

Case Number : 23

Main Facility : Tokyo Metropolitan Hiroo General Hospital

Related Facilities : Ohshima Hokubu Clinic;Toshima Clinic;Niijima
Clinic;Shikine-jima Clinic;Miyake Chuo Clinic;Mikura-jima
Aclinic;Kozu-shima Clinic;Chouritu Hachijou Hospital;Aogashima
Clinic;Ogasawara Clinic;Hagajima Clinic

Number of Facilities : 11

Practicality : Practical

Date of Start : 1994/10

Date of End :

Status : in progress

Outline : Network between the medical institutions of all islands in
Tokyo and the emergency center of Tokyo Metropolitan Hiroo
Hospital

Technology - Materials : Photophone PC/80kit

Technology - Communication Lines : Telephone circuit (analog),
excluding Ogasawara Islands that use a communication satellite

Characteristics : 24-hour service for both emergency and
non-emergency cases. Assistance in making a decision of whether
the delivery by helicopter or flying boat is required.

Evaluation : The data of 254 cases were transmitted from the islands'
hospitals to the Hiroo Hospital from October 1994 to November
1996. The images of those discharged from the Hiroo Hospital were
sent back to the relevant islands' hospitals. This system has also
been used for inter-island image conferences. Some islands
frequently use this system, while other not. It should be improved
so that old physicians or substitute physicians could use it
smoothly and emergency cases could be handled immediately.
Although dedicated equipment was used, its image quality was poor.

Keywords : Island emergency medicine, remote medical care.

References :

Person in Charge : Makoto Mitsusada

Department : Tokyo Metropolitan Hiroo Hospital

Tel : +81-3-3444-1181

Fax : +81-3-3444-3196

E-mail :

Date Updated : 1999/3/12

Case Number : 24

Main Facility : "Ogini Municipal Hospital, Home Care Support Center "

Related Facilities : 2 community -dwelling patients

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1994/12

Date of End : 1995/2

Status : finished

Outline : Among information communication technologies required in health, medicine, and welfare of the aging society, remote health counseling system through TV phone is probably realizable and requested by many layers of the society. To evaluate the effectiveness and extract technical issues of the system, experimental remote health counseling was performed by connecting the Ogini municipal hospital (service provider) with at-home patients receiving visiting care (service beneficiaries) using INS-64 TV phone, and a questionnaire survey was performed for the service providers and beneficiaries.

Technology - Materials : Hitachi HV-300 (TV phone)

Technology - Communication Lines : INS circuit

Characteristics : TV-phone health counseling for subjects including a 76-year-old male with senile dementia and a 79-year-old female after cerebral stroke

Evaluation : As for the TV-phone, the following issues were revealed: (1) color tone has to be improved; (2) the function for adjusting the brightness of the display is required; (3) the function for moving the camera lens is required; (4) spot-light function is required on the display board; (5) because images are sent as continuous frames, the images do not completely match with talks; (6) voices are sometimes interrupted when talks are made with the main body without using the receiver. As for mutual communication, the function for determining and sending initial diagnosis (body temperature, respiration, and blood pressure) with a sensor or something is required. Impressions (1) as for economic utility, a new law has to be established so that the medical fee could cover the initial investment and maintenance cost, and (2) because the network circuit is now limited to the center of the city, it is desired to spread the circuit all over the city so that the system could be used at a remote place.

Keywords : Wide area of heavy snowfall (Daily health counseling system for at-home patients at remote place), TV phone

References :

Person in Charge : Yoshihiro Abe

Department : "Ogini Municipal Hospital, Home Care Support Center "

Tel : +81-238-62-2075

Fax : +81-238-62-3740

E-mail :

Date Updated : 1999/3/10

Case Number : 25

Main Facility : "Ogini Municipal Hospital, Home Nursing Division (of Oguni municipal hospital)"

Related Facilities : 2 community -dwelling patients Ymagata Prefecture

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1995/2

Date of End : 1995/3

Status : finished

Outline : The communication between physicians and at-home elderly people through TV phone enables physicians to provide remote health counseling, including the check of daily health conditions and the measurement of health parameters. An experiment was performed to evaluate the system that can support the care of at-home elderly people by the cooperation of medical and health institutions. To support the at-home care for the elderly who cannot present to hospital by themselves due to the after-effect of cerebral stroke or functional disorder of the body, a remote health counseling system model project was performed. This project was performed in the following manner: the elderly automatically transmitted the data determined with a measuring device (body temperature, blood pressure, pulse, and electrocardiogram) to the health control supporting personal computer of the hospital; then, physicians make medical counseling or health instructions while hearing the conditions of the elderly over digital color TV phone.

Technology - Materials : Three sets of Hitachi HV-300 (TV-phone); 2 health measurement devices; and a health control supporting personal computer

Technology - Communication Lines : INS circuit (TV phone) and analog circuit (health measurement device)

Characteristics : Health counseling over TV phone for 2 subjects including a 70-year-old male with cerebral infarction and a 57-year-old female with the after effect of cerebral hemorrhage

Evaluation : Good points: (1) It is epoch-making that physicians can know the symptoms and anxiety of at-home patients from hospital; (2) The counseling on the basis of real-time data, such as blood pressure, electrocardiograms, and pulses, is beneficial for both medical institutions and patients. Future issues: (1) not all the patients can measure the data, and care providers are often required; and (2) it costs much for the initial investment of the measuring device and TV phone when patients change.

Keywords : Wide area of heavy snowfall (daily health counseling system for at-home patients in remote places), TV phone, and health measuring device (Urara)

References :

Person in Charge : Yoshihiro Abe

Department : "Ogini Municipal Hospital, Home Care Support Center "

Tel : +81-238-62-2075

Fax : +81-238-62-3740

E-mail :

Date Updated : 1999/3/10

Case Number : 26

Main Facility : "Ogini Municipal Hospital, Home Nursing Division (of Ogini municipal hospital)"

Related Facilities : 15 community-dwelling patients

Number of Facilities : 15

Practicality : Experimental

Date of Start : 1995/4

Date of End : 1996/3

Status : finished

Outline : An experiment for the remote health counseling system model project was performed to support the at-home care for the elderly who cannot visit hospital due to the after-effect of cerebral stroke or functional disorder of the body. In the experiment, the elderly automatically transmitted the data determined with a measuring device (body temperature, blood pressure, pulse, and electrocardiogram) to the health control supporting personal computer of the hospital. Then, physicians make medical counseling or health instructions while hearing the conditions of the elderly over digital color TV phone.

Technology - Materials : Six Hitachi HV-300 TV phones (3 in April; additional 3 in December), 15 health measuring devices (2 in April; additional 13 in December), 1 health control supporting personal computer, and 5 personal computers with pens (2 in April and 3 in December)

Technology - Communication Lines : INS circuit for the TV phone, and analog circuit for the health measuring device

Characteristics : This experiment was started for 2 subjects in April. The subjects increased to 15 in December, including 7 males of 66 to 93 years and 8 females of 56 to 98 years. They included 7 who showed the bedridden grade of A1 to J2 and received at-home care due to the after effect of cerebral stroke. Fifteen health measuring devices and 6 TV phones were used. Nurses visit the patients and input records to a personal computer with a pen. After coming back to the hospital, the nurses connect it to the supporting personal computer and print the records so that they could be stored as patient condition records.

Evaluation : As for the good points of TV phone, (1) emergency response can be obtained because this system is directly associated with physicians and nurses; (2) making a plan is easy because decisions can be made on the basis of the conditions of patients; (3) patients are relieved because they can see the face of physicians; and (4) the data transmission procedure is very easy. As for the good points of the health measuring device, (1) because it records health conditions of every day, physicians can know the conditions of non-visiting days; (2) it can repeat measurement; (3) because it indicates a value during measurement and the patient can show it over the TV phone, physicians can make emergency response; (4) because it records data continuously, it is helpful for making preventive measures and making instructions at visiting care. The future issues of the TV phone include that (1)

because the equipment is expensive, the government should take measures for reducing the share of patients; (2) an accessory that generates a calling sound, such as a pocket bell, is required to call a care provider outside the room; (3) a penlight-like camera would be useful for clearly showing bedridden patients; (4) a lighting device should be attached because the lack of light may make it difficult to see the countenance of patients; (5) natural dynamic picture is more desirable than stationary images (continuous transmission of frames). The future issue of the health measuring device was that a care provider is required for those who are independent in daily life, but have effects, such as paralysis or trembling.

Keywords : Wide area of heavy snowfall (daily health counseling system for at-home patients in remote places), TV phone, and a health measuring device (Urara)

References :

Person in Charge : Yoshihiro Abe

Department : "Ogini Municipal Hospital, Home Care Support Center "

Tel : +81-238-62-2075

Fax : +81-238-62-3740

E-mail :

Date Updated : 1999/3/10

Main Facility : "Ogini Municipal Hospital, Home Nursing Division (of Oguni municipal hospital)"

Related Facilities : 15 community-dwelling patients in Oguni Town

Number of Facilities : 15

Practicality : Experimental

Date of Start : 1996/4

Date of End : 1996/9

Status : finished

Outline : In 1995, an experiment was performed using additional devices, although its duration was only 3 months. Therefore, the experiment was continued in the first half of 1996. Following the previous year, to support the at-home care of the elderly who cannot visit hospital by themselves because of the after-effect of cerebral stroke or functional disorder of the body, the experiment was performed as a remote medical counseling system model project. The procedure of the previous year was followed.

Technology - Materials : Six Hitachi HV-300 TV phones, 15 health measuring devices, 1 health control supporting personal computer, and 5 personal computers with a pen (for physicians and nurses)

Technology - Communication Lines : INS circuit for the TV phone, and analog circuit for the measuring device

Characteristics : This experiment was started with 15 subjects in April. They consisted of 7 males of 66 to 93 years and 8 females of 56 to 98 years, who showed the bedridden grade of A1, A2 to J2 and received at-home care. Fifteen health measuring devices and 6 TV phones were used. Nurses visited the patients and input records to a personal computer with a pen. After coming back to the hospital, the nurses connected it to the supporting personal computer and printed the records so that they could be stored as patient condition records.

Evaluation : Results and issues: (1) It is desirable that the TV phone and health measuring device be attached and exchanged more easily even by the nurses; (2) The TV phone should provide more natural dynamic images so that speech could be rehabilitated; (3) This project using TV phone attracted attention and led to the improvement of the infrastructure of the town; (4) The combination with other devices (digital cameras and videos, etc.) will increase the effect of the TV phone; (5) The health measuring device helps to check the morbid state because it records data continuously; (6) The built-in battery of the health measuring device lasts only about 1 year. The battery should be modified so that the nurses could exchange it; (7) The TV phone and health measuring device should be more easily moved in case the user patient died or has been admitted to a hospital. It is also necessary to modify parts, such as attached cords; (8) The name and number of the TV phone and health measuring device should be more easily changed by the nurse; (9) There were 4 cases of abnormal data, such as abnormal blood pressure, due to dust or other causes; (10) Higher illuminance is required for the light of the TV phone; (11) A care

provider is necessary for those with paralysis or trembling in using the health measuring device.

Keywords : Wide area of heavy snowfall (daily health counseling system for at-home patients in remote places), TV phone, and a health measuring device (Urara)

References :

Person in Charge : Yoshihiro Abe

Department : "Ogini Municipal Hospital, Home Care Support Center "

Tel : +81-238-62-2075

Fax : +81-238-62-3740

E-mail :

Date Updated : 1999/3/10

Case Number : 28

Main Facility : The University of Tokyo Hospital

Related Facilities : The University of Tokyo Branch Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1991/9

Date of End : 1993/7

Status : finished

Outline : Inexpensive method for the tele-conference about radiographic images. Radiographic images (CT, MR, and simple radiographic images) on a light box are taken with a electronic still camera, transferred to a personal computer, and displayed on a monitor. This system communicates with another completely the same system through telephone circuit. The information on one system, such as the location of ROI on the monitor and the window level and width of images, is transmitted to the other system so that the 2 systems could share the same object under the same condition. Another telephone circuit is used to transmit voices. Thus, the tele-conference based on the 2 telephone circuits is realized. However, because it takes much time to transmit images (4 minutes per normal image (256KB)), it is necessary to send images before the tele-conference.

Technology - Materials : Image capture equipment with an electronic still camera (512*512*8bit). Image transfer equipment from a memory card to computer. Image display is NTSC on the monitor (maximum: 512*512*8bit). J3100 lap-top computer, hard disk, and color monitor made by Toshiba. Pick-up microphone and speaker phone attached to telephone for the conference.

Technology - Communication Lines : General telephone circuit, modem (9600bps)

Characteristics : Images are input with an electronic still camera. Both parties can see ROI under the same condition.

Evaluation : Because the branch hospital did not have the department of neurosurgery, radiologists of the main and branch hospitals used this system for consulting. The demonstration of tele-conference was performed at the BST of students. Although the system provided good quality for CT, MRI, and DSA, it was not acceptable for simple X-ray images. Because questions and explanations became far clearer, mutual understanding was far more advanced as compared to the previous system only with telephone. Moreover, consulting was more effectively performed. However, it took much time for transmitting an image because public telephone line is used.

Keywords : Radiographic images, public telephone circuit, ROI, image display condition, tele-conference, personal computer

References :

Person in Charge : Yuzo Onogi

Department : "Department of Radiology, Hospital Computaer Center, The
Unioversity of Tokyo Hospital"

Tel : +81-3-5800-6500

Fax : +81-3-3813-7238

E-mail :

Date Updated : 1999/2/25

Case Number : 29

Main Facility : The University of Tokyo Hospital

Related Facilities : The University of Tokyo Branch Hospital

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1993/8

Date of End :

Status : in progress

Outline : This system realizes tele-conferences on 2 personal computers at remote places by operating the software for sharing images. When a radiologist needs to consult with others about a radiographic image, he captures it to one personal computer with a scanner or DICOM and displays it on the monitor. Then, he asks another radiologist using the other personal computer at a remote place to see the monitor. Because the computers can be operated from both sides, it is easy to identify the point of interest during consulting or conference. Moreover, it is not necessary to transmit any image file.

Technology - Materials : Personal computer (Macintosh, Windows). Image sharing software

Technology - Communication Lines : Personal circuit

Characteristics : It is not necessary to transmit image files. An image on one monitor can be seen at another monitor. All components are commercially available, and the system can be established at low cost.

Evaluation : This system is used when a radiologist in the branch hospital cannot determine image diagnosis and needs to consult with other radiologists in the main hospital. It was also used at BST as an education tool for students. The system can be used anywhere in the hospitals only by installing the image sharing software. This is a very inexpensive system. It can provide sufficient image quality for CT, MR, and DSA, although simple X-ray images are not clear because 8-bit monitors are used. However, images acceptable for diagnostic purpose could be obtained when the condition of image capture was enhanced by using DICOM. When the system was operated through public telephone circuit, a little waiting time occurred in spite of the use of a 14400bps modem. It would be possible to use the system with public telephone circuit in an emergency when only a few images are transmitted.

Keywords : Tele-conference, image sharing, personal computer

References :

Person in Charge : Yuzo Onogi

Department : "Department of Radiology, Hospital Computer Center, The University of Tokyo Hospital"

Tel : +81-3-5800-6500

Fax : +81-3-3813-7238

E-mail :

Date Updated : 1999/2/25

Case Number : 30

Main Facility : "Department of Neurosurgery, NTT Kanto Teishin Hospital"

Related Facilities : "Department of Neurosurgery, Mitsuwadai General Hospital"

Number of Facilities : 1

Practicality : Experimental

Date of Start : 1995/7

Date of End :

Status : pause

Outline : It is difficult to make others understand medical information by phone. However, it is possible to talk over phone while looking at the same image by using ISDN. This system can be made at low cost by using general-purpose personal computers.

Technology - Materials : (1) Windows (Windows 3.1, 95, and NT)-compatible personal computers, such as COMPAQ, IBM note, Dell, and PC9821. (2) Image capture device (scanner, digital camera, or video capture), such as HP Scanjet11c, Fuji Film DS-8, or Power View/V(3) Image compressor for transmitting through ISDN (NET64), such as NEC Aterm 45 and NTT-IT MN128(4) Software base on C language

Technology - Communication Lines : ISDN (NET64)

Characteristics : An image with the dot size of 240*240 can be transmitted in 3 seconds. That with the dot size of 480*480 can be transmitted in 6-8 seconds. It is possible to arrange multiple images on the monitor at the same time, instantaneously switch the images, or point out an image with a pointer, while talking over the phone.

Evaluation : Commercial tele-conference systems with personal computers and television take much time to share natural images and photographs. Therefore, it is not practical to use telephone circuit. By contrast, this system can transmit images bi-directionally in a short period, and can be used without stress.

Keywords : Medical image transmission, ISDN, personal computers

References : "(1)Toshiro Kubo et. al: A Personal Tele-Conference System Using INS Net64. (2)Kubo Toshiro et al: A Person Tele-Conferance for Medical Images Using ISDNS (NET64), Proceedings of the 16th congerence in medical informatics inJapan, 342-343, 1996"

Person in Charge : KUBO Toshiro

Department : "Department of Neurosurgery, NTT Kanto Teishin Hospital"

Tel : +81-3-3448-6141

Fax : +81-3-3448-6135

E-mail : kubo@kth.ntt.co.jp

Date Updated : 1999/2/20

Case Number : 31

Main Facility : National Cardiovascular Center

Related Facilities :

Number of Facilities :

Practicality : Practical

Date of Start : 1991/6

Date of End :

Status : in progress

Outline : A kind of tele-monitoring, especially of home monitoring. This system (HOMIC) can monitor fetal heart rate and uterine contraction at home or at any facilities other than hospitals. Patients can receive the advice of experts in real time by sending test data to medical institutions through telephone circuit. A very small, portable labor monitoring device was equipped with an IC memory card and modem so that data could be easily collected and transmitted. Data are sent to the server in the National Circulation Disease Center, and physicians can see and evaluate the data on a terminal on the network.

Technology - Materials : The examination device is custom-made. Basic information was registered to the IC card in advance. One IC card is used for one foetus to prevent the confusion of data.

Technology - Communication Lines : Communication is made through general telephone circuit. Data are transmitted to the server through the modem. When new data are transmitted, the in-hospital pocket bell of the responsible physician rings.

Characteristics : The examination apparatuses have been modified so that everyone could use it easily. Because the responsible physician is automatically notified of the arrival of new data, the restriction of the physician is reduced.

Evaluation : A data transmitting experiment was performed at a fixed time zone in 20 subjects. It was confirmed that the system was practical. It is now experimentally used for controlling pregnant women requiring hospitalization at home.

Keywords : Tele-monitoring, fetal heart rate monitoring, uterine contraction, home monitoring, NST

References :

Person in Charge :

Department :

Tel : +81-6-6883-5012 ext. 2551

Fax : +81-6-6836-3871

E-mail :

Date Updated : 1999/2/26

Case Number : 32

Main Facility : "Department of Medical Information Science, Osaka
University Hospital"

Related Facilities : "Department of Medical Informatics, Kyoto
University "

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1995/3

Date of End : 1998/3

Status : finished

Outline : With the cooperation of BBCC (New generation communication
network experimental association), a circuit for high-vision
pictures was made between Ohsaka and Kyoto Universities to examine
whether it could be used for remote clinical examination. The
result showed that the circuit could be used as a tool for remote
medicine. NTSC images and voices can be transmitted
bi-directionally for discussion.

Technology - Materials : (1) Input device: high vision camera, stand
for images, and slide input device. (2) Output device: high vision
display. (3) Recording device: high vision VTR (4) Encoder and
decoder (high vision images are compressed to 1/8)

Technology - Communication Lines : B-ISDN

Characteristics : This system can transmit high vision and NTSC
images bi-directionally. Pointer and scan converter functions are
available. The system is compatible with various menus.

Evaluation : The operation of the system has not been evaluated in
medical settings. Hardware technology has been almost completed.
Now, operation techniques are being acquired. The assessment at the
lecture of the medical schools showed that the monotone
radiographic images transmitted by the system were poor in both
space resolution and concentration contrast. The result may have
been partially attributable to the problems of the input system.

Keywords : Broad-band integrating service digital network (B-ISDN),
high vision pictures

References : M. Murakami et al. : A New System of Fetal Home
Monitoring: HOMIC Network (Fetus). J Matern Fetal
Invest (1992) 2: 195-198

Person in Charge : Hiroshi Takeda

Department : "Department of Medical Information Science, Osaka
University Hospital"

Tel : +81-6-6879-5900

Fax : +81-6-6879-5903

E-mail :

Date Updated : 1998/4/20

Case Number : 33

Main Facility : "Department of Medical Information Science, Osaka
University Hospital"

Related Facilities : "Nara Research Center, Telecommunication
Advancement Organization of Japan"

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1995/10

Date of End : 1998/3

Status : finished

Outline : A medical image filing system is developed with super high
definition (SHD) images with the gradation of 2048*2048*8bit, and
the images are transmitted through B-ISDN (broad integrating
service digital network). Now, cases with circulation diseases are
being filed and evaluated. A TV conference system is combined so
that users could discuss cases.

Technology - Materials : (1) Image inputting device: Film digitizer,
stationary image camera, scanner. (2) Image server: image server
(equipped with the frame memory for 256 SHDs). (3) High definition
display

Technology - Communication Lines : B-ISDN

Characteristics : Remote communication of super high definition
images for primary image diagnosis through B-ISDN

Evaluation : The evaluation of a stand-alone system showed that SHD
was useful for primary image diagnosis. The evaluation in a
transmission experiment is now underway.

Keywords : Super high definition image, B-ISDN, TV conference system

References :

Person in Charge : Yasushi Matsumura

Department : "Department of Medical Information Science, Osaka
University Hospital"

Tel : +81-6-6879-5900

Fax : +81-6-6879-5903

E-mail :

Date Updated : 1999/3/9

Case Number : 34

Main Facility : Nagoya University Hospital

Related Facilities : Komaki City Hospital; Nagoya Memorial Hospital

Number of Facilities : 2

Practicality : Experimental

Date of Start : 1996/11

Date of End :

Status : in progress

Outline : The university affiliated hospital is connected with nearby hospitals through ISDN to perform the experiment about remote medicine of medical stationary and dynamic images by collaboration using TV conference software. Stationary images are shared on the white board of the TV conference system. As for dynamic images, video signals are input to the input terminal of a CCD camera. Stationary images are input using a commercially available scanner. CT and MRI images are used as stationary images, and pictures of the coronary artery as dynamic pictures.

Technology - Materials : (1) Terminal: NEC PC9821Xa13K12, ifStation 5133/DX M1000CS. (2) TV conference software: Pictoretell and Phoenix

Technology - Communication Lines : Public digital telephone circuit, ISDN64

Characteristics : Check of the compatibility of TV conference software products, Pictoretell and Phoenix. Experiment for transmitting dynamic pictures.

Evaluation : The diagnosis of CT and MRI images seems possible with the commercially available TV conference software. As for coronary angiography, locating stenosis and determining its approximate severity would be possible. It will be technically difficult to transmit echocardiograms.

Keywords : TV conference, ISDN, live tele-medicine

References :

Person in Charge : "Yamauchi, Kazunobu"

Department : "Department of Medical Information and Medical Records, Nagoya University Hospital"

Tel : +81-52-744-2664

Fax : +81-52-744-1356

E-mail : kyamauti@tsuru.med.nagoya-u.ac.jp

Date Updated : 1999/2/23
