SYSTEM AND METHOD FOR MANAGING AN ENDOSCOPIC LAB

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ABSTRACT

A system designed to support and manage the workflow for all users pertaining to an endoscopic laboratory, from registration and scheduling of patient information through pre-procedure, procedure and post-procedure phases of an endoscopic examination, including support for the entry, by various users associated with an endoscopic laboratory, of information and data including the processing and storage of endoscopic images captured during an endoscopic exam of a patient, for association with a patient record stored in a database, and including the entry of procedure notes and generation of reports that include the stored images, all via an integrated user interface.
Endoscope device 25

RGB Monitor 20

Video processor 40 (e.g., CV-160)

Connector 30

RGB image capture

EW imaging node (PC) 50

Processor + video capture (Matrox) 60

Memory 70

VGA Monitor 55

Connector 30
**Pre-Procedure**

- **Patient**
  - Arrive For Visit
  - Sign Pre-Procedure Document
  - Validate and Update Patient File
  - Gather and Confirm Consent Form Signatures

- **Scheduler**
  - Validate and Update Patient File
  - View Access & Pre-Visit Information Checklist
  - Produce Discharge Instructions

- **Nurse**
  - Gather and Confirm Consent Form Signatures
  - Perform Physical Exam
  - Complete Physician Checklist
  - Enter Indications and Review Nurse Documentation

- **Physician**
  - Sign Consent
  - Perform Physical Exam

**Procedure**

- **Nurse**
  - Capture Nurse's Notes
  - Log Unplanned Events
  - Record Monitoring Data
  - Capture Findings

- **Physician**
  - Start Exam
  - Capture Insights
  - End Exam
  - Produce Preliminary Procedure Notes

**Fig 3**

**Fig 4**
Fig. 7(a)
Figure 7(d)
Figure 9(f)

Figure 9(g)
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Scheduled Exam</th>
<th>Pre-Procedure Sum</th>
<th>Modify Visit</th>
<th>Lexicon</th>
<th>Vitals and Heads</th>
<th>Nursing Admission</th>
<th>Pathology Request</th>
<th>Equipment Used</th>
<th>Slavigraph Printing</th>
<th>Procedure Docs</th>
<th>Other Exam Info</th>
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</tbody>
</table>

**Figure 10(b)**

| Procedure | Scheduled Exam | Pre-Procedure Sum | Modify Visit | Lexicon | Vitals and Heads | Nursing Admission | Pathology Request | Equipment Used | Slavigraph Printing | Procedure Docs | Other Exam Info |
|-----------|----------------|------------------|--------------|---------|----------------|-------------------|                 |                |                   |               |                |
|           |                |                  |              |         |                |                   |                 |                |                   |               |                |

**Figure 10(c)**
Findings
- stomach
  - anterior wall of the antrum
    - small

- fundus site
- body site
- antrum site
- anthrum
- posterior wall of the antrum
- greater curvature of the antrum
- lesser curvature of the antrum
- other stomach site
- appearance
- base
- bleeding
- number
- polyp qualifier
- size of polyp
  - diminutive
  - small
  - medium
  - large
  - < 5 mm
  - 5 - 10 mm
  - 10 - 20 mm
  - > 20 mm

Figure 10(f)

Figure 10(g)
**Figure 13(b)(1)**

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**Figure 13(b)(2)**

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**Figure 13(b)(3)**

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**Figure 13(b)(4)**

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SYSTEM AND METHOD FOR MANAGING AN ENDOSCOPIC LAB

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/471,349 filed May 16, 2003 and incorporated by reference as if fully set forth herein. This application further relates to commonly-owned, co-pending U.S. patent application Serial Nos. ______ and ______ (Art. Dockets 17282, 17283 and 17284) incorporated by reference herein.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to imaging systems and workstations for medical applications, and particularly an system designed to support the entry, by various users associated with an endoscopic laboratory, of information and data including the capture, processing and storage of endoscopic images during an endoscopic exam, and especially for managing workflow for all user roles pertaining to the endoscopic laboratory, from registration and scheduling of patient information through pre-procedure, procedure and post-procedure phases through the generation of procedure notes via an integrated user interface.

[0004] 2. Discussion of the Prior Art

[0005] There currently exists a prior art clinical information management systems that manages patient examination data at different phases of patient care.

[0006] Typically, however, for the case of endoscopic laboratories for performing endoscopic procedures, a variety of system programs and interfaces are used to support the management of patient related examination information, including a separate program that function to schedule patient’s exams and visits and separate programs that capture examination related information at various endoscopic procedure lifecycle stages, e.g., from pre-procedure through post-procedure. At best, the current clinical management system platforms for endoscopy comprise a single media platform providing standard graphics features and image capture and presentation features.

[0007] Moreover, such prior art clinical information management systems do not accurately support and manage the workflow of all users having roles pertaining to an endoscopic laboratory.

[0008] It would therefore be highly desirable to provide a clinical information management system for an endoscopic lab with reporting features, that manages and organizes clinical information, endoscopic images and related patient data, at various levels of detail, for creating efficiencies and facilitating functions performed by users of endoscopic equipment, e.g., physicians, nurses, clinicians, schedulers, etc., based on their roles. Integral to this management system is the enablement of real-time data capture and presentation of endoscopic images and related examination data (e.g., patient ID, practitioner information, endoscope ID type).

[0009] It would be highly desirable to provide an integrated interface for an endoscopic laboratory that supports and manages the workflow of all users based on their different roles to access the database contents associated with those roles and further, a system that will automatically configure the interface screen depending upon the role of the person logged in to the system.

[0010] It would additionally be highly desirable to provide a clinical information management system designed for the practice of endoscopy that provides for the secure, remote access of patient and exam related information by physicians through a web-enabled interface.

SUMMARY OF THE INVENTION

[0011] Accordingly, it is an object of the present invention to provide a novel clinical information management system designed for the practice of endoscopy that supports and manages the workflow of all users having roles pertaining to an endoscopic laboratory, and particularly, the execution of an endoscopic procedure performed upon a patient, sequentially, through various lifecycle stages associated with the endoscopic practice. Preferably, the workflow processes associated with these lifecycle stages are flexible enough to support small, independent endoscopic practices and endoscopic departments that are integral to large healthcare institutions.

[0012] Further, it is an object of the present invention to provide a clinical information management system designed for the practice of endoscopy that supports the flow of a patient and related information through the various lifecycle stages associated with the endoscopic practice, each stage representing a grouping of related activities. Thus, users of the system can, at appropriate points in the lifecycle, capture, process, and generate reports on all the required endoscopy information. The information captured at the different stages is managed by the system application and processed to create medical records, produce reports, and provide necessary information to perform exams, etc.

[0013] As a patient typically follows the lifecycle stages in sequential order: from registration and scheduling of patient information through pre-procedure, procedure and post-procedure phases of an endoscopic examination, the present invention supports the entry, by various users associated with an endoscopic laboratory, of information and data including the processing and storage of endoscopic images captured during an endoscopic exam of a patient, for association with a patient record stored in a database, and facilitates the generation of procedure notes and other reports that include the stored images, all via an integrated user interface.

[0014] Further, according to the invention, the clinical information management system designed for the practice of endoscopy facilitates the tracking of each patient’s state (such as what stage of the process the patient is in, what information has already been captured, and which information is yet to be captured) and enables the basic lifecycle to be followed so that clinical staff can ensure that all required information is in place prior to implementing the next stage. Thus, the clinical information management system designed for the practice of endoscopy according to the invention implements a set of business rules encouraging a particular order of activities based on the current state of the patient. Via these rules, the system incrementally captures all relevant information associated with the patient and orches-
trates interactions with all users including physicians, nurses, schedulers and system administrators while providing the services necessary to perform all required actions.

[0015] The invention further supports the flow of a patient and related information through the various phases associated with the endoscopic practice, which includes: scheduling, patient file management, pre-procedure, procedure, and post-procedure phases. The system interface is integrated, yet allows the physician to reduce the time associated with producing procedure notes. For example, it provides alerts while incorporating annotated and labeled images into written reports.

[0016] The invention further provides a multi-media platform for clinical documentation. By integrating image capture and advanced graphics with an endoscopic medical knowledge base, the system of the present invention generates complete Procedure Notes and related documents. The system further automates the endoscopy clinic by managing patient examination schedules and equipment inventories while controlling "paper management."

[0017] The invention further provides for secure, remote access of patient and exam related information by physicians through the integrated, web-enabled system interface.

[0018] Thus, according to the preferred aspects of the invention there is provided a system and method for managing information flow in an endoscopy laboratory including a computer device, the laboratory adapted to enable users to perform endoscopic procedures upon patients, the method including: inputting patient information and setting up schedules for endoscopic examinations via the computer device during a registration phase of care; inputting preparatory examination information relating to the patient via the computer device prior to performing the procedure; inputting information during performance of the procedure including the real time endoscopic image capture via the computer device; inputting information regarding the patient via the computer device after performance of the procedure; storing the input registration and scheduling information, preparatory information, captured images obtained during the procedure, and post-procedure information regarding the patient in database records; organizing presentation of information included in the database records and managing access to the information and images stored in the database records via an integrated user interface associated with the computer device, the presentation and access controlled according to a user's role, wherein full support for the full flow of a patient and related information is provided through various phases associated with all users involved in an endoscope practice.

[0019] Advantageously, the based clinical information system designed for the practice of Endoscopy enables physicians and other medical personnel to utilize clinical records created directly from their procedures. It enhances clinical workflow, reduces time and cost, minimizes errors and enables interaction among disparate hospital information systems.

[0020] Moreover, the based clinical information system designed for the practice of Endoscopy according to the invention enables reduced equipment maintenance costs through the automation of equipment use and maintenance tracking.

[0021] Further benefits include, the inclusion of procedure reports in the organization's electronic medical record and, the automating the exchange of procedure and pathology information eliminating medical errors and paper-based processes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The objects, features and advantages of the present invention will become apparent to one skilled in the art, in view of the following detailed description taken in combination with the attached drawings, in which:

[0023] FIG. 1(a) illustrates an overview of an endoscopic examination system according to the invention;

[0024] FIG. 1(b) depicts generally the endoscopy lab for obtaining, processing and displaying of real-time endoscopic images in which the comprehensive, clinical information management system of the present invention is employed;

[0025] FIG. 2 illustrates a high-level Registration and Scheduling business workflow diagram depicting functionality enabled by the system application according to the invention;

[0026] FIG. 3 illustrates a high-level Pre-Procedural clinical flow diagram depicting functionality enabled by the system application according to the invention;

[0027] FIG. 4 illustrates a high-level Procedure clinical flow diagram depicting functionality enabled by the system application according to the invention;

[0028] FIG. 5 illustrates a high-level Post-Procedural clinical flow depicting functionality enabled by the system application according to the invention;

[0029] FIG. 6 illustrates a Home tab user interface according to the invention;

[0030] FIG. 7(a) illustrates a Patient File tab user interface according to the invention;

[0031] FIG. 7(b) illustrates a Patient Demographics interface screen enabling functionality for recording all patient demographics information;

[0032] FIG. 7(c) illustrates Medical Alerts interface screen for association with a patient to record a patient's medical condition;

[0033] FIG. 7(d) illustrates a Patient Summary interface screen for viewing insurance, contacts and scheduled visits information for a patient;

[0034] FIG. 8(a) illustrates a Registration tab of a user interface according to the invention;

[0035] FIG. 8(b) illustrates a New Visit interface screen according to the invention;

[0036] FIG. 8(c) illustrates a Modify Visit interface screen according to the invention;

[0037] FIG. 8(d) illustrates an Exam Detail interface screen according to the invention;

[0038] FIG. 8(e) illustrates a Lexicon interface screen according to the invention;
FIG. 8(f) illustrates a Document Distribution interface screen according to the invention;

FIG. 9(a) illustrates a Pre Procedure tab of a user interface screen according to the invention;

FIG. 9(b) illustrates a Patient Process interface screen according to the invention;

FIG. 9(c) illustrates a Consent Checklist interface screen according to the invention;

FIG. 9(d) illustrates a Patient Assessment interface screen according to the invention;

FIG. 9(e) illustrates a Viials and Meds interface screen according to the invention;

FIG. 9(f) illustrates a Physical Exam screen for a physician to perform pre-procedure checks such as a physical examination according to the invention;

FIG. 9(g) illustrates a pre-procedure summary information Screen display of according to the invention;

FIG. 10(a) illustrates a Procedure tab user interface screen according to the invention;

FIG. 10(b) illustrates a Pre-Procedre Summary interface screen according to the invention;

FIG. 10(c) illustrates an Equipment used interface screen according to the invention;

FIG. 10(d) illustrates an endoscopic Image Capture interface screen according to the invention;

FIG. 10(e) illustrates a Pathology Request interface screen according to the invention;

FIG. 10(f) illustrates a Lexicon interface screen for the procedure lifecycle stage according to the invention;

FIG. 10(g) illustrates a Print on Mavigraph interface screen according to the invention;

FIG. 10(h) illustrates a Document Distribution interface screen for the procedure lifecycle stage according to the invention;

FIG. 10(i) illustrates a Nursing Administration interface screen according to the invention;

FIG. 11(a) illustrates a Post-Procedre tab of a user interface screen according to the invention;

FIG. 11(b) illustrates an ICU Synchronization interface screen according to the invention;

FIG. 11(c)(1) illustrates an Image Management interface screen according to the invention;

FIG. 11(c)(2) illustrates the Other Exam feature displayed via the Image Management interface screen to enable image comparisons according to the invention;

FIG. 11(d) illustrates a Surgical Changes window according to the invention;

FIG. 11(e) illustrates a Recovery interface screen according to the invention;

FIG. 11(f) illustrates a Recall Patient interface screen according to the invention;

FIG. 11(g) illustrates a Document Distribution interface screen for the post-procedure lifecycle stage according to the invention;

FIG. 12 illustrates an Analysis tab user interface according to the invention;

FIG. 13(a) illustrates a System Administration tab user interface screen according to the invention;

FIGS. 13(b)(1) and 13(b)(2) illustrates a Clinical Staff user interface screen according to the invention;

FIG. 13(c) illustrates a System Settings user interface screen according to the invention;

FIG. 13(d) illustrates an Application Flow user interface screen according to the invention;

FIG. 13(e) illustrates a Facility user interface screen according to the invention;

FIG. 13(f) illustrates a Node Settings user interface screen according to the invention;

FIG. 13(g) illustrates a Video Settings user interface screen according to the invention;

FIG. 13(h) illustrates an AutoMask Settings user interface screen according to the invention;

FIG. 13(i) illustrates an Exam Type customization user interface screen according to the invention;

FIG. 13(j) illustrates a Reports Section customization user interface screen according to the invention;

FIG. 13(k) illustrates a Phase of Care user interface screen according to the invention;

FIG. 13(l) illustrates a Document Type user interface screen according to the invention;

FIG. 13(m) illustrates a Procedure Note template window and interface used to generate new Procedure Notes according to the invention;

FIG. 13(n) illustrates a Document template window used to generate new Document types according to the invention;

FIG. 13(o) illustrates an example Document template window for creating a new document template from a previously created Document template according to the invention;

FIG. 14(a) illustrates a System Administration tab user interface displaying a User List screen according to the invention;

FIG. 14(b) illustrates a User Maintenance user interface screen according to the invention;

FIG. 14(c) illustrates a Role List user interface screen according to the invention;

FIG. 14(d) illustrates a Role Maintenance user interface screen according to the invention;

FIG. 14(e) illustrates a System Log utility user interface screen according to the invention;

FIG. 14(f) illustrates a Scope Model list user interface screen according to the invention;
FIG. 14(g) illustrates a Scope list user interface screen according to the invention;

FIG. 14(h) illustrates a Scope Item user interface screen according to the invention;

FIG. 14(i) illustrates an Accessory Maintenance user interface screen according to the invention; and,

FIG. 14(j) illustrates an Equipment Category user interface screen according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is a comprehensive, real-time, interactive clinical information management system designed for the practice of endoscopy. It includes integrated reporting features, that manages and organizes clinical information obtained during phases of care relating to an endoscopic exam, and endoscopic images and related patient data, at various levels of detail, for creating efficiencies and facilitating functions performed by users of endoscopic equipment, e.g., physicians, nurses, clinicians, etc.

Particularly, the clinical information management system designed for the practice of endoscopy includes a web-browser interface that supports all the data acquisition and care-giving functions performed by users during patient registration, pre-endoscopic procedure, endoscopic procedure and post-procedure phases of care.

The clinical information management system further includes the ability to capture, process and record endoscopic images during a procedure and further includes an Image Management function enabling a user to annotate, label, import, export, and enhance the quality of images, including the ability to manage, record, and export live video clips and generate reports that include the stored images. Further to the aspect of image capture and display, the system provides an “auto-masking” feature that automatically selects an appropriate video mask based on a particular endoscope imager device being utilized by the health care practitioner.

The clinical information management system designed for the practice of endoscopy further includes a medical terminology “Knowledge Base” (KB) comprising keywords relating to the procedure, e.g., such as gastrointestinal, endoscopic and bronchoscopic terminology keywords. The keywords are captured via a graphical user interface (GUI) before, during, and/or after a procedure. The keywords are made available for labeling images captured during an examination to be used in reports, auto-populating appropriate sections of a report such as a Procedure Note, described further below, based on patient history, and building Procedure Note templates or models to auto-populate sections of information. The system also facilitates the use of custom terms that apply to a specific department or location. Thus, for example, during an exam, a user may select KB terms for a procedure via a common user interface, which is employed wherever the user needs to locate or extract keywords. This also provides a consistent way to select and use terminology.

Overview of the System

FIGS. 1(a) and 1(b) depict the hardware infrastructure comprising various hardware devices and components required to either enable the application, hereinafter alternately referred to as the EndoWorks™ system (hereinafter “EW system” manufactured by Olympus Corporation) that provides functionality for automating the endoscopy lab by, to run, or to support the required business functionality. As shown in FIG. 1(a), the hardware infrastructure of the invention, includes an endoscopic workstation 110, a printer device 112 (e.g., a Mavigraph printer), an RGB monitor 20 and video processor 40. The user provides inputs to the workstation 110 via a keyboard, mouse interface, or the like. The workstation includes a second monitor, e.g., a VGA monitor 55, and implements a web browser interface that provides the necessary information during all phases of care relating to the endoscopic exam, and facilitates for users of endoscopic equipment, e.g., physicians, nurses or clinicians, the efficient capture, management, organization and presentation of endoscopic images and patient examination data. The workflow processes associated with this aspect of the system are flexible enough to support small endoscopic practices in addition to endoscopic departments within large healthcare institutions.

FIG. 11(b) is a block diagram depicting in greater detail, the endoscopy lab 110 for supporting all EndoWorks application functions including the capture, processing and displaying of real-time endoscopic images. As shown in FIG. 11(b), the system comprises an endoscope device 25 connected via a connector device 30 to the video processor device 40, for example, an Olympus CV-160 device. As mentioned the endoscopic device includes a solid state CCD imager for generating real-time frame image signals, e.g., simultaneously generated RGB signals, which are processed by the video processor device to generate real-time video signals of the image for display on an RGB monitor 20. As shown the video processor is further connected to an imaging station or node 50, comprising a personal computer (PC) or workstation, and including processor 60, video display driver 65, and memory 70 devices for capturing the real-time video image, digitizing the image for storage in memory 70, and for further displaying a scaled version of the image, for example, on both the RGB monitor 20 and a second monitor, e.g., a VGA monitor device 55. In one embodiment, the processor implemented at the imaging node 50 includes a frame grabber board and associated hardware drivers that captures standard analog composite and Y/C video in NTSC/PAL formats from the video processor 40 and, includes analog to digital converters for capturing the component RGB in the NTSC/PAL video formats. The captured field are stored in a main memory 70 of the imaging node. A graphics controller (not shown) provided with the Matrox board is provided for handling VGA display output and includes a graphics overlay and video scaling.

While the system may function as a stand-alone system, the workstation may have the additional capability of connecting to the institution or facility network, and, to support this, may be provided with an Ethernet 100 Base T network interface card (NIC), or like equivalent, to provide network connectivity. The NIC drivers shall be compatible with Windows 2000 (or later version OS) and support the TCP/IP protocol. Thus, referring back to FIG. 1(a), the system may also include a network server 140 and database element 145 or like memory storage system for storing system application data records including patient records and associated patient data and image information. This server may be connected via a gateway application to
various "external" systems such as a hospital information system where the gateway facilitates the transfer of certain healthcare information between the system and other applications. For example, patient information stored in the system may be downloaded from or uploaded to external systems (e.g., a legacy system) via a gateway interface. The workstation 110 may communicate with the network server 140 via the Internet 170 or other network, such as a LAN or intranet. It is understood however, that the network server may function as a web server and a central repository for EndoWorks™ system definitions and data that is shared by simultaneous users. Further, the network server shall be capable of supporting a database manager. Additional processor capacity shall be required for additional concurrent users, and, a symmetric multiprocessor (SMP) computer may be implemented for supporting large numbers of simultaneous users. In such a multiuser environment, multiple client workstations access the shared server including centralized data, and appropriate serialization and locking capabilities is provided to ensure that concurrent access to data is enabled where reasonable, and to ensure the consistency of data that is being updated.

[0098] The workstation 110 may further communicate with a fax server 160, for instance, for faxing reports via a fax modem 162.

[0099] Generally, the application's software instructions, including firmware and microcode, may be stored in any type of program storage device or devices, also referred to as computer-readable media. The software is executed by a processor in a known manner to achieve the functionality described herein.

[0100] Clinical Flow

[0101] FIGS. 2-5 illustrate clinical flow diagrams that describe the most common activities associated with the system and their relationship in time in the context of managing an endoscopic laboratory according to the invention. Clinical flow is based on patient flow, which relates to how a patient is processed before, during, and after an endoscopic procedure. The overall flow across all phases of care starts with an exam request and ends with the generation of a Procedure Note, the release of the patient, and the generation of a set of related reports. User roles are represented as horizontal bands in the figures.

[0102] The registration and scheduling clinical flow 200 of FIG. 2 includes a collection of all the information necessary to set up a visit. It is initiated through an exam request made by either the patient, a surrogate for the patient, or a referring physician. The nurse and physician share the activity of preparing prep instructions and medical advice for the patient.

[0103] The Pre-Procedure clinical flow 300 of FIG. 3 starts with the arrival of the patient at the endoscopy facility and addresses all administrative and medical activities necessary to prepare the patient for the exam.

[0104] The Procedure clinical flow 400 of FIG. 4 depicts the actual examination that takes place during the Procedure phase of care. The system is used to capture images, record vital signs, and administer medications during this stage.

[0105] The Post-Procedure clinical flow 500 of FIG. 5 depicts the activities that take place after the completion of an exam. These activities include a nurse continuing to monitor the patient's recovery, a nurse completing discharge instructions, releasing the patient, and preparing billing code reports, and a physician reviewing and editing the analysis of an exam by generating a Procedure Note. A physician signs the Procedure Note when it is complete. Afterward, management reports, patient recall requests, and referral letters can be created and distributed.

[0106] User Interface

[0107] The invention is now described in connection with a user interface that permits the user to access specific features associated with managing an endoscopic laboratory. It is understood that a user is an individual who is authorized access to the EndoWorks™ application through a system login comprising a user ID and a password. The user logs into a specific department, selected at login time. A user may have access to one or more departments. When logging in to the selected department, the user is assigned a default facility. A user may be a specific clinical staff member, which in turn identifies the user's qualifications (role), such as physician, nurse, or scheduler, for the department. As will be described in greater detail herein, after successful authentication, the application (based on the user's privileges) authorizes the user to access specific functions associated with the user's role in the department. Other non-medical users also exist, such as system administrators.

[0108] According to this aspect of the invention, the predefined application layout or interface is based on user roles, i.e., actions that user performs using the system, including roles such as Physician, Nurse and scheduler, for example. Facilities or medical departments use roles to give users access to different options within the application. For example, as described in greater detail herein, a facility can configure the system to allow a scheduler to access only the Patient Registration tab.

[0109] Once a user logs in to the system, for example, by entering a user ID and password, and depending on that user's role, that user may access the features associated with that user's role using the tabs located at the top of the screen, with each permitting access to a specific functionality.

[0110] 1. Home tab 600 (FIG. 6). The Home tab is the default home page, and is pre-defined for each role. Preferably, based on a user’s role in the selected department, a default homepage is generated predefined for that role by the application, but it can be changed to another to suit the user’s needs. The most common tasks that can be performed via the Home tab include: view Scheduled Exams; Create a New Visit; view Pending Items; view Pathology Status; view Unsigned Reports which enables an attending physician to view and sign unsigned Procedure Notes; Sign Reports, which enables a user to view unsigned Procedure Notes for a specific physician and mark them as signed; Carbon Copies which function automatically generates and sends a notification to the recipients that a document is available for them in the system when the user distributes a document to a medical provider, clinical staff, or contact via email. A recipient may then login to the system and view a list of documents on the Carbon Copies screen; an Intensive Care Unit (ICU) Synchronization, that ensures that the user's imaging station is not connected to the network server when the user performs an exam in ICU mode. When the user finishes the exam, the user must upload images and data
from the workstation to the server repository. When the workstation is re-connected to the network, a series of simple commands will upload the data and images captured during the exam. After the data is uploaded, the user uses the ICU Synchronization option to synchronize images and data; and, a feature of viewing Recall Letters that enables a user to recall a patient for another examination. As mentioned, access to these tasks is based on the user’s role. For example, if the user logs into the application as a scheduler, then the user would not see the Sign Reports menu option, since that option is reserved for the physician role.

II. Patient File tab 700 (FIGS. 7(a)-7(d))—allows a user to capture information specific to the individual patient. This tab is used to record a patient’s demographic information; a patient’s medical alerts, GI/pulmonary, medication, family, and social history information, and view a summary of the patient information.

III. Registration tab 800 (FIGS. 8(a)-8(f)). This tab is used to: (a) create and modify visit and/or exam information; (b) view past, current, or future schedules; (c) assign resources for an examination including procedure rooms and equipment; and (d) distribute registration documents.

IV. Pre-Procedural tab 900 (FIGS. 9(a)-9(g)). This tab is used to: (a) record care plan information for a specific visit; (b) record medical alert information; (c) record GI, pulmonary, family, and social history information; (d) manage physical examination, patient assessment, and physician check information; (e) manage prep status information for the patient; (f) manage consent information for a visit; (g) capture vital signs and medications administered before the examination; (h) display a summary of selected Pre-Procedural information and capture nurse handoff information; and (i) distribute Pre-Procedural documents.

V. The Procedure Tab 1000 (FIGS. 10(a)-10(j)). This tab is used to: (a) capture images during an endoscopic procedure; (b) record live video clips; (c) record scope time used during an examination; (d) view images and Procedure Notes from a previous exam; (e) print images for an exam on a laser jet or a Mavigraph printer; (f) record nurse administration information; (g) record accessories and equipment used during an examination; (h) generate pathology requests; (i) distribute procedure documents; and, (j) according to the present invention, capture vital signs and medications administered during the examination.

VI. The Post Procedure Tab 1100 (FIG. 11(a)-11(z))—After an examination is completed, this tab is used to perform post-procedural tasks. These tasks include synchronizing images in the ICU mode, monitoring a patient’s vital sign and medication information, managing captured images, and writing Procedure Notes. Images from a current procedure, e.g., image 1 and image 2, and from a prior procedure, e.g., image 3, image 4, and image 5, can be displayed together for comparison. This tab is used to: (a) record patient recovery information; (b) manage images captured during an exam; (c) label, annotate, enhance, and print images; (d) import and export images to and from the current examination; (e) manage video clips recorded during an examination; (f) write and sign Procedure Notes; (g) capture patient recall information; (h) assess performance of a trainee participating in an examination; (i) capture patient survey information; (j) distribute Post-Procedure documents; and (k) perform ICU synchronization.

VI. The Analysis Tab 1200 (FIG. 12)—used to generate redefined template-based management reports to satisfy end-user administrative reporting requirements related to patient, procedure and facility management, efficiency analysis, and resource utilization. This tab is used to generate: (a) Continuous Quality Improvement (CQI) reports; (b) efficiency reports; (c) equipment analysis reports; (d) procedure analysis reports; and (e) administration reports.

VIII. The Admin Tab 1300 (FIGS. 13(a)-13(o) and 14(a)-14(j))—used to perform administrator tasks and ensure the efficiency and security of the system. The system can be customized based on the needs and requirements of the facility, physician, and clinical staff. This tab is used to: (a) maintain system data (such as Patient ID type and department information); (b) maintain application resource data (such as clinical staff and contact information); (c) perform system configuration (such as configure Mavigraph printer and video settings); (d) customize how the application will flow and generate information (for example, changing the order and location of menus within the application and editing or creating templates/models that are used to create Procedure Notes); (e) customize user-defined fields (such as other patient information and other visit information); (f) control access to or within the application (such as user and role maintenance); and (g) maintain equipment used during the procedure.

Home Tab

With further respect to the homepage tab 600 such as shown in FIG. 6, a user may access the Scheduled Exams interface screen 620 by selecting a Scheduled Exams menu option 602 that initiates display of a list of scheduled exams and provides the ability to create a new visit and exam. Via the Scheduled Exams screen 620, a user may enter the facility name, date, or attending physician to search for an exam. A list 630 of scheduled exams will be displayed depending upon the search data input and details of an exam may be viewed by clicking a Details icon 609 corresponding to the exam.

Via the Scheduled Exams tab, a user may create a new visit by selecting the New Visit button 612 to access a New Visit screen, as will be described herein with respect to FIG. 8(b), which enables the user to enter the desired information associated with the scheduling of a new visit for a patient. More details regarding the registration of patients will be explained in greater detail herein.

Via the home page tab 600 of FIG. 6, a user may access the Pending Items interface screen by selecting a Pending Items menu option 604 enabling that user to view all pending tasks. Via a pending task interface screen (not shown), a user may search for a pending item based on task,
date, or the patient, and further select a Task Details icon to view the task. From a Task dropdown a user may perform activities including, but not limited to: modifying a database record, deleting a database record, add a note, or delete a note.

[0123] Via the home page tab, a user may access a Pathology Status interface screen (not shown) by selecting Pathology Status menu option 606 enabling a user to view the status of pathology requests or, search the database for an existing request by entering search criteria such as attending, date, patient, or request status. If the user is not an attending, a default list is not displayed. The user may additionally edit or delete existing pathology results. When a pathology result is deleted, all of the specimens associated with that record are deleted. The user may select an Edit Pathology Status icon to access the Pathology Result screen where a user may further edit the status of the request, review the request, or delete the request.

[0124] Patient File Tab

[0125] With further respect to the Patient File tab 700 (FIG. 7(a)), the information entered is captured and stored in a patient file that is the repository for all patient data required by different clinical staff. It manages the input and presentation of relevant historical data such as past treatments and lab results, medical alerts, and medications currently prescribed for the patient. Thus, via the interface Patient File tab 700 (FIG. 7(a)), the user may access Patient File menu selection options based on that user’s role. Before any endoscopic exam or procedure is performed, the user must register a patient. When registering a patient, relevant patient information may be captured including: Demographics, Medical alerts, GI history, Pulmonary history, Medication history, Social history, and Family history. Once the patient’s information is entered, it does not have to be entered again for any other exam or procedure for that patient.

[0126] To add a New Patient Record via the Patient File tab, a user selects the Patient Search menu choice 702 which causes for display the Patient search screen 720 including a “new” button 722, that, when selected initiates display of a Patient Demographics screen to capture the new patient’s information. Including ID Type, Patient ID, Last Name, and First Name, insurance and medical contact information and enter any optional information, if necessary. As shown in FIG. 7(b), the Patient Demographics screen 730 includes icons enabling functionality for adding all patient demographics information including a new Insurance Carrier (or editing an existing one) and adding a new physician or editing the selected physician.

[0127] Referring back to FIG. 7(a), to modify an existing patient’s record:

[0128] a user may first search for a patient by entering search criteria in search entry fields, and click a Details icon 709 where the Patient Demographic screen 730 shown in FIG. 7(b) is displayed. The user may then modify the information as desired. The user may view a summary of a patient’s information by first accessing the Patient Search screen to search for a patient, click a Select icon 719 to select the patient which causes a display of a Patient Summary screen such as shown in FIG. 7(d). It should be understood that a patient record may be deleted from the Patient Demographic screen shown in FIG. 7(b) by selecting the delete button 739.

[0129] Further functionality enabled via the patient demographic screen 730 includes: assigning or adding a new patient ID to a selected patient by accessing the Patient Demographic screen for the patient and clicking a New button next to the ID Type; and, deleting a patient ID by clicking the Delete icon located to the right of the patient ID that is to be deleted.

[0130] Referring back to the patient file tab of FIG. 7(a), the system includes functionality for managing medical alert information, which is associated with a patient having a condition that requires special consideration. Via selection of the Medical Alerts option 704, there is initiated for display a Medical Alerts screen 740 such as shown in FIG. 7(c). Via the Medical Alerts screen 740, a plurality of medical alert categories can be selected from a Medical Alerts drop-down list 742. When a user sets a medical alert for a selected patient, a View medical alerts for the patient icon 759 is generated for display in the status bar 749. As long as the patient is selected, the icon remains on the status bar. To view all medical alerts set for the patient, a user may select the View Medical alerts for the patient icon 759. As shown in FIG. 7(c), the Medical Alerts screen 750 includes two sections: Medical Alerts and Notes. The Medical Alerts section is used to record a patient’s medical condition and the Notes section is used to record relevant or detailed information regarding a patient’s condition.

[0131] To add a medical alert record for a patient via the Medical Alerts screen 740, the user first selects the required category of medical alert from the Medical Alerts drop-down list, selects a Yes radio button to enable a medical alert, and, clicks a Select from Calendar icon 769 to enter the date in the Date Recognized field. A Select Date window appears where a user may select the date the patient was first diagnosed with the condition (related to the alert), and, enter details of the alert if the corresponding Details field is active. The user may also click a New button on the right of the Notes section, and enter notes related to the medical alert category.

[0132] Further functionality enabled via the Medical Alerts screen 740 shown in FIG. 7(c) includes: removing a medical alert record and, deleting a note. Further, any comorbidity that requires special consideration in the performance of an endoscopic procedure is referred to as an alert. As will be described in greater detail herein, a system administrator may define system alerts at the system level without regard to facility or department. A system alert is a criteria for determining whether a medical alert item is to be set to indicate an alert, i.e., warrants a system alert display indication. If the patient in the context has one of the comorbidities designated as an alert, for example, an allergy, the Medical Alerts icon 759 is displayed in the status bar. A user may view system alerts set by the system administrator via the Medical Alerts screen by clicking a System Alerts button to display the system-defined alerts for the selected category. The System Alerts window for the selected medical category is displayed for user viewing.

[0133] Referring back to the patient file tab of FIG. 7(a), the system further includes functionality for managing a patient’s GI History Information via a GI History screen (not
shown) by recording and editing information about a patient’s past diagnoses, surgeries, and other procedures related to the gastrointestinal system. The GI History screen is displayed when the user logs in to the application in the GI department. After selecting a patient via the Patient Search screen (FIG. 7(a)), an authorized user may select the GI History menu option 706 to enable functionality for retrieving and displaying the patient’s GI History. Functionality enabled via the displayed GI History screen includes: adding a past diagnosis by opening a Past Diagnosis window and entering the date, diagnosis, organ, and comments about the patient’s past diagnosis and, updating past diagnosis information where a date field, a certainty/disease status field, are provided to enable entry of the date and certainty/disease status information. Other functionality via the GI history screen includes: modifying a past diagnosis, deleting a past diagnosis by deleting an existing record; viewing a procedure note report associated with the past diagnosis; adding a past surgery record via Date, Surgery, Organ, and Comments entry fields in a Past Surgery section and, modifying or deleting a past surgery record; and, adding a past procedure record via Date, Procedure, and Comments entry fields in a Past Proceuido section, modifying or deleting a past procedure record, and viewing a Procedure Note report associated with a past procedure.

[0134] Via the patient file tab of FIG. 7(a), it should be understood that if a user logs into a Bronchoscopy department of a hospital, for instance, functionality will be provided for managing a patient’s Pulmonary History Records via a Pulmonary History screen (not shown) by recording and editing information about a selected patient’s previous pulmonary procedures; adding a pulmonary history record; modifying a Past Procedure Record for Pulmonary History and deleting a pulmonary history record; and, viewing a Procedure Note report associated with a past pulmonary procedure.

[0135] Further, via the patient file tab of FIG. 7(a), the system includes functionality for managing a patient’s medical medication history via a Medication History screen (not shown) by recording and editing information about a patient’s current and past medications. The Medication History screen (not shown) is displayed by selecting the Medication History menu option 708 to enable functionality for retrieving and displaying a selected patient’s Medication History.

[0136] Functionality enabled via the Medication History screen includes: adding a medication to the history record, for example, by entering either the full drug or brand name, or the first few letters of the name followed by a wildcard in a Search field, where a list of all medications matching the criteria will be displayed for selection in a Medication Search window. A user may further select a Search icon next to a Strength field to search for the strength of the medication. A user may then select the drug strength from a Drug Strength window (not shown) and enter a start date for the medication to the Date Started field and, enter a stop date for the medication to the Date Stopped field (if not a current medication). It is understood that a user may further delete a medication from patient’s history record.

[0137] Referring back to the patient file tab of FIG. 7(a), the system includes functionality for updating a patient’s Social History via a Social History screen (not shown) that enables a user to record information about the social behavior and legal considerations of a patient. The Social History screen is displayed by selecting the Social History menu option 710 to enable functionality for retrieving and displaying a selected patient’s Social History. Functionality enabled via the Social History screen includes: adding a Social History Record for a patient including entry of information relating to five areas: 1) Tobacco use including entry of the date the patient stopped using tobacco and the pack years (i.e., the number of packs per day and the number of packs years); 2) Alcohol use including entry of the date the patient stopped consuming alcohol and the drink years (i.e., the number of drinks per week and the number of drink years); 3) IV Drug use including entry of the date the patient stopped IV drug abuse and detailed information about the IV drug abuse; 4) Living will information; and 5) a power of attorney, whereby a user may enter information via a DNR (Do Not Resuscitate) Details field. It is understood that the user’s Social History Record may be further modified.

[0138] Referring back to the patient file tab of FIG. 7(a), the system includes functionality for updating a patient’s Family History via a Family History screen (not shown) that enables a user to record information about the occurrences of cancer or other relevant family medical conditions. Preferably, there are different Family History screens for the Bronch and GI departments. The Family History screen is displayed by selecting the Family History menu option 712 to enable functionality for retrieving and displaying a selected patient’s Family History. To add a GI cancer record, for instance, for a selected patient via the Family History screen, an Add button is provided adjacent to GI Cancer that is selected to display a GI Cancer window. From that window, a user may select the type of cancer from the Type dropdown list, or select Other-Details, where a Details field is provided to enable the user to enter comments in the Details field. The user may further click a New button next to a Relation which enables the addition of a line to the section, where the user may select the relative from the Relation dropdown list and enter the age that the relative was diagnosed with the cancer.

[0139] Via the Family History screen, a user may further add a non-GI cancer record for a relation, or add a Bronch Cancer record for a patient’s relation. Furthermore, another relevant family history record may be added (e.g., non-cancer), and further be deleted or modified.

[0140] Via the patient file tab of FIG. 7(a), further system functionality is enabled for entering or modifying other patient information via an Other Patient Information screen (not shown) which is generated to enable the capture of additional preset and user-defined data that relates to a patient by selecting the Other Patient Information menu choice 714 which enables functionality for retrieving and displaying a selected patient’s other information.

[0141] Registration Tab

[0142] With further respect to the Registration tab 800 (Figure (a)), functionality is provided that allows the user to create, modify or delete a visit, or create, modify or delete examination(s) within a visit. Thus, after creating a patient record, the user may schedule an exam for a patient. It is understood that a visit may include a series of one or more procedures performed on a patient. The user may select “New Visit” and “Modify Visit” screens to schedule a
patient visit or modify an existing visit. Thus, as shown in the Registration tab 800 of FIG. 8(a), to create a new visit, a user will select the New Visit menu option choice 802 that causes the display of a New Visit screen 820 such as shown in FIG. 8(b). Via the New Visit screen 820, a user may select the facility for the visit from the Facility dropdown list 822 (a default is the facility to which the user is currently logged in); enter the visit ID in the Visit ID field 824 which is a unique facility-supplied identifier for the visit; click the Patient Search icon 825 next to the Patient field to select the patient or, return to the Patient Demographics window (FIG. 7(b)) to create a new record for the patient if no patient record is found after the Patient Search; select a referring physician from the Referring dropdown list 826 that includes the names of all medical providers for the patient (the default value is the patient’s Primary Care Physician); select a patient class from the Patient Class dropdown list 828; enter the date of the visit in the Date field 830 (a default is the current date); click a clock icon 832 to enter time of the visit (a default is the current time); and, click the Add button 833 beside Exam if the user needs to add an exam for the visit in which an Exam Detail screen is displayed.

[0143] Referring back to the Patient File tab 700 (FIG. 7(c)), subsequent to creation of a patient visit record, a user may select a Patient Summary option 703 which causes display of a Patient Summary screen 750 shown in FIG. 7(d) which displays all of a patient’s demographics data captured when the patient’s record was created or last modified, and, from which a user may select the existing visit from the Visit Information section 760 of the screen. The user may further select a Modify Visit icon 767 to initiate display of a Modify Visit screen which provides functionality for modifying an existing Visit Record or deleting a Visit Record.

[0144] Referring back to the Registration tab of FIG. 8(a), the system includes functionality for enabling scheduling of an exam only after a visit record is created. To add an Exam to a visit, the user may access the Modify Visit screen 830 shown herein in view of FIG. 8(c), by selecting the Modify Visit menu option 804 from the Registration tab of FIG. 8(a). In FIG. 8(c), clicking the Add button 832 next to Exam causes display of an Exam Detail screen 840, shown in FIG. 8(d) from which a user may enter an exam date in the Date field 842, a time of the exam in the Time field 844 and, select an exam type from the Exam Type dropdown list 845. The attending physician may be selected from the Attending dropdown-list 846. If the user wants to search for an attending or clinical staff, the Clinical Staff icon 848 may be selected to cause display of a Clinical Staff List window (not shown) where a user may select a clinical staff from the list. If the clinical staff is not found in the list, the user may select a New Attending icon 849 that displays a Clinical Staff window (not shown) via which relevant information about the clinical staff may be entered. To edit an attending information, the user may select the attending and click the Edit Attending icon 850 that causes the Clinical Staff window to be displayed via which the user may make the relevant changes. The user will further be prompted to: enter accession number from the Accession Number field 853; select room number from the Room dropdown list 866; select a duration of the exam from the Duration dropdown list 868; select the needed resource type from the Available dropdown list 869; and, select the resource needed for the exam from the Available dropdown list 870. An arrow icon 852 may be selected by the user to move the resource to the Assigned list box 875. For example, a user may desire to allocate a special accessory or endoscope to an exam, in which case the system may generate a Special Accessory Scope required icon 878 for display next to the exam in the Modify Visit screen 830 (FIG. 8(c)).

[0145] Referring back to the Registration tab of FIG. 8(a), the system includes functionality for displaying the Scheduled Exams for the current day via a Scheduled Exam screen 880 which is the default screen displayed upon user access to the Registration tab 800. Via the Scheduled Exam screen 880, a user may: select a Schedule for today icon 882, which when selected, causes display of the current day’s schedule (a default view); select a Schedule for the Week icon 884, which when selected displays the schedule for a week (e.g., from Sunday to Saturday). Preferably, the week selected for display is controlled with the date increment and date decrement icons 885a, 885b that respectively, increments or decrements the date by the interval currently displayed on the schedule; select a schedule for the Month icon 887, which when selected displays the schedule for a month starting with the first day of the selected month. The month selected for display is also controlled with the date increment and date decrement icons; select a Scheduled icon 888, which when selected, indicates that the exam has been scheduled and has not been performed (appears under status); select a Performed icon (not shown), which, when selected, indicates that the exam has been performed (appears under status); select a Procedure Note Signed icon (not shown), which, when selected, indicates that the exam has been performed and the associated Procedure Note has been signed (appears under status); select a Select this Exam icon 889 which, when selected, enables a user to select exams, document, etc...; select a Modify Visit icon 890, which when selected, enables a user to modify exams, document etc...; and, select a Select Date from Calendar icon, that causes the display of a calendar used to select a date.

[0146] Referring back to the Registration tab of FIG. 8(a), the system further provides a “Lexicon” function to select and organize terms from a Knowledge Base. The Knowledge Base is a medical terminology database. When a user, e.g., physician, finds something noticeable during an exam, the Lexicon function is used to record that observation. By selecting the left menu choice 806, a Lexicon screen 895 is displayed such as shown in FIG. 8(e) via which a user may pick terms (based on his/her observation) from the Knowledge Base which comprises a frame 896 having terms stored logically in a tree format. From this structured tree, a user can select and use this information to write a Procedure Note comprising a plurality of sentences formed from selected keywords. More specifically, as described in commonly-owned, co-pending U.S. patent application Ser. No. ______ (Atty Docket 17282), the Knowledge Base includes keywords, which are the medical terms that are the basic building blocks of the Knowledge Base; menus that organize keywords; and views which are collections of menus and their associated keywords organized within a tree and are used navigate through the Knowledge Base and select appropriate medical terms or keywords. Particularly, each Knowledge Base term is called a keyword. When a user selects a keyword or term from the right frame 896 (list of available terms), it appears in the left panel (list of selected terms). The menus are classified into categories, called menu types, which comprise keywords that are similar in nature.
For example, a size menu type would contain the keywords small, medium, and large. Preferably, a menu can be single-select, multi-select, or unique. If a user selects a keyword from a single-select menu, other keywords within the menu are disabled. For example, if size of polyp is a single-select menu, a user can select only one size from the available sizes such as small, medium, or large; if a user selects a keyword from a multi-select menu, the selected item is appended to the same level as any other keyword from the menu. For example, if the organ is a multi-select menu and a user selects stomach as the first organ and duodenum as the second, duodenum appears at the same level as stomach; and, if a keyword is selected from a unique menu, the user cannot select the keyword again. That is, when a user attempts to select the key word again from the right panel, the keyword is highlighted in the left panel to indicate that it has already been selected. For example, the organ menu is unique, and the user selects stomach as the first organ. If that user selects stomach again in the right panel, the keyword stomach in the left panel is highlight to indicate that stomach has already been selected.

[0147] The Lexicon arranges Knowledge Base content to different report sections, based on phases of care. A facility determines which Report Sections 898 are to be available in the Lexicon screen for a Phase of Care. As shown in FIG. 8(a), the Lexicon screen 895 includes icons 897 for: initiating functionality for generating a report via the Lexicon screen 895; initiating functionality to move up in the Knowledge Base tree; initiating functionality to move down in the Knowledge Base tree; initiating functionality to add billing codes; and, initiating functionality to delete a keyword from the tree; and, icons 898 for: initiating functionality to add a new term from Knowledge Base; initiating functionality to move to the last multi-select menu in the left side; and, initiating functionality to move to the previous keyword.

[0148] A grammar engine is implemented in cooperation with the Lexicon to ensure proper sentence generation from the selected keywords in the manner as described in U.S. patent application Ser. No. ______ (Atty Docket 17282).

[0149] Referring back to the Registration tab of FIG. 8(a), the system includes functionality for printing and distributing documents such as letter to the referer and appointment letter via a Document Distribution screen 860 shown in FIG. 8(f). Generated documents may be distributed via, email, or fax. A user may distribute a maximum of nine copies of a document which documents may be previewed and edited prior to printing or distributing. A user may additionally edit the recipient list for each document type. Thus, after navigating to the Registration tab 800 in FIG. 8(a) and selecting a particular exam, a user clicks on the Registration Docs menuchoice 808 to display a Document Distribution screen 860 shown in FIG. 8(f). To edit or review a document, from the Document Distribution screen 860, a user selects a template for the document from a Template dropdown list 861 and, clicks an Edit Document icon 862 corresponding to the document that user needs to edit or review. The document will be displayed in a new window where the required changes may be made to the document. The user will be further able to review, edit and print the document by selecting icons from the Document Distribution screen. With respect to recipients of the document, there are three types of recipients: a Contact, Medical Provider, and Clinical Staff, and a user may add or remove a recipient, via a recipient list. To edit recipient list, a user clicks a checkbox 863 associated with the document to be edited. A user may then click an Edit Recipient List icon 864 adjacent to the current recipient list which initiates functionality for displaying an Edit Recipient window (not shown). Via this window, a user may click Contact to modify a recipient other than a medical provider or clinical staff. The Contacts List window is displayed with categories of recipients. Additionally provided is a Medical Provider to select a medical provider from the Medical Provider List window and a Clinical Staff that may be clicked to select a clinical staff from the Clinical Staff List window.

[0150] Thus, the system provides further functionality initiated by the user to distribute a document via the Document Distribution screen (FIG. 8(f)) by clicking a checkbox on the left side of the document that is to be distributed and selecting a template for the document from the Template dropdown list, prior to clicking Distribute. Further to this feature, the system provides additional functionality for distributing education documents to patients that inform them about procedures or findings. For example, if a user finds a polyp in the stomach of a patient, and the system has set an education trigger for the word “polyp,” a document based on an education template is generated for that user to distribute to the patient. Printing is one of the many medium options available to distribute education documents. It is understood that, if the user’s facility has not set an education trigger, no education document will be generated.

[0151] An education document may be distributed by a Document Distribution screen by clicking the checkbox next to the document to be distributed and selecting a template for the document from the Template dropdown list and a number of copies that need to be printed from the Copies dropdown list.

[0152] Pre-Procedure Tab

[0153] With further respect to the Pre-Procedure tab 900 (FIG. 9(a)), functionality is provided that allows the user to: retrieve scheduled exams; search for an exam; create a new visit; review the schedule summary; record a pre-procedure call; search for a patient record; manage patient demographic information; manage medical alert information; manage GI history information; manage pulmonary information; manage social history information; manage family history information; manage patient process information; manage consent checklist information; manage patient prep status information; manage patient assessment information; manage physical exam information; manage vital sign and medication data; manage physician check information; review/edit pre-procedure documents; review/edit clinical lexicon data; review the pre-procedure summary; and, manage other visit information.

[0154] With respect to retrieving visit exam information via the Pre-Procedure interface screen 900 shown in FIG. 9(a), a user may select the scheduled exams menu choice 902 to initiate functionality for viewing the details of an exam such as its date, time, and location, the attending physician, and any required resources; make changes to exam information (if required); add an exam to a patient visit (if an exam does not exist); and, add notes about the condition of the patient or any other information about the exam. Thus, when a patient comes to the endoscopic facility for a procedure, the patient’s exam information is first
retrieved. Via the Scheduled Exams screen display 930 such as shown and described with respect to FIG. 9(a), a user may view a list of all exams scheduled at the facility (by default, scheduled exams are displayed for the current day), and review the scheduled exam information to: review allocated medical staff and equipment resources; modify exam information (i.e. assign other resources); and add an exam to a patient’s visit (if one does not exist). Particular functionality enabled in this phase of care, is the ability to enter notes about the condition of the patient or any other information relevant to the exam. That is, before a user enters pre-procedure data for a patient, a user may review the patient’s schedule summary and either enter, view, or modify pre-procedure call information. Thus, via the Pre-Procedure interface in FIG. 9(a), a user may select the Schedule Summary menu option 904 to initiate functionality for selecting an exam and view a summary of the pre-procedure call for the selected exam, enter or modify pre-procedure call information for an exam.

[0155] During pre-procedure, a user may verify and record pertinent information for a patient. Thus, by selecting a Patient Search option 906 from the pre-procedure screen, a Patient Search screen (not shown) is displayed to search for a patient in response to entry of search criteria (e.g., last name), and verify or record that patient’s demographics (name, address, emergency contact, patient insurance coverage information, medical provider’s information, etc.), a patient’s comorbidities and medical alert information such as shown and described with respect to FIG. 7(b). For example, if a patient is allergic to latex, this medical information may be recorded before the exam is performed on the patient. The user will further be able to verify or record the patient’s GI history; Pulmonary history; Social history; and Family history. Such patient demographics information may be captured at the time of registration just prior to an exam via a Patient Demographics screen such as shown and described with respect to FIG. 7(b) which may be accessed in the pre-procedure phase to record or modify, for an existing patient, non-clinical patient data such as: Name; Address; Emergency Contact; Patient Insurance Coverage Information; Medical Provider Information; and other Information. A new patient demographics record may additionally be created with new demographic information captured.

[0156] Further, from the Pre-procedure screen 900 shown and described with respect FIG. 9(a), a Medical Alerts menu option 908 may be selected to enable a user to view, modify or remove information about a patient’s comorbidities and related medical history, as shown and described herein with respect to FIG. 7(e), and further record or delete any information in the Notes field 741.

[0157] Further, from the Pre-procedure screen 900, the GI History menu option 910 may be selected to enable a user to view, modify or remove a patient’s GI diagnosis information (or Pulmonary diagnosis information if the user is logged in the Bronch department) relating to that patient’s past surgery or procedure.

[0158] Further, from the Pre-procedure screen 900, the Social History menu option 912 may be selected to view, modify or remove that patient’s past social history information or add a new record, and a Family History menu option 914 may be selected to enable a user to view, modify or remove information relating to that patient’s family history (e.g., Bronch and GI Cancer, Non-GI Cancer, and Other Relevant Family History) in order to maintain occurrences of cancer or other relevant medical conditions within the patient’s family. Preferably, there are different family history screens for Bronch and GI departments.

[0159] Besides managing patient-based information via the Pre-Procedure tab 900 as described herein, a user may additionally manage exam-based information. Thus, before performing a procedure, a user may capture relevant patient care information by selecting the Patient Process menu option 915 which causes display of a Patient Process interface screen 950 as shown in FIG. 9(b) enabling a user to create a patient process record including information such as arrival, registration, and pre-procedure times and, to create a care plan for the patient based on a patient class (e.g., inpatient, outpatient transfer, and outpatient). If the facility is to store any patient belongings, this information, in addition to the location of the belongings, is to be recorded via this screen.

[0160] Thus, for a selected exam, a user may record or edit information via the Patient Process Screen 950 including the patient’s arrival date and time, registration start and end times, and pre-procedure start and end times and select a patient’s scheduled care plan class from the Current dropdown list 951. If the user selects Inpatient transfer, the department and unit in the From field 955 is entered. Select the current care plan (if different from scheduled plan) from the Care Planned dropdown list 952. A user may further enter information via the Patient Process Screen including other information relevant to care planned in the Details entry field 953; select the planned disposition of the patient following the procedure from the Plan Specifics dropdown list 954; select the ID Bracelet, Vascular Bracelet, or Allergy Bracelet checkboxes (if applicable); enter the name and phone number of the person transporting the patient in the Contact and Phone fields (if applicable); select the In Waiting Room checkbox 955 if the person transporting the patient is in the waiting room; enter the location where the patient’s belongings are being stored in the Default Location field 956; and, select a checkbox(s) for each applicable patient belonging. This automatically populates the associated Location field with the default location, however, a user may change the location if a belonging had been stored elsewhere.

[0161] Before performing any procedure, a user needs to ensure that the patient has provided consent to perform the procedure. Thus, before performing a procedure, a user may select a Consent Checklist menu option 916 via the Pre-Produce tab 900 (FIG. 9(a)) which causes display of a Consent Checklist screen 960 as shown in FIG. 9(c) enabling a user to record whether or not the patient gives consent for the procedures that will be performed. The user may modify any of the information but cannot delete the consent checklist record. Thus, for a selected exam, a user may modify existing information or enter information via the Consent Checklist screen 960 including the consent checklist information by selecting the Consent Form, Reviewed, Signed, and Witnessed radio button 961 if the user has obtained signed consent. If the user has not obtained consent, then he/she may select the Not Obtained radio button 962. Selecting Not Obtained disables the Explanation and Obtained For sections. The reason consent was not
obtained may be selected from the Details dropdown list. If consent was obtained, a user may select the person from the Given To dropdown list to whom the consent explanation is given and enter the name of the person to whom the explanation is given in the Name(s) field shown in FIG. 9(c). The user may further indicate the method(s) by which the explanation is given by selecting the appropriate checkbox (verbal, brochure, etc.) and, select the appropriate checkboxes to indicate consent was obtained for the Procedure, Sedation/Anesthesia, or Blood or Blood Products. To select all of these, click the Select All button. The user may further select the appropriate checkboxes to indicate explanation was given for the potential Risks, Benefits, Limitations, and Alternatives or select all by clicking Select All.

The user may further select the person from whom consent was obtained from the Obtained From dropdown list and enter the name of the person from whom consent was obtained in the Name(s) field. The user may further enter the date and time the consent was obtained in the Obtained On and Time fields, respectively, and indicate the name of the staff member who obtained the consent by selecting from the Obtained By dropdown list shown in FIG. 9(c). The user may further indicate the name of the staff member who witnessed the consent given by selecting from the Witnessed By dropdown list and, select the Discharge instructions reviewed, signed and witnessed check box, if instructions were provided and accepted by the patient. The user may further enter the name of the staff member who reviewed the discharge instructions with the patient and witnessed the patient signing the discharge instructions in the Name field and enter the date and time when the discharge instructions were provided using the Date or time icon to populate the respective Date or time field or, by manually entering the date or time. Furthermore, the user may enter any other information in the Notes text entry box shown in FIG. 9(c).

[0162] Further, when preparing a patient for an exam, the user may use a Prep Status screen to record information such as: NPO (nothing by mouth); Bowel preparation; Prep results and Current medications. Thus, before performing a procedure, a user may select a Prep Status menu option 917 via the Pre-Procedure tab 900 of FIG. 9(a), which causes display of a Prep Status screen (not shown) enabling a user to enter the prep status information in a database record. There may be different Prep Status screens for the Bronch and GI departments and an exam must be selected before accessing the Prep Status screen. Via the Prep Status screen, the user may select the appropriate NPO from the NPO dropdown list, select either the Taken or Not Taken radio button (GI only) for bowel preparation, and, select the appropriate prep result from the Bowel Prep Results dropdown list (GI only). The user may further enter any other information in the Other Results field, if appropriate (GI only). By clicking the history next to Current Medications, a user may view the patient’s medication history via a Medication History screen (not shown) and add new current medication(s) for the patient, if appropriate. To add a new medication via the Prep Status screen, an Add Medication screen is displayed that enables a user to enter the first few letters of the medication name in the Drug (Brand) Name search field to search for the medication that needs to be added. The user may additionally search by drug and/or brand names. By selecting search icons, additional Search screens (not shown) may be displayed that enables a user to select the medication that is to be added, select a dosage and delivery method. An Update Medication History checkbox may be selected to add the medication to the medication history of the patient and, the start date of the medication.

[0163] Further, before performing a procedure, a user may select a Patient Assessment menu choice 918 via the Pre-Procedure tab 900 of FIG. 9(a), which causes display of a Patient Assessment screen 970 as shown in FIG. 9(d) providing functionality enabling a user to record information relevant to patient pain, emotional status, learning needs, and IV initiation. The data captured on this screen is important when assessing the patient’s overall condition and may be modified via the Patient Assessment screen. To record patient assessment information via the Patient Assessment screen 970, the user may select a value from the Pain Score dropdown list 972, enter the location, quality, and/or duration of pain in the Location/Quality/Duration field 974, enter relevant information in the Measures to Alleviate Pain field 976, enter relevant information in the Management Plan field 977, select a radio button 978 representing the patient’s Emotional Status. The available selections for Emotional Status include: Calm/Relaxed, Anxious/Participates in Care, and Agitated/Unable to Participate in Care. Further, via the Patient Assessment screen 970, the user may select a radio button 975 corresponding to the patient’s preferred learning method (e.g., seeing, hearing, or doing) and, enter the patient’s preferred language in the Preferred Language field. The user may further select a Needs Interpreter checkbox if the patient needs an interpreter, and, select one or more barriers to the patient’s abilities to learn via available checkbox selections for Vision, Hearing, Physical, Emotional, and Cognitive reasons. Via the Patient Assessment screen 970, the user may select the appropriate IV Type and Needle Gauge dropdown fields in a Venous Access section shown in FIG. 9(d). A user may select system defaults for these, by clicking a Default button, or, if “other” choice is selected for Gauge, the user may enter the needle size in the Specify field provided. The user may further select a site of the IV from the Site dropdown list, enter the start time of the IV in the Start Time field, select the name of the clinical staff member who started the IV from the Administered By dropdown list, and, select an existing IV checkbox if an existing IV is used.

[0164] Before performing a procedure, a user may further select a Physical Exam menu choice 920 via the Pre-Procedure tab 900 of FIG. 9(a), which causes display of a Physical Exam screen (not shown) enabling a user to record information such as the patient’s weight and height (a patient’s estimated and actual height and weight, or e.g., 66 inches or centimeters/pounds or kilograms (the system will fill in the other unit field by calculation)), general appearance (from a dropdown list to select the patient’s appearance as either well or ill), nourishment (select whether the patient is well-nourished, poorly nourished, or emaciated from the dropdown list), stated age, appearance, color (select whether the patient’s color is normal, pallor, jaundice, or rash from a dropdown list, for example), skin palpation (select whether the patient’s skin palpation is warm, cold, dry, or diaphoretic from a dropdown list, for example), GI system function (for example, by clicking Yes/No radio buttons for the choices listed), and other information (such as Karnovsky Status information from a dropdown list, for example) that is appropriate before the physician begins the exam. There are different Physical Examination screens for the GI and Bronch departments and, a user must select an exam before
accessing the Physical Examination screen. The Physical Examination record for a patient may subsequently be modified.

[0165] Before performing any procedure, it is advantageous to record the patient’s vital signs, medication information and intra-procedural assessment information. Thus, before performing a procedure, a user may select a Vitals and Meds menu choice 922 from the Pre-procedure tab 900 of FIG. 9(a), which causes display of a Vitals and Meds screen 980 such as shown in FIG. 9(e), enabling a user to enter a patient’s vital and administered medication information. Additionally, via the Vitals and Meds screen 980 display of FIG. 9(e), a user may also record pre-procedure Aldrete scores to compare the patient. As shown in FIG. 9(e), the Vitals And Meds screen interface includes two tabs: a Vitals And Meds tab, and Assessment tab. The Vitals And Meds tab includes two displayed sections: a Vitals which include, for example, rows for entry of information for a patient such as pulse rate, respiration, systolic, diastolic, O2 saturation, quantity and method of O2, and temperature, for example; and, Medications for a patient including information about medications administered during the different phases of care. The Assessment tab includes the other two sections: Aldrete Scores which are scores for activity, respiration, circulation, consciousness, O2 saturation, dressing, pain, ambulation, fasting—feeding, and urine output; and, Intra-procedural Assessments which include intra-procedural observations for the patient before and during an exam. This information comprises LOC (level of consciousness), skin/circulation, rhythm strip, emotional status, pain, and notes.

[0166] As further shown in FIG. 9(e), the vitals and meds interface 980 displays generated columns that are populated with values of the patient’s vitals data at the time of each reading. That is, each column is created and associated with an instant of time (i.e., a “timestamp”) as indicated. For each time new patient vital data is entered, a column is created in the right side portion of the interface. To add a column via the Vitals And Meds screen, a user may click an icon to initiate functionality for causing the addition of a new column associated with a current time. A column is thus added to the vitals and med display with the current time. A patient’s vitals and meds information may be captured at different time-intervals. However, by default, a user will only see one column in the Vitals And Meds screen of FIG. 9(e). Therefore, the user may add more columns for different time intervals. To add multiple columns via the Vitals And Meds screen, a user may click an icon to initiate functionality for causing the addition of multiple columns. Particularly, an add multiple columns window is displayed the user is able to click a Date icon to enter the date or, type it in manually. By default, the current date is populated. The user may further click the Time icon to enter the time or type it in manually. By default, the current time is populated. Further, the user is enabled to enter the interval and columns to the Interval and Columns fields (not shown). Thus, to record a patient’s vital information it is first required that a column is available to record the vitals values in the Vitals section of the Vitals And Meds tab. If not, the user will be prompted to add a column or add multiple columns. The values may then be entered to any or all of the vitals (except O2) using a slider interface entry mechanism, spinners, or a text box.

[0167] Further information with respect to the entry and recordation of Vitals and medication information, Aldrete scores, and inter-procedural assessments and unplanned events is described in commonly-owned, co-pending U.S. patent application Ser. No. ____ (Atty. Docket 17283) incorporated by reference as if fully set forth herein. It should be understood that further vitals and medication information may be recorded via the Vitals and Meds interface during the Procedure phase of care. If any information was recorded during the pre-procedure phase of the examination, this information will be displayed in the screen during the Procedure.

[0168] Before performing a procedure, it is necessary for the physician to document his/her review of a patient before an exam. Thus, a user may select a Physician Checks menu option 923 via the Pre-procedure tab 900 of FIG. 9(a), which causes display of a Physical Exam screen 980 shown in FIG. 9(f) that enables a user to: select the Nurse Documentation Reviewed checkbox to indicate that the physician has performed a review of the nurse documentation; select either the Normal or the Abnormal radio buttons for each of the items listed in the Focused Physician Exam section displayed. To set the unselected radio buttons to normal, the user may click the Set Unselected To Normal button. This is useful because in many cases they are almost normal. If an item is set to Abnormal, the corresponding Details field is enabled to allow entry of information. The user may further: select a value from the ASA (American Society of Anesthesiologists) physical status classification dropdown list; select an item from the Patient is suitable candidate for planned procedure with dropout list; select an item from the Level of Consciousness dropdown list; select the Emergency Equipment Available checkbox, if appropriate; select the Authorize Post-Procedure discharge when standard criteria are met checkbox, if appropriate; and, select the name of the clinical staff member who performed the physician checks from the Reviewed By dropdown list. This is a mandatory field and must be filled before the record can be saved. Further, the user must provide the date that physician checks were performed by entering the date manually or by using the Date icon and provide the time that physician checks were performed by entering the time manually or by using the Time icon.

[0169] Further, via the Pre-Procedural tab 900 shown in FIG. 9(d), the user may access the Lexicon function to select terms from the Knowledge Base as described herein with respect to FIG. 8(e) and, in further detail as described in commonly-owned, co-pending U.S. patent application Ser. No. ____ (Atty. Docket 17282). As described, the Lexicon contains the Knowledge Base content into different report sections, based on Phases of Care. These report sections appear as tabs in the Lexicon screen, and for the Pre-Procedural phase of care, the report sections include “indications”, Unplanned events, and codes. Thus, via the Lexicon, a user is provided with the ability to associate Billing Codes with selected Keywords. A user may use these codes in Procedure Note and thus to bill certain other medical institutions for services rendered. To associate a billing code with a selected keyword via the Lexicon screen, the user selects the keyword that the user wants to associate the billing code with, and selects a type of code set from a Code Set dropdown list (not shown). After entering the number of code that the user is searching for in the Number field, a user may enter description of the code in the Description field and the system will respond by displaying a list of billing codes based on the search criteria entered. If the user does not enter
any search criterion, all the billing codes from the selected code set are displayed from which the user may select one or more billing codes.

[0170] Further, via the Pre-Procedural tab 900 shown in FIG. 9(a), a user may select a Pre-Procedural Summary menu choice 924 which causes display of a Pre-Procedural Summary screen 995 shown in FIG. 9(g) that enables a user to record, review and/or edit a summary of pre-procedure and nurse handoff information. This includes the status of the prep, consent, current medications, and abnormal findings from the physical examination. To record pre-procedure summary information, the user accesses the Pre-Procedural Summary screen 995, and selects either the Yes or No radio button to indicate whether the pre-procedure nurse's report has been provided. An Edit button may be clicked to display the Capture Visit Times screen from which the user may enter the pre-procedure end date and time using the Date and Time icons. The name of the prep nurse is also selectable from the Prep Nurse dropdown list, and the name of the procedure room nurse may be selected from the Room Nurse dropdown list. Any other relevant information may be entered in the Nursing Notes field via this display. It is understood that the pre-procedure summary information may be modified via the screen display of FIG. 9(g).

[0171] Further, via the Pre-Procedural tab 900 shown in FIG. 9(a), a user may select a Pre-Procedural Docs menu choice 926 that causes display of a Document Distribution screen (not shown) that enables a user to print and distribute documents related to pre-procedure information in a manner such as described herein with respect to FIG. 8(f). Generated documents may be distributed via email or fax. The documents may be previewed and edited prior to printing or distributing and, as described herein, the user may also edit the recipient list for each document type.

[0172] A user may also access an Other Visit Information screen (not shown) via the Pre-Procedural tab 900 of FIG. 9(a) to record custom pre-procedure visit information that is not yet captured in one of the other screens. Based on the requirements of the particular facility, the system can be used to record specific information if an exam is selected.

[0173] Procedure Tab

[0174] With further respect to the Procedure tab 1000 (FIG. 10(a)), functionality is provided enables the user to: review the pre-procedure summary; modify patient visit information; record items used during the exam; manage scope information; capture images and record video clips; modify pathology and specimen information; record a patient's vital signs and medication information; view other exam information; update the lexicon; manage the printer (e.g., Mavigraph) queue; manage procedure documents; and, record and maintain nursing administration information.

[0175] Before performing a procedure, a physician may need to view the following information: the particulars of a scheduled exam to give the physician exam details; a Pre-Procedural summary to picture pre-procedure information about the patient; visit information if another visit exam is required for the patient; Pathology record to view the result or lab tests; and, any equipment necessary to capture the information about the equipment used for the procedure. Thus, according to functionality described herein with respect to FIG. 8(a), a user may view the Scheduled Exams option via the procedure tab to view details of exam, to search for an exam, or to add a new visit.

[0176] Further, via the Procedure tab 1000, as shown in FIG. 10(a), a user may select the Pre-Procedural Summary menu choice 1001 which causes display of the Pre-Procedural Summary screen 1020 shown and described herein with respect to FIG. 10(b) that provides functionality enabling the automatic population of a synopsis of information obtained during the pre-procedure phase of care in the display screen.

[0177] Further, via the Procedure tab 1000, a user may select the Modify Visit menu choice 1002 that enables a user to schedule a patient visit and to modify an existing visit record as shown and described herein with respect to FIG. 8(c).

[0178] Further, via the Procedure tab 1000, the user may select the Equipment Used menu option 1003 which causes display of an Equipment Used screen 1030 such as shown in FIG. 10(c). Via the Equipment Used screen 1030 a user may record the information pertaining to equipment used in the examination, particularly by adding the media information in a displayed Media section, or, click a New button next to Accessory, to add a new entry in the Accessory section which enables a user to select an accessory category from a Category dropdown list and enter the item number and quantity. By clicking the Add button next to Equipment, an Equipment Detail screen (not shown) is displayed from which the user may select the accessory category from a Category dropdown list. If the user selects Electrosurgical Generators from the Category dropdown list, for example, an Electrosurgical section is enabled via which a user may enter other equipment information, e.g., a serial number, etc. All of the entered equipment information in the Equipment Used and equipment detail screen may be saved.

[0179] With respect to the performance of a procedure, during the actual exam, a user may: manage scope information; capture images and record video clips; modify pathology and specimen information; record a patient's vital signs and medication information; view other exam information; manage a mavigraph printer queue; distribute documents; and, maintain nursing administration information.

[0180] Thus, via the Procedure tab 1000, a user may select the Image Capture menu choice 1004 that enables generation and display of an image capture interface screen 1050 such as shown in FIG. 10(d) that provides the user with the ability to: capture images and record video clips, modify and delete these images, and incorporate them into a report document. If an endoscope device to be used is not connected to the application, a warning message may be generated that the device cannot communicate and the user prompted to ensure the scope device is connected to the system.

[0181] Initially, via the Image Capture screen 1050, a user may add and delete scope information via the Add Scope Information section 1052 of the interface shown in FIG. 10(d). Typically, an endoscope device employs includes an ID chip that provides information such as scope name, serial number, etc. and this data is sent to the EW system (e.g., imaging node) through the video processor. The system adds new scope information automatically when it receives this
data. If a scope does not contain ID chip, the user may add the new scope information manually. To add new scope information, a user may click New button on the right of Scope Information, click a Search icon and locate the scope type that needs to be added via a displayed Scope Model dropdown list (not shown). The user may select a scope model number and a serial number. The user may additionally select a Time icon 1053 to enter the current time or type it in manually, and, click on a Calculate Duration icon 1054 that initiates functionality for calculating the duration and the total Duration time that the scope is being used.

[0182] During the procedure, in order to capture images, the user may click a Pause icon in order to freeze the image. To capture an image, a user may click a Capture icon which initiates functionality for displaying the image in an Images box 1055 such as shown in FIG. 10(a). If a user double clicks the image, the image is generated for display in a further space as shown by the enlarged image 1056 in FIG. 10(d). If, during an exam, the scope device is disconnected, the user must re-initialize the system, e.g., reconnect the device to the system within the Image Capture screen. The system will automatically re-initialize or it may be manually reset.

[0183] With respect to image capture, the system provides three mask settings: an automatik, primary and secondary settings. A Toggle Mask function is provided that enables the user to toggle between these video settings. If a system administrator has applied the automask setting, then the user may either switch between these video settings, or select a new video setting. For example, by clicking a Toggle Mask button 1057 located next to a Mask dropdown list 1058; the automask settings will change to the primary settings. By clicking the Toggle Mask button again, the primary settings will change to the secondary settings. When a scope is connected to the system, the default automask settings are applied. The user may change the default automask settings by selecting a setting from a Mask dropdown list. Further details regarding the automasking function provided are described in commonly-owned, co-pending U.S. patent application Ser. No. ______ (Atty Docket 17284), the whole contents and disclosure of which is incorporated by reference as if fully set forth herein.

[0184] To record video clips: a user may click a Record Clips icon 1059a that enables functionality for recording a video clip and storing the clip for later playback via the Image Management section 1055 or, delete Video Clips. With further regard to deleting clips, by clicking the Delete Clips icon 1059b all unsaved video clip(s) are displayed in a screen (not shown) that enables a user to select the clip(s) to be deleted.

[0185] Further functionality enabled by the system during the performance of an endoscopic procedure is the ability to capture and view pathology and specimen information such as: Lab, Specimen, Cytology, and Biohazard details. Thus, via the Procedure tab 1000 of FIG. 10(a), a user may select the Pathology Request menu option 1005 that enables generation and display of a Pathology Request screen 1060 for the selected exam such as shown in FIG. 10(e). To create a pathology request record via the Pathology Request screen, the user selects an Add button to enable selection of a laboratory from a Lab dropdown list and enter other relevant information including the jar number, collecting method and specimen information in a specimen section associated with a specimen record (not shown). During the course of the examination, a user may make further edits or required changes to the pathology request and specimen record, or add or delete records via the Pathology Request screen.

[0186] During the procedure, it is advantageous to record the patient’s vital signs, medication information and intra-procedural assessment information. Thus, a user may select a Vitals and Meds menu choice 1006 from the procedure tab 1000 in FIG. 10(a) which causes display of a Vitals and Meds screen (not shown) enabling a user to enter a patient’s vital signs and administered medication information via the graphical user interface in the manner as described in greater detail herein with respect to FIG. 9(e).

[0187] Further, via the Procedure tab 1000 shown in FIG. 10(a), the user may access the Lexicon function 1007 to select terms from the Knowledge Base as described herein with respect to FIG. 8(e) and, in further detail as described in commonly-owned, co-pending U.S. patent application Ser. No. ______ (Atty Docket 17282), the whole contents and disclosure of which is incorporated by reference as if fully set forth herein. One feature of the lexicon is that the Knowledge Base arranges content to different report sections based on the phases of care. A facility determines which Report Sections should be available in the Lexicon screen for a Phase of Care (endoscopic procedure lifecycle stage). Thus, a user will select a Report Section to display the hierarchical tree of items (menus and keywords) for the report section and current examination and the tree of the lexicon interface displays the available items. Thus, for example, if a physician finds a small polyp in the anterior wall of the antrum of stomach, the lexicon screen will result in the display 1065 as shown in FIG. 10(f).

[0188] As mentioned, during the procedure phase of care, it is possible manage the printer (e.g., Mavigraph) queue; manage procedure documents; and, record and maintain nursing administration information.

[0189] Thus, via the Procedure tab 1000 of FIG. 10(a), a user may select the Mavigraph Printing menu choice 1008 that generates a Mavigraph Printing screen (not shown) enabling a user to search for a printing queue for the printer device, e.g., a mavigraph, particularly by entering a facility and selecting a printer. Via this screen, a user may further print images for current exam, for example, by selecting the number of images a user needs to print on a page from the Images per Page dropdown list and selecting one or more print options from Annotations, Enhancements, and Anatomical Diagram choices as shown in the print on mavigraph interface screen 1070 shown in FIG. 10(g).

[0190] Further functionality via this phase of care, includes the ability to manage procedure documents, particularly by selecting a Procedure Docs menu option 1009 via the Procedure tab 1000 which causes display of a Document Distribution screen 1075 such as shown and described herein in further detail with respect to FIG. 10(h). Via the Document Distribution screen 1075 a user may review, edit, and print a document from the Document Distribution screen, and further, select a recipient and cause the distribution of patient and exam related documents to the intended recipient (e.g., clinical staff), for example, by print, email, or FAX.

[0191] During the procedure, it is further advantageous to capture and maintain nursing administration information.
Thus, via the Procedure tab \textbf{1000} shown in FIG. \textbf{10(a)}, a user may select the Nursing Admin menu choice \textbf{1010} that enables generation and display of a Nursing Administration screen \textbf{1080} for the selected exam such as shown in FIG. \textbf{10(i)}. Via the Nursing Administration screen \textbf{1080}, a user may click a button \textbf{1081} to display a Capture Visit Times screen that enables a nurse to enter a Room In date and time, a Procedure/Sedation Start time, a Procedure End time, and a Room Out date and time. The user may further enter relevant Safety and Position information in respective displayed Safety and Position sections, and, select the present medical staff information from a Resource dropdown list. By clicking a Scheduled button, a user may further enter the medical staff person who is assigned to the procedure in the Assigned textbox and, further enter information about the Room Nurse and Recovery Nurse in the Handover section \textbf{1082}.

[0192] Post-Procedure Tab

[0193] With further respect to the Post-Procedure tab \textbf{1100} (FIG. \textbf{11(a)}), functionality is provided that allows the user to: synchronize images in ICU mode; manage exam images; print images on either mavigraph or laser printer; create procedure notes for the exam; sign procedure notes; gather a patient’s current vitals and medication information; prepare a patient recovery sheet; create a patient recall letter; perform a trainee assessment; distribute post procedure documents such as billing reports, Procedure Notes, and referral letters.

[0194] After performing a procedure, a physician may perform the following operations: synchronize images in the ICU mode: manage images; review/edit clinical Lexicon; generate Procedure Notes; record patient’s current vital signs and medication information; prepare a recovery sheet for a patient; prepare recall patient letter; complete patient satisfaction survey; perform trainee assessment; and, distribute post procedure documents.

[0195] According to functionality described herein with respect to FIG. \textbf{11(a)}, when a user is performing an exam in ICU mode, his/her imaging station is not connected to the network server (see FIG. \textbf{1(a)}), i.e., is physically disconnected from the network. The application supports the capture of all necessary data, perform the examination and store the information until reconnected to the network. The locally stored data is then uploaded to the server database. Thus, for example, when an exam is finished, the user must upload and synchronize images and data from the workstation to the server repository. In one embodiment, when a user re-connects the workstation to the network and logs in to the system, the user enters a series of commands that will initiate functionality to upload and synchronize the data and images captured during the exam.

[0196] Thus, according to functionality described herein, a user may first view the details of exams from the Scheduled Exams display by selecting menu option \textbf{1102} via the post-procedure tab \textbf{100} of FIG. \textbf{11(a)} to view details of exam, to search for an exam, or to add a new visit.

[0197] Further, via the Post-Procedure tab \textbf{11(a)} of FIG. \textbf{11(a)}, a user may select the ICU Synchronization menu choice \textbf{1104} which causes display of the an ICU Synchronization screen \textbf{1130}, such as shown in FIG. \textbf{11(b)}, to synchronize images in the ICU mode within the database. A user may select a node from a Node dropdown list that generates for display a list of exams on the selected node that are conducted in ICU Mode. After the user selects the exam to be synchronized, the ICU Exam screen is displayed with a list of likely matches. The user will search for a scheduled exam, or retrieve a list of exams for display, based on user search input, if the exam is not in the list of matches. A user clicks the Synchronize This Exam icon next to the exam to be synchronized and initiates synchronization for the selected exam. Entry into the Image Management screen within the Post Procedure tab will confirm whether the synchronization has been performed successfully. If the user does not find the exam to be synchronized, the user may create a new visit and thus add an exam to the visit.

[0198] Particularly, the user may, via the ICU Exam screen, select the facility for the visit from the Facility dropdown list (e.g., the default facility is the facility to which the user is currently logged in); enter visit ID in the Visit ID field. A visit ID is a unique facility-supplied identifier for the visit; click a Patient Search icon next to a Patient field to display a Patient Search screen. If no patient record is found in the Patient Search field, a new record for the patient may be created by clicking a New Patient icon to display the Patient Demographics window having functionality as described herein to assign a resource for synchronization. The images and data are synchronized to the repository and the ICU Synchronization screen is displayed again. To verify if the synchronization was successful, the user then navigates to the Image Management function by selecting the Image Management menu choice \textbf{1106} that causes display of the Image Management screen \textbf{1140} such as shown and described herein with respect to FIG. \textbf{11(c)} that provides functionality for managing images captured during a procedure, particularly: annotate images, label images or associate findings to an image; display details of an image; enhance the quality of images; import and export images; view other exam images; print images on either a mavigraph or laser printer; and delete images.

[0199] By selecting an import image button, a few exam images in a folder may be imported in the current exam (by clicking an Import an Image to the current exam icon \textbf{1141}), using an import image function. By selecting an Export the selected Image icon \textbf{1142}, image(s) files are exported to a destination folder including BITMAP, JPG or TIFF images, for example, using an image export function, via the Image Management screen \textbf{1140} for storage.

[0200] To highlight or comment on certain critical areas of an image, a user can add lines, circles, ellipses, arrows, and text as annotations, and further, may also change the color, shape, dimensions, and location of an annotation. Annotations that are created via the image management interface are stored as overlays, and do not affect the original image, and further can show or hide annotations. To annotate an image, for a selected exam, the Image Management screen \textbf{1140} of FIG. \textbf{11(c)} displays all the images captured during the selected exam from which a user may click select the image to annotate from an image list \textbf{1145}.

[0201] By selecting an appropriate shape icon from a displayed annotation menu \textbf{1147}, a line, a rectangle, an ellipse, or a circle may be clicked and dragged onto the image, such as the exemplary annotation \textbf{1132} shown in the selected image \textbf{1133} shown in FIG. \textbf{11(c)}(1). The selected
shape will appear on the image in which a text message may be inserted via selection of a text icon, which is dragged to create a textbox on the image.

[0202] To move a shape in an image, a user selects a Selection Mode icon 1148 on the selected image, and clicks a previously-created annotation shape that he/she wants to move and drag to the desired location. The Selection Mode icon is used to switch back and forth from drawing a new image to selecting an existing one. To draw another shape, a user clicks the Selection Mode icon 1148 again to switch to Drawing Mode. The user may further delete a shape in an image.

[0203] To enhance an image a user selects a Enhance Image icon 1151 on the selected image, which initiates display of an enhancements window (not shown) including mechanisms such as: a Zoom slider to change the size of the image, if desired, a Sharpness slider to change the sharpness of the image, if desired, a Contrast slider to change the contrast view of the image, if desired, and a Brightness slider to increase or decrease brightness of the image. The enhanced image may be reset by to its original setting by clicking a Reset button.

[0204] The user may further select functionality for showing or hiding an annotation on a selected image by clicking the Show/Hide Annotation icon 1153, and further, initiate functionality for viewing Other Exam Images. If a patient has undergone a similar exam in the facility and the user wants to view images from that exam, an Other Exam dropdown list 1155 is provided to enable a user to select image results from the other exam. As shown in the example image management screen 1140 of FIG. 11(c)(2), the other exam images are accessed and displayed for an image in an image list 1156 format simultaneously with the display of a current image list of captured images for user comparison.

[0205] Returning back to FIG. 11(c)(1), via the interface, a user may Magnify images from the other exam using the View Large Image icon next to the other Exam dropdown list, and further Procedure Notes recorded for the other exam using the View the Procedure Note icon 1157. The title bar of the Procedure note may include the date and type of the other exam.

[0206] It is understood that, in situations when the user has no findings to associate with an image, a user may label the image for future identification via the Image Management screen by clicking the Label all selected images from the current exam icon 1158 to display a Label window in which a label may be entered in the label text entry pop-up textbox (not shown). Subsequently, the label may be modified or deleted via the Image Management screen.

[0207] The user may further delete all unlabeled images from the current exam with just a click by selecting a Delete all unlabeled images from the current exam icon 1159 via the Access the Image Management screen 1140 of FIG. 11(c)(1).

[0208] If the user captures images relating to specific findings and wants to associate the findings description to the captured images, the Lexicon menu option 1107 may be selected from the Image Management screen 1100 shown in FIG. 11(c)(1) to enter a finding using the knowledge base section 1149. First, for a selected image, a Findings tab 1146 is selected from the displayed Knowledge Base section and a finding title is clicked from the displayed Knowledge Base tree. The finding information will be generated by and appear in the left side of the Knowledge Base interface in the manner as described herein and in greater detail in commonly-owned, co-pending U.S. Ser. No. ______ (Atty. Docket 17282). Then, by clicking the Associate Findings icon 1160 from the image management screen shown in FIG. 11(c)(1), the finding is associated with the selected image. When the user associates a finding to an image, the image is also marked for printing.

[0209] To disassociate a finding from an image, an image that has a finding is selected and the Disassociate Findings icon 1162 is clicked by the user. It is noted that when a user disassociates a finding from an image, the image does not get unmarked for printing.

[0210] The system of the invention provides an anatomical diagram to document any surgical changes. When a user associates a finding that includes a site with an image, a dot is displayed corresponding to site of the finding. There are different surgical diagrams for different exam types. To view the surgical diagram the user clicks an image that is associated with a finding via the Image Management screen 1140 shown in FIG. 11(c) and selects a Surgical Changes icon 1163 to display the Surgical Changes window 1165 such as shown with respect to FIG. 11(d). Functionality is further provided to enable a user to annotate a surgical diagram by using the toolbar in the Surgical Changes screen for drawing arrows, circles, lines, rectangles, and solid rectangles in the selected image as described herein with respect to image capture. A user may additionally type and format text, move, hide, and delete annotations as described herein.

[0211] Returning to FIG. 11(c)(1), if the user desires to print images for an exam, the images for printing must be first marked by clicking the Mark selected images for printing icon 1172 via the Image Management screen 1140 and printed on a mavigraph or any other suitable printer (for example). Preferably, a suitable indication, such as a “P”, as shown in FIG. 11(c)(1) for example, is provided in the corner of a captured image that marks that image for printing. Subsequently, a user may click the Unmark selected image for printing icon 1173 to unmark an image, and remove the “P” indication on the top-right corner of the image.

[0212] To print images on a mavigraph printer, the Mavigraph Printing functionality is provided for adding a print job for the currently selected mavigraph printer. A user may print one or more print jobs, and reprint an existing print job. Thus, after marking the images to be printed in the Image Management screen, a user may select the Mavigraph Printing menu option 1108 from the Image Management screen of FIG. 11(c)(1) which displays a Mavigraph Printer drop-down list from which a mavigraph printer may be selected. It is understood that, as described herein with respect to FIG. 10(g), for the current exam, an Annotation checkbox may be selected if the user wants to print images with their annotations; an Enhancements checkbox may be selected to print images with their enhancements in terms of sharpness, contrast, and brightness; and, an Anatomical Diagram checkbox may be selected to print the anatomical diagram for the exam. Further functionality is provided for deleting a print job, clicking on the checkbox next to the print job to be deleted.
If video clips were recorded during the procedure, a user may manage those clips via the Post Procedure tab, and particularly play and delete video clips, and save a video clip to another file. To play a video clip, via the Image Management screen, a Video Clips icon may be selected to display the Video Clips List window where the user may further click a Preview icon (not shown) to play the video clips in a suitable viewer such as Windows Media Player, or, delete video clips. By clicking the Video Clips icon to display the Video Clips List window, a Video clip(s) may be selected for deletion or be saved to another file via the Image Management screen, e.g., by clicking a Download icon and selecting a destination file location.

As mentioned previously herein, a user may use the Lexicon function to select terms from the Knowledge Base. For example, when it is desired to record procedure related information for the exam, the user may select the Lexicon function to record findings. The Lexicon arranges the Knowledge Base content into different report sections, based on Phases of Care, these report sections appear as tabs in the Lexicon screen such as shown in FIG. 10(f) including an indications tab 1177a, a procedure tab 1177b, a findings tab 1177c, an unplanned events tab 1177d, a recommendations tab 1177e, a summary tab 1177f, and a billing codes tab 1177g. By clicking on a tab to see the Knowledge Base terms associated with the report section, a facility determines which report sections should be available in the Lexicon screen for a phase of care. A system administrator can make a report section available to appropriate phases of care via an Admin tab 1300.

Functionality enabled via the Lexicon screen is described in greater detail herein and in applicants' herein incorporated co-pending U.S. patent application Ser. No. (Att'y Docket 17282). When the user picks or selects an available term (based on that user's findings) from the right hand side pane, it is copied to the left hand side pane that displays the selected terms thus logically build a comprehensive description of the exam. These selected terms along with other exam data collected during various phases of care are used to generate Procedure Note and other exam related documents.

One particular use of the Lexicon is the ability to associate Billing Codes with selected keywords. These codes may be used in Procedure Note and thus provides the ability to bill certain other medical institutions for services. To associate a billing code with a selected keyword the user accesses the Lexicon screen portion such as shown in FIG. 11(a), selects the keyword desired to be associated with the billing code; clicks the Code icon and select a code set display option (not shown) from a displayed Select Billing Codes window (not shown). After selecting a Code Set, a Code Sets window is displayed whereby the user may search for a billing code from this window. The user selects a type of code set from the Code Set dropdown list and enters number of the code to be searched for in an optional Number field, or further enter a description of the code in an optional Description field. A list of billing codes based on the entered search criteria is displayed or, by default, all the billing codes from the selected code set are displayed if no search criteria is entered. A user from this list may then click a billing code to select it, or further select multiple billing codes.

As mentioned herein, a Procedure Note is documented information about a specific exam and is used to document findings, diagnosis, medication, recommendation, and other information such as past diagnosis; a user may additionally use the Procedure Note function to manage images; view information such as images and Procedure Notes for other exams; select terms from the Knowledge Base tree; generate report text; select billing codes; sign a note; generate different versions of a note; and discard or delete a note.

Via the Post-Procedure tab of FIG. 11(a), a previously created Procedure Note template configured in a manner as specified by a facility or a physician to display captured information in a document, is selected. A system administrator previously creates the Procedure Note template. Thus, for a selected exam a user selects a Procedure Note menu option via the tab of FIG. 11(a) and a Select Procedure Note Template screen (not shown) is displayed that enables a user to search for a Procedure Note template based on facility and/or physician name. A resulting list of Procedure Note templates is displayed that are selectable by a user.

As shown in FIG. 11(a), an example selected Procedure Note screen is shown that includes three sections: an Image Strip 1145, to manage images for the current exam as described herein with respect to FIG. 11(c)(1); a Procedure Note Builder 1182 providing an interface for editing and generating Procedure Note documentation; and, a Knowledge Base Interface 1179, to pick Knowledge Base terms to generate a report.

As mentioned herein with respect to FIG. 11(a), a user may use the Images section similar as a user would use the Image Management screen (FIG. 11(c)(1)). The Image section of the Procedure Note screen buttons enables functionality for: deleting selected images from the current exam; deleting all unlabeled images from the current exam; mark/unmark selected images for printing; viewing a larger image; labeling all selected images from the current exam; deleting the label from all selected images from the current exam; associate/disassociating findings; showing/hiding a menu or a strip; and, viewing images and Procedure Notes for other exams associated with the selected patient.

A user may further use the Procedure Note function to select Knowledge Base terms for an examination. Thus, the Knowledge Base section is used to select terms and when a Note is created, the user may select a Generate Report icon to generate a report including sentences in the document section. The Generate Report icon is activated if changes are made to the selected terms. If any of the selected keywords are associated with a sentence model, the sentence is generated and populated in the displayed report within the specific Report Section.

If a Use Organ Labels function has been previously activated for the exam type, the sentences for findings are prefixed with the name of the organ. For example, if there were a find of “polyt” in “stomach” and the Use Organ Labels is set to Yes for the exam type, the sentence in the report would look like:

STOMACH: There was a polyp found in the stomach.

When a sentences are generated for findings, and if there is an image associated with that finding, the image number appends at the end of the finding. For example, if
there is a finding of polyp with "image 1" within stomach, the finding sentence would appear like:

[0224] There was a polyp found in the stomach (1).

[0225] A keyword in the Knowledge Base may have a sentence model for the Summary section associated with it. If a selected template has a Summary section and a selected keyword has a summary sentence model, the summary sentence for the keyword appears in the Summary section. For example, if a polyp is found in the stomach and a diagnosis of polyp, the summary sentence would be:

[0226] Diagnosis—polyp

[0227] A further mentioned herein, a user may use the Procedure Note function to select relevant billing codes for the exam. If a keyword has a billing code associated with it, a user would see all billing codes and descriptions associated with the keyword in response to selecting the Code icon 1180 and select relevant billing codes associated with a keyword for the current exam.

[0228] Further functionality enabled via the Procedure Note screen 1190 of FIG. 11(a) includes: saving a Procedure Note by clicking Save; and, signing a Procedure Note if the Procedure Note text is completed. It is understood that only attending physicians for the examination can sign the Procedure Note. If a Validate & Sign Procedure Note setting is set to Yes, the physician will be asked to validate his/her user ID and password. Signing a note will lock the report from further editing. It is further understood that saving a Procedure Note updates a patient’s past procedure, past diagnosis, and past surgeries records; saving a Procedure Note As a Template, for example, for those situations where a user makes changes to an existing Procedure Note and wants to apply those changes to future Procedure Notes. The modified Procedure Note may be saved as a template which can be used to generate future Procedure Notes. Thus, via the Procedure Note screen 1190 a user may select the Save As button and assign a name to the template, select either a facility or physician name to assign an owner to the template.

[0229] It is understood that the time in which Procedure Notes are created is reduced by: providing procedure reporting via the medical knowledge base interface that implements shortcuts for commonly used items; and, incorporating annotated and labeled images into the written reports. Further, the appropriate sections of the report may be auto-populated based on patient data previously gathered during Pre-Procedural, Procedure, and Post-Procedural phases.

[0230] As mentioned, once a Procedure Note is signed, it is locked and cannot be edited. To make any changes to an existing, signed Procedure Note, the user must create a new version of the Procedure Note. The new version of the Procedure Note is an exact copy of the current signed Procedure Note, without regenerating any sentences or updating any database fields. To generate a new version via the Procedure Note screen a user may clicks a New button and a new version of the Procedure Note is generated.

[0231] A procedure note may further be deleted by clicking Discard via the Procedure Note screen. Discarded Procedure Notes are stored in a Discard Bin, where they can be viewed but not restored. A Procedure Note may be deleted as long as the Note is not signed. Further functionality enabled via the Procedure Note screen includes functionality for creating a new exam follow-up request by selecting an Exam Follow-up icon 1198 from the Procedure Note screen. To create a new exam follow-up request: A New Exam Follow-up window (not shown) is displayed in response that enables a user to: select an assignee from the Assigned To section; select the status of the request from a Status dropdown list; and click New if the user has any notes to enter. An exam follow-up request is generated, which the user may view from a Pending Items screen in the Home tab associated with that user.

[0232] Further, via the Post-Procedural tab 1100, a user may record the current condition of a patient, and particularly: prepare a recovery sheet based on the patient’s vitals and meds information; determine the level of service provided to the patient; record a patient satisfaction survey; access trainees, if any trainees are involved in the procedure; and distribute exam-related documents.

[0233] Thus, after performing the procedure, the user may record the patient’s vital information, administer any medication provided, note the Aldrete scores, and record intra-procedural assessment information to determine the condition of the patient upon selection of the Vitals and Meds menu choice 1111 shown in FIG. 11(a). This functionality is implemented via the Vitals And Meds screen to record the data as shown and described herein with respect to FIG. 9(c).

[0234] After a procedure is completed, the user may further use a Recovery screen 1195 such as shown herein with respect to FIG. 11(e) to capture recovery data for a patient. The recovery sheet also serves as a discharge document, where the user enters arrival and departure times, post procedure discharge information, the last Aldrete score, the patient’s venous details, etc. If the user needs to call the patient for a follow-up, the user may create a new post-exam follow up request from this screen.

[0235] The user may prepare a recovery sheet from the Recovery screen 1195 as shown in FIG. 11(e) after selecting the Recovery menu choice 1112 from the Post Procedure tab 1100 and selecting an exam. Via the Recovery screen, a user may further display the Capture Visit Times window where the user may enter a Recovery Arrival date and time and a Time Out of Unit time and date. The user may further select the relevant Authorize Post Procedure Discharge information. In one embodiment, a Last Aldrete Score section is populated automatically with the last Aldrete score that was captured in the Vitals And Meds screen of FIG. 9(c). The user may further enter Venous Details. Further, by clicking a New button in a Post-Exam Call section (not shown), a user may setup a post call meeting and select an assignee for the post-exam call from the Assigned To section. To assign a clinical staff, a Clinical Staff icon may be displayed and a clinical staff selected from a Clinical Staff Lists. A user may further select the status of the post exam call from the Status dropdown list. If it is a new call, the status would be Open. Other information in the New Post Exam Call window may be populated from the system database. The user may further enter the Discharge Details and enter relevant information in the Patient Belongings section. If there are no belongings to return to the patient, there will be No Belonging(s) to Return indication.
To recall a patient for another examination, the user must issue a recall letter to the patient. A Recall Patient screen may be used to add an item to the Recall Letter Queue to remind a patient of a follow-up examination. Recall letters are exam notifications which are generated and then sent to a patient. To add an item to Recall Letter Queue via the post-procedure screen, a user must navigate to the Post Procedure screen 1100 in FIG. 11(a), and, for a selected exam, select Recall Patient menu option 1113 to display the Recall Patient screen 1196 such as shown in FIG. 11(f). Via the Recall Patient Screen of FIG. 11(f), the user may select the facility where the patient is to visit, and enter the patient name and select the convenient time provided entry fields. The user then selects the exam for which the user wants to recall the patient from the Exam dropdown list, selects the attending physician from the Attending dropdown list and enters any notes.

The user may view and print recall letters from the Recall Letters screen in the Home tab shown in FIG. 6. To print recall letters via the home tab 600, a user selects Recall Letters menu option 607 to display the Recall Letters screen, and selects a facility from the Facility dropdown list (not shown). Other search input, if desired, may be entered as well. In response, the system generates for display a list of recall letters, sorted by patient return date. The user may then click a Details icon to view the details of the recall. The Recall Patient screen is displayed where the user may make changes to the recall, if desired. A Select checkbox may be clicked to select a letter and subsequently printed.

It is understood that a recall letter may be selected and printed from a Select Template pop-up window from which a user may select a recall letter from the Template Name dropdown list for printing.

The system provides a Patient Satisfaction Survey screen to capture the patient’s level of satisfaction on certain elements, such as procedure, staff, exam time, and overall visit. The ratings for each item include excellent, very good, good, fair, or poor. To record a patient’s satisfaction details via the Post Procedure tab 1100, for a selected exam, a user selects a Patient Survey menu option 1114 to cause display of the Patient Survey screen (not shown) wherein the user may enter the patient’s satisfaction rating for each of a plurality of rating items including Endoscopist’s manner, technical skills, patient’s wait time, etc.

If a trainee is involved in a procedure, the user may use a Trainee Assessment screen to access the performance record of a trainee. The Intubation and Therapeutic Maneuvers may also be assessed. To record trainee assessment information via the Post Procedure tab 1100 shown in FIG. 11(a), the user selects a Trainee Assessment menu option 1115 to display a Trainee Assessment screen (not shown). A trainee may be selected from the Trainee dropdown list and Assessment information and the optional Intubation and Therapeutic Maneuvers information may be entered.

In a situation where a user wants to distribute documents (such as referral letters) to another physician or facility, a Document Distribution function may be implemented. The user may distribute post procedure documents such as billing reports, Procedure Notes, discharge instructions, exam images, nurse reports, or referral letters, by email or fax. The user may further preview and edit the documents prior to printing or distribution, and further edit the recipient list for each document type. An exam must be selected to view the Document Distribution screen.

To preview, edit, and distribute documents via the Post Procedure tab 1100 shown in FIG. 11(a), the user selects Post Procedure Docs menu option 1116 to display a Document Distribution screen 1120 for a particular exam, such as shown in FIG. 11(g). From this screen, a user may edit or review a document by accessing the Document Distribution screen, selecting a template for the document from the Template dropdown list 1121, and select an Edit Document icon corresponding to the document that needs to be edited or reviewed. The document will be displayed in a new window where the required changes may be made. A document may also be printed without distributing it via the Document Distribution screen.

A user may edit the recipients of a document from the Document Distribution screen 1120 and additionally add and delete recipients from the list via the Document Distribution screen. After selecting a document to be distributed, a user may select an Edit Recipient List icon 1122 adjacent to the document which causes for display an Edit Recipient window providing a contact choice to add a recipient other than a medical provider or clinical staff. The Contacts List screen is displayed with categories of recipients. An icon is provided to delete a recipient.

To distribute a document, a user accesses the Document Distribution screen 1120 of FIG. 11(g), and clicks the checkbox 1123 associated with the document to be distributed. A template is selected for the document from a Template dropdown list and the user may click Distribute via a selected media, e.g., print on a default printer, or e-mail for the recipient to view.

Furthermore, education documents may be distributed to patients to inform them about procedures or findings. For example, if the user’s facility has set an education trigger for the word “polyp”, then when a polyp is found in the stomach of a patient, a document based on an education template can be generated for the user to distribute to that patient. If the facility has not set an education trigger, no education document will be generated. An education document may be selected via the Document Distribution screen 1120 by selecting the document, clicking the checkbox next to the document to be distributed, selecting the template for the document from the Template dropdown list, and selecting the number of copies that need to be printed.

Analysis Tab

With respect to the Analysis tab, as shown in FIG. 12, the EW system provides menu selections for invoking a pre-defined queries for a category defined in the menu. When a user selects a report from the menu list and pushes execute button, the system invokes a pre-defined query and displays the results according to a pre-defined template. Predefined queries shown in the analysis tab 1200 of FIG. 12, for example, enable the generation of a statistics report regarding CQI (Continuous Quality Improvement). Other pre-defined queries may be invoked to generate reports regarding efficiency, equipment analysis, procedure analysis and administration.

System Administration Tab

With further respect to the System Administration tab 1300 (FIG. 13(a)), functionality is provided that allows
a user having administration privileges to: maintain system data; maintain application resource data; manage patient and clinical staff information; customize application settings and functions; manage user and role information; configure facility, node, mavigraph, and video settings; manage logs and queues; manage equipment information; modify the user-defined screen. A system administrator is also responsible for configuring the system to maximize system performance; maintain the Knowledge Base by adding new keywords, sentence models, and menu structures; record and maintain resource information such as endoscopy equipment information and clinical staff records; add and remove users and assign appropriate privileges to each user; review system and activity logs for periodic administration and take corrective measures to solve any problems.

[0250] With respect to the administrator function of maintaining system data, functions are provided that are accessible by a user having administrative privileges to perform the functions that allow the maintenance of system data. Via the system administration tab 1300, selection of the System menu option 1301 initiates display of a system screen such as shown in FIG. 13(a), that provides functionality to enter, store, delete and/or modify system information stored in the database, including, but not limited to, the following: 1) Insurance Carrier information: by further selecting the Insurance sub-menu option 1302 shown in FIG. 13(a) functionality is enabled for creating, modifying, storing and deleting of carrier name, carrier code, and other insurance carrier information, including an active checkbox which is selectable to make the insurance carrier record available to the clinical staff; 2) Procedure Room information: by selecting the Procedure Room sub-menu option 1303 shown in FIG. 13(a), functionality is enabled for creating, modifying, storing and deleting database records about the procedure rooms (e.g., room names or room numbers) in the facility for storage in the system database. Adding procedure room information would enable clinical staff to allocate a room to an examination. Each procedure room is identified by its name and facility; 3) Race information: by selecting the Race system sub-menu option 1304 shown in FIG. 13(a), functionality is enabled for creating, modifying, storing and deleting records of race information such as American Indian, Native Alaskan, White or Caucasian, Asian, Black or African American, etc.; 4) Ethnicity information: by selecting the Ethnicity system sub-menu option 1305 shown in FIG. 13(a), functionality is enabled for creating, modifying, storing and deleting entries in a standard list of Ethnicities including, but not limited to: American, Australian, Canadian, Caribbean, Chinese, European, Hispanic, Indian, Japanese, etc. 5) Name Prefixes information: by selecting the Name Prefix system sub-menu option 1306 shown in FIG. 13(a) functionality is provided for enabling an administrator to create, modify, store and delete entries of defined name prefixes (and associated genders) that can be assigned to a person such as: Dr., Father, Miss, Mr., Mrs., Ms., etc.; 6) Academic Degree information: by selecting the Academic Degree system sub-menu option 1307 shown in FIG. 13(a), functionality is enabled for creating, modifying, storing and deleting information relating to Academic Degrees that can be assigned to a person such as: D.O., L.P.N., M.D., M.S.N., R.N., etc.; 7) State/Province information: by selecting the State/Province system sub-menu option 1308 shown in FIG. 13(a) functionality is enabled for modifying, storing and deleting states/provinces records that are installed within the application or create new state/provinces (and their abbreviations). The application includes all 50 states, their corresponding US post office state abbreviations, and all Canadian provinces and territories; 8) Country information: by selecting the Country system sub-menu option 1309 shown in FIG. 13(a), functionality is enabled for modifying, storing, adding and deleting country names (e.g., USA and Canada) and their abbreviations or to add new countries to the list; 9) Department information: by selecting the Department system sub-menu option 1310 shown in FIG. 13(a), functionality is enabled for modifying, storing creating and deleting Departments information (and abbreviations). A department is a sub-organization or practice within an institution or facility that specializes in one or more medical areas, such as Gastroenterology (GI) or Bronchoscopy (Bronch). It provides services for one or more exam types (specialty), such as EGD or ERCP. Clinical staff can be qualified to perform or work in one or more departments and specific accessory equipment is associated with the department. The system supports multiple departments with department records established and maintained using the department maintenance function. When a Department List screen is accessed, the defined departments are displayed alphabetically by name; 10) Patient Identifier Type information: by selecting the Patient Identifier Type system sub-menu option 1311 shown in FIG. 13(a), functionality is enabled for modifying, storing, creating or deleting the Patient Identifier Type information for a facility which is a code used to identify a patient. For example, the identifier code “MRN” is the default patient identifier type. A facility can create its own identifier type and edit, add, or delete departments via a Patient Identifier Type screen. It is understood that a default patient identifier type must be set using the facility settings function. This unique patient identification can also be helpful if one facility decides to merge another; 11) Medical Alerts information: by selecting the System Alerts sub-menu option 1312 shown in FIG. 13(a) functionality is enabled for modifying, storing, creating or deleting medical alerts or comorbidities for a facility. As mentioned herein, the system is programmed to notify the user of a patient comorbidity by means of a medical alert. System medical alerts are system level comorbidities identified by a facility. If a patient has a designated system medical alert, the medical alerts icon 759 such as shown in FIG. 7(c) is displayed in the status bar 749. This medical alerts icon is displayed and stays on the status bar whenever the concerned patient is selected. Medical staff can click on the medical alert icon to view a list of all medical alerts for the patient. There are 13 categories of medical alerts defined in the system, e.g., allergy, coagulation, etc. Each category includes alerts that cannot be edited or changed.

[0251] As mentioned, a further function provided via the System Administration tab 1300 (FIG. 13(a)), is the maintenance of application resource data. With respect to the administrator function of maintaining application resource data, functions are provided that are accessible by a user having administrative privileges to perform functions such as: creating or modifying patient information, clinical staff information or contact information. Clinical staff is defined as the professional and certified medical personnel employed by or affiliated with an institution, facility, or clinic. Each clinical staff is associated with a role defined in the system. With respect to the maintenance of clinical staff, for example, a member can have the following roles for an
exam type: attending physician, EGD, Nurse, and others such as ERCP. Only a clinical staff member with the proper qualifications can perform the roles required for an exam type. The system of the invention supports the search for addition, modification, and deletion of clinical staff records.

[0252] Thus, via the system administration tab 1300 shown in FIG. 13(b)(1) selection of the system Clinical and Patient menu choice 1315 enable the maintenance of these application resource data types by displaying a Clinical Staff List screen providing available clinical and patient sub-menu choices. After selection of the Clinical & Patient menu option 1315, a user further selects the Clinical Staff sub-menu option 1316 which displays the Clinical Staff List screen (not shown) which enables the user to search for a clinical staff using one or more criteria entered in the search fields provided that include the following: a Primary function; a Facility; a Staff ID; and a first and last name of the medical staff member. To add a physician in the system via the Clinical Staff List screen, user may click a new button which enables display of a Clinical Staff screen 1340 as shown in FIGS. 13(b)(1) and 13(b)(2) providing fields for entering clinician’s personal information data such as: staff ID, a prefix, last name of the physician and first name, and, enabling selection of “Physician” from a Primary Function dropdown list. Further functionality enabled via the Clinical Staff screen includes the ability to: assign a facility to the physician by selecting a facility from the Facility dropdown list (e.g., more than one facility may be assigned to the physician); assign an academic degree to the physician by selecting a degree from a Degree dropdown list (e.g., more than one degree may be assigned to the physician); assign an exam to the physician by selecting an exam from an Exam dropdown list; and, select a role that the physician would be performing in the selected exam from the Role dropdown list. There are only three roles available—attending, assisting, and trainee, however, functionality is available to add another exam and role. It is understood that all exams may be assigned to the physician.

[0253] In the same manner as described with respect to adding a physician into the system by creating a physician record, a nurse may be entered into the system by creating a nurse record. That is, before a nurse is assigned to an exam, the nurse’s information must be added in the system that is accomplished via the Clinical Staff screen 1340 of FIGS. 13(b)(1) and 13(b)(2). To modify or delete a clinical staff member from the system, the administrator may access the Clinical Staff List screen, search for the clinical staff record to be modified, click the Details icon next to the clinical staff, and via the Clinical Staff screen, make the desired changes or click a Delete icon to delete the selected record.

[0254] Further, via the system administration tab 1300, selection of the system Clinical & Patient menu option 1315, and further, the Contacts 1317 sub-menu choice enables display of a Contacts List (not shown) enabling addition of a new contact such as a new pharmacy, or a new vendor. Thus, the system enables the facility to maintain contacts other than clinical staff, including but not limited to: Pharmacy; Billing; Pathology; Quality assurance; Biomedical department; Medical records; Outside physician office; Outside hospitals; Ambulance services; Infusion control; Hospital contacts; Vendors and Regulatory agencies. Specifically, via the Contacts List screen, the administrator may enter a search query for an existing contact record. The existing contact record is brought up in a contacts screen display (not shown) that enables a user to modify the contact information or delete the contact record.

[0255] The Configuration Management function of the present invention maintains application configuration items including: System Settings, Node Settings for a specific node, Printer (e.g., Mavigraph) Settings, Video Settings, Auto Mask Settings, and Facility Settings. With respect to system settings, the system may further enable the set-up parameters for the system to record and display data. System settings are configured when the application is installed, but they can be changed at anytime via a System Settings screen. Particularly, via the administration tab 1300, a user may select a Configuration menu choice 1318 to display available configuration sub-menu options. A select System Settings sub-menu choice 1320 is provided that, when selected, generates for display the System Settings screen 1350 such as shown in FIG. 13(c).

[0256] Via the System Settings screen 1350 a user may modify the required System Settings information by providing entry fields for entering system parameters such as: Institution Name and Institution Logo which is an image file containing the institution’s logo in formats such as BMP, JPEG or JPG, for example; SSN/SIN Format which setting is used to specify the format for entering a Social Security Number (SSN) or Social Identification Number (SIN), depending on the country (e.g., a default value is ###-##-###-## where # is a number between 0 and 9); a Phone Format setting used to specify the institution’s phone number entry format; a Thousand Separator format setting that determines the separator used when entering numbers over 999; a Decimal Separator setting that determines the separator used in decimal numbers; a Time Format setting that determines the time format for the institution, and is a choice of Military or Standard time; a Date Format setting is used to specify the institution’s date entry format; a Compression format setting that is used to specify the institution’s preferred graphics compression format (e.g., a default value is none (i.e., no compression); other acceptable values are loss less, high, medium, and low); and, a Language setting that is used to specify the predominant local language and which setting is used to determine the value displayed as the preferred language on the Patient Assessment screen.

[0257] As mentioned, a further function provided by the system is the maintenance of the layout of the application based on a facility’s requirements. That is, the system is a highly customizable application with the ability to decide which options that are to be made available to users. For example, the administrator can choose to allow or forbid a user in the nurse role to access the Procedure Notes section.

[0258] Thus, via the via the System Administration tab 1300 (FIG. 13(c)), the administrator may access the Application Flow configuration sub-menu option 1322 which causes for display the available configuration options in an Application Flow screen 1355 such as shown in FIG. 13(d). To modify the existing layout via the Application Flow screen 1355, the user may select a tab from the Tab dropdown list 1356 which provides all of the available sub-menu option choices in an Available textbox 1357a, and provides all assigned options listed in an Assigned textbox 1357b. The user may then select options from the Available menu choices list that are to be assigned to users by clicking a
Right Arrow icon to add the selected options to the Assigned list 1357a, or select options from the Assigned list to remove, and, click the Left Arrow icon to remove the selected options from the Assigned list 1357b.

[0259] The administrator may further add a new facility, customize a facility’s preferences and operating procedures from a Facility Settings screen, and also set system default options for the facility such as primary patient identifier type, default patient class, and IV type. Other settings that affect the operation of the application are not specific to the facility and are controlled through the system settings function. A Facility List screen is accessed via the Admin tab 1300 by selecting the Facility Settings sub-menu option 1324 from the available configuration options displayed. Upon selection of the Facility Settings menu choice 1324, the Facility List screen is displayed (not shown) from which an administrator is enabled to modify information by selecting the Details icon next to a selected facility to be modified, or delete a particular facility. To add a new facility information in the system, the Facility List screen is accessed to select a new option which displays a Facility screen 1360 such as shown in FIG. 13(e) enabling user entry of new facility information such as: name in a Name field; facility abbreviation in the Abbreviation field; a state of the facility from the State dropdown list; a country of the facility from the Country dropdown list; a primary patient identifier type for the facility from the Primary Patient Identifier Type dropdown list; a default patient class from the Default Patient Class dropdown list (e.g., there are chip-type combinations available—inpatient, inpatient transfer, and outpatient); an IV Type that is to be set as a default for the facility from the IV Type dropdown list; the new facility’s work start time, end time, week start day, week end day, and interval information in the Hours of Operation section; and, a name and phone number of the system administrator.

[0260] The administrator is further able to define node settings for nodes or computers that the facility will use to perform exams. From a Node Settings screen 1365, such as shown in FIG. 13(f), the administrator can: define node settings such as node name, physical address of the node, and communication port, set a primary video masking setting; set a secondary video masking setting; set an auto mask setting; and, select a default mavigraph printer for the node. To access the Node Settings List screen, via the System Administration tab 1300 (FIG. 13(c)), the administrator may select the Node Settings configuration sub-menu option 1325. Upon selection of the Node Settings configuration option, a Node Settings List screen is displayed (not shown) enabling a user to edit, add, or create new node setting records. When the Node Settings List screen is accessed, the defined nodes are displayed. From the Node Settings List screen, an administrator is enabled to modify information by selecting a Details icon next to a selected node to be modified, or, delete a particular node. To add a new node information in the system, the Node Settings List screen is accessed to select a new option which displays a Node Settings screen 1365 such as shown in FIG. 13(f) enabling user entry of new node information such as: name of the node in a Node Name field; a facility from the Facility dropdown list; a physical address of the node in a Physical Address field; an input type from the Input Type dropdown list; a COM port from the COM Port dropdown list; and other relevant information. Further, via the Node Settings screen 1365, a default mavigraph printer may be selected from the Default Mavigraph dropdown list (a list of mavigraph printer is generated when a mavigraph printer device is added to the facility in the Mavigraph settings screen as described herein), and, a default label is assigned to the printer in the Default Printer field. Via the Node Settings screen 1365, the administrator may further select a primary video setting for the node from a Primary Setting dropdown list 1366. The administrator may further select a secondary video setting from a Secondary Setting dropdown list 1367 and, select an Apply Automatic checkbox 1368 if an auto-mask setting is to be enabled.

[0261] The administrator is further able to add, modify and delete a printer, e.g., a mavigraph printer, from a Mavigraph Printer List screen (not shown). To access the Mavigraph Printer List screen, via the System Administration tab 1300 (FIG. 13(c)), the administrator may select the Mavigraph Settings configuration sub-menu option 1326 initiating display of the Mavigraph Settings List screen enabling an administrator to add, modify and delete a mavigraph settings record. When a user accesses the Mavigraph Printer List screen, a list of mavigraph printers is displayed which may be further used to assign a default mavigraph printer to a node in the Node Settings screen. To add a new mavigraph settings record in the system, the Mavigraph Settings List screen is accessed to select a new option which displays a Mavigraph Settings screen (not shown) enabling user entry of new printer information such as: the name of the mavigraph printer in the Mavigraph Name field, the location of the mavigraph printer, and the facility to which the mavigraph printer belongs from a Facility dropdown list. An Active checkbox may be selected to make the printer available for the clinical staff.

[0262] The administrator is further able to add, modify, and delete video configuration settings, and configure mask settings that define how information is displayed on the RGB monitor via a Video Settings List screen. The user may preview the video settings on the RGB monitor where the changes are automatically displayed. To access the Video Settings List screen, via the System Administration tab 1300 (FIG. 13(c)), the administrator may select the Video Settings configuration sub-menu option 1328. Upon selection of the Video Settings configuration option 1328, a Video Settings List screen is displayed (not shown) enabling an administrator to view the currently defined video settings, e.g., sorted alphabetically by name. The administrator may delete a video configuration (provided it is not associated with a node) and may further modify information by selecting a Details icon next to a selected video setting to be modified. To add a new video settings record, the Video Settings List screen is accessed to select a new option which displays a Video Settings screen 1370 such as shown in FIG. 13(g) enabling user entry of new video settings information such as: a name to the video configuration in the Name field; a video signal from the Video Signal dropdown list; and select an Active checkbox to make the configuration settings available to users. Further, via the Video Settings screen 1370, a user may assign top, left, bottom, and right mask settings for live video, thumbnail, and patient info in the Mask Settings section 1372.

[0263] The administrator is further able to edit, add, or create mask settings for a specific video processor and chip-type combination via an Auto Mask Settings screen. When the screen is accessed, the defined auto mask settings,
processor-type, chip-type, and defined video settings, are displayed and sorted by processor-type. It is understood that the combination of processor-type and chip-type must be unique. To access the Auto Mask settings screen, via the System Administration tab 1300 (FIG. 13(c)), the administrator may select the Auto Mask settings configuration sub-menu option 1329. Upon selection of the Auto Mask settings configuration option 1329, an Auto Mask settings screen (not shown) is displayed enabling a user to view the currently defined auto mask settings. Via this Auto Mask settings screen, an administrator may delete an auto mask configuration and may further modify information by selecting a Details icon next to a selected auto mask setting to be modified. To add a new auto mask settings record in the system, the Auto Mask settings screen is accessed to select a new option which displays an Auto Mask Settings screen 1375 such as shown in FIG. 13(h) enabling a user define a new Auto Mask Setting by selecting a Processor Type, Chip Type, and Video Settings from respective Processor Type, Chip Type, and Video Settings dropdown lists. It is understood that once defined, masks are automatically selected by the system based on the scope or processor being used.

[0246] As mentioned, a further function provided by the system is the ability to customize certain aspects of how the application functions. These functions include: the editing of Exam Type information; the editing of information that defines a Report Section; the maintenance of Report Sections included within the Phases of Care for the application; the management of Report Templates and of Document Types; the editing or creating of templates for all documents; and, the maintenance of the system Knowledge Base.

[0245] Thus, via the System Administration tab 1300 (FIG. 13(h)), the administrator may access the Customization menu choice 1330 that causes for display the available customization sub-menu options. Upon selection of the Exam Type sub-menu option 1331, an Exam Type List screen (not shown) is displayed enabling a user to view the currently defined exam types. From this screen, a user may add, delete, and modify exam types, including, but not limited to: Bronchoscopy, Colonoscopy, Esophagogastroduodenoscopy, Endoscopy Retrograde, EGD/Colonoscopy, Esophagogastroduodenoscopy/Sigmoidoscopy, Cholangiopancreatography, Endoscopy Ultrasound, Colonoscopy, Colonoscopy, Liver Biopsy, Lower Endoscopy Ultra Sound, Paracentesis, Enteroscopy, and, Upper Endoscopy Ultra Sound, etc. Following each listed exam is an abbreviation, associated department, and a Details icon. A current record may be deleted unless it is an application default or if it is referenced elsewhere. To add a new exam type record in the system, the Exam Type List screen is accessed to select a new option which displays an Exam Type screen 1380 such as shown in FIG. 13(i) enabling an administrator entry of a new Exam type including information such as: a name of the exam type in the Name field name; select a department from the Department dropdown list; assign an abbreviation to the exam type in the Abbreviation field; click New next to Report Sections to add a new report section; select a report section from the Section drop down list; click New next to the Default Medications to add a new medication including the entry of the drug name, strength, unit, and the route of the medication. As mentioned, an administrator is further able to add a Report Section to or remove a Report Section from an Exam Type, and, include an optional default medication to the exam type record.

[0266] As mentioned, a further function provided by the system is the ability to edit information that defines a Report Section and maintain the Report Sections included within the Phases of Care for the application. Thus, via the System Administration tab 1300 (FIG. 13(i)), the administrator may access the Report Sections menu option 1332, a Report Sections List screen (not shown) is displayed enabling a user to add, delete, and modify report sections types. As described herein with respect to FIG. 10(f), report sections are used to generate Procedure Notes for a specific exam type. When the administrator creates a Procedure Note template, he/she may choose to include a few or all the report sections in it, and further assign these report sections to a phase of care and then use them in the Lexicon screen as tabs to record data. The user may create, modify, and delete report sections from the Report Section List screen. To add a new report section record in the system database, the Report Sections List screen is accessed to select a new option which displays a Report Sections screen 1382 such as shown in FIG. 13(j) enabling an administrator entry of a new Report Sections type including information such as: the name of the report section in the Name field; a display order for the report section; and, click the Active checkbox to make the report section available to users.

[0267] As mentioned, a further function provided by the system is the ability to edit manage the four phases of care namely, Registration, Pre-Procedural, Procedure, and Post-Procedural. These phases are illustrated as the Registration, Pre-Procedural, Procedure, and Post Procedure tabs in the application. There are specific report sections available that can be assigned to each phase of care. These report sections are used to generate a Procedure Note. As shown in FIG. 13(k), the Phase of Care function is used to assign these report sections to a phase of care. These report sections are viewed as tabs 898 in the Lexicon screen as described herein with respect to FIG. 8(e) and FIG. 10(f), for example. Thus, for example, the Lexicon screen of the Registration tab includes the Introduction, Indications, and Code report sections. Via the Phase of Care screen, the administrator may configure the Lexicon screen of the Registration phase of care by adding or removing a report section.

[0268] Thus, via the System Administration tab 1300 (FIG. 13(i)), the administrator may access the Phase of Care customization sub-menu option 1333 that causes the display of a Phase of Care List screen (not shown) enabling an administrator to view the currently defined phases of care. From this Phase of Care List screen, an administrator may assign a report section record by clicking a Details icon next to one of the phase of care records. The Phase of Care screen 1383 such as shown in FIG. 13(l) is displayed in response, enabling a user to select a report section from the Default Report Section dropdown list, click the Report Sections from the Available column 1376, assign or add the necessary report section, and click the Right Arrow icon to add the report section to the Assigned column 1377. In a like manner, the administrator may un-assign a report section record via the Phase of Care screen 1383 by clicking the Report Sections from the Assigned column 1377 to remove it from a Phase of Care and click the Left Arrow icon to remove the report section 1376 from the Phase of Care.
As mentioned, a further function provided by the system is the ability to manage Report Templates and Document Types. Document types are the categorization of different documents required by clinical staff at different phases of care. These documents are generated by using document templates in the application. A list of document types predefined in the system, include but are not limited to: an Appointment Letter, a Recall Letter, a Pre-Discharge Instruction, a Pathology Request, a Procedure Note, a Nurse Report, a Discharge Instruction, a Referral Letter, a Billing Report and Pathology Labels.

Thus, via the System Administration tab 1300 (FIG. 13(i)), the administrator may select the Document Types customization sub-menu option 1334 that causes the display of a Document Type List screen (not shown), enabling a user to view the currently defined document types. From this Document Type List screen, a user may: create/modify a document type; Assign the document to a Phase of Care; and assign the document type to an exam type. Further, a clinical staff member and/or a contact may be added as the document recipient. To add a new document type record in the system database, the Document Type List screen is accessed to select a new option which displays a Document Type screen 1384 such as shown in FIG. 13(1) enabling an administrator entry of a new Document Type including information such as: a name for the document in a Document Type Name field; and, a default number of copies desired to be printed at the time of document distribution; and enable system functions such as: the ability to assign a Phase of Care to the document type; the ability to select a phase of care from the Phase of Care dropdown list; the ability to add another phase of care; the ability to add an Exam Type; the ability to select an exam type from the Exam Type dropdown list; the ability to add another exam type; the ability to add all the exam types; the ability to add a Clinical Staff recipient (e.g., a person such as referring, primary care physician, or nurse from the Person dropdown list; and, the ability to add a Contact Recipient, e.g., by selecting a category and person. By clicking the Active checkbox the new document type is available for the staff.

As mentioned, a further function provided by the system is the ability to manage Report Templates. For example, to create a Procedure Note template for an exam type, a Report Template function is provided via a Report Template Screen. Via the System Administration tab 1300 (FIG. 13(i)), the administrator may select the Report Template customization sub-menu option 1335 that causes the display of a Select Procedure Note Template screen (not shown) enabling a user to search for a procedure note template by selecting an exam type, facility, or physician which generates for display a list of Procedure note templates, based on the entered search criteria. If no criteria were entered, all records would be displayed. A New Procedure Note Template is generated via the Select Procedure Note Template screen by selecting a New option which causes for display a Procedure Note Template window 1386 such as shown in FIG. 13(m). From this template window 1386, the administrator may enter the name of the new Procedure Note in a Name text field, and perform functions such as: selecting an exam type from the Exam Type dropdown list; select either the Facility Owner or Physician Owner radio button to choose an owner of the procedure note template; and, select a Facility or Physician depending on the previous choice. A blank Procedure Note Template frame 1385 is additionally generated for display as shown in FIG. 13(n). From this interface, the administrator may select a report section from the Report Section tab 1391 as shown in FIG. 13(n), and click Insert button to insert the section in the template in the right-hand pane 1392; and, further modify the text with the text tools found in the right pane. These steps may be repeated to create multiple sections in the new Procedure Note template. The template record may then be saved in the database. It is understood that a new version of an existing template may additionally be created. Further, from the originally displayed Select Procedure Note Template screen (not shown), the user may modify or delete a procedure note template.

It is understood that the document template functionality provided in the system may be used to generate document templates for documents other than Procedure Notes. These documents include pathology labels, recall letter, and letters of referrers. From a Document Template Search screen (not shown), the administrator may search for a document and create, modify, or delete a document. Thus, via the System Administration tab 1300 (FIG. 13(i)), the administrator may select the Document Template customization sub-menu option 1336 that causes the display of a Document Template search screen enabling an administrator to enter search criteria such as: document type, facility, and/or physician which generates for display a list of document type templates based on the entered search criteria.

A New document template is generated via the Select Document Template screen by selecting a New option which causes for display a Document Template window 1387, such as shown in FIG. 13(n). From this template, the administrator may enter the following information including, but not limited to: the Name in a text field; and perform functions such as: select an exam type from the Exam Type dropdown lists; select either the Facility Owner or Physician Owner radio button to choose an owner of the document template; and, select a Facility or Physician from the appropriate dropdown list. A blank template may be additionally created.

The administrator may further select a report section from the Report Section tab 1393 of the Document Template screen such as the example Document Template screen 1389 as shown in FIG. 13(o), click Insert button to insert the section in the template in the right pane; and, further modify the text with the text tools found in the right pane 1394. These steps may be repeated to create multiple sections in the document template. The template record may then be saved in the database, or create a new version of an existing template. It is understood that, from the Document Template Search screen (not shown) the user may modify or delete a document template.

As mentioned, a further function provided by the system is the ability to control user access to or within the application or portions of the application. These security functions include: User Maintenance—the ability to allow the creation and modification of application user accounts; and, Role Maintenance—the ability to allow the creation and modification of user roles. Thus, via the System Administration tab 1300 (FIG. 14(a)), the administrator may access the Security menu choice 1402 and select User
security sub-menu option 1404 that initiates the display of a User List screen 1420, such as shown in FIG. 14(a) enabling an administrator to query the database for an existing user record such by entering search criteria, e.g., letters and wildcards. If no criteria is entered, the pre-populated User List screen is displayed with records displayed alphabetically by user ID.

0276 To add a new User ID, the user must have been defined as a clinical staff or contact before an ID is assigned to a user. A new user record is generated via the User List screen 1404, by selecting a New option which causes for display a User Maintenance screen 1430 such as shown in FIG. 14(b). From this screen, the administrator may enter a user ID in the User ID field, enter a password in the Password field; and select a user type from the User Type dropdown list. A user type can be either clinical staff or contact. The Search icon may be selected to insert a user's full name. If a contact is selected from the User Type dropdown list, the Contact List window is displayed and likewise, if a clinical staff is selected from the User Type dropdown list, the Clinical Staff List window is displayed where a user may be searched and selected. Alternatively, the name of the user may be entered in the User Name field. Further information for the new user record includes: the selection of a facility for the user from a Facility dropdown list; selection of the Active checkbox to activate the user; and, the selection of a Role to be assigned to the user. To select a Role to be assigned, a department is selected from the Department dropdown list and a role is selected from the Role dropdown list. It is understood that, from the User List screen 1420 (FIG. 14(a)) the user may modify or deactivate a user record. With respect to modification, changes may be made to required fields except, for example, read-only fields, screen by searching for a user and selecting a details icon 1422. Further, a role may be assigned to a user, and further, an assigned user role may be deleted by selecting a delete icon 1432 (FIG. 14(b)).

0277 As mentioned, a further function provided by the system is the ability to manage roles. Each user created in the system must have an assigned role. Based on the role, a user would be able to use specific functions of the system application.

0278 Predefined roles may include, but are not limited to: Administrator, All, BronchNurse, BronchPhysician, GI Nurse, GI Physician, and, Scheduler.

0279 The Role Maintenance function allows the administrator to create, copy, modify, and delete roles for the application. Any role may be deleted that is not associated to a user and is not an application-defined role. Each user is assigned one role; which is associated with specific screens or functionality. The selected role gives the user access to these specific screens. The role data can be changed and saved while the role member is logged into the system. Every role has access to the system Home tab 600 (FIG. 6). The role maintenance function may be used to add a new tab record by selecting a tab name from the drop-down lists and Default Tab Page fields. These fields are mandatory and cannot be left blank if this function is selected.

0280 With respect to Role maintenance, via the System Administration tab 1300 (FIG. 14(a)), the administrator may select the Role security sub-menu option 1406 that causes the display of a Role List screen 1440, such as shown in FIG. 14(c) enabling an administrator to view the current roles, modify or delete existing roles, and add a new role. A new user Role is generated via the Role List screen 1440, by selecting a New option which causes for display a Role Maintenance screen 1450 such as shown in FIG. 14(d). From this screen, the administrator may enter a name in the Role Name field and select a default tab page for the role from the Default Tab Page dropdown list. Any tab that is not to be assigned to the role may be deleted by clicking the Delete icon on the appropriate line. The administrator may further select menu options from the Available textbox to assign to the role, and add the selected menu options in the Assigned textbox.

0281 When the role maintenance function is accessed, the list of roles is displayed as shown in FIG. 14(c). An existing record may be modified as required. To modify an existing role record, the Role List screen is accessed and a Details icon selected next to the record to be modified. The Role Maintenance screen is displayed enabling an administrator to locate the field requiring change and enter a change or select the correct entry from the dropdown list, add a new tab record, or select menu changes as necessary. A user may further copy a record, all the tabs and menu options from a previous role to a new role which requires the assignment of a name to the role. An existing role record may be deleted from the database via the Role List screen, as long as it is not associated to a user and is not an application-defined role.

0282 As mentioned, a further function provided by the system is the ability to maintain the system application. Utilities used to maintain the application a system log function to view and manage the log of all application errors and messages generated by the application; an Activity Log function to manage the log of application activity, a Mavigraph Queue function to manage the print queue for a Mavigraph printer, and, a Discarded Notes function to view a list of discarded Procedure Notes, and an Unlock Function to unlock the locked functions of the application.

0283 Thus, via the System Administration tab 1300 (FIG. 14(c)), the administrator may access the Utilities menu choice 1502 providing the described system application functions as shown in FIG. 14(c). Thus, with respect to managing the system log, selecting the System Log utilities sub-menu option 1504 enables a user to search for a system log record using date, facility name, user id, and node name options and then view or delete the selected log. With respect to managing the Mavigraph Queue function, selecting the Mavigraph Printing Utilities sub-menu option 1506 enables generation of a Mavigraph Printing screen provided to allow the user to manage the mavigraph printers available in the facility, and particularly view all the mavigraph print queues and, delete a mavigraph print queue job(s). With respect to managing the Activity Log, selecting the Activity Log Utilities sub-menu option 1508 enables generation of an Activity Log screen provided to list the records made when a user reads or writes information in the application. These entries are stored with a date/time stamp, user ID, menu name, page, and access (read or write) and may be viewed or deleted. These entries also contain patient ID if there is a patient in the context. With respect to the Discarded Notes function, selecting the Discarded Notes Utilities sub-menu option 1510 enables generation of a Discarded Procedure Note screen provided to enable viewing of discarded pro-
procedure notes, however, prevents the deletion or editing of Procedure Note(s) listed in the screen.

0284] When a user closes the browser window instead of logging out of the system, the last function used by the user gets locked. As mentioned, the system provides unlock functions to unlock the locked functions. There are three types of locks: 1) Exam related lock: Exam related lock locks the image capture, vitals and medication, nursing admin, equipment used, Lexicon, image manager, and Procedure Note functions; 2) a Visit related lock: Visit related lock locks the recovery function; and 3) Function level lock: Function level locks lock contain the ICU Synchronization, and the Knowledge Base maintenance functions. With respect to Unlock Functions, selecting the Unlock Functions Utilities sub-menu option 1512 enables generation of an Unlock Functions screen providing a list of unlock functions from which a user may select a function to unlock.

0285] As mentioned, a further function provided by the system is the ability to maintain the system equipment. Thus, inventory functions are used to track items used during procedures. These functions include: the maintenance of Scope Model, i.e., different types of scopes; the maintenance of actual scope items; the maintenance of different types of equipment items (i.e., equipment and accessories).

0286] The Scope Model Maintenance function allows the administrator to view and manage different types of scopes used by the application. The Scope Model Maintenance screen displays a list of available scope models which are defined by category and used for the following exam types: Bronchoscopy; EGD; Esophagoscopy; Ileoscopy; ERCP; Enteroscopy; Sigmoidoscopy; Colonoscopy; and, EUS (upper and lower).

0287] Thus, via the System Administration tab 1300 (FIG. 14(f)), the administrator may access the Equipment menu choice 1602 providing a display of available equipment options as shown in FIG. 14(f). Thus, with respect to managing Scope Models, the Scope Model equipment sub-menu option 1604 is selected to display a Scope Model List screen 1620 as shown in FIG. 14(f), from which a user may select a Scope Model Record, and view, modify, edit, or delete it. To add a new Scope Model Record, a Scope Model data entry screen is displayed in response to selecting a New button, that enables entry of relevant scope data (e.g., a name, category and channel size, and use for a particular Exam type) in a series of fields and stored as a record in the database.

0288] A Scope Item Maintenance screen may be further displayed enabling an administrator to create, edit, and delete each of the individual scope item entries. The application displays a list of all scopes available to the user based on the input criteria. This function allows the administrator to search for a scope item by entering the scope model, name, serial number, and facility. To access a Scope Item List, the administrator selects the Scope equipment sub-menu option 1606, a Scope List screen 1625 is accessed, as shown in FIG. 14(g), from which the administrator is given the option to select the scope model in use (based on input criteria) from a list of all active scope models. Models are listed alphabetically by name and records in the list may be modified or deleted. The administrator may further create a new scope record by selecting the New button. This causes display of a Scope Item screen 1630 as shown in FIG. 14(h), that includes blank fields for entry of scope equipment data including: the Scope Model, serial number of the Scope Model, the name of the scope in the Name field, the facility, and optionally, the purchase date.

0289] This equipment maintenance function also includes a repair history record that provides details including, but not limited to: the scope’s repair date, by whom, a repair description, and the cost of the repair. The administrator has the option to add, modify, or delete the repair history record. To add a new repair history record, a user first searches for a scope item or creates a new scope item record and navigates to display a Repair History section as shown in FIG. 14(h). By selecting a New button, entry fields are provided to enter the date of repair in the Date field, enter the name of the company or person who repaired the scope item in the Repaired By field, enter a brief description about the repair in the Description field, and enter the cost of repair in the Cost field. An existing scope item record may be further modified or deleted from the database if it is not associated with other database records via the Scope List screen.

0290] As part of the scope maintenance function, the system provides an accessory category function that allows the user to view and manage different types of accessories that are used by the application. The default accessory categories that are provided with the application include, but are not limited to: Aspiration, Electrosurgical Knife, Injection Needles, Biopsy Needles, Endoscopic Mucosal Resection (EMR), Ligating Device, Biiliary Stents, ERCP Camu-lae, Lithotriptors, Biopsy Forceps, Esophageal Stents, Liver Biopsy Device, Clip Fixing Device, EUS Probes, Metal Stents, Coagulation Electrodes, Grasping Forceps, Microbi-ology Brushes, Cytology Brushes, Guide Wire, Miscella-neous, Dilating Catheter, Hemostasis Probes, Naso/Biliary Drains, Dilation Balloons, Hot Biopsy Forceps, PEG/PEJ, Polypectomy Snares, Retrieval Balloons, Retrieval Basket, Sphincterotomes, Spray Catheters, and Suturing Device.

0291] Thus, with respect to managing Accessories, via the System Administration tab 1300 (FIG. 14(f)), the administrator may select the Accessory Equipment category sub-menu option 1608 to display a Accessory Category List screen (not shown) from which a user may select and modify a current Accessory Category record, create a new one, or delete the current record. After deletion of a current Accessory Category record, the application returns to the list function. The system further provides an optional function for the entry of model information. The user further has the option to add a new model or delete a model, as long as there are no accessory records associated with that model.

0292] Further functionality includes the ability to view and manage the accessories used by the system via an Accessory List screen (not shown) which is accessed by selecting the Accessories equipment sub-menu option 1610 as shown in FIG. 14(f). From the displayed Accessory List screen (not shown), the user may create, modify, or delete an accessory entry and, further, has the option to delete the current Accessory record as long as it has not been associated with an examination; after deletion the application displays the search function. When the Accessory List screen is accessed, the defined accessory entries are displayed and may be sorted by model and serial number, for example, in ascending order. It is understood that the com-
bination of model and serial number must be unique. To add an accessory, the administrator selects a New button from the Accessory List screen that initiates display of an Accessory Maintenance data entry screen 1650, such as shown in FIG. 14(i) via which the administrator may enter all pertinent information relating to the new accessory item to be entered including: a category of the accessory item from a Category dropdown list, a facility for the item from a Facility dropdown list, an item name in an Item Name field, and other optional information. An Active checkbox may be selected to make the item available to the clinical staff.

[0293] As part of the equipment maintenance function, the system further provides an equipment category function that allows the user to view and manage different types of equipment used by the application. The list of equipment categories (name and settings type) predefined in the system include, but are not limited to: Cryotherapy generators, Curvilinear transducer, Electrocautery device, Electrosurgical generators, Fluorescence imaging unit, Fluoroscope, Heat probe generators, and Laser devices.

[0294] Thus, via the System Administration tab 1300 (FIG. 14(f)), the administrator may select the Equipment Category equipment sub-menu option 1612 to display an Equipment Category List screen (not shown) from which a user may edit, add, or create a new equipment category record. An optional function enables a user to enter model information. If this optional function is used, the fields shown as required are mandatory (e.g., model name) and are not left blank. A checkbox may be further provided to indicate if the model is reusable. The user may further have the option to add a new model or delete a model, as long as there are no clinical staff or equipment records associated with that model. To add an equipment category, the administrator selects a New button from the Equipment Category List screen that initiates display of an Equipment Category data entry screen 1660, such as shown in FIG. 14(j) via which the administrator may enter all pertinent information relating to the new equipment item to be entered including: a name of the equipment, an Exam Type to associate the equipment category with one or more exam types, and other optional information. An Active checkbox may be selected to make the equipment item available to the clinical staff.

[0295] Further functionality includes the ability to view and manage the equipment used by the application via an Equipment List screen (not shown). Thus, via the System Administration tab 1300 (FIG. 14(f)), the administrator may select the Equipment sub-menu menu option 1614 which causes display of the Equipment List screen (not shown) from which the user may create, modify, or delete an equipment entry. The user further has the option to delete the current record as long as it has not been associated with an examination. When the Equipment List screen is accessed, the defined equipment entries are displayed and may be sorted by model and serial number in ascending order. It is understood that the combination of model and serial number must be unique. To add a new equipment maintenance record, a user may access the Equipment List screen, and in response to selecting a new button option, the system generates an Equipment Maintenance screen (not shown) from which the user may select a category from a Category dropdown list, select a facility from a Facility dropdown list, and, enter a serial number of the equipment in the Serial Number field, and enter other optional information.

[0296] Context Information

[0297] It is understood that, as a user navigates within the application, certain contextual information (CI) is tracked. This information is used as input to many of the system application’s functions. The CI consists of the following:

[0298] Department, User, Facility, Patient, Visit, and Examination.

[0299] Thus, for example, “Department” information is set when a user logs in to the application and is not changed until the user logs out of the application. “User” information is additionally set when a user logs in to the application, however, can be changed by logging out of the application. “Facility” information is set when a user logs in to the application based on the user’s default facility. The current facility is updated to reflect the facility at which the visit is taking place once the user selects a visit (or an examination within a visit).

[0300] “Patient” information is set when a user selects either a patient using a Patient File function, a visit from Scheduled Exams, or the Patient Summary, or an examination from Scheduled Exams, Patient Summary, Pending Items, or New/Modify Visit. By default, there is no patient in the CI when the user first logs in to the application. If there is currently a patient in the CI and a new patient is selected, the visit and examination information will be cleared from the CI. System functions using the patient that is currently in the CI, include but are not limited to: Patient Summary, Patient Demographics, Patient Insurance Coverage, Medical Alerts, Gastroenterology and Bronchoscopy, GI History, Pulmonary History, Medication History, Social History, Family History, Gastroenterology and Bronchoscopy, Unplanned Events Summary, Related Tests and Labs Summary, and Other Patient Information. If one of the previous functions requiring a patient in the CI is accessed and there is no patient in the CI, the application indicates that no patient has been selected. The user shall then be redirected to the Patient Search function to select a patient.

[0301] “Visit” information is set when a user selects a visit for a patient (Scheduled Exams, and Patient Summary) or saves a visit from New/Modify Visit. When the visit is selected, the patient and the visit itself will be placed into the CI. If there is currently a visit selected, the examination information is cleared from the CI. System functions using the visit that is currently in the CI include, but are not limited to: Schedule Visit, Scheduler’s Medical Alert Questions, Patient Preparation Instructions, Gastroenterology, Patient Preparation Instructions, Bronchoscopy, Appointment Letter, Schedule Summary, Patient Assessment, Patient Process, Physical Exam, Gastroenterology and Bronchoscopy, Related Labs, Gastroenterology and Bronchoscopy, Related Tests, Prep Status, Gastroenterology and Bronchoscopy, Vital and Medications, Consent Checklist, Physician Checks, Pre-Procedural Summary, Recovery, Patient Survey. If one of the above functions requiring a visit in the CI is accessed and there is no visit in the CI, the application automatically indicates that no visit has been selected and the user is redirected to the Scheduled Exams function to select a visit.

[0302] Gateway Interfaces

[0303] As mentioned, in view of FIG. 1(e), the Endoworks™ system is adaptable to interface to hospital
systems, as well as other external systems via dedicated gateway interfaces such as: Health Level 7 (HL7), Digital Imaging and Communication in Medicine (DICOM), and generic Extensible Markup Language (XML) Gateway interfaces. Thus, system of the invention results in improved administrative efficiency by supporting the flow of procedure information between the hospital, performing physician, referring physician, and patient through extensive integration capabilities including: HL7 which is the standard that currently addresses the interfaces among various systems that send or receive patient admissions, registration, discharge or transfer data, queries, resources, patient schedules, orders, results, clinical observations, billing information, medical records, referral, and patient care; DICOM which provides a detailed specification describing the means of formatting and exchanging image, reporting, and patient information; and, XML which may be employed when data is distributed between the EndoWorks™ system and other hospital systems using industry standard XML formatting.

F0304 Further benefits provided by the EndoWorks™ system include support for clinical studies and research whereby a ‘study’ may be customized to capture specific patient- and exam-related data over a period of time. Thus, the application supports user-definable clinical research studies and provide a means of compiling and publishing resultant data. Interfacility and intrafacility studies are additionally possible. The application permits customization of patient selection criteria, data collection forms, study duration, and number of patients to include in the study.

F0305 While there has been shown and described what is considered to be preferred embodiments of the invention, it will, of course, be understood that various modifications and changes in form or detail could readily be made without departing from the spirit of the invention. It is therefore intended that the invention be not limited to the exact forms described and illustrated, but should be construed to cover all modifications that may fall within the scope of the appended claims.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent is:

1. A method for managing information flow in an endoscopy laboratory including a computer device, said endoscopy laboratory adapted to enable users to perform endoscopic procedures upon patients, said method including:
   a) inputting patient information and setting up schedules for endoscopic examinations via said computer device during a registration phase of care;
   b) inputting preparatory examination information relating to said patient via said computer device prior to performing said procedure;
   c) inputting information during performance of said procedure including the real time endoscopic image capture via said computer device;
   d) inputting information regarding said patient via said computer device after performance of said procedure;
   e) storing said input registration and scheduling information, preparatory information, captured images obtained during said procedure, and post-procedure information regarding said patient in database records;
   f) organizing presentation of information included in said database records and managing access to said information and images stored in said database records via an integrated user interface associated with said computer device, said presentation and access controlled according to a user's role,

2. The method as claimed in claim 1, further including the step of tracking a patient's state to ensure all information is captured in a particular order prior to implementing a next phase of care stage based on the current user state.

3. The method as claimed in claim 1, wherein said patient information includes historical data, medical alerts, and medications currently prescribed for the patient, said system further enabling the presentation of said historical data, medical alerts, and medications currently prescribed for the patient.

4. The method as claimed in claim 1, wherein said patient information includes scheduling information for setting up an endoscopic examination to be performed, said method further including the step of: assigning resources for an examination including procedure rooms and equipment to be used for a procedure.

5. The method as claimed in claim 1, wherein the step of inputting preparatory examination information includes providing check of preparation, medication, and consent relating to the start of a patient's visit.

6. The method as claimed in claim 1, wherein the step of inputting information during performance of said procedure includes enabling interaction with a knowledge base including selectable keywords via said integrated user interface that enable the build of a hierarchical list of keywords that will be used to automatically generate documentation related to the examination at each phase of care stage.

7. The method as claimed in claim 1, wherein the step of inputting information during performance of said procedure includes enabling a user to record each of a patient's vital signs, medication details, equipment use details and pathology specimen information relative to the procedure.

8. The method as claimed in claim 1, wherein the step of inputting information regarding said patient after performance of said procedure includes information relating to monitoring a patient in a recovery room, including medications administered.

9. The method as claimed in claim 1, wherein the step of inputting information regarding said patient after performance of said procedure includes adding annotations to images captured during said exam.

10. The method as claimed in claim 1, further including the step of providing predefined template-based management reporting capability, including the generation of templates for generating procedure notes, reports, and other documentation at each phase of care stage.

11. The method as claimed in claim 1, further including the step of providing a hardware configuration of said endoscopic laboratory via said integrated user interface.
13. The method as claimed in claim 1, further including the step of creating and modifying user roles, and the access to system functionality based on said roles.

14. The method as claimed in claim 1, further including the step of automatically associating billing codes with specific medical terminology to enable generation of billing information related to specific exams.

15. The method as claimed in claim 6, further including the step of maintaining the knowledge base by enabling the addition of new keywords, sentence models and menu structures associated with each phase of care stage.

16. The method as claimed in claim 1, further including the step of maintaining resource information including equipment resources and clinical staff records.

17. The method as claimed in claim 1, further including the step of tracking contextual information including user, patient, examination, department and facility where an examination is to be performed as a user navigates through each phase of care stage via said integrated interface.

18. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for managing information flow in an endoscopy laboratory including a computer device, said endoscopy laboratory adapted to enable users to perform endoscopic procedures upon patients, said method steps comprising:

   g) inputting patient information and setting up schedules for endoscopic examinations via said computer device during a registration phase of care;

   h) inputting preparatory examination information relating to said patient via said computer device prior to performing said procedure;

   i) inputting information during performance of said procedure including the real time endoscopic image capture via said computer device;

   j) inputting information regarding said patient via said computer device after performance of said procedure;

   k) storing said input registration and scheduling information, preparatory information, captured images obtained during said procedure, and post-procedure information regarding said patient in database records;

   l) organizing presentation of information included in said database records and managing access to said information and images stored in said database records via an integrated user interface associated with said computer device, said presentation and access controlled according to a user’s role,

wherein support for the full flow of patient and related information is provided through various phases associated with all users involved in an endoscopy practice.

19. The program storage device readable by a machine as claimed in claim 18, wherein said method steps further include the step of tracking a patient’s state to ensure all information is captured in a particular order prior to implementing a next phase of care stage based on the current user state.

20. The program storage device readable by a machine as claimed in claim 18, wherein said patient information includes historical data, medical alerts, and medications currently prescribed for the patient, said system further enabling the presentation of said historical data, medical alerts, and medications.

21. The program storage device readable by a machine as claimed in claim 18, wherein

   said patient information includes scheduling information for setting up an endoscopic examination to be performed, said method further including the step of:

   assigning resources for an examination including procedure rooms and equipment to be used for a procedure.

22. The program storage device readable by a machine as claimed in claim 18, wherein the step of inputting preparatory examination information includes providing check of preparation, medication, and consent relating to the start of a patient’s visit.

23. The program storage device readable by a machine as claimed in claim 18, wherein the step of inputting information during performance of said procedure includes enabling interaction with a knowledge base including selectable keywords via said integrated user interface that enable the build of a hierarchical list of keywords that will be used to automatically generate documentation related to the examination at each phase of care stage.

24. The program storage device readable by a machine as claimed in claim 18, wherein the step of inputting information during performance of said procedure includes: enabling a user to record each of a patient’s vital signs, medication details, equipment use details and pathology specimen information relative to the procedure.

25. The program storage device readable by a machine as claimed in claim 18, wherein the step of inputting information regarding said patient after performance of said procedure includes information relating to monitoring a patient in a recovery room, including medications administered.

26. The program storage device readable by a machine as claimed in claim 18, wherein the step of inputting information regarding said patient after performance of said procedure includes adding annotations to images captured during said exam.

27. The program storage device readable by a machine as claimed in claim 18, further including the step of enabling comparison of captured images related to a current exam with saved images relating to a patient’s prior exam.

28. The program storage device readable by a machine as claimed in claim 18, further including the step of providing predefined template-based management reporting capability, including the generation of templates for generating procedure notes, reports, and other documentation at each phase of care stage.

29. The program storage device readable by a machine as claimed in claim 18, further including the step of customizing a hardware configuration of said endoscopic laboratory via said integrated user interface.

30. The program storage device readable by a machine as claimed in claim 18, further including the step of: creating and modifying user roles, and the access to system functionality based on said roles.

31. The program storage device readable by a machine as claimed in claim 18, further including the step of automatically associating billing codes with specific medical terminology to enable generation of billing information related to specific exams.
32. The program storage device readable by a machine as claimed in claim 23, further including the step of maintaining the knowledge base by enabling the addition of new keywords, sentence models and menu structures associated with each phase of care stage.

33. The program storage device readable by a machine as claimed in claim 18, further including the step of maintaining resource information including equipment resources and clinical staff records.

34. The program storage device readable by a machine as claimed in claim 18, further including the step of tracking contextual information including user, patient, examination, department and facility where an examination is to be performed as a user navigates though each phase of care stage via said integrated interface.

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