

Where are the doctors when you need one?

Finding a doctor or specialist could soon be as easy as picking up a phone. Telemedicine consultant, *Vincenzo Gulla*, gives his insights into telehealth

The idea of telehealth has been around for many years. Telemedicine generally refers to the use of communications and information technologies for the delivery of clinical care. In this discipline medical information is transferred via telephone, the internet or other networks for the purpose of consulting and sometimes even remote medical procedures or examinations.

Videocommunication now has the prime role of improving the quality of life for patients and reducing costs for healthcare structures. Broadband capacity, better videoconferencing equipment and the use of high definition are making telemedicine a real option for the health industry. There is also an important role to be filled by a-v integrators on designing systems that address local needs.

Telemedicine can be used as a means of consultation between doctors, doctors and patients or as an educational tool. It also makes it possible to provide specialised expertise in remote places where otherwise it would be difficult or impossible to get. Telecare for the elderly and chronically ill is also a key application facilitated by visual communication. It offers a call centre style of consultation, available 24/7.

Home care, teleconsulting or distance learning applications may be put into practice at different levels. A popular use is of video communication resources is to share images between experts, such as live surgical operations, dermatology pictures or live images, X-ray and Digital Imaging and Communication in Medicine (DICOM) acquired data or other medical high resolution images. The sharing of images equates to an interview between doctors, experts and patients, and is much more efficient than a basic telephone call or email. It is also faster and sometimes more cost-effective than meeting in person. Multi-site videoconference makes interacting



Telemedicine will be useful for remote areas

with one or more speakers possible as if they were present in the same room at the same time.

Ways in which telemedicine is used

The telemedicine/telehealth market may be split into three areas: doctor to doctor (D2D), distance learning and doctor to patient (D2P).

* D2D applications target medical opinion sharing between specialist and centres of excellence. It is used to speed up diagnosis and provide quicker and more flexible decision-making.

The practise is typically known as second opinion or teleconsultation, including telepathology, teleradiology and so on, allowing doctors to compare and exchange their opinions and clear doubts — of vital importance in remote areas or dispersed locations. Widely adopted in the medical market, second opinion practise does not always require top-of-the-range equipment. Low-cost desktop videocommunication software, running

KEY FACTS

Telemedicine is a viable alternative to doctors and patients meeting in person. The bandwidth and picture quality allow life-like meetings that bridge distances and provide speedy and reliable solutions to health issues.

- * www.tiaracom.com.my
- * www.sony.com
- * www.sct.scot.nhs.co.uk
- * www.aethra.com
- * www.aditechsr.com

on normal computers integrated with perhaps high-resolution cameras, can do the trick.

* Medical distance learning or knowledge sharing for continuous medical education is an important part of the telemedicine. Doctors from any where in the world can access information and education, updating learning directly to their own workspace, PC, desktop or lab.

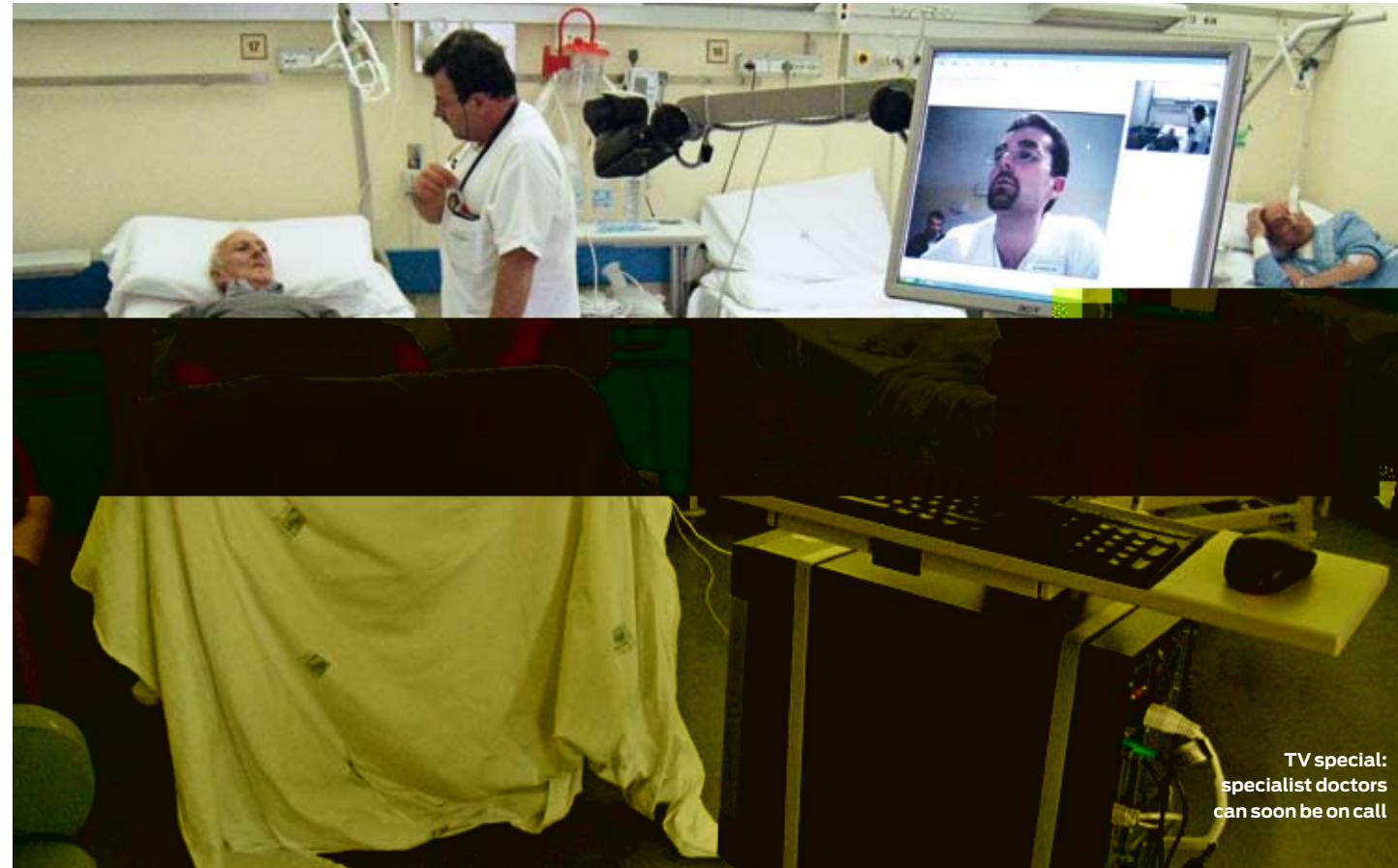
* D2P and home care is used for routine health control, psychological support or monitoring of vital parameters of patients in their own homes. Cases where it is useful include early hospital discharge, chronic illness or elderly care.

D2P provides similar benefits to a doctor's visit without the need for the practitioner to be physically there. Patients can simply plug electro-medical devices on to their telemedicine units and monitor vital signs such as blood pressure, temperature, heart beat, oxygen saturation, ECG or, in some more critical cases, body activity and posture.

Video is essential to guarantee the correct measurements of vital parameters taken locally by the patient. The care giver can control whether medical devices such as ECG machine, stethoscope or pressure cuff are positioned in the right way and they can train the patient on how to use them properly. This 'you see me/I see you' approach is an important way to guarantee continuity of a trust-based relationship between the care giver and the patient.

The virtual hospital model for early discharge is another option of D2P services. This implies the connection between a remote hospital and the patient's home using any telecommunication link available.

Several videoconferencing manufacturers and



TV special: specialist doctors can soon be on call

CASE STUDY

Polish Military Institute improves patient care

Due to its role as a scientific research institute and centre of postgraduate education, the Military Institute of the Health Services in Poland has always been at the forefront of technological advances. In 2005 the Institute continued integrating videocommunications technology into its organisation.

As part of its Telemedicine Project, the Institute utilises Aethra's telemedicine system Eykona. The Institute is now able to hold medical videoconferences from the operating theatre with the use of the DICOM Standards, and it is an integral part of the Institute's telemedicine project.

Eykona combines videoconferencing with high-tech medical peripherals and a comprehensive patient database. Clinically reliable and cost-effective, the system enhances remote consultations and provides increased access to quality healthcare for patients everywhere.

Developed and designed to support remote medical consultations, Eykona manages electronic medical records, processes medical images, provides video consultation services, and allows users to share patient data via both live and Store and Forward applications.

- * www.wim.mil.pl
- * www.aethra.com

telehealthcare providers have developed special videocommunication systems addressing second opinion needs. For instance:

* Aethra has provided videocommunications equipment for second opinions since 1996 to worldwide healthcare organisations. An example of its technology is the Eykona (see case study).

* Sony has a number of HD systems addressing hospital operation room monitoring and distance learning. The PCS-G70P is a high-end VC system designed to complement healthcare applications where high audio and video quality are key. The PCS-G50P is a mid-range videoconference system that delivers a powerful product for communication challenges.

* Scotty, a secure VC unit from the Tiara group of companies (Tiaracom), allows portable videocommunications for applications in remote areas. It is a fully equipped yet compact office unit for secure speech, data and video communication over Inmarsat. The kit includes a rugged notebook computer,



Screen test: DICOM viewer for quick analysis

Scotty Video-Communication, two Inmarsat GAN satellite modems, integrated KIV 7 and OMNIxi encryption docking stations, Scotty high efficiency data-transfer system, printer and scanner, Scotty Universal Synchronous Network Interface, double Inmarsat GAN antenna unit, and peripherals such as telephone handsets and battery chargers.

* The Scottish Centre of Telehealth based in Aberdeen has recently launched a trial using Cisco's Health Presence system. The system uses high-quality video, audio and call centre technologies linked to diagnostic equipment such as stethoscopes and pulse oximeters to create a realtime virtual consultation.

Results from trials demonstrate that patients prefer simple to use and easy to manage terminals. Videophones or videocommunication TV set-top boxes are the most popular and efficient when linked to low cost and high performing electromedical devices. Such telemonitoring devices run over IP networks and make efficient use of PSTN, ADSL or other broadband technologies.

What happens with the data

Each of us is different and our health data needs to be kept in an orderly way for the telecare to accomplish its main objectives. A telemonitoring network for home care requires a centralised video call centre, including a patient database, vital parameter remote managing software and data storage, to allow tracking of patients' histories.

One of the most advanced videocommunication systems for telemonitoring is provided by Zydacon, an Austrian spin off from Scotty Group's telemedicine division. Based on its experience in the field, the company launched its Betavista product. The end user terminal is a TV set-top box running over IP networks which can be linked to a number of medical devices via Bluetooth, making the terminal easy to use for any patient.

The system has messaging embedded features for medical messages or to remind about prescriptions. Betavista also offers an innovative video call centre which can provide four contemporary multivideo communication sessions for second opinion or community applications.

There is no doubt that telemedicine can be a market driver for the videocommunication industry and there is a growing demand for such systems. But experience shows that the one-size-fits-all model does not work for telecare. This is where the role of system integrators becomes key to the application.

In many cases they will have to take off the shelf equipment and adapt it. For example, Italian company ADiTech has recently created a mobile telemonitoring system integrating a VC TV set-top box with the electromedical equipment available on an ambulance, to provide realtime monitoring for rescue teams. The ambulance was linked to the Medical Emergency management operation centre via UMTS. The whole system was bespoke.

Another example of telemedicine in action is a network implemented for the IRCCS Centro Neurolesi 'Bonino-Pulejo' of Messina, a Sicilian neurology research hospital, where three VC remote home care solutions were integrated to provide telehabilitation, teleassistance and realtime vital parameter monitoring to 35 patients' homes. ■