

Case Number : 117

Main Facility : Mogami-machi municipal Health Center

Related Facilities : "Medical office of Nersing home for the-aged
" "KOBASO" ", home-dwelling patients, medical office of Mogami
Hospital, house of Director amaogsmi-mschi district hesalth care
and nursing service"

Number of Facilities : 15

Practicality : Practical

Date of Start : 1998/4

Date of End :

Status : in progress

Outline : This system consists of 1 host personal computer in the
health center, 13 personal computers at elderly homes and patients'
houses, TV phones, and measuring instruments for vital signs. These
components were connected through the INS circuits of NTT. To
supplement this system, a simple TV phone was installed at the
office of the hospital and the house of the chief community nurse
in charge of at-home care. Two mobile personal computers are also
used so that community nurses could see other vital data at
patients' houses.

Technology - Materials : This system consists of products from
various manufacturers, such as Phoenix Mini, in order to respond
various future demands from the field.

Technology - Communication Lines : INS circuits

Characteristics : The at-home medicine of the Mogami-cho is performed
for 45 terminal or nearly terminal patients. Twelve patients were
selected as the subjects of this system. They have received total
medicine consisting of visiting treatment, care, and rehabilitation.

Evaluation : The operation of the system just began in April 1998. It
will be evaluated, and associated problems be tackled.

Keywords :

References :

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Date Updated : 1999/3/11

Case Number : 118

Main Facility : "Department of Dermatology, Yamagata Prefectural
Shinjo Hospital"

Related Facilities : "Department of Internal Medicine, Mogami Town
Hospital "

Number of Facilities : 1

Practicality : Practical

Date of Start : 1998/4

Date of End :

Status : in progress

Outline : This system consists of TV phones at the Mogami and Shinjo
Hospitals connected through an INS circuit of NTT to transmit the
images of skin diseases to the clinic of the department of
dermatology, Shinjo Hospital and receive the diagnostic information
prepared by dermatologists. This system was developed because
there is no department of dermatology in the Mogami Hospital.

Technology - Materials : This system consists of products from
various manufacturers.

Technology - Communication Lines : INS circuit

Characteristics : The Mogami Hospital was connected with the Shinjo
Hospital, a base hospital of the region, to exchange medical
information mainly on dermatology. It will be used for other
fields of medicine.

Evaluation : The operation of the system just began in April 1998. It
will be evaluated, and associated problems be tackled.

Keywords :

References :

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Date Updated : 1999/3/8

Case Number : 119

Main Facility : Dr. Igarashi's Clinic

Related Facilities : "Honda clinic; Department of Pediatrics, Showa University School of Medicine, Toyosu Hospital; National Institute of Radiological Sciences; Division of Orthopaedic Surgery, Iwamizawa Municipal General Hospital "

Number of Facilities : 3

Practicality : Experimental

Date of Start : 1996/3

Date of End :

Status : in progress

Outline : Medical images, such as X-ray images, are digitized with digital camera and other devices, attached to E-mails, and sent to remote medical institutions for obtaining advice about diagnosis. In addition, medical images without personal information are presented on the home page to invite advice. This method is effective for those who cannot receive an image file with an E-mail.

Technology - Materials : Digital camera: Ricoh DC-IS (1/3-inch, 410,000 pixels (380,000 effective pixels)) (768 x 576 dots). Personal computer: TWO TOP 55C-M200/pvk (CPU: MMX Pentium 200 MHz, memory: 64MB). Graphic board: I-O data, GA-PG3D4/PCI (memory 4MB, 1280 x 1024 dots, 16,770,000 colors). CRT: Iiyama MF-8615G. E-mail software: AL-Mail 32, Version 1.01

Technology - Communication Lines : Internet service providers (Internet WIN, SANNET, etc.)

Characteristics : All hardware of this system, including the personal computer and digital camera, is of popular edition, and can be introduced at low cost. Most software products used are share-ware or free-ware. Because commercial providers are used to access the Internet, this system can be used in the environment of general Internet users.

Evaluation : The lung cancer lesion near the hilum, which could not be identified on an original X-ray image, could not be identified on the image transferred with an E-mail. However, a tumor identified on an abdominal plain XP could be easily located on the transferred image. Moreover, an osteophyte of degenerative knee joint disease was clearly delineated. The above system seemed acceptable for medical use, especially in the field of orthopedic surgery.

Keywords : Digital camera, e-mail, home page, remote medicine, medical image

References :

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Date Updated : 1999/2/27

Case Number : 120

Main Facility : National Ookura Hospital

Related Facilities :

Number of Facilities : 0

Practicality : Practical

Date of Start : 1997/4

Date of End :

Status : in progress

Outline : A system to make an at-home diagnosis of a pregnant woman has been developed. It has been refined for clinical application. So far, the system has been tried in 8 pregnant women. The system will be completed in 1998, and a field work will be started to confirm if it is payable or not.

Technology - Materials : This system allows bi-directional transmission of motion pictures and voices (TV phone) and real-time transmission of fetal heart rate using analog telephone circuits. A liquid shutter style monitor is used to improve image quality.

Technology - Communication Lines : Analog telephone circuit

Characteristics : A clinically acceptable at-home medical system using a general analog telephone circuit was developed. This is the only trial that aims to develop an useful and payable system.

Evaluation :

Keywords : Pregnant woman, at-home medicine, TV phone, POTS

References :

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Date Updated : 1999/3/16

Case Number : 121

Main Facility : Furuya Neurosurgical Clinic

Related Facilities : Juntendo Izunagaoka Hospital; Fujinomiya City
General Hospital; Shizuoka General Hospital

Number of Facilities : 3

Practicality : Practical

Date of Start : 1997/4

Date of End :

Status : in progress

Outline : The doctor in charge was a neurosurgeon (general and
infantile neurosurgeon) studying neuro-radiology. He opened a
neurosurgical clinic in Heda village, Tagata-gun, Shizuoka
prefecture in March 1997. The clinic has borrowed a helical CT
scanner purchased by Shizuoka prefecture and Heda village to
improve the facilities of remote clinics in Shizuoka prefecture
since April 1997. To make the best use of the CT equipment, the
clinic has treated out-patients of neurosurgical and other fields
in the medically depopulated region of Nishi-Izu. It has also
performed remote image diagnoses for the patients in the fields
other than neurosurgery.

Technology - Materials : Helical CT scanner (Toshiba X vision/GX),
Film digitizer VXR-8, Power Mac 8500/8100

Technology - Communication Lines : INS 64

Characteristics : Placing a few specialists and improving remote
medical systems in a remote region was effective for both its
medicine and economy even if it was medically depopulated.

Evaluation : This case was a trial of how neurosurgical and other
special treatments could be given to patients in a medically
depopulated region through a remote diagnostic system. The
operation of remote medicine requires the cooperation and
understanding of not only specialists in general hospitals, but
also nearby practitioners and local self-governing body. Therefore,
all those concerned should be evaluated for remote diagnosis.

Keywords : Nishi-izu, Heda village, helical CT scanner, remote image
diagnosis

References :

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Date Updated : 1999/2/25

Case Number : 122

Main Facility : Hokkaido University Hospital

Related Facilities : Nakashibetsu Town Hospital; Shin-nittetsu
Muroran General Hospital;

Number of Facilities : 4

Practicality : Experimental

Date of Start : 1997/11

Date of End :

Status : in progress

Outline : Medical images, such as CT and MRI images, generated in the associated institutions were transmitted to the DICOM server and image reading station of the base institutions through ISDN circuits (64 Kbps). The radiologists in the base institutions read them and made reports. The reports were sent back to the associated institutions by fax. The images generated in the associated institutions of (A) to (C) were mainly transmitted to Hokkaido University Medical School Affiliated Hospital, and those in (D) to the Central CI clinic, although the former associated institutions may send them to the Central CI clinic, and vice versa.

Technology - Materials : Trame Wave by US Access Radiology was used. Images were input directly to DICOM (the associated institution of D), with a video capture (B and C), and with a film digitizer (A). The network can be managed and the transmission be monitored and controlled from the operation centers in Tokyo and Boston. Wavelet technique is used to compress images.

Technology - Communication Lines : 13 INS 64 circuits and 8 routers

Characteristics : The network can be controlled from remote operation centers. In Hokkaido University, images can be transmitted to both the image reading room in its affiliated hospital and the image reading station in the office of the department of radiology. The destinations can be set by the day of the week and time zone. Wavelet technique is used to compress images.

Evaluation : CT and MRI images are transmitted 2 to 5 times per week from the Municipal Nakashibetsu Hospital (A) and about 5 times per week from the Shinnittetsu Muroran General Hospital (B). The transmission of images will be started soon for the General Urakawa Red Cross Hospital (C) and Hoshigaura Hospital (D).

Keywords : Tele-radiology, image processing, wavelet compression, auto-routing

References :

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Date Updated : 1998/4/20

Case Number : 123

Main Facility : Secom Hospi-net Center

Related Facilities : "medical facilities (38 To, Do, Fu and Prefecture)
"

Number of Facilities : 113

Practicality : Practical

Date of Start : 1995/4

Date of End :

Status : in progress

Outline : CT and MR image diagnosis supporting service

Technology - Materials : (1) Center: Receiving system: receiving server (SUN WS+ISDN Router) Data control system: data base server (Sun WS + Oracle), MOJ Juke Box server (Sun WS + MOJ Juke Box), and Fax server (Macintosh + FAX modem); Job system: image reading terminal (HP WS (composed of 3 monitors) + Macintosh) x 5 sets, reception, and transcribe terminal (6 Macintosh personal computers). (2) Customer: System for examination, incorporation, and transmission: transmission terminal (PC + AD board + scanner + ISDN board)

Technology - Communication Lines : ISDN circuit

Characteristics : This service quickly sends image reading reports back to customers (within 1 hour in case of emergency). Customers can have a tele-conference with the radiologist responsible for the report at a desired time.

Evaluation : This service of remote MR and CT image diagnosis has been used in the routine medical examination of family doctors and has proved useful as a doctor's consultant in deciding a diagnosis/therapeutic policy. We will support the medical examinations of family doctors in all the fields of remote medicine as well as in the support of image diagnosis. Because image reading reports are sent to the hospitals and clinics that requested diagnosis under the agreement and instruction of contracted medical institutions, the institutions can contribute to the local medicine as an image examination center and the increase in the operating ratio of expensive medical devices.

Keywords : Support of medical examinations of family doctors, tele-conference between attending physicians and specialists, double-check, improvement of local medicine, cooperation between hospitals and clinics

References :

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Date Updated : 1999/2/24

Case Number : 124

Main Facility : Hayashi Eye Hospital

Related Facilities : "Tenjin branch Clinic of the Hayashi Eye
Hospital, Koga branch Clinic of the Hayashi Eye Hospital"

Number of Facilities : 2

Practicality : Practical

Date of Start : 1992/6

Date of End :

Status : pause

Outline : High definition images required for ophthalmologic
examinations are transmitted to share them by the main hospital
and its branch clinics. This allows doctors to make joint
diagnoses.

Technology - Materials : (1) Image input device: SONY DXC-760MD, (2)
Processing device: SONY DHI-2000, (3) Recording device: SONY
SMO-S501, (4) Output device: UP-5000, (5) Communication device: NTT
(ISDN)

Technology - Communication Lines : ISDN

Characteristics : (Description)

Evaluation : Compared to the current system, this system is slower in
transferring images, but provides higher definition.

Keywords : Image transfer, remote diagnosis, telephone circuit

References :

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Date Updated : 1999/3/12

Case Number : 125

Main Facility : "Department of Nuclear Medicine, Gunma University
School of Medicine"

Related Facilities : Ohta General Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1997/10

Date of End :

Status : in progress

Outline : An experiment is now underway to examine whether
transferring nuclear medical images through an ISDN circuit and
making a report about them is practical or not.

Technology - Materials : The 2 Macintosh personal computers installed
at both hospitals were connected with a NTT INS 64 (ISDN) circuit.
Software for making reports (Pop-Reporter) was installed into the
personal computer of the General Ohta Hospital, and the software
was controlled from Gunma University with remote control software
(Timbuktsu). The remote control software can be manipulated in the
same way as the Macintosh computers because it shares their
screen.

Technology - Communication Lines : INS64

Characteristics : Both equipment and software products are
inexpensive (several ten-thousand yen), and can be easily
manipulated.

Evaluation : Although the image quality was acceptable, the equipment
responded too slowly as compared to the speed of reading images.

Keywords : Image communication, report making

References :

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Date Updated : 1999/2/25

Case Number : 126

Main Facility : laboratory of Molecular & Cellular Pathology Hokkaido
University School of Medicine

Related Facilities : "Shin-nittetsu Muroran General Hospital, Muroran,
Japan"

Number of Facilities : 1

Practicality : Practical

Date of Start : 1998/4

Date of End :

Status : in progress

Outline : An unique tele-personal-computer system using a Fuji
digital camera, HC2500, and ISDN circuit was developed in April 1998,
and replaced the combination of Pathtran 1000 and an analog
circuit that had been used since December 1992. The new system has
been tested.

Technology - Materials : Digital camera, HC2500 (Fuji Film)

Technology - Communication Lines : ISDN

Characteristics : Microscopic images are transmitted with a top-grade
digital camera.

Evaluation : High quality images can be transmitted at acceptable
speed.

Keywords : Digital camera, high image quality, ISDN, intra-operative
quick diagnosis

References :

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Date Updated : 1999/3/15

Case Number : 127

Main Facility : "Department of Clinical Pathology, Kure Kyosai Hospital"

Related Facilities : "Department of Surgery, Kure City Medical Association Hospital; Division of Operation Room, Kure Kyosai Hospital; Division of Pathology, Hiroshima Memorial Hospital; 1st Department of Pathology, Tottori University School of Medicine"

Number of Facilities : 4

Practicality : Practical

Date of Start : 1992/8

Date of End :

Status : in progress

Outline : [Experiment] The Kure Kyosai Hospital was connected with the Hiroshima Memorial Hospital with an ISDN circuit, and pathologic samples presented to the department of pathology of the Hiroshima Memorial Hospital for intra-operative quick diagnosis were transmitted to the department of pathology of the Kure Kyosai Hospital (40 cases; see the reference 2); [Practical use] (1) The pathologic laboratory of the Kure Kyosai Hospital was connected with the operation rooms of the hospital and the Kure Doctors' Association Hospital with a ISDN circuit for transmitting images for intra-operative quick diagnosis and examining image findings (see the reference 2). (2) The Kure Kyosai Hospital was connected with the Tottori University Medical School with an ISDN circuit to give remote lectures from the pathologic laboratory of the hospital to the students of the medical school (once in 1996 and 1997). (3) Using the same system as the above (2), remote lectures about cytodiagnosis were given from the pathologic laboratory of the hospitals to the clinical technologists in the medical school.

Technology - Materials : Still image transmitting device, IUM64

Technology - Communication Lines : 1 ISDN circuit (additional 4 ISDN circuits and TV conference system were used for the lectures).

Characteristics : No special construction is required to introduce this system to an operating room. The big monitor of the system provides clear views.

Evaluation : This system can be easily introduced. It provides wide applications because a video printer or recorder can be easily combined.

Keywords : VM64, ISDN, pathologic laboratory, surgical operation room

References :

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Date Updated : 1999/2/26

Case Number : 128

Main Facility : Seki MRI Net

Related Facilities :

Number of Facilities :

Practicality : Practical

Date of Start : 1998/2

Date of End :

Status : in progress

Outline : Non-compressed CT and MR images complying with a common standard were transmitted at midnight through an existing ISDN and Internet.

Technology - Materials : Images complying with a common standard (DICOM/NEMA) were transmitted at midnight in a full-automatic manner. They were transmitted directly to destinations within a radius of 40km, and through the Internet to those beyond a radius of 40km. Images were viewed with a medical image reading software for Macintosh (Canoscope).

Technology - Communication Lines : ISDN and Internet

Characteristics : Non-compressed medical images could be transmitted to remote places in an inexpensive manner through the Internet for the first time in Japan.

Evaluation : Operation and evaluation

Keywords : The same image quality as that obtained with a dedicated monitor could be obtained.

References : [HTTP://www.dango.or.jp/ksmrdx/index.htm](http://www.dango.or.jp/ksmrdx/index.htm)

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Date Updated : 1999/3/13

Case Number : 129

Main Facility : Fukuoka Tokushukai Medical Center

Related Facilities : Tsushima Izuhara Hospital; Naze Tokushukai
Hospital

Number of Facilities : 2

Practicality : Practical

Date of Start : 1997/7

Date of End :

Status : in progress

Outline : The therapeutic policy for acute myocardial infarction in
acute stage was decided on TV conferences, and technical support of
percutaneous coronary angioplasty (PTCA) was given.

Technology - Materials : (1) Phoenix (NTT). (2) Venue 2000 (Picture
Tell)

Technology - Communication Lines : (1) 2B ISDN (128 kbps). (2) 6B
ISDN (384 kbps).

Characteristics : The treatment of emergency patients with acute
diseases is the most serious problem in isolated islands and
remote places. This system was designed to support it.

Evaluation : The mortality rate of acute myocardial infarction was
15.8% (6/38) in the Tsushima Izuhara Hospital for the 3 years
before this system was introduced. However, the rate was reduced to
0% (0/14) for 9 months after the system was introduced. PTCA was
performed in 12 patients in acute stage. Stent implantation was
performed in 4 patients. It was decided to perform conservative
therapy in 2 patients on the basis of the angiograms transmitted
to the Fukuoka Tokushukai Hospital. A 0.014" guide wire could be
recognized and the location of stent implantation be indicated
appropriately on transmitted images

Keywords : Remote diagnosis, emergency care for acute diseases, acute
myocardial infarction, PTCA

References :

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Date Updated : 1999/3/1

Case Number : 130

Main Facility : Sapporo National Hospital

Related Facilities : Wakkanai Municipal Hospital; National Sanatorium
Dohoku Hospital;

Number of Facilities : 2

Practicality : Practical

Date of Start : 1997/5

Date of End :

Status : in progress

Outline : (A) Tele-cytology (mainly with the Municipal Wakkanai Hospital): In routine cytodiagnosis, cytotechnologist check cells and the chief cytodiagnosis and pathologic physician microscopically examines and makes diagnoses of them. In the institutions without such cytodiagnostic physician, glass slides were mailed to the institution with a cytodiagnosis physician. This project was designed to (1) transmit digital images taken by a cytotechnologist through a computer network, instead of mailing glass slides; (2) to transmit the images to a ftp server through an INS64 circuit; and (3) to disclose the images to the participants on our mailing list to make diagnoses based on many opinions. (B) Intra-operative quick pathologic diagnosis (National Sanatorium Dohoku Hospital): The basic procedure is the same as that of (A). However, in taking microscopic images, a pathologist examines the dynamic pictures transmitted with a TV phone system in advance and appoint the site of the images and magnification. It is often possible to make a diagnosis only with dynamic pictures. The hospitals make contact with each other by telephone because a diagnosis must be made quickly.

Technology - Materials : (1) Capture of stationary images: Nikon E2i, a single-lens reflex camera, 1,280,000 pixels, 2/3 inch CCD. (2) Dynamic pictures: Hitachi HV-C20Sy. (3) Client's computer: None specified. (4) Stationary image transferring circuit: INS net 64. (5) Dynamic picture transmitting circuit: INS net 64, 2B mode (6) Dynamic picture transferring device: NEC Media Point. (7) Dial-in server. (8) ftp server. (9) Mail server. (10) Software: Adobe Photoshop, ftp client software

Technology - Communication Lines : INS net 64

Characteristics : Neither the above (A) nor (B) system was purchased as a total system. Rather, the systems were constructed by combining the above commercial or existing equipment and communication channel. The software products used were also commercially available and general-purpose ones. The systems are inexpensive and simple, and their components can be easily updated. It is possible to adjust the systems to the field to which tele-pathology is applied.

Evaluation : The above (A) was used to make a diagnosis of 273 cases between the National Sapporo Hospital and Municipal Wakkanai Hospital by the end of March 1998. The high definition images of the system were fully evaluated and discussed by the participants on the mailing list, which seemed to improve diagnostic accuracy

and the diagnostic techniques of the participants. The above (B) has been just introduced. The dynamic pictures could be screened from a remote place (National Sapporo Hospital): a diagnosis could be made only with dynamic pictures in some cases. Above all, this system eliminated the question of who should select the images for diagnosis. The combination of dynamic pictures with stationary images increases the accuracy of pathologic diagnosis.

Keywords : Tele-pathology, tele-cytology, intra-operative quick pathologic diagnosis, cytodiagnosis

References :

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Date Updated : 1999/2/24

Case Number : 131

Main Facility : "Department of Medical Informatics, Tohoku University"

Related Facilities : Onagawa Town Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1997/4

Date of End : 1999/3

Status : in progress

Outline : Correction of the regional gap in medical care by
establishing a broad network that meets urgent medical needs on
the basis of the cooperation of specialists and regional hospitals

Technology - Materials : (1) Microscope with an Olympus remote
controller. (2) Shimadzu remote image diagnosis network (SimMed)
connected with relevant departments in the affiliated hospital
with Ethernet (currently connected with a personal LAN, and will be
connected with the hospital LAN)

Technology - Communication Lines : INS384 personal circuit

Characteristics : Because the Megawa Municipal Hospital is a small
hospital with 100 beds, various specialists of the affiliated
hospital support the network. Network-based tele-medicine is
promoted with the departments to which patients were referred.

Evaluation : Tele-medicine, DICOM-compatible network

Keywords :

References :

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