METHOD AND SYSTEM FOR ESTABLISHING ELECTRONIC MEDICAL RECORD TREATMENT PLAN

A method on a computer-readable medium for generating a medical diagnosis and/or treatment plan. The method includes the steps of identifying a symptom, ordering a suggested laboratory or imaging test, recording a result of said test, generating a diagnosis based on said symptom, said laboratory or imaging test, and generating a treatment plan based on said diagnosis.
— as to the applicant’s entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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METHOD AND SYSTEM FOR ESTABLISHING ELECTRONIC MEDICAL RECORD TREATMENT PLAN

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application claims the benefit of and priority to U.S. Provisional Patent Application Serial No. 60/911,241, filed April 11 2007, entitled “Method And System For Establishing Electronic Medical Record Treatment Plan,” which is hereby expressly incorporated by reference in its entirety including all exhibits.

FIELD

[0002] The present disclosure relates generally to the field of electronic medical records. The disclosure more specifically relates to a method of generating a medical diagnosis and/or treatment plan based on electronic medical records.

BACKGROUND

[0003] Medical diagnosis and treatment of patients have traditionally been performed by medical professionals based on personal knowledge or a written record (e.g., a medical reference text) of what may be causing various symptoms in the patient and how to remedy the symptoms and/or the cause, which leaves room for error by the medical professional. “Statistically about 80% of the medical mistakes are the result of predictable mental traps, or cognitive errors, that bedevil all human beings. Only 20% are due to technical mishaps - mixed-up test results or hard-to-decipher hand-writing - that typically loom larger in patient's minds and on television shows." (“Where Doctors Go Wrong,” Time Magazine, March 26, 2007). As computer systems became more common, this medical knowledge as well as patient medical records gradually were transferred to computers as centralized access points. Computer systems also allow for standardized communication of medical information and patient records over networks, such as the Internet, using protocols such as Current Procedural Technology (CPT®), International Classification of Diseases (ICD-9), or Health Level Seven® (HL7). Computer programs have been written that are intended to aid medical professionals in the diagnosis and/or treatment of patients by analyzing the symptoms and/or or medical history of a patient, however these systems tend to provide
false diagnoses, for example due to a lack of relevant information, low cost effectiveness, or lack of a comprehensive treatment plan. Other systems may require the medical professional to form a hypothesis and later verify the hypothesis with evaluation and testing, however if the original hypothesis is wrong, the process must be started over. Many of these systems do not facilitate information exchange within a computer network to improve medical document efficiency or to provide updates to the diagnosis software. Other systems may only be configured for use by a single type of user, for example a doctor, while not providing access to other types of users, such as the patient.

[0004] Therefore, there is a need for an improved medical diagnosis and treatment plan system and method capable of generating medical diagnoses and treatment plans with more accuracy, increased cost effectiveness, and a more comprehensive treatment plan. There is also a need for a medical diagnosis and treatment plan system and method capable of managing patient records in a standard format to facilitate information exchange of medical and system information.

SUMMARY

[0005] One embodiment of the disclosure relates to an apparatus for generating a medical diagnosis or treatment plan includes a computing system, a user interface, a network, a database, and a server. The server is configured to provide a diagnosis and recommended treatment plan based on one or more symptoms, a physical examination, and a laboratory and/or imaging test.

[0006] Another embodiment of the disclosure relates to a method on a computer-readable medium for generating a medical diagnosis and/or treatment plan. The method includes the steps of identifying a symptom, ordering a suggested laboratory or imaging test, recording a result of said test, generating a diagnosis based on said symptom, said laboratory and/or imaging test, and generating a treatment plan based on said diagnosis.

[0007] Another embodiment of the disclosure relates to an apparatus for managing patient medical records and generating a medical diagnosis and/or treatment plan. The apparatus includes means for identifying a symptom, means for ordering a suggested laboratory and/or imaging test, means for recording a result of said test, means for generating a diagnosis
based on said symptom, said laboratory and/or imaging test, and means for generating a treatment plan based on said diagnosis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a block diagram of a medical records and treatment plan system according to one exemplary embodiment.

[0009] FIG. 2 is a process flow diagram illustrating a process for maintaining medical records and generating a patient diagnosis and treatment plan with in the system of FIG. 1, according to one exemplary embodiment.

[0010] FIG. 3 is a process flow diagram illustrating details of the method of FIG. 2, according to two exemplary embodiments.

[0011] FIG. 4 is a process flow diagram illustrating details of the diagnosis and treatment plan method of FIG. 2, according to one exemplary embodiment.

[0012] FIG. 5 is a process flow diagram illustrating decision logic used to find a medical diagnosis in the method of FIG. 4, according to one exemplary embodiment.

[0013] FIG. 6 is a process flow diagram illustrating the process for managing electronic medical records in the method of FIG. 2, according to one exemplary embodiment.

[0014] FIG. 7 is a schematic diagram illustrating entities that may communicate with or access a medical record of a user via the system of FIG. 1, according to one exemplary embodiment.

[0015] FIG. 8 is a schematic diagram illustrating a user interaction in an assessment process of the system of FIG. 1, according to one exemplary embodiment.

[0016] FIG. 9 is a schematic diagram illustrating administrator management of the system of FIG. 1, according to one exemplary embodiment.

[0017] FIG. 10 is a process flow diagram illustrating administrator management of the system of FIG. 1, according to one exemplary embodiment.
[0018] FIG. 11 is a schematic diagram illustrating user interaction in a patient management process of the system of FIG. 1, according to one exemplary embodiment.

[0019] FIG. 12 is a schematic diagram illustrating user interaction in a treatment plan communication process of the system of FIG. 1, according to one exemplary embodiment.

[0020] FIG. 13 is a schematic diagram illustrating agent interaction in a patient management process of the system of FIG. 1, according to one exemplary embodiment.

[0021] FIG. 14 is a schematic diagram illustrating customer interaction in a subscription management process of the system of FIG. 1, according to one exemplary embodiment.

[0022] FIG. 15 is a schematic diagram illustrating administrator interaction in a CPT management process of the system of FIG. 1, according to one exemplary embodiment.

[0023] FIG. 16 is a schematic diagram illustrating administrator interaction in an ICD-9 management process of the system of FIG. 1, according to one exemplary embodiment.

[0024] FIG. 17 is a schematic diagram illustrating administrator interaction in a treatment plan management process of the system of FIG. 1, according to one exemplary embodiment.

[0025] FIG. 18 is a computer screenshot of a patient management page in the system of FIG. 1, according to one exemplary embodiment.

[0026] FIG. 19 is a computer screenshot of a symptom page in the system of FIG. 1, according to one exemplary embodiment.

[0027] FIG. 20 is a computer screenshot of a diagnosis page in the system of FIG. 1, according to one exemplary embodiment.

[0028] FIG. 21 is a computer screenshot of a treatment plan page in the system of FIG. 1, according to one exemplary embodiment.

[0029] FIG. 22 is a computer screenshot of a patient history page in the system of FIG. 1, according to one exemplary embodiment.

[0030] FIG. 23 is a computer screenshot of a services provided summary page in the system of FIG. 1, according to one exemplary embodiment.
FIG. 24 is a computer screenshot of a patient summary page in the system of FIG. 1, according to one exemplary embodiment.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

Referring to FIG. 1, a system 10 is configured to manage the diagnosis and/or treatment provided to a patient. In one embodiment, system 10 can be configured to provide a patient electronic medical record (EMR) operation, provide a patient diagnosis information operation, and provide a patient treatment plan operation. System 10 generally includes an application server 12, a database server 14, a data repository 16, a web server 18, a network 20, and a computing system 22.

Application server 12 is configured to provide and receive information related to medical records and medical diagnosis and treatment to and from a user of computing system 22. Server 12 typically includes an EMR business rule engine 24 and a diagnostic and treatment engine 30. EMR business rule engine 24 is configured to add patient EMRs to database server 14, manage or edit existing EMRs in EMR database server 14, and retrieve and send EMR information using predefined business rules as requested by a user. EMR business rule engine 24 communicates with data repository 16 so that patient EMRs conforms to medical documentation standards and may be usable with other medical systems. Application server 12 may be of any past, present, or future technology that is capable performing logical operations related to medical information.

EMR diagnosis engine 26 is configured to use existing EMRs, user inputs and/or other EMR systems to provide a medical diagnosis and/or treatment plan to the user. The diagnosis or treatment plan may be generated by EMR diagnosis engine 26 based on Gender, Age, Symptom, Physical Exam, Lab Procedure, Image, other medication information, or any combination thereof, that is used in decision logic to determine the diagnosis and treatment plan. EMR diagnosis engine 26 may also communicate with data repository 16 so that medical diagnosis and treatment information conforms with medical documentation standards that may be saved in an EMR and may be usable with other medical systems.

Database server 14 is configured to interface with data repository 16 in order to manage EMRs, diagnosis templates, disease classifications, and procedural terminology.
According to various exemplary embodiments, database server 14 generally interfaces with data repository 16 using a database programming language, for example Sybase®, Oracle®, MS SQL Server®, MySQL Engine®, another language, or any combination thereof.

[0036] Data repository 16 is configured to store data used by system 10 through database server 14. According to one exemplary embodiment, data repository 16 may be located on database server 14. According to another exemplary embodiment, data repository 16 may be located remotely from and in communication with database server 14. Data repository 16 includes a CPT® database 28 (i.e., to store procedural terminology), an ICD-9® database 30 (i.e., to store disease classifications), an EMR database 32 (i.e., to store patient medical records), and a diagnosis template database 34. Diagnosis template database 30 is typically configured to store the relations between elements of the diagnosis algorithm, for example with a number of data tables. Diagnosis template database 30 defines the relationships between EMRs, symptoms, physical exams, laboratory tests, diagnoses, and treatment plans together.

[0037] Web server 18 is configured to provide a world-wide-web page to computing system 22 based on information from application server 12 and database server 14. According to various exemplary embodiments, web server 18 may provide Active Server Pages (ASPTM), JavaServer Pages (JSP™), any other type of webpage, or any combination thereof. According to various exemplary embodiments, web server 18 may provide a webpage using Extensible Markup Language (XML), HyperText Markup Language (HTML), any other type of a programming or scripting language, or any combination thereof.

[0038] Network 20 is configured to facilitate communication (e.g., EMR information, diagnosis information, treatment plan information, etc.) application server 12, database server 14, web server 18, and computing system 22. Network 20 may be a wired or wireless network, for example, a LAN, WAN, the Internet, or any other network that is capable of facilitating communication between application server 12, database server 14, web server 18, and computing system 22. Communication with the network may be achieved via IEEE 802.11 Wi-Fi, IEEE 802.3 Ethernet, or modulate and demodulate (modem) technologies, or any other suitable communication technology.
Computing system 22 is configured to interact with application server 12, database server 14, and web server 18 so that the user may retrieve and manage EMRs and diagnosis or treatment plan information. Computing system 22 may include a user interface 31, a processor 32, an input device 34, and an output device 36. User interface 22 is configured to provide a graphical and interactive screen to facilitate user interaction between computing system 22, application server 12, database server 14, and web server 18 (e.g., see FIG. 18-23). According to various exemplary embodiments, user interface 22 may be embodied on computing system 22, on application server 12, or a removable medium such as a disk or CD-ROM. Processor 32 may be any processor capable of past, present or future design that is capable of receiving input, providing output, and communicating with server 12. Input device 34 may include a keyboard, a mouse, a light pen, a track pad, a disk drive, a voice interface, or any other suitable computer input device or combination thereof. Output device may include a monitor, a printer, a speaker, a disk drive, or any other suitable computer output or combination thereof.

While system 10 is shown to include four remote systems in communication with each other, it is noted that in other exemplary embodiments, computing system 22, application server 12, database server 14, and web server 18 may be integrated into a single computing system or multiple nodes of computers performing the role specified by application server 12, database server 14, and web server 18.

In another exemplary embodiment, multiple computing systems may be included to facilitate user interaction from multiple locations or by multiple users. In other exemplary embodiment, additional servers may be included to provide data backup, distributed processing, etc. In still other exemplary embodiments, multiple computing systems and additional servers may be used.

Referring to FIG. 2, a method 40 is configured to manage patient EMRs and generate a Subjective Objective Assessment Plan (SOAP); a medical diagnosis and treatment plan. At a step 42, system 10 performs a patient management process. Patient EMRs may be added, updated/edited, or deleted. At a step 44, system 10 performs a symptom identification process. Based on inputs by a patient, medical professional, or from data extracted from an EMR, system 10 may identify symptoms. At a step 46, system 10 recommends medical tests, procedures, or exams and records the results of the tests or
procedures once performed by a medical professional. At a step 48, system 10 generates a
diagnosis based on one or more patient EMRs, identified symptoms from step 44, and/or
test results recorded at step 46. At step 50, system 10 recommends a treatment plan based
on the diagnosis generated at step 48 and any applicable information from a patient EMR
(e.g., medications, risk factors, etc.).

[0043] Referring to FIG. 3, further details of two exemplary embodiments of the method
of FIG. 2 are shown. A process flow 52 illustrates that prior to the identification of
symptoms, gender, concern or history of a diagnosis area (i.e., head, face, neck, bones,
heart, chest, gastrointestinal, genital urinary, vascular, and breasts), and age are factored
into the diagnosis and treatment plan generated. These additional factors may be extracted
from an EMR or entered by the patient or a medical professional. Once symptoms have
been identified, a medical professional performs a physical exam independent of lab and/or
imaging test orders. The results (i.e., a lab or image finding and the physical exam) are
recorded, which factors in to the diagnosis and treatment plan(s) system 10 generates.

[0044] Referring to FIG. 4, a method 60 includes a number of steps that may be taken in
system 10 to generate and use a diagnosis and treatment plan. At a step 62, a diagnosis area
is identified based on an EMR, history, or area of patient or medical professional concern.
At a step 64, symptoms (e.g., major symptoms, specific symptoms, etc.) are selected on
system 10, for example manually entered by a medical professional or patient. At a step 66,
system 10 recommends a physical exam, lab test, and/or imaging test. At a step 68, system
10 records the results of the physical exam, lab test, and imaging test of step 66. At a step
70, system 10 performs or generates a diagnosis based on the diagnosis area, symptoms,
physical exam, lab test, and/or imaging test. At step 72, system 10 suggests a possible
treatment plan based on the diagnosis and patient information (e.g., medications, risk
factors, etc.). At a step 74, system 10 delivers the treatment plan, for example by printing
and/or emailing, to the patient, medical professional, and/or insurance company. At a step
76, system 10 adds the patient diagnosis and treatment plan to the patient history or EMR.

[0045] Referring to FIG. 5, a method 80 determines a medical diagnosis used in step 70 of
method 60. At a step 82, system 10 analyzes demographic data related to a patient from the
patient EMR or from information entered manually. At a step 84, system 10 uses decision
logic to traverse a diagnosis tree based on patient demographic data, symptoms, physical
exam results, lab test results, and/or imaging results. At a step 86, system 10 determines
one or more possible diagnoses based on the diagnosis tree traversal. According to various
exemplary embodiments, the decision logic and diagnosis tree may be of any past, present,
or future design that is capable of providing a diagnosis based on patient demographic data,
symptoms, physical exam results, lab test results, and/or imaging results.

[0046] Referring to FIG. 6, a method 80 manages patient EMRs on system 10. At a step
82, system 10 searches for a patient based on user inputs (e.g., name, social security
number, etc.). If the patient is not new, the patient profile may be retrieved and updated at
step 84. If the patient is new, a patient profile is added at step 86 using information from
other EMR systems at step 88, if available.

[0047] Referring to FIG. 7, system 10 may include a number of different types of users.
A patient may have access to personal diagnosis and treatment information as well as
personal EMRs. An insurance company may have access to various information in a patient
EMR, for example billing information, diagnosis information, procedures ordered, and/or
procedures performed. A nurse may have access to the EMRs of various patients for use in
treatment, for documentation of test results, etc. A doctor may similarly have access to the
EMRs of various patients as well as be able to confirm and prescribe diagnoses, treatment
plans, and medications. A primary contact doctor may have full access to all of the aspects
of system 10 so that he or she may act as a source of information, troubleshooter,
administrator, etc.

[0048] Referring to FIG. 8, a further characterization is given of the interaction between a
user (e.g., a patient, doctor, nurse, insurance company, etc.) and system 10 following a
diagnosis and treatment plan process similar to those of FIG. 2-4.

[0049] Referring to FIGS. 9-11, a user with administrator access rights has the ability to
manage various aspects of system 10 including patient treatment plans, terminology
database 18, and disease classification database 20, order subscriptions, and user addition.
Management of a patient treatment plan may include verification or override of a diagnosis
or plan suggested by system 10, an update in the logic used by EMR diagnosis engine 26, or
any other function related to treatment plan management. Management of terminology
database 18 may include updating a CPT® version, or any other function related to
terminology management (see FIG. 15). Similarly, management of disease classification
database 20 may include updating an ICD-9 version, or any other function related to disease classification management (see FIG. 16). Management of order subscriptions may include verification or editing of lab procedures, for example. In addition to administrative tasks, an administrator may also perform general diagnosis, treatment, and EMR tasks, for example as a doctor may perform.

[0050] Referring to FIG. 12, any user (e.g., doctor, nurse, patient, agent, etc.) may use system 10 to send an e-mail including an attached treatment plan and order confirmation. According to one exemplary embodiment, the email may be sent to other users, for example from a patient to an insurance company.

[0051] Referring to FIG. 13, an agent, for example from an insurance company, may use system 10 to search for patients, add new patients, update patient information. An insurance agent may wish to use the patient information internally for procedure approval, proper diagnosis, and/or proper coding.

[0052] Referring to FIG. 14, a customer or user may manipulate system 10 to manage order subscriptions. Order subscription typically includes product selection (e.g., type of lab test) and submission of customer information (e.g., name, insurance information, etc.). Once the order is filled, a forecast for procurement (FOP) is processed. Once the FOP is confirmed, the confirmation is sent, for example to the medical records, to the insurance company, to the patient, etc.

[0053] Referring to FIGS. 15-17, an administrator may update or manage CPT® database 27, ICD-9® database 28, and/or EMR diagnosis engine 26. Updating of CPT® database 27 and ICD-9® database 28 typically includes obtaining the latest CPT® or ICD-9 data (e.g., over network 20), loading the data into staging tables, and importing the data to a respective reference table (i.e., in database 27 or 28). Management of EMR diagnosis engine 26 generally includes the initiation of a search of ICD-9® database 28 for an entry of interest and insertion or an update of a treatment plan into EMR diagnosis engine 26 for the corresponding entry.

[0054] Referring to FIG. 18-23, a plurality of screenshots give exemplary embodiments of user interface 31 in system 10. Referring specifically to FIG. 18 for example, a patient EMR management screen allows editing and entry of various patient information including
name, social security number (SSN), date of birth, language preference, address, phone number, etc.

[0055] Referring specifically to FIG. 19, a symptom selection screen gives a patient summary and history along with drop-down boxes to choose a general symptom area and type followed by checkboxes to select specific symptoms.

[0056] Referring specifically to FIG. 22, a diagnosis review and assessment screen summarizes patient information as well as symptoms and patient history. The screen also provides an area for objective assessment of diagnoses and physical exams or test that have been or will be ordered as well as an assessment of the test result as it relates to the diagnosis.

[0057] Referring specifically to FIG 21, a treatment plan review and assessment screen provides a number of diagnosis possibilities to select from based on symptoms and laboratory/imaging tests ordered. The diagnosis may be followed by a number of treatment plan options to select from that correspond to various diagnosis codes.

[0058] Referring specifically to FIG. 22, a patient history screen provides details of a patient and his or her associated treatment plan history. Each treatment plan history may individually selected and reviewed more fully.

[0059] Referring specifically to FIG. 23, a service history screen outlines the services previously provided as well as when, a current status, and who last updated the status.

[0060] Referring to FIG. 24, an example summary of a treatment plan (that may be emailed or printed as shown in FIG. 4, for example) is shown. This document generally includes patient information, significant findings resulting from physical or lab tests, diagnosis information, and any treatment plan information available.

[0061] Attached as Exhibit A to the provisional application (application number 60/911,241) is a business requirement document that further characterizes other exemplary aspects of system 10 described above. Attached as Exhibit B to the provisional application (application number 60/911,241) is the “Health Level Seven Implementation Support Guide for HL7 Standard Version 2.3” (Health Level Seven, 1998), which characterizes an exemplary electronic medical record type that may be used in system 10.
[0062] While the exemplary embodiments illustrated in the Figures and described above are presently preferred, it should be understood that these embodiments are offered by way of example only. Accordingly, the present invention is not limited to a particular embodiment, but extends to various modifications that nevertheless fall within the scope of the appended claims. The order or sequence of any processes or method steps may be varied or re-sequenced according to alternative embodiments.

[0063] Describing the invention with Figures should not be construed as imposing on the invention any limitations that may be present in the Figures. The present invention contemplates methods, systems and program products on any machine-readable media for accomplishing its operations. The embodiments of the present invention may be implemented using an existing computer processors, or by a special purpose computer processor for an appropriate electronic medical records system, incorporated for this or another purpose or by a hardwired system.

[0064] Embodiments within the scope of the present invention may include program products comprising machine-readable media for carrying or having machine-executable instructions or data structures stored thereon. Such machine-readable media can be any available media which can be accessed by a general purpose or special purpose computer or other machine with a processor. By way of example, such machine-readable media can comprise RAM, ROM, EPROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code in the form of machine-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer or other machine with a processor. Combinations of the above are also included within the scope of machine-readable media. Machine-executable instructions comprise, for example, instructions and data which cause a general purpose computer, special purpose computer, or special purpose processing machines to perform a certain function or group of functions. Software implementations of the present invention could be accomplished with standard programming techniques with rule based logic and other logic to accomplish the various connection steps, processing steps, comparison steps and decision steps.

[0065] The foregoing description of embodiments of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the
invention to the precise form disclosed, and modifications and variations are possible in light of the above teachings or may be acquired from practice of the invention. The embodiments were shown and described in order to explain the principals of the invention and its practical application to enable one skilled in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated.
WHAT IS CLAIMED IS:

1. An apparatus for generating a medical diagnosis or treatment plan, comprising:
   a computing system;
   a user interface;
   a network;
   a database; and
   a server configured to manage electronic medical records and generate a diagnosis and recommended treatment plan based on one or more symptoms, a physical examination, and a laboratory and/or imaging test.

2. The apparatus of claim 1, wherein said computing system comprises a processor, an input device, and an output device.

3. The apparatus of claim 1, wherein said server comprises an electronic medical records engine configured to manage an electronic medical record of a patient.

4. The apparatus of claim 1, wherein said server comprises a diagnosis and treatment engine configured to generate said medical diagnosis or treatment plan.

5. The apparatus of claim 1, wherein said database comprises one or more databases of the group consisting of: an electronic medical record database, a terminology database, and a disease classification database.

6. The apparatus of claim 5, wherein said user interface is manipulated by a user of the group consisting of: a doctor, an administrator, a nurse, a patient, and an insurance agent.

7. The apparatus of claim 6, wherein said administrator is capable of managing said treatment plan, said treatment database, said disease classification database, an order subscription, and user access.

8. The apparatus of claim 6, wherein said user is capable of delivering said treatment plan by email or printing.
9. The apparatus of claim 6, wherein said insurance agent is capable of search for patients, adding, patients, and updating medical records of patients.

10. A method on a computer-readable medium for generating a medical diagnosis and/or treatment plan, comprising the steps of:
    identifying a symptom;
    ordering a suggested laboratory and/or imaging test;
    recording a result of said test;
    generating a diagnosis based on said symptom, said laboratory and/or imaging test; and
    generating a treatment plan based on said diagnosis.

11. The method of claim 8, comprising the step of managing electronic medical records.

12. The method of claim 9, wherein said diagnosis and treatment plan is added to an electronic medical record.

13. The method of claim 9, wherein said managing electronic medical records comprises the steps of:
    searching for a patient;
    updating a patient profile if said patient is found;
    adding a patient profile if said patient is not found.

14. The method of claim 11, wherein said adding a patient profile retrieves information from an electronic medical records system.

15. The method of claim 8, wherein said diagnosis and treatment plan is based on a physical examination.

16. The method of claim 14, wherein said physical examination is performed independently of said result of said test.

17. The method of claim 14, wherein said physical examination is performed independently of said ordering a laboratory or imaging test.
18. The method of claim 8, comprising the step of identifying a diagnosis area.

19. The method of claim 8, comprising the step of delivering said treatment plan, wherein said delivering includes sending an email or printing.

20. An apparatus for managing patient medical records and generating a medical diagnosis and/or treatment plan, comprising:
   means for identifying a symptom;
   means for ordering a suggested laboratory and/or imaging test;
   means for recording a result of said test;
   means for generating a diagnosis based on said symptom, said laboratory or imaging test; and
   means for generating a treatment plan based on said diagnosis.
Start

Patient Management

SOAP
Identify Symptoms

Order Tests and Record Results

Perform Diagnosis

Recommend Treatment Plan

End

FIG. 2
FIG. 3
Start

Identify Diagnosis Area

Identify Symptoms

Recommend Physical Exam, Lab Test, or Imaging Test

Record Results from Physical Exam, Lab Test and Imaging Test

Perform Diagnosis

Suggest Possible Treatment Plan

Print Treatment Plan

Delivery Media? Email

Print

Email Treatment Plan

Add Patient Diagnosis and Treatment Plan to History

End of Diagnosis
User

- Identify Diagnosis Area
- Select Symptoms
- Suggest Physical Exam, Lab and Imaging
- Record Lab and Imaging
- Determine Diagnosis
- Recommend Treatment Plan
- Add to Diagnosis History

FIG. 8
FIG. 12

User
- Attach Treatment Plan
- Attach Order Confirmation
- Send Email

FIG. 13

Agent
- Search Patient
- Add New Patient
- Update Patient Information
<table>
<thead>
<tr>
<th>Patient Profile</th>
<th>Symptoms</th>
<th>Diagnosis</th>
<th>Treatment Plan</th>
<th>Search/Logout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient: 12345678</td>
<td>First Name</td>
<td>Gender</td>
<td>Date of Birth</td>
<td>Race</td>
</tr>
<tr>
<td>Social Security Number</td>
<td>Marital Status</td>
<td>Language</td>
<td>Residency Status</td>
<td></td>
</tr>
<tr>
<td>Address Details</td>
<td>Time Zone</td>
<td>Country</td>
<td>Address Start Date</td>
<td>Address End Date</td>
</tr>
<tr>
<td>Contact Details</td>
<td>Phone Type</td>
<td>Home</td>
<td>Phone Number</td>
<td>Ext.</td>
</tr>
<tr>
<td>Contact Preferences</td>
<td>Preferred Time to Contact</td>
<td>Anytime</td>
<td>Preferred Method of Contact</td>
<td>Phone</td>
</tr>
</tbody>
</table>
**FIG. 19**

### Patient Profile
- **Patient Name:** Diane Jones
- **SSN:** 123−34−2345
- **Gender:** Female
- **Marital Status:** Married
- **Date of Birth:** September 5, 1960
- **Race:** Caucasian
- **Language Preference:** English
- **City:** Chicago
- **State:** IL
- **Street:** 1234 N. Any Street
- **Zip Code:** 60601
- **Legal Residency Status:** Citizen

### History

<table>
<thead>
<tr>
<th>Last Diagnosis</th>
<th>Area</th>
<th>Diagnosis Code</th>
<th>Treatment Plan</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/21/2006</td>
<td>Gastrointestinal</td>
<td>540.9</td>
<td>Surgery</td>
<td>Closed</td>
</tr>
<tr>
<td>12/23/2005</td>
<td>Gastrointestinal</td>
<td>540</td>
<td>Medication</td>
<td>Closed</td>
</tr>
<tr>
<td>12/21/2005</td>
<td>Gastrointestinal</td>
<td>564</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
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<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td>764</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
</tbody>
</table>

### Symptoms
- **General Area:** Gastrointestinal
- **General Symptom:** Abdominal Pain

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗ Left Lower Abdominal Pain</td>
<td>Pain in the lower abdominal area...</td>
</tr>
<tr>
<td>✗ Lower Back Pain</td>
<td>Lower back pain related to the abdomen...</td>
</tr>
<tr>
<td>✗ Fever and Chills</td>
<td>Lower back pain related to the abdomen...</td>
</tr>
<tr>
<td>✗ Blood in Stool</td>
<td>Ipsum Lorem</td>
</tr>
</tbody>
</table>

Total Records: 7

Then, the document includes a section titled "Symptoms" with a table listing various symptoms and their descriptions. Below the table, there are buttons labeled "Done," "Back," "Save," and "Save/Next."
**Patient Profile**

- **Patient Name:** Diane Jones
- **SSN:** 123-34-2345
- **Gender:** Female
- **Marital Status:** Married
- **Date of Birth:** September 5, 1960
- **Race:** Caucasian
- **Language Preference:** English
- **Street:** 1234 N. Any Street
- **City:** Chicago
- **State:** IL
- **Legal Residency Status:** Citizen
- **Zip Code:** 60601

**Symptoms**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Description</th>
<th>Total Records: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Lower Abdominal Pain</td>
<td>Pain in the lower abdominal area.</td>
<td></td>
</tr>
<tr>
<td>Lower Back Pain</td>
<td>Lower back pain related to the abdomen...</td>
<td></td>
</tr>
<tr>
<td>Fever and Chills</td>
<td>Lower back pain related to the abdomen...</td>
<td></td>
</tr>
</tbody>
</table>

**History**

<table>
<thead>
<tr>
<th>Last Diagnosis</th>
<th>Area</th>
<th>Total Records: 7</th>
<th>Diagnosis Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/21/2006</td>
<td>Gastrointestinal</td>
<td></td>
<td>540.9</td>
</tr>
<tr>
<td>12/23/2005</td>
<td>Gastrointestinal</td>
<td></td>
<td>540</td>
</tr>
<tr>
<td>12/21/2005</td>
<td>Gastrointestinal</td>
<td></td>
<td>564</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td></td>
<td>764</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td></td>
<td>764</td>
</tr>
</tbody>
</table>

**Objective Assessment**

**Diagnosis**

<table>
<thead>
<tr>
<th>Physical Exam</th>
<th>Lab CPT Ordered</th>
<th>Lab Result</th>
<th>Lab Result Range</th>
<th>Imaging CPT Ordered</th>
<th>Imaging Result</th>
<th>Imaging Result Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABD: RLQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rebound</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RLQ: PAIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Grade Fever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FIG. 21

Patient Profile

Patient Name: Diane Jones  SSN: 123-34-2345  Gender: Female  Marital Status: Married
Date of Birth: September 5, 1960  Race: Caucasian  Language Preference: English  Legal Residency Status: Citizen
Street: 1234 N. Any Street  City: Chicago  State: IL  Zip Code: 60601

Symptoms

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Description</th>
<th>Total Records: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Lower Abdominal Pain</td>
<td>Pain in the lower abdominal area.</td>
<td></td>
</tr>
<tr>
<td>Lower Back Pain</td>
<td>Lower back pain related to the abdomen...</td>
<td></td>
</tr>
<tr>
<td>Fever and Chills</td>
<td>Lower back pain related to the abdomen...</td>
<td></td>
</tr>
</tbody>
</table>

Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Physical Exam</th>
<th>Lab CPT</th>
<th>Imaging CPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABD:RLQ</td>
<td></td>
<td>85024</td>
<td>N/A</td>
</tr>
<tr>
<td>Rebound</td>
<td></td>
<td>85025</td>
<td>70336</td>
</tr>
<tr>
<td>RLQ:Pass</td>
<td></td>
<td>85013</td>
<td>70540</td>
</tr>
<tr>
<td>Low Grade Fever</td>
<td></td>
<td>85610</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Treatment Plan

<table>
<thead>
<tr>
<th>Diagnosis Code</th>
<th>Description</th>
<th>Treatment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>540</td>
<td>Surgery</td>
<td></td>
</tr>
<tr>
<td>564</td>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>567</td>
<td>Ipsum Lorem</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>Follow Clinically, Pharmacotherapy</td>
<td></td>
</tr>
</tbody>
</table>

Done
**Patient History**

**Patient Profile**

Patient Name: Diane Jones  
SSN: 123-34-2345  
Gender: Female  
Marital Status: Married  
Date of Birth: September 5, 1960  
Race: Caucasian  
Language Preference: English  
Legal Residency Status: Citizen  
Street: 1234 N. Any Street  
City: Chicago  
State: IL  
Zip Code: 60601

**Treatment Plan History**

<table>
<thead>
<tr>
<th>Last Diagnosis</th>
<th>Diagnosis Area</th>
<th>Diagnosis Code</th>
<th>Treatment Plan</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/21/2006</td>
<td>Gastrointestinal</td>
<td>540.9</td>
<td>Surgery</td>
<td>Closed</td>
</tr>
<tr>
<td>12/23/2005</td>
<td>Gastrointestinal</td>
<td>540</td>
<td>Medication</td>
<td>Closed</td>
</tr>
<tr>
<td>12/21/2005</td>
<td>Gastrointestinal</td>
<td>564</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td>764</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td>764</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td>764</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
<tr>
<td>12/18/2005</td>
<td>Gastrointestinal</td>
<td>764</td>
<td>Ipsum Lorem</td>
<td>Closed</td>
</tr>
</tbody>
</table>
NAME: Diane Jones  
ADDRESS: 1234 N. Any Street, Chicago IL, 60601

You are a Female aged 56 now in Chicago, USA. Your diagnosis summary which you completed on: Tuesday, October 23, 2006 at 9:15:00 am highlighted the following information.

PERSONAL INFORMATION:
Sex: Female  
DoB: September 5, 1950  
Weight: 150 lb  
Height: 5ft 4in  
BMI: 25.5

Country of Birth: Mississippi, USA  
Country of Residence: Chicago, USA  
Current Location: Chicago, USA  
Planning to Travel to: France

Weight: You appear to be overweight as indicated by your BMI (Body Mass Index) between 25 and 29.9. A healthy range is between 18.5 and 24.9.

SIGNIFICANT FINDINGS:

Presenting Findings
Abdominal pain, for weeks
Headache, getting worse, one side of head, recurring, throbbing
Joint Pain, grating noise, not multiple
Knee locking
Overweight
Temple Tender
Vaginal discharge, bloodstained, weeks

DIAGNOSIS
Any CURRENT KNOWN HEALTH ISSUES need to be considered in conjunction with the following diagnoses as identified in this session of your diagnosis.

Your Diagnosis Summary can be stored and automatically used to establish your health record or www.NABU.com
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(8) - G06Q 50/00 (2008.04)
   USPC - 705/2
   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)
   USPC - 705/2

   Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
   USPC - 705/3

   Electronic data base consulted during the international search (name of database and, where practicable, search terms used)
   PubWEST(USPT,PGP,EPA,JPAB); Google Scholar
   Search Terms Used:
   Generate, build, create, recommend, suggest, propose, treat, therapy, plan, diagnosis, symptom, laboratory, lab, image, test

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2002/0019749 A1 (BECKER et al.) 14 February 2002 (14.02.2002) entire document, especially para [0022], [0023], [0034], [0037], [0038], [0040], [0042], [0079], [0084], [0087], [0139]</td>
<td>1-20</td>
</tr>
</tbody>
</table>

* Special categories of cited documents:
   “A” document defining the general state of the art which is not considered to be of particular relevance
   “E” earlier application or patent but published on or after the international filing date
   “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
   “O” document referring to an oral disclosure, use, exhibition or other means
   “P” document published prior to the international filing date but later than the priority date claimed
   “T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
   “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
   “Y” 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
   “Q” document member of the same patent family

Date of the actual completion of the international search: 26 June 2008 (26.06.2008)

Date of mailing of the international search report: 07 JUL 2008

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer: Lee W. Young
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2007)