plan code | |
| Carrier ID | |
| Relative Cost or Average Whole Price Indicator | (0/1) |
| Cost Display Indicator | (symbol/value) |
| Cost Display Symbol | |
| Benefit Cap | |
| Deductible | |

Insurance Carrier Co-pay

| Data | Comment |
|------------------|---------|
| Formulary ID | |
| Co-pay Tier | |
| Amount | |
| Transaction code | |
| Last modified | |

Authorization Rule

| Data | Comment |
|--------------|---------|
| Formulary ID | |
| Rule ID | |
| Rule text | |

Connect Phase 1.0

Systems Requirements
Specification**Formulary Drug**

| Date | Comment |
|---------------------|--|
| Formulary ID | |
| DDID | |
| Coverage Indicator | indicates what type of drug is covered, i.e. Brand vs. Generic |
| Preferred Indicator | indicates if the drug is on formulary |
| Relative Cost | |
| Rule ID | authorization rule |
| Co-pay Tier | |

Formulary Exclusion

| Date | Comment |
|--------------|---------|
| Formulary ID | |
| DDID | |

Therapeutic Category

| Date | Comment |
|----------------------|---------|
| Category ID | |
| Category Description | |

Sub-Therapeutic Category

| Date | Comment |
|--------------------------|---------|
| Sub-Category ID | |
| Category ID | |
| Sub-Category Description | |

Therapeutic Drugs

| Date | Comment |
|-----------------|---------|
| Sub-Category ID | |
| DDID | |

Drug Indicators

| Date | Comment |
|---------------------|---------|
| DDID | |
| Formulary exclusion | |
| Full exclusion | |

Allergy

| Date | Comment |
|--------------|---------|
| Allergy ID | |
| Allergy Name | |
| Description | |

Connect Phase 1.0

Systems Requirements
Specification**NCPDP**

| NCPDP | |
|--------------------------------|--|
| NCPDP Provider Number | |
| Name | The DBA Name of the Provider |
| Store Number | The store number (usually assigned by parent company) associated with the provider |
| Address 1 | |
| Address 2 | |
| City | |
| State Code | |
| Zip Code | |
| Mailing Address 1 | |
| Mailing Address 2 | |
| Mailing Address City | |
| Mailing Address State Code | |
| Mailing Address ZIP Code | |
| Dispenser Class Code | |
| Dispenser Type Code | |
| Affiliation Code | |
| Affiliation Effective Date | |
| Payment Center Code | |
| Payment Center Effective Date | |
| Federal License Number | |
| Federal Tax ID | |
| State License Number | |
| State Tax ID | |
| Medical ID | |
| Always Open Flag | |
| Provider Hours | |
| Electronic Fund Transfer Route | |

DEA

| DEA | |
|-----------------|------------------------|
| Date | |
| DEA Number | |
| BAC | Business Activity Code |
| Drug Schedule | |
| Expiration Date | |
| Company Name | |
| Address 1 | |
| Address 2 | |
| Address 3 | |
| Address 4 | |
| State | |
| Zip Code | |

Connect Phase 1.0

Systems Requirements
Specification**Mail Order Eligibility**

| Field | Comments |
|------------------------|---|
| DDID | |
| Label Name | DDID Description |
| GPI Code | |
| Daily Frequency Factor | Quantity X Refill; strength is independent |
| Dosage Form | (TA,SJ,CA,TS,TR,PA,KA,AS,CC,SR,ZA,CE) need full list |

First DataBank (Please refer to First DataBank Documentation, Framework v1.1 Documentation.pdf, for detailed description)

| Field | Comments |
|--|----------|
| Brand and Generic Designations | |
| Generic Cross Reference | |
| Therapeutic Classifications | |
| Dosage Form | |
| Direct and Net Wholesale Prices and Effective Dates | |
| Historical Pricing | |
| Drug-Drug Interactions | |
| Drug-Disease Conflicts | |
| Counseling Messages | |
| Dosage Range Check | |
| Min/Max Daily Dose -- Adult, Geriatric and Pediatric | |
| Best Dose | |
| Drug Allergy Alerts | |
| Side Effects | |
| Duplicate Therapy Checking | |
| Pediatric and Geriatric Precautions | |
| Pregnancy and Lactation Precautions | |
| Duration of Therapy | |
| Indications | |

Section 5: First DataBank

The following information is a brief description of the data that shall be captured by First DataBank:

First DataBank (Please refer to First DataBank Documentation, Framework v1.1 Documentation.pdf, for detailed description)

| Data | Comments |
|--|----------|
| Brand and Generic Designations | |
| Generic Cross Reference | |
| Therapeutic Classifications | |
| Dosage Form | |
| Direct and Net Wholesale Prices and Effective Dates | |
| Historical Pricing | |
| Drug-Drug Interactions | |
| Drug-Disease Conflicts | |
| Counseling Messages | |
| Dosage Range Check | |
| Min/Max Daily Dose -- Adult, Geriatric and Pediatric | |
| Best Dose | |
| Drug Allergy Alerts | |
| Side Effects | |
| Duplicate Therapy Checking | |
| Pediatric and Geriatric Precautions | |
| Pregnancy and Lactation Precautions | |
| Duration of Therapy | |
| Indications | |

Below is an example of the information captured by the First DataBank Database

Dispensable Drug

| Data | Comments |
|--------------------|--|
| DDID | Dispensable drug identifier |
| Description | |
| Search Description | The description, in upper case, with all special characters removed |
| Phonetic Codes | Phonetic spelling of description, in upper case, for use in searching |
| DNID | Drug Name ID - from fdb_drugname table - represents a unique drug name |
| RTID | Route of administration identifier - from fdb_route table |
| DFID | Dosage form identifier - from fdb_doseform table |
| Strength | Drug strength |
| Strength Units | Strength unit of measure |

Connect Phase 1.0

Systems Requirements
Specification

| | |
|---------------------------|--|
| RDID | RoutedDrugID - from fdb_routeddrug table - represents the unique combination of a Drug Name and an available Route of Administration for that drug |
| GPI | Generic Product Identifier - provided for backward compatibility to MDDb |
| KDC | |
| GCNSeqNo | Number that represents a generic formulation |
| RtGenID | Routed Generic ID - from fdb_routedgeneric table |
| HICL | |
| GenericLinkIndicator | |
| NameTypeCode | Indicates type of drug name |
| NameSourceCode | Indicates whether a packaged product exists for this product |
| GenderSpecificDrugCode | Identifies drugs that are used exclusively or most likely used in either males or females |
| RefFederalLegendCode | Indicates Rx or OTC |
| RefMultiSourceCode | Differentiates between single-source and multi-source drugs |
| RefFederalDEAClassCode | Indicates the DEA class |
| RefGenericDrugNameCode | Specifies whether a product is a brand, a generic, or an alternative brand, using the product name as the criteria |
| RefGenericCompPriceCode | Indicates how the product is priced |
| RefGenericPriceSpreadCode | Indicates the price spread of the product |
| RefInnovatorCode | Identifies the original innovator product(s) for a particular generic code number |
| RefGenericTheraEquivCode | Specifies whether a product is a brand, an Orange Book rated generic, a non-Orange Book generic or a product of unknown equivalence |
| RefDESICode | Indicator that marks a particular drug as declared less than effective by the FDA |
| RefDESI2Code | Indicator that marks a second drug as declared less than effective by the FDA. This field differs from the DESI field because it includes the 1990 HCFA expanded DESI list, which were previously not included in the DESI field |
| SingleIngredientInd | Flag to determine if drug contains a single ingredient only |
| MedicalDeviceInd | Indicates if the dispensable drug is considered a medical device |
| ObsoleteDate | Indicates the date on which a drug product was no longer available in the marketplace per manufacturer's notification, or the best estimate of that date |

Connect Phase 1.0

Systems Requirements
Specification

| | |
|--------------------------|--|
| ReplacedIndicator | Flag to determine if product code replaced an older product |
| SingleDoseRouteInd | Route of administration identifier for a single dose |
| HasPackagedDrugsInd | |
| HasEquivPackagedDrugsInd | |
| HasImagesInd | |

Section 6: DEA Data

The following information shall be captured in the DEA file:

DEA

| Data | | Comment |
|-------------------------|--|-------------------------------|
| Date | | |
| DEA Registration Number | | |
| BAC | | Business Activity Code* |
| Drug Schedules | | |
| Expiration Date | | |
| Company Name | | Name of Company or Individual |
| Address 1 | | |
| Address 2 | | |
| Address 3 | | |
| Address 4 | | |
| State | | |
| Zip Code | | |

*Every record is assigned one of the following Business Activity Codes:

| | |
|--|--|
| A - Pharmacy | |
| B - Hospital/Clinic | |
| C - Practitioner | |
| D - Teaching Institution | |
| E - Manufacturer | |
| F - Distributor | |
| G - Researcher | |
| H - Analytical Lab | |
| J - Importer | |
| K - Exporter | |
| M - Mid-Level Practitioner | |
| N, P, R, S, T, U - Narcotic Treatment Programs | |

Section 7: Formulary Data

The following information shall be captured in the Formulary Dataset:

Rx-Solutions Formulary

| Date | Comment |
|--------------------------|---------|
| Formulary ID | |
| Brand name | |
| Generic name | |
| Plan ID | |
| Therapeutic class | |
| Sub class | |
| Relative Class | |
| Notes | |
| pkeyfield | |
| Cover Flag | |
| HCFA Chemo | |
| State code | |
| LowCoplay2 | |
| Therapeutic class member | |
| Sub Class Member | |
| Notes member | |
| Provider flag | |
| NotForElderlyFlag | |

Rx-Solutions Plan

| Date | Comment |
|-----------------|---------|
| Plan ID | |
| Plan Name | |
| Date Data Moved | |
| Display Order | |
| State Code | |
| Active | |

Section 8: NCPDP/NABP Data

The following information shall be captured in the NCPDP file:

NCPDP

| Field Name | Comments |
|--------------------------------|--|
| NCPDP Provider Number | |
| Name | The DBA Name of the Provider |
| Store Number | The store number (usually assigned by parent company) associated with the provider |
| Address 1 | |
| Address 2 | |
| City | |
| State Code | |
| Zip Code | |
| Mailing Address 1 | |
| Mailing Address 2 | |
| Mailing Address City | |
| Mailing Address State Code | |
| Mailing Address ZIP Code | |
| Dispenser Class Code | |
| Dispenser Type Code | |
| Affiliation Code | |
| Affiliation Effective Date | |
| Payment Center Code | |
| Payment Center Effective Date | |
| Federal License Number | |
| Federal Tax ID | |
| State License Number | |
| State Tax ID | |
| Medical ID | |
| Always Open Flag | |
| Provider Hours | |
| Electronic Fund Transfer Route | |
| Transaction Code | |
| Transaction Date | |

Section 9: Networked Pharmacies

The following information shall be captured in the Networked Pharmacy List:

Networked Pharmacy List

| Networked Pharmacy List | |
|-------------------------|--|
| Pharmacy ID | |
| NCPDP Provider Number | |
| Class Code | |
| Name | |
| Address | |
| City | |
| State | |
| Zip | |
| Phone | |

Section 10: Mail Order Eligible Drug Information

The following information is contained in the Mail Order Eligible Drug List:

Mail Order Eligibility

| Mail Order Eligibility | |
|--|---|
| DDID | DDID Description |
| Label Name | |
| GPI Code | |
| Daily Frequency Factor | Quantity X Refill; strength is independent |
| Dosage Form | (TA,SJ,CA,TS,TR,PA,KA,AS,CC,SR,ZA,CE) need full list |
| Alternative | |
| Message | |
| Is this the resulting rules table for PBM preferences integration? | |

Section 11: Rx-Claims Member Data Interface and Data Structure

The following information shall be captured in the Rx-Claims data feed:

Member Information and Eligibility

| Data | Comments |
|-----------------------------------|---|
| Member ID | |
| NCPDP Eligibility Response Status | <A = (Eligible) R = (Member not eligible for date requested) N = (Not found)> |
| Plan Code from the group file | |
| Carrier ID | |
| Account ID | |
| Group | |
| Last Name | |
| First Name | |
| Middle Initial | |
| Sex | |
| Date of Birth | CCYYMMDD |
| Address1 | |
| Address2 | |
| City | |
| State | |
| Zip | |
| Phone | |
| Co-pay Brand | Value \$999.99 |
| Co-pay Generic | Value \$999.99 |
| Co-pay 3 (Non-formulary) | Value \$999.99 |
| Co-pay 4 | Value \$999.99 |
| Benefit Remaining | Value \$9999999.99 |

Member Eligibility Request String

| Data | Comments |
|------------------------|--|
| Member ID | |
| Person Code | PIN Code, optional |
| Health Plan Identifier | Code defined by health plan identifier (PSI2500 for PacifiCare CA) |
| Member DOB | CCYYMMDD |
| Requested Date | CCYYMMDD |

Connect Phase 1.0

Systems Requirements
Specification**Drug History**

| Field Name | Field Description |
|----------------------------|--|
| Member ID | |
| Continuation Key | Populated when there is at least one more drug |
| Drug Count | Number of drug records to follow |
| DM Labeler Code | (1st of 3 for NDC) |
| DM NDC Product Code | (2nd of 3 for NDC) |
| DM NDC Package Code | (3rd of 3 NDC) |
| TCD Sbm Dte Filled | CCYYMMDD |
| TCD Sbm Metric Qty | |
| Days Supply | Value 999 |
| Approved Co-pay | Value \$99999.99 |
| 39 additional drug records | additional sets of drug records |

FILLED @ NABP

Drug History Request String

| Field Name | Field Description |
|------------------------|--|
| Member ID | |
| Person Code | PIN Code |
| Health Plan Identifier | |
| Member DOB | CCYYMMDD |
| Limit Date | CCYYMMDD |
| Prescriber ID | (DEA Number) |
| Continuation Key | Value to be passed to request next 40 drug records |

Connect Phase 1.0

Systems Requirements
Specification**Section 12: Rx-Express Interface and Data Structure**

The following information shall be captured in the Rx-Express data feed:

Mail Order Member

| Data | Comment |
|---|---|
| OP Code | Value "MD" |
| Status | |
| Context-ID | This value must be stored and sent in all subsequent request messages |
| First Name | |
| Last Name | |
| Middle Initial | |
| Address 1 | |
| Address 2 | |
| City | |
| State | |
| ZIP | |
| Phone | |
| Plan Type | |
| Plan Name | |
| Plan Code | The US state codes |
| Address 1 | Address for shipping |
| Address 2 | Address for shipping |
| City | Address for shipping |
| State--optional for entry but want to make easy | Address for shipping |
| ZIP | Address for shipping |
| Billing Name | |
| Address 1 | |
| Address 2 | |
| City | |
| State | |
| ZIP | |
| Credit Card Number | |
| Credit Card Type | |
| Exp Date | CCYYMM |
| Member Number | |
| E-mail | |

Optional**Mail Order Member Information Request String**

| Data | Comment |
|---------------|------------|
| OP Code | Value "VU" |
| Member Number | |
| DOB | CCYYMMDD |

WHAT IS CLAIMED IS:

1. A method for preparing a prescription for a patient, the method comprising:
synchronizing formulary and coverage data between a first server and a point-of-care device;
synchronizing patient data between the first server and the point-of-care device;
displaying the patient data on the point-of-care device;
entering prescription data on the point-of-care device, the prescription data comprising a pharmaceutical;
analyzing the prescription data to generate warnings related to the formulary and coverage data and the patient data;
sending the prescription data from the point-of-care device to the first server;
printing a prescription corresponding to the prescription data from the first server; and
sending the prescription data to a second server.
2. The method for preparing a prescription as in Claim 1 wherein the point-of-care device and the first server are connected by a network.
3. The method for preparing a prescription as in Claim 2 wherein the network comprises a wireless network.
4. The method for preparing a prescription as in Claim 1 wherein the point-of-care device comprises a handheld computing device.
5. The method for preparing a prescription as in Claim 1 wherein the second server comprises a server associated with a pharmacy.
6. A method for writing a prescription for a patient, the method comprising:
synchronizing patient data between a point-of-care device and a server;
entering prescription data on the point-of-care device, the prescription data comprising a pharmaceutical;
checking for undesirable patient reactions caused by the pharmaceutical;
checking for appropriate coverage for the pharmaceutical; and
sending the prescription data from the point-of-care device to a pharmacy.
7. The method for writing a prescription as in Claim 6 wherein the patient data comprises the medical history of the patient.
8. The method for writing a prescription as in Claim 6 wherein the patient data comprises existing medication being used to treat the patient.
9. The method for writing a prescription as in Claim 6 wherein the patient data comprises the coverage provided by the patient's health plan.
10. The method for writing a prescription as in Claim 9 wherein the patient data further comprises the appropriate formulary for which the patient is covered.

11. A system for facilitating medical service and prescription writing, the system comprising:
 - a point-of-care device configured to display patient information to a doctor and further configured to have prescription data entered into the point-of-care device while the doctor examines the patient;
 - a synchronization means for sending information related to a patient to the point-of-care device and for receiving the prescription data for the patient from the point-of-care device;
 - a formulary checking means for receiving treatment coverage data related to the patient and analyzing whether the prescription data represents a covered treatment;
 - a printing means for providing the patient with a receipt corresponding to the prescription data after the doctor examines the patient and before the patient leaves the office.
12. A prescription writing system for facilitating writing prescriptions comprising:
 - a point-of-care module configured to be carried by a doctor;
 - a first server located within an office of the doctor;
 - a synchronization module configured to send patient data related to a patient from the first server to the point-of-care module and to send coverage data from the first server to the point-of-care module;
 - a display on the point-of-care module configured to display the received patient data to a doctor;
 - a prescription module configured to prompt the doctor to write a prescription for the patient upon viewing the displayed patient data;
 - an interaction analysis module configured to examine the prescription and the patient data to check for undesirable reactions to the prescription;
 - a coverage analysis module configured to examine the prescription and the coverage data to determine whether the patient has appropriate health plan coverage for the prescription; and
 - an output module configured to send the prescription data from the point-of-care module to the first server, the first server being configured to print the prescription for the patient and to transmit the prescription data to a pharmacy.
13. The system as in Claim 12 wherein the synchronization module is configured to communicate with the point-of-care module wirelessly.
14. The system as in Claim 12 wherein the point-of-care module is a handheld computing device.
15. The system as in Claim 12 wherein the interaction analysis module is located within the point-of-care module.
16. The system as in Claim 12 wherein the coverage analysis module is located within the point-of-care module.
17. A prescription writing system for facilitating writing prescriptions comprising:
 - a first server storing patient data related to a patient;
 - a point-of-care module configured to display data to a doctor and receive input from a doctor;
 - a synchronization module configured to send the patient data to the point-of-care module;

an interaction analysis module configured to examine the prescription and the patient data to check for undesirable reactions to the prescription; and

a coverage analysis module configured to examine the prescription and the patient data to determine whether the patient has appropriate health plan coverage for the prescription,

the point-of-care module further configured to send the prescription data to the first server, and the first server being further configured to print the prescription for the patient and to transmit the prescription data to a pharmacy.

18. The system as in Claim 17 wherein the synchronization module is configured to send the patient data wirelessly.

19. The system as in Claim 17 wherein the point-of-care module further comprises a pharmacopoeia of pharmaceutical data.

20. The system as in Claim 17 wherein the first server is further configured to send the prescription data to a health plan provider associated with the patient.

21. The system as in Claim 17 wherein the first server is further configured to send a mail order prescription request and the pharmacy comprises a mail order pharmacy.

22. The system as in Claim 17 further comprising a patient reminder module configured to automatically send to the patient one or more reminders to perform one of the following actions: fill a prescription, refill a prescription or take the medication corresponding to a prescription.

23. A point-of-care device for facilitating medical service and prescription writing, the device comprising:

a synchronization module configured to receive patient information data of a patient from a server;

a display module configured to display the received patient information data to a doctor; and

a prescription module configured to prompt the doctor to write a prescription for the patient upon viewing the displayed patient information data of the patient;

wherein the synchronization module is further configured to send data regarding the written prescription to the local server.

24. The point-of-care device of claim 23, wherein the device stores prescription writing recommendations for a plurality of drugs.

25. The point-of-care device of claim 24, wherein the prescription module displays a stored prescription writing recommendation for a drug selected by the doctor.

26. The point-of-care device of claim 23, further comprising a favorites module configured to store a list of favorite prescriptions and to allow the doctor to select as prescription from the list of favorite prescriptions.

27. The point-of-care device of claim 26, wherein a favorite prescription includes one or more medications or treatments.

28. The point-of-care device of claim 23, further comprising a warning module configured to display a warning when a drug selected by the doctor is not within a formulary of a health plan of the patient.

29. The point-of-care device of claim 28, wherein the warning module is further configured to display one or more alternative drugs within the formulary of the health plan of the patient when a drug selected by the doctor is not within the formulary.

30. The point-of-care device of claim 23, further comprising a warning module configured to display a warning when a drug selected by the doctor is likely to cause interaction with another drug being taken or to be taken by the patient.

31. The point-of-care device of claim 23, further comprising a warning module configured to display a warning when a drug selected by the doctor is likely to trigger an allergy of the patient.

32. The point-of-care device of claim 23, further comprising a warning module configured to display a warning when a drug selected by the doctor is likely to cause duplication with another drug being taken or to be taken by the patient.

33. The point-of-care device of claim 23, wherein the synchronization module is configured to communicate with the server using one or more wireless access points.

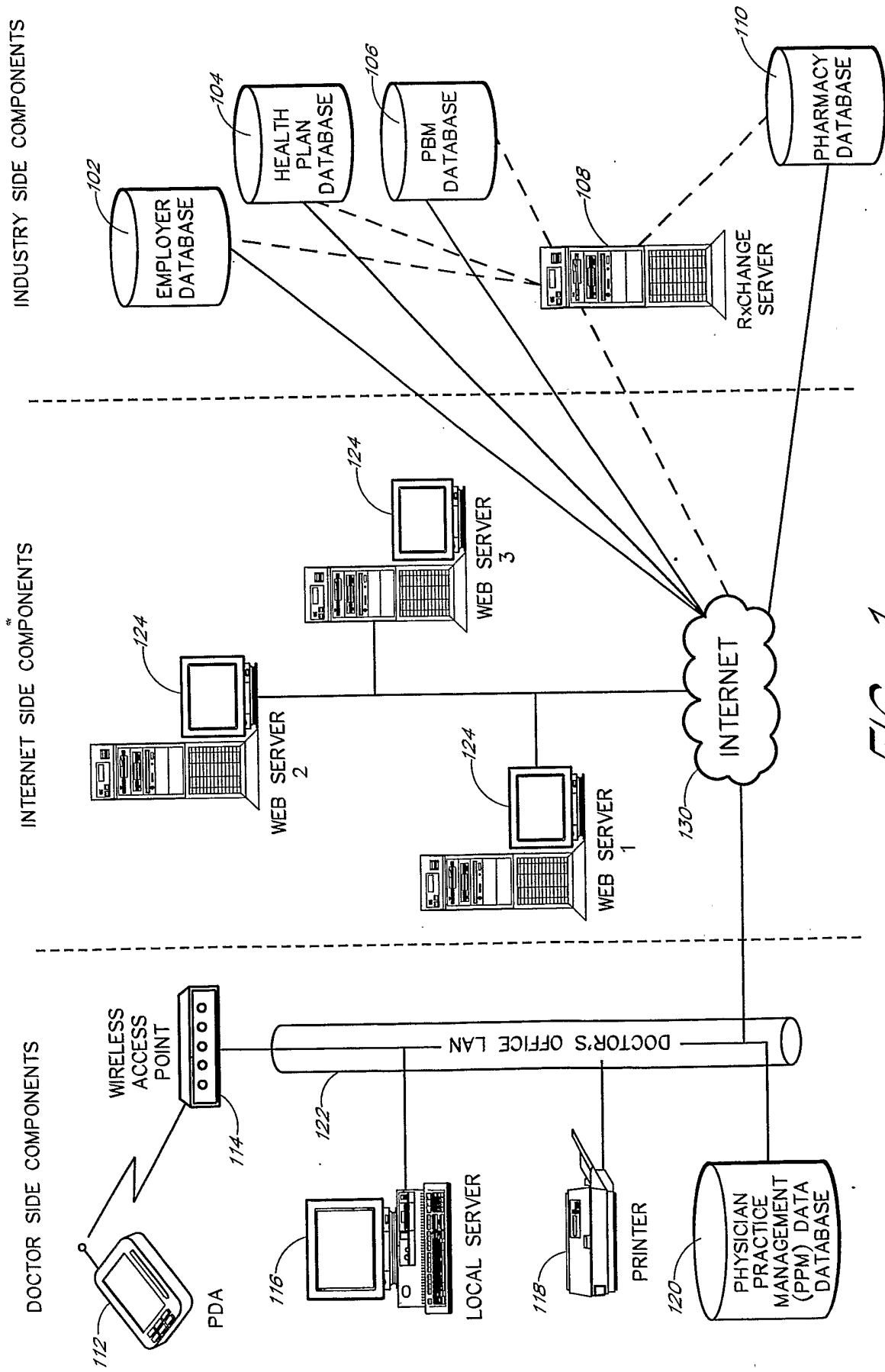


FIG. 1

2/20

12:11p

Login

Rx-Connect

Select Location:

Main Street Office

User:

ERybody

Password:

Login

| | | | | | | | | | | | | | |
|-------|----|---|---|---|---|---|---|---|---|---|---|---|---|
| 123 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | - | = | ⬅ |
| Tab | q | w | e | r | t | y | u | i | o | p | [|] | |
| CAP | a | s | d | f | g | h | j | k | l | ; | ' | | |
| Shift | z | x | c | v | b | n | m | , | . | / | | ⬅ | |
| Ctl | áü | ` | \ | | | | | | | ↓ | ↑ | ⬅ | ➡ |

Doctor Patient << Logout

200 202 218 216 204 206 208 210 212 214

FIG. 2

3/20

☐ Patient Queue 4:37p

Patients Waiting For:

Evan Rybody, M.D. ▼

| Patient | DOB | Appt Time |
|-------------------|-----------|-----------|
| Anderson, Andy | 2/3/1954 | 2:45 PM |
| Billings, Betty | 1/7/1986 | 1:30 PM |
| Casey, Carla | 10/18/... | 10:00 AM |
| Dominguez, Daniel | 2/19/1... | 4:15 PM |
| Easton, Ellie | 9/9/1954 | 10:45 AM |
| Feinman, Frank | 11/2/1... | 8:45 AM |

New Rx Rx History Allergy/Misc

Doctor Patient << Logout

▲

300

304

302

306

FIG. 3

4/20

☐

Patient Queue

4:37p

Patients Waiting For:

Evan Rybody, M.D. ▼

| Patient | DOB | Appt Time |
|-------------------|-----------|-----------|
| Anderson, Andy | 2/3/1954 | 2:45 PM |
| Billings, Betty | 1/7/1986 | 1:30 PM |
| Casey, Carla | 10/18/... | 10:00 AM |
| Domínguez, Daniel | 2/19/1... | 4:15 PM |
| Easton, Ellie | 9/9/1954 | 10:45 AM |
| Feinman, Frank | 11/2/1... | 8:45 AM |

Select a Printer

Change Password

Settings

Sync

Favorites

Patient Queue


Allergy/Misc

Doctor

Patient

<<

Logout



▲

206

300

FIG. 4

5/20

Favorites Management

12: 45p

| Drug Alias | Drug Name | Strength |
|------------|---------------------|----------|
| Amox7 | Amoxicillin OR TABS | 500 MG |
| Claritin | Loratadine OR TABS | 10MG |

◀

|||

▶

Add

Edit

Delete

Doctor

Patient

<<

Logout

▲

508

500

502

504

506

FIG. 5

6/20

Settings

☒ Enable Drug Warnings

☒ Enable Off-Formulary Notification

☒ Enable Suggested RxTablet Choices

OK Cancel

note: changes will not be saved until the
OK button is pressed

600

FIG. 6

7/20

Rx History 11:42a

Patient: Easton, Ellie
(PacifiCare California Commercial)

| Prescriptions | Strength |
|--------------------|----------|
| Glucophage OR TABS | 500 MG |
| Glucophage OR TABS | 500 MG |

Navigation: Details Renew

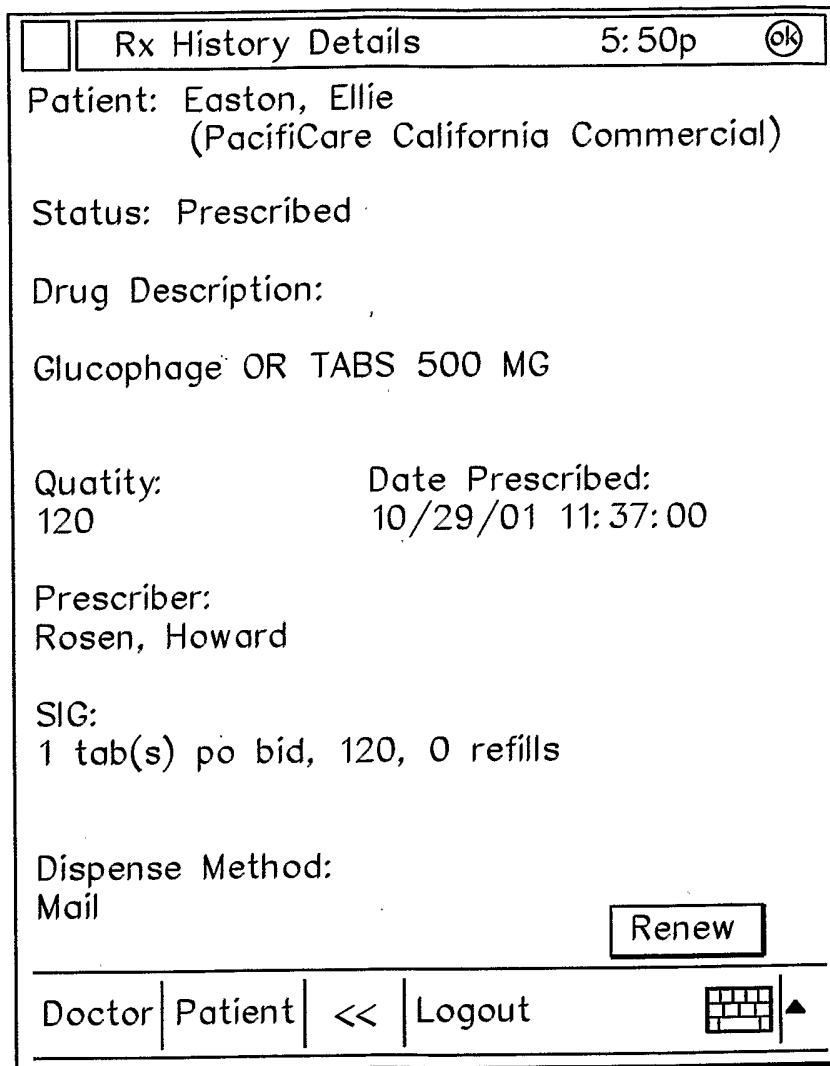
| Misc Medications | Comments |
|---------------------|------------|
| Other | st. john's |
| Vioxx OR TABS 25... | |

Navigation: Details Renew

Doctor | Patient | << | Logout

FIG. 7

8/20



☐ Rx History Details 5:50p

Patient: Easton, Ellie
(PacifiCare California Commercial)

Status: Prescribed

Drug Description:
Glucophage OR TABS 500 MG

Quantity: 120 Date Prescribed: 10/29/01 11:37:00

Prescriber:
Rosen, Howard

SIG:
1 tab(s) po bid, 120, 0 refills

Dispense Method:
Mail

Doctor | Patient | << | Logout

FIG. 8

9/20

☐ Allergy/Misc. Meds 4:53p

Patient: Easton, Ellie
(PacifiCare California Commercial)

| Allergies | Comments |
|--------------|-------------------|
| Other | nuts |
| Sulfonyureas | hives, itching... |

Add Edit Delete

| Misc Medications | Comments |
|-----------------------|-----------------|
| Other | st. john's wort |
| ☑ Vioxx OR TABS 25... | |

Add Edit Delete


Doctor | Patient | << | Logout 

FIG. 9

10/20

☐ Allergy/Misc. Meds 4:53p

Patient: Easton, Ellie
(PacifiCare California Commercial)

900

| Allergies | Comments |
|--------------|-------------------|
| Other | nuts |
| Sulfonyureas | hives, itching... |

Add Edit Delete

| Misc Medications | Comments |
|------------------|-------------|
| Oth | john's wort |
| 🗑 Vio | |

Add

History
Allergy/Misc
New Rx
Review Rx

Doctor Patient << Logout

208

FIG. 10

11/20

☐ Edit Allergy 11:14p


Patient: Easton, Ellie
(PacifiCare California Commercial)

Edit Allergy:

Sulfonyureas ▼ Search

Comment:
hives, itching - no SOB

Save Cancel

Doctor Patient << Logout  ▲

1100

FIG. 11

12/20

☐ Edit Medication , 5: 11p

Patient: Easton, Ellie
(PacifiCare California Commercial)


Edit Medication

Other ▼ Search

Comment:

st. john's wort

Save Cancel

Doctor Patient << Logout  ▲

1200

FIG. 12

13/20

1300

Drug Search

6:09p

Patient: Easton, Ellie
(PacifiCare California Commercial)

Search by:

Name

GO

Drug Name

Cost

Viogen-C OR CAPS

Viokase 16 OR TABS

Viokase 8 OR TABS

Viokase OR PACK

Viokase OR POWD

Viocx OR SUSP

Viocx OR TABS

\$105

7 drugs found

Doctor

Patient

<<

Logout

1310

Drug Search

4:29p

Patient: Easton, Ellie
(PacifiCare California Commercial)

Search by:

Therapeutic Category

Metabolic/Endocrine Agents

Antidiabetic

☐ Search All Drugs

Brand Name

Generic Name

Cost

Chlorpromide

Chlorpropa...

\$15

Diabeta OR TABS

Glyburide

\$10

Diabinese OR T...

Chlorpropa...

\$15

Dymelor OR TABS

Acetohexa...

\$10

Glipizide OR TABS

Glipizide

\$5

Glucophage OR...

Metformin HCl

\$70

27 drugs found

Doctor

Patient

<<

Logout

1320

Drug Search

6:09p

Patient: Easton, Ellie
(PacifiCare California Commercial)

Search by:

Favorites

Personal Favorites

Drug Alias

Drug Name

Stren...

Amox7

Amoxicillin OR TABS

500 MG

Claritin

Loratadine OR TABS

10 MG

2 Personal Favorite(s) Found

Doctor

Patient

<<

Logout

FIG. 13

14/20

☐ Off Formulary Notification 3: 14p

Drug Name: Vioxx OR TABS

You selected a non-formulary drug.
Do you wish to prescribe a formulary alternative?

| Brand Name | Generic Name | Cost | ▲ |
|--------------------|----------------|------|---|
| Anaprox DS OR... | Naproxen S... | \$10 | ≡ |
| Anaprox OR TABS | Naproxen S... | \$10 | |
| Choline & Mag... | Choline & M... | \$5 | |
| Choline & Mag... | Choline & M... | \$5 | |
| Clínoril OR TABS | Sulindac | \$20 | |
| Diclofenac Sodi | Diclofenac... | \$30 | |
| Diflunisal OR T... | Diflunisal | \$25 | ▼ |

Change Keep

Doctor | Patient | << | Logout

FIG. 14

15/20

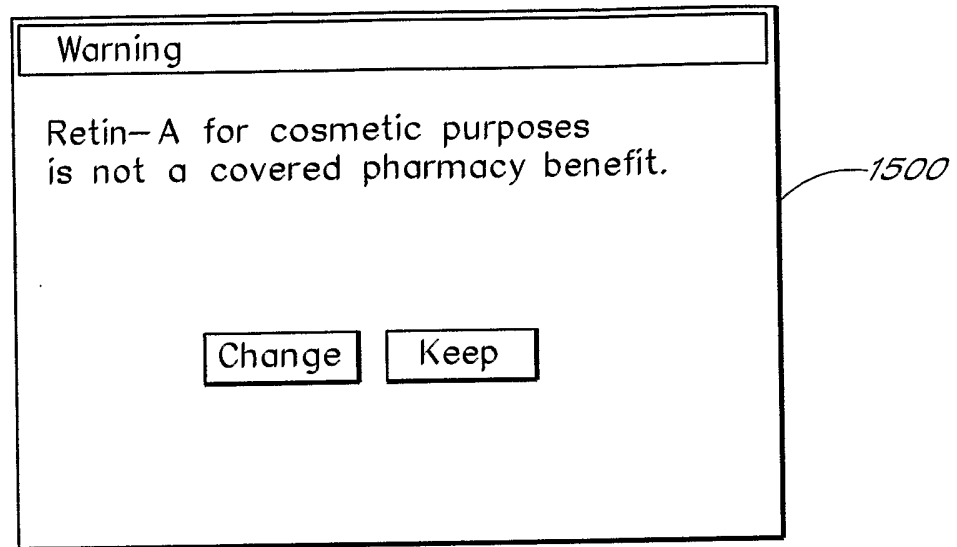


FIG. 15

16/20

☐ Drug Warnings 4:32p

Patient: Easton, Ellie
(PacifiCare California Commercial)

Drug Name: Glipizide OR TABS

Drug Warnings

(0) DRUG-DRUG INTERACTIONS
(1) DRUG ALLERGIES
(0) DUPLICATE THERAPIES

DRUG ALLERGIES:
Allergy to sulfonylureas causes an allergen
group interaction: sulfonylureas

Doctor | Patient | << | Logout

1600

FIG. 16

17/20

☐ Rx Tablet 10:35a

Patient: Easton, Ellie
(PacifiCare California Commercial)

Drug Name:

Strength ☐ ud Action

Dse Amt Dse Unit Route Frequency

Modifier Duration/Misc Special Qty

Qty Unit Refill

Disp Method Retail Qty

Doctor | Patient | << | Logout

FIG. 17

18/20

☐ Review Rx 7:14p.

Patient: Easton, Ellie
(PacifiCare California Commercial)

| Drug Name | Stren... | Method | Sig |
|---------------|----------|----------|-------------|
| Retin-A Mi... | 0.1% | Print Rx | apply sm a |
| Glucophag... | 500MG | Print Rx | take 1 tab(|
| Glucophag... | 500MG | Mail | take 1 tab(|

Add Edit Delete Submit


Doctor Patient << Logout 

FIG. 18

19/20

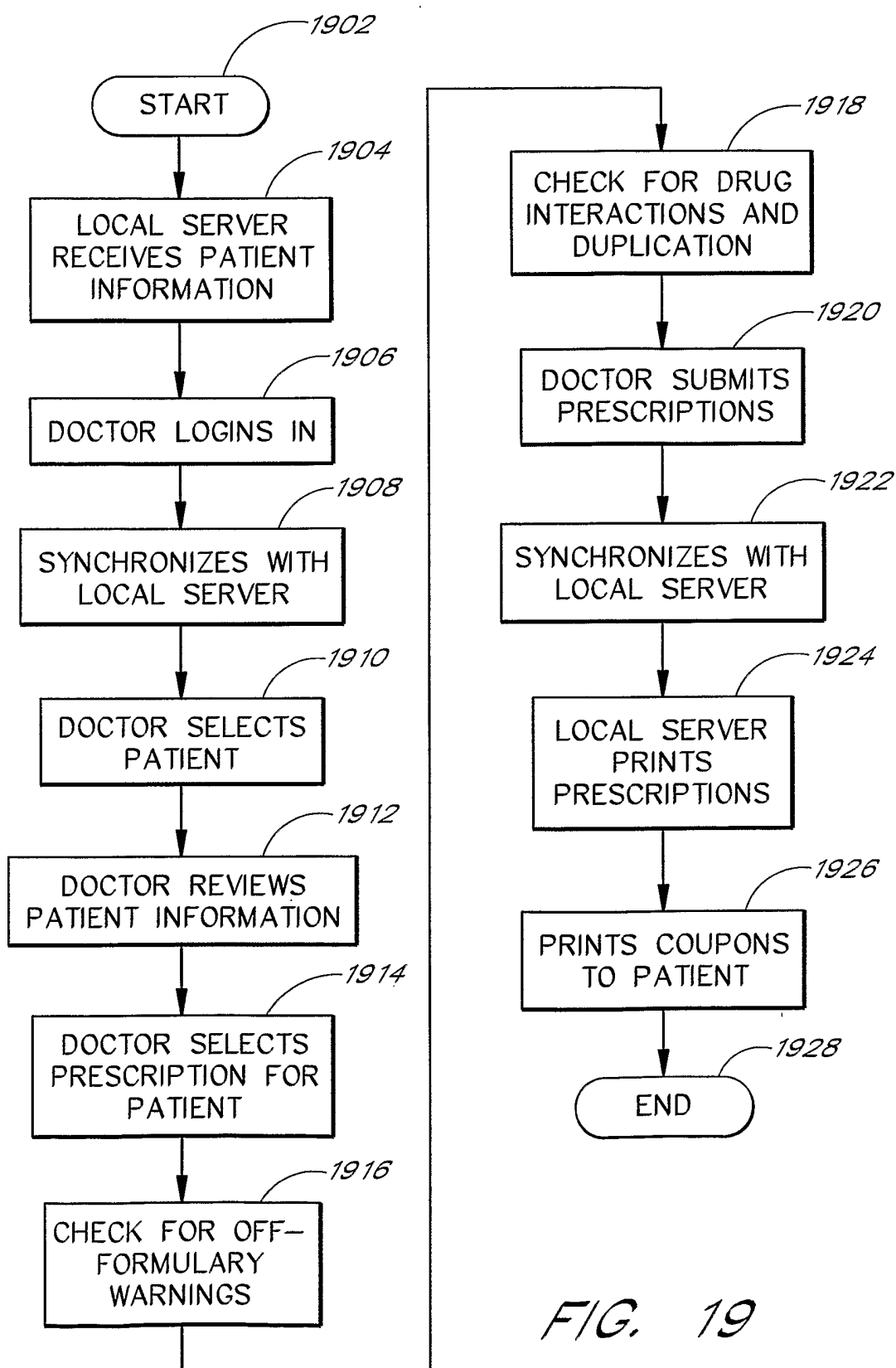


FIG. 19

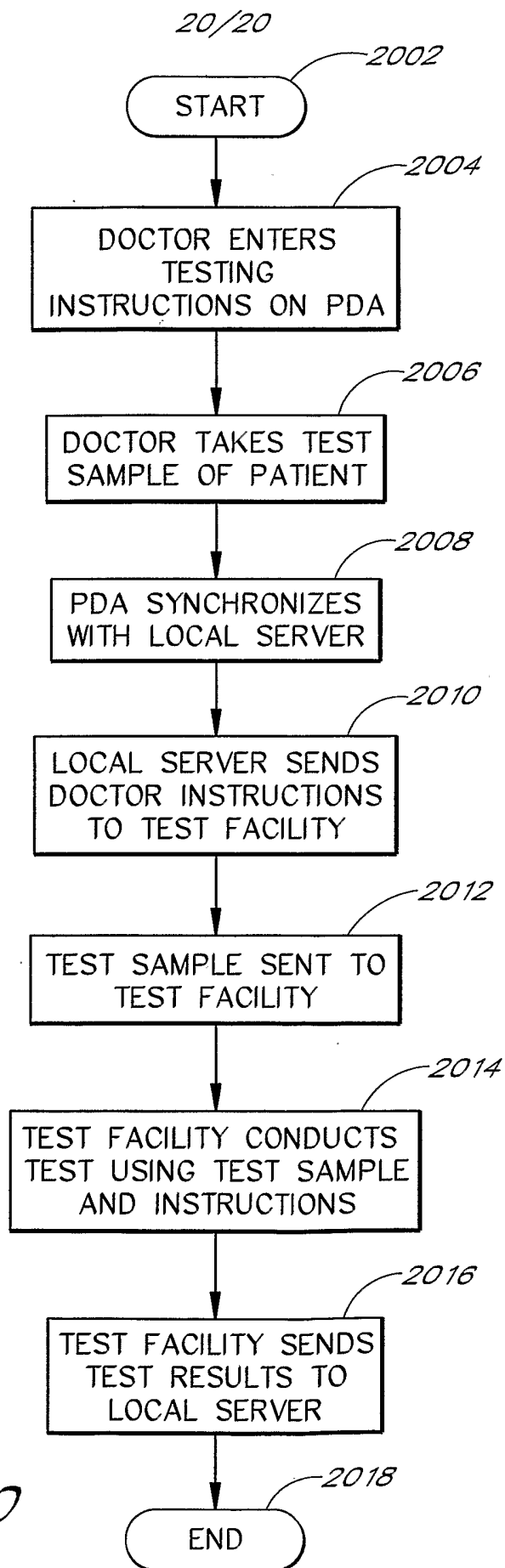


FIG. 20

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/10549

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/60

US CL : 705/2, 3

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/2, 3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| Y | US 5,924,074A (Evans) 13, July 1999 (13.06.1999), Figures 5, 21, 22, 24, column 6, lines 35-55, column 7, lines 5-40, column 11, lines 19-30, column 12, line 1 to column 15, line 65 | 1-33 |
| Y | US 5,884,273A (Sattizahn et al.) 16 March 1999 (16.03.1999), Figure 1, column 1-5. | 1-33 |
| Y | US 5,758,095A (Albaum et al.) 26 May 1998 (26.05.1998), Figures 1, 9, 21, 27, 30, 34 | 1-33 |

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

10 October 2002 (10.10.2002)

Date of mailing of the international search report

28 JAN 2003

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks

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