

Teleoncology in the Institute of Oncology Sremska Kamenica - Strategy of Development

Svetozar ZDRAVKOVIĆ
Dubravka STRIBER DEVAJA
Vladimir Vit. BALTIĆ

INSTITUTE OF ONCOLOGY SREMSKA KAMENICA,
SREMSKA KAMENICA, YUGOSLAVIA

The aim of this article is to present the directives of developing strategy of teleoncology in the Institute of Oncology Sremska Kamenica. Four aspects of teleoncology services are identified: primary care, video-consultations for making diagnosis and treatment, education (for both physicians and patients with their families) together with researching, and post-treatment care (supportive, palliative and terminal care). Each of these teleoncology services is complex and important, consisting of different applications. Although the costs of developing and implementing of telemedicine services are large, the benefits for human population are undoubtedly larger, so every community must find the strength to win a battle for bringing telemedicine services into every-day practice.

KEY WORDS: *Telemedicine; Teleoncology; Oncology*

INTRODUCTION

Telemedicine has mostly been described as the practice of medicine at the distance, in other words, when the physicians and patients are physically separated during the process of medical procedure. Today, telemedicine applications have been used in nearly every field of medicine, including radiology, pathology, neurology, psychiatry, dermatology, cardiology, surgery... One aspect of telemedicine that has increasingly become common is teleoncology, i.e. the delivery of oncology services from the distance to the patients with serious diseases and complex treatment and who permanently need health care. The Institute of Oncology Sremska Kamenica has been providing oncology services and treatment of the patients for many years. Now, we are trying to do all that is necessary to offer our patients telemedicine services in oncology - teleoncology. It is hard to define precisely what teleoncology involves, but services such as primary care, video-consultations for making diagnosis and treatment, education for both physicians and patients with their families and post-treatment care are certainly included in teleoncology. Having the above stated on side, and the level of telecommunication infrastructure, the costs of development which directly depend on the

strength of national economy, and general strategy of development of medical care in country on the other side, the Institute of Oncology has decided to plan its own strategy of development of teleoncology.

PRIMARY CARE

The primary care in oncology is probably the most important medical procedure in treating the cancer, because only the early detection of cancer can make cancer curable. On the other side, it significantly decreases the expenses of the treatment of oncology patients, which implicitly enables better health care. We think that the use of Internet web site is the best way to educate people in primary care, according to their needs and possibilities. Having in mind dynamic development and wide acceptance of the Internet, the importance of its role is obvious. But, to make the use of Internet as effective as it can be, we must take into consideration which type of oncological information can be exchanged through the Web and at what educational level.

In the first place, the primary care should help the collecting of oncology data from oncology centers for the Register of malignant disease of Autonomous Province of Vojvodina. The creation of the web page which will summarize the rates of incidence and mortality from five most frequent cancer localizations in Vojvodina should be accomplished very soon. It will be in the form of a table and a colored map and will show data for both male and female patients, based on the outcomes of the Register of malignant disease of Autonomous Province of Vojvodina. The aim of this web page is to promote primary care and early detection to all health

Address correspondence to:

Svetozar Zdravković, Institute of Oncology Sremska Kamenica, Computer Center,
Institutski put 4, 21204 Sremska Kamenica, Yugoslavia
E-mail: svetozar@uns.ns.ac.yu

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professionals, specially in Vojvodina, which is the primary area of health care for our Institute. Also, with its further developing, it will provide basic information on cancer disease, including risk factors and the instructions of how to live as healthy as possible, and all other information related to the policy of primary care.

The current web page for primary care existing within the official web site of the Institute of Oncology, is named 'Breast self-test' (<http://www.onk.ns.ac.yu/Prevention4.htm>). It presents one aspect of primary care, and its purpose is to help all women to perform this kind of preventive procedure at least once per month. According to preventive policy of the Institute of Oncology, five more programs for early detection of the cancer of female genital organs, colon, lung, skin, and prostate will be included in this group of teleoncology services via web pages.

VIDEO-CONSULTATIONS

Video-consultations for making diagnosis and treatment have two aspects: one is the ad hoc video-consultation for making diagnosis or treatment of a specific case and the other is TIC (Teleoncology Interdisciplinary Council), i.e. Oncology Commission.

Ad hoc video-consultations are usually done with an advanced and well-known medical institution, covering the requirements in almost every oncology fields: pathology, radiology, surgery, internal medicine etc. Our Institute often performs video-consultations on pathology cases with the Military Medical Academy in Belgrade.

The video-conferencing is now obtained by using of ISDN (Integrated Service for Digital Network) Base connector and the speed of 128 kb/s (two B channels); in future, with further developing of telecommunication infrastructure, 2 MB connectors or ISDN Primary connectors will be used. Any of the existing communication softwares on the market, such as Microsoft(r) NetMeeting as one of the most popular, can be used for this purpose.

TIC is an institution which performs permanent exchanging of expert opinions on oncology cases. It is primarily defined as a body of the Institute of Oncology to give an expert and multidisciplinary opinion to other health institutions. Naturally, when such expert bodies are organized in other health institutions in our country (which is to be expected in near future), the Institute will be the user of TIC's services as well. Of course, the using of TIC's services abroad, either with the Institute's cooperation partner or with any other ad hoc defined health institution, goes without saying. TIC consists of surgeons, oncologists, radiologists, immunologists, pathologists and other experts from all fields of medicine. TIC operates in three phases:

The preparation phase: it assumes some of IT (information tech-

nology) solutions, such as PACS (Picture Archiving and Communications Systems), with all specific equipment for picture acquisition (microscope with CCD camera connected to personal computer (PC), digital interfaces of MRI, CT, US machines for connection to PC, scanner for transparent medical films such as X-ray film, etc.), and electronic patient record (EPR) as the part of HIS (Hospital Information System) stored in DBMS (DataBase Management System). PACS enables storing and forwarding of all kinds of medical images (CT, MRI, US, X-ray, pathologic picture,...). Most of these images can be found in DICOM 3.0 (Digital Imaging and Communications in Medicine) format or in the JPEG format. EPR enables to collect all necessary information of patient's disease including data of family history of cancer, anamnesis, diagnosis, treatment and follow-up. The preparation phase includes: receiving of the request for TIC either by submitting specific form via web site or directly by an e-mail message containing all necessary medical data and relevant medical images; creation of the exact TIC referring to a specific case; sending of all medical facts to the member of the TIC; and finally defining of the exact date and time for video-consultation with a confirmation sent to the user of TICs' service.

The discussion phase: this phase is done on-line during video-consultations using 'white board', direct audio communication, chat or other available options of video-conferencing software used for establishing and running of video-consultation. This phase is ended when TIC makes final agreement that all relevant medical information are known and processed, so the conclusion is ready to be made.

The conclusion phase: this phase can be done on-line, during video-consultation session, or off-line, after the TIC meeting. The decision strictly depends on TIC. After the conclusion has been made, it is sent to the user upon his request, either by e-mail in next 24 hours in an off-line regime, or immediately in on-line regime.

This process of TIC's work can be changed during the exploitation of this service according the expert's demands or by 'power of experience'.

EDUCATION AND RESEARCH

Education in the field of oncology is intended for both physicians and patients with theirs families and is used as a teleoncology service by both groups. There are two ways of education: one is the web site, which enables the entering of a query into the database by means of relevant keywords and the other is the publication of educational CDs.

The official web site of the Institute already offers the opportunity to search database of articles written by physicians from the Institute, either by using keywords or by name of the author(s) (<http://www.onk.ns.ac.yu/Articles.asp>). The other approach is

possible by using of electronic on-line journal 'Archive of Oncology' (<http://www.onk.ns.ac.yu/Archive/Home.asp>), which is the forum for providing fast scientific information on clinical and experimental oncology, with all default search tools defined for electronic publications. These two mentioned approaches are intended to experts, physicians and all other medical professionals.

The web pages for laymen (patients or common people) will be developed in the next phase of education program. They will include all popular information about cancer that should be available to both urban and rural population, and help everybody to live with minimal risk factors for carcinogenesis.

Educational CDs will be published on the occasions important for further education and according to the policy of the Institute.

Finally, the Computer center in cooperation with all physicians from the Institute should create a special web page to be used only by professionals as a 'guide' to the well known medical database.

The research projects are very important source of knowledge not only for the physicians and medical practice but for common people also. The Institute permanently participates in clinical trials, which are organized in four phases (two pre-clinical - pharmacological and toxicological phases, and two clinical phases followed by clinical response to a given treatment - complete response (CR), partial response (PR), stabile disease (SD) and progressive disease (PD)). Two clinical trials are now being carried out in the Institute of Oncology: RUBOXIL(r) and EXAMES-TAN(r). As it is necessary to have permanent correspondence with appropriate health and pharmacology institution abroad during the trials, Internet and its various services appear to be the best solution for this request. Actual ecological problems in our country such as pollution of the river Danube with oil and its products from Novi Sad's Oil refinery during the bombardment in 1999, pollution of the river Tisa with cyanide and other heavy metals from the factory in Romania and radioactive contamination of soil with poor uranium in Republic of Srpska, Bosnia and Herzegovina as the consequence of the bombardment, are also important research projects in the Institute. As the results of these researches will be of great importance for both Serbia and Republic of Srpska, the Institute will present the outcomes of these researches in the best possible way (on Internet and CD). The possibility of creating a special database with these results, with an access by Internet, is also available.

POST-TREATMENT CARE (SUPPORTIVE, PALLIATIVE, TERMINAL CARE)

Cancer is a complex and serious disease, which can leave consequences even when the disease is cured. Using the experience of the Institute's physicians during the post-treatment period, three important problems are noticed: pain, various psychological

problems (depression, unwillingness to continue with normal life, etc.) and limited mobility of upper extremity as a consequence of mastectomy. The creation of web pages named Psychotherapy, Pain Therapy and Rehabilitation, respectively, is directly caused by these problems. Psychotherapy is designed as the off-line communication between a patient or a member of patient's family and a psychiatrist, aimed at the restoration of patient's normal life and activities. Pain Therapy program gathers interdisciplinary group of physicians with the aim to eliminate pain as much as possible through either defining of necessary protocol which will be given to a general practitioner by a patient or member of a patient's family, or making arrangements for the application of such a protocol in the outpatient department of the Institute, at any time. Rehabilitation is an on-line program which offers a set of exercises for the patients with breast mastectomy who need to improve the mobility of upper extremities. The types of exercises are defined on the basis of the records entered into the database, which is accessed via the web page after submitting identification data of the patient. The exercises are presented by corresponding text and picture explanation of the proper way of exercise performing.

The above mentioned teleoncology services are intended for Institute's patients only. So far, all teleoncology services concerning post-treatment care are in Serbian language, because the majority of patients are from Serbia. If necessary, these web pages can be offered in English language and languages of ethnic communities in Vojvodina.

DISCUSSION

Telemedicine is developing so rapidly, that soon, it will be very hard to imagine health care without these specific medical services. Even a middle developed country, such as Serbia is (in spite of a difficult political, economical, and social decade it has just passed through), must find the strength to win a battle for implementing telemedicine services into its health policy as soon as possible. The costs of developing and implementing telemedicine services are large, but benefits for human population are undoubtedly larger.

The Institute of Oncology, as the referent telemedicine center in Vojvodina, according to the project of developing telemedicine in Yugoslavia authorized by the federal government, has an additional obligation to contribute further development of telemedicine services.

This meeting has convinced us that our intention to develop teleoncology is right one. With the support of Serbian government and its competent ministry, Serbian telecommunication company, the Institute's management and all physicians and health professionals from our Institute and other health institutions, these teleoncology services can become reality in next five years.

Naturally, the financing of the development of teleoncology is very complex and burdensome task for the whole community. But, the advantages of teleoncology services (improved health care at lower costs, etc.,) will certainly force every community to seek for solutions that will introduce teleoncology in every-day medical practice.

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