

Case Number : 10

Main Facility : "Department of Radiology, Nagoya University School of
Medicine"

Related Facilities : "Duke University Medical Center, Nagoya Institute
of Technology, Technology & Development Division Communication
Policy Bureau Ministry of Telecommunications"

Number of Facilities : 3

Practicality : Experimental

Date of Start : 1996/9

Date of End : 1997/3

Status : proceeding

Outline : One of the projects of the International Joint Project,
"Global Interoperation of Broad Network (GIBN)," with the theme of
"Remote medical care demonstration experiment for the treatment of
cancer and other diseases"

Technology - Materials : Stereoscopic television

Technology - Communication Lines : NTT Multimedia experimental
network (45Mbps) - The fifth Pacific Ocean submarine optical cable
(156Mbps) - AT&T inter span

Characteristics : The three-dimensional images of MRI and endoscopic
images are bi-directionally transmitted with stereoscopic
television (for the naked eyes). TV conference is also made with
stereoscopic images.

Evaluation : Japan-USA joint clinical evaluation is made for
three-dimensional images by stereoscopic television.

Keywords : Stereoscopic television

References : (1) SPIE Volume 2409 96-101, 1995 (2) Radiology
201 (p), 530, 1996

Person in Charge : Takeo Ishigaki

Department : "Department of Radiology, Nagoya University School of
Medicine"

Tel : +81-52-744-2326

Fax : +81-52-744-2334

E-mail : i45265a@nucc. cc. nagoya-u. ac. jp

Date Updated : 1999/3/14

Case Number : 11

Main Facility : "Department of Medical Information science, Faculty of
Medicine, Kyushu University"

Related Facilities : "University of Missouri-Columbia, Kanntou Teisin
Hospital"

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1975/2

Date of End : 1997/3

Status : in progress

Outline : The analog signals of standard 12-lead electrocardiograms
are transmitted over telephone to make highly accurate automatic
analyses. The signals were transmitted not only from remote places
outside the hospital, but also from many laboratories in the
hospital. Approximately 50 automatic analyses per day have been
made.

Technology - Materials : (1) 1975-1987: Three-channel
electrocardiograph with low noise recording and automatic
telephone dialing functions, FM dual modulation interface, A/D
converter, process computer, and general-purpose digital calculator
(2) 1987-: digital electrocardiograph, process computer, and
general-purpose digital computer

Technology - Communication Lines : (1) 1975-1987: General public
telephone that transmits the analog signals of the FM modulation
method. (2) 1987-: Digital circuit network.

Characteristics : (1) 1975-1987: The world top level automatic
diagnosis of electrocardiograms can be immediately made. Because
the system uses a general public telephone line, the diagnosis can
be made for the patients in remote places, isolated islands, or
foreign countries. (2) 1987- The same as above. Time sequence
comparative diagnosis can be made by referring to the database of
the analytical results of electrocardiograms. Digital
communication lines were required. Noise was further reduced.

Evaluation : (1) 1975-1987: Can be put into practical use if the
telephone quality (noise level) of Japan and USA is ensured. (2)
The noise problem of the communication line was resolved. The
world top level diagnostic reliability has been maintained.

Keywords : Automatic diagnosis of electrocardiograms, Bonner Program,
Comparative diagnosis

References :

Person in Charge : "Yoshiaki Nose, M. D. Ph. D. "

Department : "Department of Medical Information Science, Faculty of
Medicine, Kyushu University"

Tel : +81-92-642-5880

Fax : +81-92-642-5889

E-mail : nose@info.med.kyushu-u.ac.jp

Date Updated : 1999/2/24

Case Number : 12

Main Facility : Mie Unversity Hospital

Related Facilities : Matsusaka City Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1995/4

Date of End : 1995/12

Status : proceeding

Outline : Dedicated remote pathologic diagnosis system made by Nikon

Technology - Materials : Remote pathologic diagnosis system made by
Nikon, NTSC

Technology - Communication Lines : INS64

Characteristics : Operates on INS64.

Evaluation : Pathologists reach the same diagnosis at more than 90%
of cases. Therefore, there is no problem related with the
consistency among pathologists. The remote operation of
cytodiagnosis was poor. The system is too expensive.

Keywords : Remote pathologic diagnosis, INS64

References :

Person in Charge : Taizo Shiraishi

Department : "Mie Unversity Hospital, Pathology Division"

Tel : +81-59-232-1111 ext. 5397

Fax : +81-59-231-5229

E-mail : tao@doc.medic.mie-u.ac.jp

Date Updated : 1999/2/19

Case Number : 13

Main Facility : "Department of Radiology, Mie University School of
Medicine"

Related Facilities : Owase City Hospital; Yamada Red Cross General
Hospital; Nishii Clinic; Atsuta Children's Clinic; National Mie
Hospital

Number of Facilities : 5

Practicality : Practical

Date of Start : 1992/4

Date of End :

Status : pause

Outline : Image consulting system with telephone conversation.
Real-time examination of EKG and other examination data are
performed at the same time. Pathologic system is included.

Technology - Materials : VM64 (NTT) by NTSC signals

Technology - Communication Lines : INS64 (128 Kbps)

Characteristics : The system allows the comprehensive examination of
various data (including images) and provides the opportunity to
hear the opinions of experts.

Evaluation : The system has achieved numerous results, including the
rescue of a patient with a head injury and the confirmative
diagnosis of sarcoidosis which could not be determined in a
certain hospital. The remaining problems include a small number of
users and the operation in the university. Clinicians were
generally satisfied with CX-P. There remains a
compatibility-related problem.

Keywords : Remote image diagnosis, consulting system

References :

Person in Charge : Kan TAKEDA

Department : "Department of Radiology, Mie University School of
Medicine"

Tel : +81-59-231-5195

Fax : +81-59-231-5195

E-mail :

Date Updated : 1999/3/15

Case Number : 14

Main Facility : Shimane medical university

Related Facilities : Oki hospital; Nichihara kyozon hospital; Shimane institute of health science; Masuda medical association hospital

Number of Facilities : 4

Practicality : Experimental

Date of Start : 1996/6

Date of End :

Status : in progress

Outline : The images of X-ray CT and MRI are sent from hospitals at remote places, such as isolated islands, to the university hospital through the digital circuit (ISDN). The physicians in the university hospital examine the images, and send the examination reports back to the hospitals. Because all the X-ray CT and MRI images as well as their reports are stored in a database, the previous data of each patient can be referred to in a moment for further examination. - Oki Hospital (June to September, 1996); Nichihara Kyozon Hospital (January to March, 1997); Hospital for Serious Diseases (it is now considered whether this hospital can serve as a base institution of remote image diagnosis); Masuda Physicians' Association Hospital (January 1998 - The system is being used by receiving a subsidy as the Shimane Pref. Remote Place Medical Care Improving Project)

Technology - Materials : (1) Image Display Equipment: CPU-DODEL715/80SPU (Hewlett Packard), 3 Displays - A4331A (Hewlett Packard), (2) Examination result input and output device: Apple Power Macintosh 7200, Nanao Flex Scan 54T, (3) Others: Separate type uninterruptible power supply

Technology - Communication Lines : ISDN circuit

Characteristics : All the images and reports of patients are stored in a database so that the previous data could be referred to in a moment for further examination. Because video capture is used to collect image data at the sending side, the initial investment is very low.

Evaluation : Images could be transmitted relatively quickly (about 2 seconds per image). The quality of the transmitted images was almost comparable to that of films. However, further improvement is required for the problem that image conditions cannot be adjusted on the monitor. The reference to previous films and reports was easy and useful. It was expected that the work of the sending hospitals would be reduced. The system error related with the image transfer occurred only between Hospinet and the department of radiology, Shimane Medical College. This was mainly attributed to software bug because the system that had been run on-line was dialed up for the first time.

Keywords : Image database, image transfer, CRT diagnosis, local medicine

References : " Innervision, Vol12, No7, 86-89, 1997 "

Person in Charge : Masaki Sugihara

Department : Shimane medical university

Tel : +81-853-23-2111

Fax : +81-853-20-0695

E-mail : sugihara@shimane-med.ac.jp

Date Updated : 1999/3/15

Case Number : 15

Main Facility : Kyoto University Hospital

Related Facilities : Osaka University Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1995/4

Date of End : 1998/3

Status : finished

Outline : The experiment about the medical application of B-ISDN, which is the communication infrastructure of the 21st century, was conducted as a part of B-ISDN applying system development. The medical schools of universities (Kyoto and Ohsaka universities) are continuously connected through ATM exchanger to perform the real-time bi-directional transmission of high-vision pictures. They share the new picture systems and multimedia environment, such as the exchange of lectures and speeches, clinical examination meetings, demonstration of advanced medicine, simultaneous meetings and workshops, and exchange of students. Through these attempts, the cooperation of the universities for the medical research and education in the 21st century is being examined.

Technology - Materials : (1) Picture system: HDTV, HDTV camera, and camera for pictures, (2) Others: Matrix switch, scan converter, and image DB

Technology - Communication Lines : B-ISDN, ATM exchanger

Characteristics : Based on the belief of the leaders of the departments of medical information of the 2 universities that information-oriented society will lose borders, continuous communication has been established between the medical schools to create new medical culture.

Evaluation : Lectures, speeches, and academic conferences have been held almost regularly, which has promoted the information exchange between the medical schools of the 2 universities by sharing new information space. These efforts have been highly rated in the 2 universities.

Keywords : B-ISDN, ATM, HDTV, border-less

References : "Minato K et al: High-Definition TV Tele-Conference Between Two Medical Schools, Proceedings of the 16th conference in medical informatics in Japan, 736-737, 1996; Takahashi, et al: A trial of seamless communication between Kyoto and Osaka univ. hospital using B-ISDN, Proceedings of the 14th conference in medical informatics in Japan, 347-348, 1994"

Person in Charge : Takashi Takahashi

Department : Kyoto University Hospital

Tel : +81-75-751-3646

Fax : +81-75-751-3076

E-mail : tak@kuhp.kyoto-u.ac.jp

Date Updated : 1998/4/20

Case Number : 16

Main Facility : Kushiro Neurosurgical Hospital

Related Facilities : Nemuro Municipal Hospital; Nakashibetsu Town Hospital; Betsukai Town Hospital; Akkeshi Town Hospital; Akan Town Kokumin Kenkou Hoken Hospital; Shibetsu Town Kokumin Kenkou Hoken Hospital; Hoshigaura Hospital; Shibeche cho Hospital; Rausu Town Kokumin Kenkou Hoken Hospital; National Teshikaga Hospital

Number of Facilities : 10

Practicality : Practical

Date of Start : 1993/6

Date of End :

Status : in progress

Outline : System that quickly transmits CT images, which were taken with a 3CCD camera, as stationary images through general telephone circuit. The system can be used at any time and is mainly intended for neurosurgical cases.

Technology - Materials : Hitachi VG-100 (3CCD camera, monitor, stationary image transmitting device, video printer, and video floppy)

Technology - Communication Lines : General telephone circuit (NTT)

Characteristics : Neurosurgical diagnosis, remote diagnosis of therapeutic policy

Evaluation : It has been used to make neurosurgical diagnoses and determine therapeutic policies for general and emergency cases in a wide area (including a remote place that takes 3 hours for an ambulance car). It has been proved to be very useful.

Keywords : Teleradiology

References :

Person in Charge : Koji Saito

Department : Kushiro Neurosurgical Hospital

Tel : +81-154-37-5512

Fax : +81-154-37-5521

E-mail : kojinkai@po.infosphere.or.jp

Date Updated : 1999/3/4

Case Number : 17

Main Facility : "Division of Homecare and the Department of Medical Informatics, Hokkaido University Hospital"

Related Facilities :

Number of Facilities :

Practicality : Experimental

Date of Start : 1996/10

Date of End :

Status : in progress

Outline : System in which images of a patient (those of the affected site and catheter injection site, etc.) and simple dynamic images obtained at a visiting care are transmitted to the hospital in order to record and store them as well as receive instructions from physicians and physical therapists.

Technology - Materials : Digital camera, mobile phone and modem, personal computer for receiving the images, and communication software

Technology - Communication Lines : Telephone circuit

Characteristics : Provides a practical system using commercial, inexpensive equipment.

Evaluation : Provides better image quality more immediately and better storability than a Polaroid camera. There remains the room for improvement for hardware and software. The simple dynamic pictures are useful for giving the guidance for rehabilitation.

Keywords : Visiting care, stationary image transmission, mobile phone, rehabilitation

References :

Person in Charge : Tsunetaro Sakurai

Department : "Department of Medical Informatics, Hokkaido University Hospital"

Tel : +81-11-706-6017

Fax : +81-11-700-5608

E-mail : tsakurai-hok@umin.ac.jp

Date Updated : 1999/2/19

Case Number : 18

Main Facility : "Department of Ophthalmology, Asahikawa Medical College"

Related Facilities : Asahikawa Takasagodai Hospital; Kushiro Red Cross Hospital; Sapporo Memorial Eye Clinic; Jiscikai Inomata Hospital; Furano West Hospital; Oji General Hospital; Sapporo-Kosei General Hospital; Shizunai Municipal Hospital; Asahikawa Municipal Hospital Department

Number of Facilities : 9

Practicality : Practical

Date of Start : 1995/8

Date of End :

Status : in progress

Outline : This system connects the department of ophthalmology, Asahikawa Medical College with related hospitals with the ISDN net 1500 circuit to bi-directionally transmit the color dynamic images and voices of surgeries and medical care in real time. Like general television sets, the dynamic images provide 30 frames per second. The pictures provide sharp image quality because the image processing method unique to Matsushita has been employed. As an image input device, a digital 3CCD camera is connected with a slit lamp and surgical microscope, and the transmission of clear microfine images is ensured.

Technology - Materials : Custom-made Telemeet D-406T (1500/30) second 30 frame machine by Matsushita Communication Industry

Technology - Communication Lines : NTT [ISDN net 1500], network through general public circuit

Characteristics : Using the color dynamic image and voice information transmitted from remote related hospitals, appropriate diagnosis and instructions can be made in the college at the same level as in the remote hospitals.

Evaluation : (1) Support of related hospitals in making diagnoses and determining therapeutic policies for serious cases, and (2) support of surgery by live surgery. The system has contributed to remote medicine by smoothly transmitting high quality dynamic images.

Keywords : Optical fiber, Ophthalmology, remote medicine, support of surgeries performed at emote places, Japan-US transmission

References : "Innervision, Vol12, No7, 64-65, 1997 "

Person in Charge : "Akitoshi Yoshida, M. D. "

Department : "Department of Ophthalmology, Asahikawa Medical College"

Tel : +81-166-68-2540

Fax : +81-166-65-9529

E-mail :

Date Updated : 1999/2/26 .

Case Number : 19

Main Facility : "Second Department of Pathology, Hiroshima University School of Medicine"

Related Facilities : Yoshida general hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1995/4

Date of End :

Status : in progress

Outline : A trial operation of the quick intraoperative pathologic diagnosis by stationary image transmission system was started in April 1995 between the Health and Welfare Association Yoshida General Hospital and the Second Department of Pathology, Hiroshima University Medical School as a part of the remote place base hospital operation project of Hiroshima pref. The system was confirmed useful for diagnosis in a total of 178 patients by the end of March 1998.

Technology - Materials : A pathologic diagnosis system "Medical Image Network System" jointly developed by Inohara Shokai (Hiroshima) and NTT was used. This system uses Integrated Services Digital Network (ISDN) circuit made by NTT, and consists of stationary image transmitting equipment, high definition color monitor, medical microscope and CCD camera attached to it, CCD camera for taking the pictures of organs, photomagnetic disk drive for saving image data, speaker phone for talking, and facsimile. The ISDN circuit is a high-speed digital circuit that has 2 channels that transmit 64 kbit information per second and 1 channel for 16 kbit signals. It transmits both voice and images simultaneously. VM-64 is based on NTSC (National Television System Committee) system, and transmits a high definition image (768 x 494 pixels) in about 12 seconds. The monitor used was PVM-1442Q by Sony. CCD cameras used were XC-999 made by Sony, which was connected with a microscope made by Nikon. A magneto optical disk drive, MK-1280, by Mitsubishi chemicals was used for saving image data. The capacity of a disk was about 2000 monotone images and about 1000 color images.

Technology - Communication Lines : ISDN circuit (2B+D)

Characteristics : The operation room, pathologic laboratory, and pathologic office were connected via the ISDN circuit, which made it possible to talk in real time. It is also possible for the pathologic office to explain pathologic examination results to the surgeon with images. The pathologist can specify a part to be magnified with an arrow on the image. When the target is large, the macroscopic pictures of an organ can be taken with the CCD camera attached to the stand and sent to the pathologic office so that an instruction for the section to be cut could be obtained.

Evaluation : The quick intraoperative pathologic diagnosis was made in a total of 178 patients between April 1995 and March 1998. The most frequent target of the clinical diagnosis was gastric tumor in 66 patients, followed by the large intestine and rectum tumor in 33, mammary gland tumor in 16, pulmonary tumor in 4, thyroid tumor in

13, ovarian tumor in 10, and cholelithiasis in 12 (Table 1). The most frequent purpose of the clinical diagnosis was the determination of the infiltration of malignant tumor at the stump in 73 patients, followed by the determination of lymph node metastasis in 86, and histological diagnosis of tumor in 49 (Table 2) (The total is greater than 178 because the system was used for multiple purposes in the same patient). In addition, the number of tissue samples provided per patient ranged from 1 to 9 (mean: 1.97). The total tissue samples of the 178 patients was 342. The mean time from the transmission of sample images to the report of diagnosis was 15 minutes (42 minutes at the longest). Low-magnitude images were not always good, while high-magnitude images had diagnostically acceptable quality.

Keywords : Stationary image transmitting system, telepathology, quick intraoperative pathologic diagnosis, remote place medicine, digital communication

References :

Person in Charge : "Yukio Takeshima, Koji Arihiro, Takashi Nishisaka, Kouki Inai"

Department : "Second Department of Pathology, Hiroshima University School of Medicine"

Tel : +81-82-257-5152

Fax : +81-82-257-5154

E-mail :

Date Updated : 1999/2/19

Case Number : 20

Main Facility : Imaging Net Ltd.

Related Facilities : Four private hospitals and Four public hospitals

Number of Facilities : 7

Practicality : Practical

Date of Start : 1996/6

Date of End :

Status : in progress

Outline : Image diagnosis using MRI and CT

Technology - Materials : (1) Institution side: Output distribution from modality, video-capture board, general-purpose computer, ISDN board, image scanner (for patient information), and dedicated software (based on Window 95) (2) Terminal for reading images: ISDN board, 2 general-purpose computers, video card for multi-monitor, 2 20-inch monitors, and Macintosh for reporting + Fax modem

Technology - Communication Lines : ISDN circuit

Characteristics : Image diagnosis can be easily performed at the institution side. Basically, the result is reported on the next day by demonstrating findings with draw software.

Evaluation : Image quality was acceptable for MRI and CT. Compared to films, this system provides better efficiency for reading MR angiograms and chest photographs by continuously changing pictures. It can be used with mobile terminals, although the range of use is limited.

Keywords :

References : "Ueki M et al, Teleradiology using personal computer, THE JAPANESE JOURNAL OF ACUTE MEDICINE 20:921-925, 1996."

Person in Charge : Keisuke Kita

Department : Imaging Net Ltd.

Tel : +81-725-50-2810

Fax : +81-725-50-2811

E-mail :

Date Updated : 1999/2/20

Case Number : 21

Main Facility : "Aomori Prefectural Central Hospital; Mutsu General hospital; Jichi Medical School, School of Medicine"

Related Facilities : Shimokita Medical Center Oma Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1993/9

Date of End : 1993/11

Status : finished

Outline : We have introduced Tele-medicine to compensate for the poor medical conditions in remote places. CT images were transmitted using photophone, which was effective to some degree. We obtained an opportunity to make an experiment of Telemedicine by transmitting more advanced high-vision pictures. As the 1993 medical research project of the High Vision Promotion Center, the experiment was performed in order to "make the best use of the high vision technology in the medicine of remote places." High vision pictures were transmitted via a communication satellite from the Ohma hospital located at the north end of the Honshu Island to the Aomori Prefectural Central Hospital, which is the largest hospital in Aomori and away from the Ohma hospital for 4 hours by bus. The physicians at the 2 hospitals discussed cases over the television conference system. The Tele-medicine was demonstrated to be effective. Subsequently, an experiment to transmit high-vision stationary images with INS-64 was made between the 2 hospitals for about 3 months. The images could be transmitted at low cost because public telephone circuit was used. It was also demonstrated that even images compressed to 1/30 could be read. The Tele-medicine using the high-vision technology was useful for the medicine in remote places.

Technology - Materials : (1) High-vision dynamic pictures using a communication satellite, Super Bird, " microscopic system equipped with a high vision camera, high vision stationary image transmitting system, and television conference system, (2) High vision stationary image transmission using NTT INS-64: compression 1/10 to 1/30

Technology - Communication Lines : Communication satellite, Super Bird, and INS64

Characteristics : High vision dynamic pictures using a communication satellite and high vision stationary images using INS-64

Evaluation : (1) High vision dynamic pictures: Panbronchiolitis (Hypertrophy of the bronchial wall in chest plain X-ray examination, mucosal swelling in bronchofiberscopy, and infiltration of lymphocytes and plasmacytes into the bronchioles in histological examination), sarcoidosis (BHL and an intrapulmonary nodal lesion with a diameter of 1mm in plain X-ray examination, nodal swelling and vasodilation in bronchofiberscopy, and epithelioid cells in histological examination), lung cancer (relatively vaguely defined tumor in the chest X-ray examination, increased chromatin and nucleous in cytodiagnosis), dermatitis

(clearly defined edematous erythema, central bouton, and striated dermatitis by ???), fixed drug eruption (clearly defined border between previous drug eruption's scar and present drug eruption), cardioechography (dynamic images could be read naturally). The images of other many cases were transmitted, which provided diagnostically acceptable image quality. (2) High vision stationary images using INS-64: Low-magnitude pathologic tissue images were transmitted as low-quality dynamic pictures, while high-magnitude images were transmitted as high vision stationary images. The diagnosis of chest X-ray images could be obtained with the compression from 1/10 to 1/30 (3) Image resolution: High vision dynamic picture transmission via a communication satellite are better than previous image transmission technologies in Japan and foreign countries in terms of rapidity. However, it has disadvantages in terms of cost, manpower, and initial investment. High vision stationary image transmission through INS-64 provides higher resolution than previous techniques for stationary image transmission. It could transmit a highly compressed image immediately. It was considered that it could transmit images on the national network.

Keywords : Medicine in remote places, communication satellite, high vision

References :

Person in Charge : Kon Akihide

Department : "Department of surgery, Noheji municipal hospital"

Tel : +81-175-64-3211

Fax : +81-175-64-5571

E-mail :

Date Updated : 1996/12/1

Case Number : 22

Main Facility : Noheji municipal hospital

Related Facilities : Obuchi clinic

Number of Facilities : 1

Practicality : Practical

Date of Start : 1996/7

Date of End :

Status : in progress

Outline : When an emergent patient was delivered to a clinic in a remote place, experts in the base hospital of the remote place were requested to give advice for triage. However, when cerebrovascular disorder developed at night, it was difficult to take and develop head CT images because no radiation technician was stationed at night. Therefore, an interface was installed between the CT and computer terminal of the clinic to reach the personal computer of the base hospital through the public telephone circuit. Thereafter, when a disease requiring CT appears, the physician in the clinic takes CT images and transmit them via computer communication. It provides higher resolution than photophone. Because it does not require the development on roentogen films, it reduces time and does not require a radiation technician. The use of INS-64 has enabled us to transmit the roentogen images of a fracture or the chest taken by a roentogen film scanner. It is useful as a system for supporting clinics in remote places.

Technology - Materials : (1) Clinic: Personal computer (Quadra 950), Video signal inputting DVI system (CEMAX-ICON), Personal computer (PM8500), Roentogen film scanner - Lumiscan 75 (Fremins) (2) Hospital: Personal computer (PM7500), Personal computer (PM8500), Large monitor for receiving images, 15K display (Dataray)

Technology - Communication Lines : INS (From May 1997)

Characteristics : TeleMax system can transmit only monochrome images. The images sent can be processed on the large monitor dedicated for receiving. The use of an interface between CT and personal computer can omit the development on roentogen films. It takes only telephone charge for every transmission, and can therefore be operated at inexpensive cost. The personal computers can be used for purposes other than image transmission.

Evaluation : Acceptable resolution can be obtained at compression of 1/15 for CT images. Pulmonary markings can be read at compression of 1/2 for chest X-ray photographs. The change from public telephone circuit to INS-64 reduced transmission time.

Keywords : Medicine in remote places, TeleMax

References :

Person in Charge : Nodagashira Tatsuya

Department : "Department of surgery, Noheji municipal hospital"

Tel : +81-175-64-3211

Fax : +81-175-64-5571

E-mail :

Date Updated : 1999/3/12
