Core Standards for
Telemedicine Operations November 2007
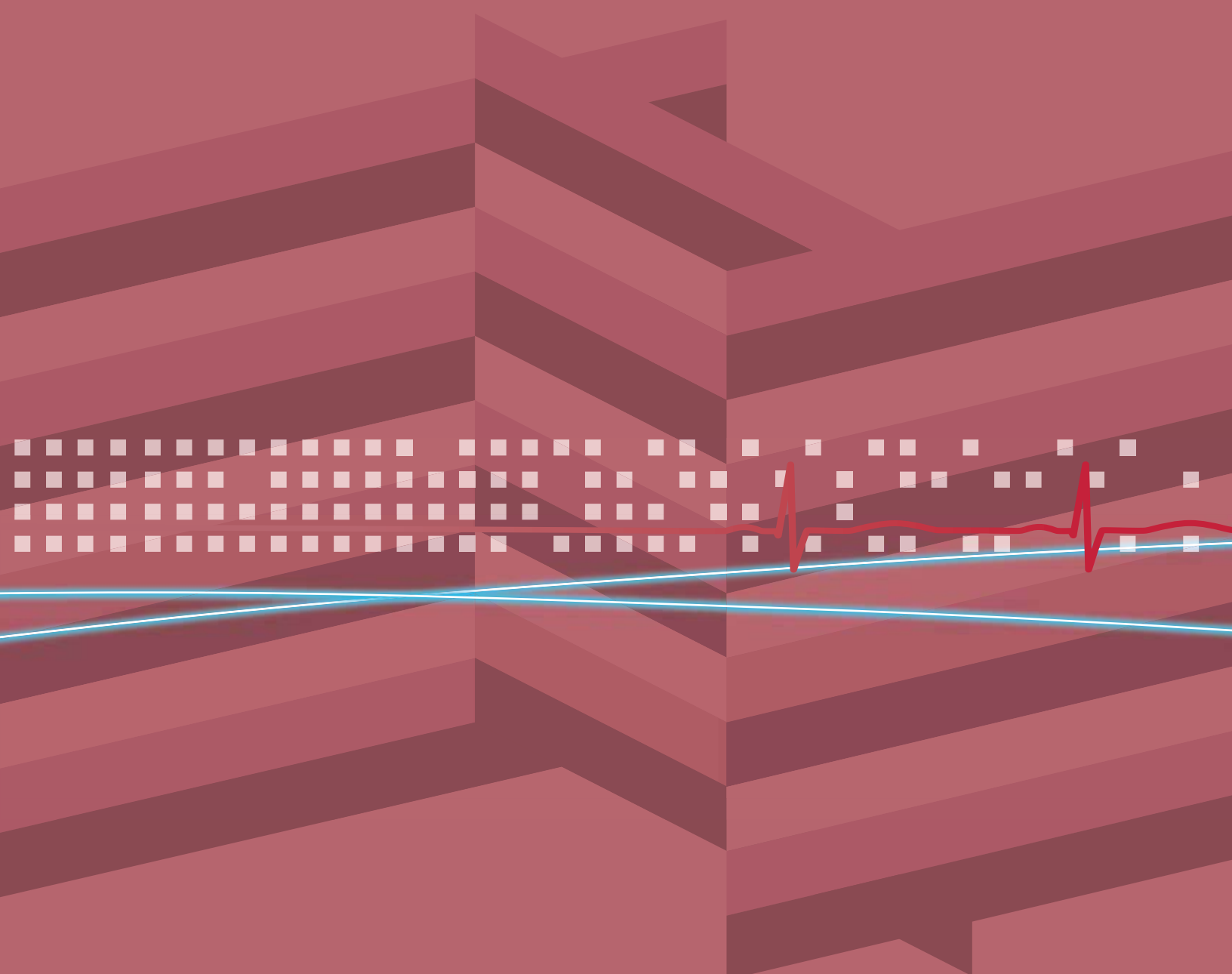
The American Telemedicine Association

Core Standards for Telemedicine Operations

Preamble

The American Telemedicine Association (ATA), with members from throughout the United States and throughout the world, is the principal organization bringing together telemedicine practitioners, healthcare institutions, vendors and others involved in providing remote healthcare using telecommunications. ATA is a nonprofit organization that seeks to bring together diverse groups from traditional medicine, academia, technology and telecommunications companies, e-health, allied professional and nursing associations, medical societies, government and others to overcome barriers to the advancement of telemedicine through the professional, ethical and equitable improvement in health care delivery.

ATA has embarked on an effort to establish practice guidelines and technical standards for telemedicine to help advance the science and to assure the uniform quality of service to patients. They are developed by panels that include experts from the field and other strategic stakeholders and designed to serve as both an operational reference and an educational tool to aid in providing appropriate care for patients. The guidelines and standards generated by ATA will undergo a thorough consensus and rigorous review, with final approval by the ATA Board of Directors. Existing products will be reviewed and updated periodically.

The practice of medicine is an integration of both the science and art of preventing, diagnosing, and treating diseases. Accordingly, it should be recognized that compliance with these guidelines will not guarantee accurate diagnoses or successful outcomes. The purpose of these standards is to assist practitioners in pursuing a sound course of action to provide effective and safe medical care that is founded on current information, available resources, and patient needs. The practice guidelines and technical standards recognize that safe and effective practices require specific training, skills, and techniques, as described in each document. The resulting products are properties of ATA and any reproduction or modification of the published practice guideline and technical standards must receive prior approval by ATA.

If circumstances warrant, a practitioner may responsibly pursue a course of action different from the guidelines when, in the reasonable judgment of the practitioner, such action is indicated by the condition of the patient, restrictions or limits on available resources, or advances in information or technology subsequent to publication of the guidelines. Nonetheless, a practitioner who uses an approach that is significantly different from these guidelines is strongly advised to provide documentation, in the patient record, that is adequate to explain the approach pursued.

Scope

The following standards are fundamental requirements to be followed in providing remote medical services, interactive patient encounters, and any other electronic communications between patients and practitioners for the purposes of health care delivery. They apply to individual practitioners, group practices, health care systems, and other providers of health related services where there are telehealth interactions between patients and service providers for the purposes of health care delivery. These standards do not apply to specific clinical practices. Standards and guidelines addressing specific clinical areas will be developed by separate work groups within ATA and its collaborators.

Definitions

A set of terms and definitions that are commonly used in telemedicine/telehealth has been developed and is available for public comment and review on the ATA website. However, for the purposes of this document, there are several terms that need to be clarified. The term "organization" includes organizations and health professionals who work in organizations. "Health professionals" refers to individuals. The key word "shall" is used to indicate a mandatory requirement, statement, or action.

Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve, maintain, or assist patients' health status. Closely associated with telemedicine is the term "telehealth," which is often used to encompass a broader definition of remote health care that does not always involve clinical services. Videoconferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education, and nursing call centers, are all considered part of telemedicine and telehealth (ATA, 2007).

Standards are defined as a statement established by consensus or authority, that provide a benchmark for measuring quality and that are aimed at achieving optimal results (NIFTE Research Consortium, 2003).

Administrative Standards

Organizations

1. Organizations providing services via telehealth shall follow the standard operating policies and procedures of the governing institution. If the telehealth operation is a sole entity or part of a solo practice, that entity or solo practice shall have policies and procedures in place to govern all administrative functions that responsibly include and address aspects of telehealth with regards to:

    a. Human resource management

    b. Privacy and confidentiality

  c. Federal, state, and other credentialing and regulatory agency requirements

  d. Fiscal management

  e. Ownership of patient records

  f. Documentation

  g. Patient rights and responsibilities

  h. Network security

  i. Telehealth equipment use

  j. Research protocols

2. Organizations providing telehealth programs shall have in place a systematic quality improvement and performance management process that complies with any organizational, regulatory, or accrediting, requirements for outcomes management.

3. Organizations and health professionals providing telehealth services shall ensure compliance with relevant legislation, regulations, and accreditation requirements for supporting patient/client decision-making and consent, including protection of patient health information.

4. Organizations shall have a mechanism in place for assuring that patients are aware of their rights and responsibilities with respect to accessing health care via telehealth technologies, including the process for communicating complaints.

5. Organizations shall integrate telehealth into the existing operational procedures for obtaining consent for treatment from patients and organizations shall provide a mechanism for additional informed consent when required for invasive procedures.

6. Organizations providing telehealth services that establish collaborative partnerships shall be aware of applicable legal and regulatory requirements for appropriate written agreements, memorandum of understanding, or contracts. Those contracts, agreements, etc., shall be based on the scope and application of the telehealth services offered, and, shall address all applicable administrative, clinical, and technical requirements.

Health Professionals

1. Health professionals providing telehealth services shall be fully licensed and registered with their respective regulatory/licensing bodies and with respect to the site where the patient is located, administrative, legislative, and regulatory requirements.

2. Health professionals providing telehealth services shall be aware of credentialing requirements at the site where the consultant is located and the site where the patient is located, in compliance with and when required by regulatory and accrediting agencies.

3. Health professionals shall be aware of their locus of accountability and any/all requirements (including those for liability insurance) that apply when practicing telehealth in another jurisdiction.

4. Health professionals using telehealth shall be cognizant of when a provider-patient relationship has been established within the context of a telemedicine encounter between the health care provider and the patient, whether interactive or store-and-forward, and proceed accordingly with an evidence-based, best possible standard of care.

5. Health professionals providing telehealth services shall have the necessary education, training/orientation, and ongoing continuing education/professional development to ensure they possess the necessary competencies for the safe provision of quality health services in their specialty area.

Clinical Standards

1. The organization and health professionals shall be satisfied that health professionals providing care via telehealth are aware of their own professional discipline standards and those standards shall be upheld in the telehealth encounter, considering the specific context, location and timing, and services delivered to the patient.

2. Health professionals shall be guided by professional discipline and national existing clinical practice guidelines when practicing via telehealth, and any modifications to specialty-specific clinical practice standards for the telehealth setting shall ensure that clinical requirements specific to the discipline are maintained.

Technical Standards

1. Organizations shall ensure that equipment sufficient to support diagnostic needs is available and functioning properly at the time of clinical encounters.

2. Organizations shall have strategies in place to address the environmental elements of care necessary for the safe use of telehealth equipment.

3. Organizations shall comply with all relevant safety laws, regulations, and codes for technology and technical safety.

4. Organizations shall have infection control policies and procedures in place for the use of telehealth equipment and patient peripherals that comply with organizational, legal, and regulatory requirements.

5. Organizations providing telehealth services shall have policies and procedures in place to comply with local legislated and regulatory rules for protection of patient health information and to ensure the physical security of telehealth equipment and the electronic security of data.

6. Organizations shall have appropriate redundant systems in place that ensure availability of the network for critical connectivity.

7. Organizations shall have appropriate redundant clinical video and exam equipment for critical clinical encounters and clinical functions.

8. Organizations shall meet required published technical standards for safety and efficacy for devices that interact with patients or are integral to the diagnostic capabilities of the practitioner when and where applicable.

9. Organizations providing telehealth services shall have processes in place to ensure the safety and effectiveness of equipment through on-going maintenance.

References

1. American Telemedicine Association. http://atmeda.org/news/definition.html. Last accessed August 7, 2007.

2. National Initiative for TeleHealth Guidelines: Environmental Scan of Organizational, Technology, Clinical and Human Resource Issues. RW Pong, JC Hogenbirk, K Byrne, L Liboiron-Grenier, P Jennett, M Yeo, J Finley, D Reid, C Szpilfogel, S Heath, P Brockway, T Cradduck. April 30, 2003. www.liebertonline.com/doi/pdf/10.1089/153056**2**04773644661. Last accessed August 7, 2007.

Telemedicine/Telehealth Terminology

The following is a list of terms and definitions that are commonly used in telemedicine/telehealth. The list was assembled for the purpose of encouraging consistency in employing these terms in ATA related documents and resource materials. The list is not all-inclusive and may be augmented by for specialty areas as deemed appropriate by ATA member groups.

Application Service Provider (ASP): An ASP hosts a variety of applications on a central server. For a fee, customers can access the applications that interest them over secure Internet connections or a private network. This means that they do not need to purchase, install and maintain the software themselves; instead they rent the applications they need from their ASP. Even new releases, such as software upgrades, are generally included in the price.

Asynchronous: This term is sometimes used to describe store and forward transmission of medical images or information because the transmission typically occurs in one direction in time. This is the opposite of synchronous (see below).

Authentication: A method of verifying the identity of a person sending or receiving information using passwords, keys and other automated identifiers.

Bandwidth: A measure of the information carrying capacity of a communications channel; a practical limit to the size, cost, and capability of a telemedicine service.

Bluetooth Wireless: Bluetooth is an industrial specification for wireless personal area networks (PANs). Bluetooth provides a way to connect and exchange information between devices such as mobile phones, laptops, PCs, printers, digital cameras and video game consoles over a secure, globally unlicensed short-range radio frequency. The Bluetooth specifications are developed and licensed by the Bluetooth Special Interest Group.

Broadband: Communications (e.g., broadcast television, microwave, and satellite) capable of carrying a wide range of frequencies; refers to transmission of signals in a frequency-modulated fashion, over a segment of the total bandwidth available, thereby permitting simultaneous transmission of several messages.

Clinical Information System: Relating exclusively to the information regarding the care of a patient, rather than administrative data, this hospital-based information system is designed to collect and organize data.

CODEC: Acronym for coder-decoder. This is the videoconferencing device (e.g., Polycom, Tandberg, Sony, Panasonic, etc) that converts analog video and audio signals to digital video and audio code and vice versa. CODECs typically compress the digital code to conserve bandwidth on a telecommunications path.

Compressed video: Video images that have been processed to reduce the amount of bandwidth needed to capture the necessary information so that the information can be sent over a telephone network.

Computer-based Patient Record (CPR): An electronic form of individual patient information that is designed to provide access to complete and accurate patient data.

Data Compression: A method to reduce the volume of data using encoding to reduce image processing, transmission times, bandwidth requirements, and storage space requirements. Some compression techniques result in the loss of some information, which may or may not be clinically important.

Diagnostic Equipment (Scopes, Cameras & Other Peripheral Devices): A hardware device not part of the central computer (e.g. digitizers, stethoscope, or camera) that can provide medical data input to or accept output from the computer.

Digital Camera (still images): A digital camera is typically used to take still images of a patient. General uses for this type of camera include dermatology and wound care. This camera produces images that can be downloaded to a PC and sent to a provider/consultant over a network.

Digital Imaging and Communication in Medicine (DICOM): A standard for communications among medical imaging devices; a set of protocols describing how images are identified and formatted that is vendor-independent and developed by the American College of Radiology and the National Electronic Manufacturers Association.

Disease Management: A continuous coordinated health care process that seeks to manage and improve the health status of a carefully defined patient population over the entire course of a disease (e.g., CHF, DM) The patient populations targeted are high-risk, high-cost patients with chronic conditions that depend on appropriate care for proper maintenance.

Distance Learning: The incorporation of video and audio technologies, allowing students to "attend" classes and training sessions that are being presented at a remote location. Distance learning systems are usually interactive and are a tool in the delivery of training and education to widely dispersed students, or in instances in which the instructor cannot travel to the student's site.

Distant Site: The distant site is defined as the telehealth site where the provider/specialist is seeing the patient at a distance or consulting with a patient's provider. (CMS) Others common names for this term include – hub site, specialty site, provider/physician site and referral site. The site may also be referred to as the consulting site.

Document Camera: A camera that can display written or typed information (e.g., lab results), photographs, graphics (e.g., ECG strips) and in some cases x-rays.

Electronic Data Interchange (EDI): The sending and receiving of data directly between trading partners without paper or human intervention.

Electronic Patient Record: An electronic form of individual patient information that is designed to provide access to complete and accurate patient data, alerts, reminders, clinical decision support systems, links to medical knowledge, and other aids.

Encryption: A system of encoding data on a Web page or e-mail where the information can only be retrieved and decoded by the person or computer system authorized to access it.

Firewall: Computer hardware and software that block unauthorized communications between an institution's computer network and external networks.

Full-motion Video: This describes a standard video signal that allows video to be shown at the distant end in smooth, uninterrupted images.

Guideline: A statement of policy or procedures by which to determine a course of action, or give guidance for setting standards (Loane & Wootton, 2002).

H.320: This is the technical standard for videoconferencing compression standards that allow different equipment to interoperate via T1 or ISDN connections.

H.323: This is the technical standard for videoconferencing compression standards that allow different equipment to interoperate via the Internet Protocol (see below).

H.324: This is the technical standard for videoconferencing compression standards that allow different equipment to interoperate via Plain Old Telephone Service (POTS).

Health Level-7 Data Communications Protocol (HL-7): This communication standard guides the transmission of health-related information. *HL7* allows the integration of various applications, such as bedside terminals, radiological imaging stations, hospital census, order entries, and patient accounting, into one system.

HIPAA: Acronym for Health Information Portability Act.

Home Health Care & Remote Monitoring Systems: Home health care is care provided to individuals and families in their place of residence for promoting, maintaining, or restoring health; or for minimizing the effects of disability and illness, including terminal illness. In the Medicare Current Beneficiary Survey and Medicare claims and enrollment data, home health care refers to home visits by professionals including nurses, physicians, social workers, therapists, and home health aides. Using remote monitoring and interactive devices allows the patient to send in vital signs on a regular basis to a provider without the need for travel.

Informatics: The use of computer science and information technologies to the management and processing of data, information and knowledge.

Integrated Services Digital Network (ISDN): This is a common dial-up transmission path for videoconferencing. Since ISDN services are used on demand by dialing another ISDN based device, per minute charges accumulate at some contracted rate and then are billed to the site placing the call. This service is analogous to using the dialing features associated with a long distance telephone call. The initiator of the call will pay the bill. ISDN permits connections up to 128Kbps.

Interactive Video/Television: This is analogous with video conferencing technologies that allow for two-way, synchronous, interactive video and audio signals for the purpose of delivering telehealth, telemedicine or distant education services. It is often referred to by the acronyms – ITV, IATV or VTC (video teleconference).

Internet Protocol: The Internet Protocol (IP) is the protocol by which data is sent from one computer to another on the Internet. Each computer on the Internet has at least one address that uniquely identifies it from all other computers on the Internet. IP is a connectionless protocol, which means that there is no established connection between the end points that are communicating. The IP address of a videoconferencing system is its phone number.

Interoperability: Interoperability refers to the ability of two of more systems* to interact with one another and exchange information in order to achieve predictable results (*refers to more than technical systems) (Bergman, Ulmer and Sargious, 2001). There are three types of interoperability: human/operational; clinical; and technical (Canadian Society for Telehealth, 2001). Interoperability refers to the ability of two or more systems (computers, communication devices, networks, software, and other information technology components) to interact with one another and exchange data according to a prescribed method in order to achieve predictable results (ISO ITC-215).

ISDN Basic Rate Interface (BRI): This is an ISDN interface that provides 128k of bandwidth for videoconferencing or simultaneous voice and data services. Multiple BRI lines can be linked together using a multiplexer (see below) to achieve higher bandwidth levels. For instance, a popular choice among telehealth networks is to combine 3 BRI lines to provide 384k of bandwidth for video-conferencing. It should be noted that BRI services are not available in some rural locations. One should check with their telecommunications providers on the availability of BRI service before ordering videoconferencing equipment that uses this type of service.

ISDN Primary Rate Interface (PRI): This is an ISDN interface standard that operates using 23, 64k channels and one 64k data channel. With the proper multiplexing equipment the ISDN PRI channels can be selected by the user for a video call. For instance if the user wants to have a videoconference at 384k of bandwidth then they can instruct the multiplexer to use channels 1 through 6 (6 x 64k = 384k). This is important because the user typically pays charges based on the number of 64k channels used during a videoconference. The fewer channels used to obtain a quality video signal the less expensive the call.

JCAHO: Acronym for Joint Commission on Accreditation of Healthcare Organizations.

Lossless: A format of data compression, typically of an order of less than 2:1, in which none of the original data information is lost when the image is reproduced.

Lossy: A process of data compression at a relatively high ratio, which leads to some permanent loss of information upon reconstruction.

Medical/ Nursing Call Center: A call center is a centralized office that answers incoming telephone calls from patients. Such an office may also respond to letters, faxes, e-mails and similar written correspondence. Usually staffed by nurses, call centers provide basic health information and instructions to callers but do not provide an official diagnosis of conditions or prescribe medicine. Call centers act as an initial triage point for patients.

Mobile Telehealth: The provision of health care services with the assistance of a van, trailer, or other mobile unit in which the health care provider might provide patient services at a distance from a normal medical facility. Services may also be provided through mobile technologies that allow a mobile vehicle equipped with medical technologies to attach to an existing health care facility, such as mobile CT, MRI, or TeleDentistry.

Multiplexer (MUX): A device that combines multiple inputs (ISDN PRI channels or ISDN BRI lines) into an aggregate signal to be transported via a single transmission path.

Multi-point Control Unit (MCU): A device that can link multiple videoconferencing sites into a single videoconference. An MCU is also often referred to as a "bridge".

Multi-point Teleconferencing: Interactive electronic communication between multiple users at two or more sites which facilitates voice, video, and/or data transmission systems: audio, graphics, computer and video systems. Multi-point teleconferencing requires a MCU or bridging device to link multiple sites into a single videoconference.

Network Integrators: Organizations specializing in the development of software and related services that allows devices and systems to share data and communicate to one another.

Originating Site: The orginating site is where the patient and/or the patient's physician is located during the telehealth encounter or consult (CMS). Other common names for this term include – spoke site, patient site, remote site, and rural site.

Patient Exam Camera (video): This is the camera typically used to examine the general condition of the patient. Types of cameras include those that may be embedded with set-top videoconferencing units, handheld video cameras, gooseneck cameras, camcorders, etc. The camera may be analog or digital depending upon the connection to the videoconferencing unit.

Peripheral Devices: Any device that is attached to a computer externally, i.e. Scanners, mouse pointers, printers, keyboards; and clinical monitors such as pulse oximeters, weight scales, are all examples of this.

Pharmacy Solutions: The use of electronic information and communication technology to provide and support comprehensive pharmacy services when distance separates the participants.

POTS: Acronym for Plain Old Telephone Service.

Presenter (Patient Presenter): Telehealth encounters require the distant provider to perform an exam of a patient from many miles away. In order to accomplish that task an individual with a clinical background (e.g., LPN, RN, etc) trained in the use of the equipment must be available at the originating site to "present" the patient, manage the cameras and perform any "hands-on" activities to successfully complete the exam. For example, a neurological diagnostic exam usually requires a nurse capable of testing a patient's reflexes and other manipulative activities. It should be noted that in certain cases, such as interview based clinical consultations such as Telemental Health or Nutrition Services, that a licensed practitioner such as an RN or LPN, might not be necessary, and a non-licensed provider such as support staff, could provide telepresenting functions.

RHIO: Regional Health Information Organization (RHIO) and Health Information Exchange (HIE) are often used interchangeably. RHIO is a group of organizations with a business stake in improving the quality, safety, and efficiency of healthcare delivery. RHIOs are the building blocks of the proposed National Health Information Network (NHIN) initiative at the Office of the National Coordinator for Health Information Technology (ONCHIT).

Router: This device provides an interface between two networks or connects sub-networks within a single organization. It routes network traffic between multiple locations and it can find the best route between any two sites. For example, PCs or H.323 videoconferencing devices tell the routers where the destination device is located and the routers find the best way to get the information to that distant point.

Standard: A statement established by consensus or authority, that provides a benchmark for measuring quality, that is aimed at achieving optimal results (NIFTE Research Consortium, 2003).

Store and Forward (S&F): S&F is a type of telehealth encounter or consult that uses still digital images of a patient for the purpose of rendering a medical opinion or diagnosis. Common types of S&F services include radiology, pathology, dermatology and wound care. Store and forward also includes the asynchronous transmission of clinical data, such as blood glucose levels and electrocardiogram (ECG) measurements, from one site (e.g., patient's home) to another site (e.g., home health agency, hospital, clinic).

Switch: A switch in the videoconferencing world is an electrical device that selects the path of the video transmission. It may be thought of as an intelligent hub (see hub above) because it can be programmed to direct traffic on specific ports to specific destinations. Hub ports feed the same information to each device.

Synchronous: This term is sometimes used to describe interactive video connections because the transmission of information in both directions is occurring at exactly the same period.

System/Network Integration: The use of software that allows devices and systems to share data and communicate to one another.

T1/DS1: A digital carrier or type of telephone line service offering high-speed data, voice, or compressed video access in two directions, with a transmission rate of 1.544 Mbps.

T3/DS3: A carrier of *45* Mbps.

TCP/IP (Transmission Control Protocol/Internet Protocol): The underlying communications rules and protocols that allow computers to interact with each other and exchange data on the Internet.

Telecommunications Providers: An entity licensed by the government (the Federal Communications Commission in the U.S.) to provide telecommunications services to individuals or institutions.

Teleconferencing: Interactive electronic communication between multiple users at two or more sites which facilitates voice, video, and/or data transmission systems: audio, graphics, computer and video systems.

Telehealth and Telemedicine: Telemedicine and telehealth both describe the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Although evolving, telemedicine is sometimes associated with direct patient clinical services and telehealth is sometimes associated with a broader definition of remote healthcare services.

Telematics: The use of information processing based on a computer in telecommunications, and the use of telecommunications to permit computers to transfer programs and data to one another.

Telementoring: The use of audio, video, and other telecommunications and electronic information processing technologies to provide individual guidance or direction. An example of this help may involve a consultant aiding a distant clinician in a new medical procedure.

Telemonitoring: The process of using audio, video, and other telecommunications and electronic information processing technologies to monitor the health status of a patience from a distance.

Telepresence: The method of using robotic and other instruments that permit a clinician to perform a procedure at a remote location by manipulating devices and receiving feedback or sensory information that contributes to a sense of being present at the remote site and allows a satisfactory degree of technical achievement. For example, this term could be applied to a surgeon using lasers or dental hand pieces and receiving pressure similar to that created by touching a patient so that it seems as though s/he is actually present, permitting a satisfactory degree of dexterity.

Teleradiology and Picture Archiving and Communications Systems (PACs): The electronic transmission of radiological images, such as x-rays, CTs, and MRIs, for the purposes of interpretation and/or consultation. Digital images are transmitted over a distance using standard telephone lines, satellite connections, or local area networks (LANs). Teleradiology also is beginning to include the process of interfacing with the hospital information systems/radiology information systems (HIS/RIS) in the transport of digital images. PACs provide centralized storage and access to medical images over information systems.

Ultrasound: A device that uses high-frequency sound waves to examine structures inside the body. It can rapidly detect tumors and other abnormalities, often right in the physician's office.

Universal Service Administrative Company (USAC): The Universal Service Administrative Company administers the Universal Service Fund (USF), which provides communities across the country with affordable telecommunication services. The Rural Health Care Division (RHCD) of USAC manages the telecommunications discount program for health care.

Videoconferencing Systems: Equipment and software that provide real-time, generally two way transmission of digitized video images between multiple locations; uses telecommunications to bring people at physically remote locations together for meetings. Each individual location in a *videoconferencing* system requires a room equipped to send and receive video.

Videoconferencing: Real-time, generally two way transmission of digitized video images between multiple locations; uses telecommunications to bring people at physically remote locations together for meetings. Each individual location in a *videoconferencing* system requires a room equipped to send and receive video.

WiFi: Originally licensed by the Wi-Fi Alliance to describe the underlying technology of wireless local area networks (WLAN) based on the IEEE 802.11 specifications. It was developed to be used for mobile computing devices, such as laptops, in LANs, but is now increasingly used for more services, including Internet and VoIP phone access, gaming, and basic connectivity of consumer electronics such as televisions and DVD players, or digital cameras. (Wikipedia)