



Learning Resource Center (LRC) Project Best Practices and Lessons Learned:

A Guide to Improving
Healthcare through
Information and
Communication
Technology



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The Learning Resource Center Model

In 1995, the American International Health Alliance (AIHA) established its first group of Learning Resource Centers (LRCs) at health institutions in Central and Eastern Europe (CEE) and the New Independent States (NIS) that were participating in the USAID-funded health care partnerships program. The project was envisioned as a way to maximize the investment AIHA was making in supporting Internet connectivity at CEE/NIS institutions in order to facilitate communications among its partners. AIHA has now established over 130 LRCs at a wide range of health organizations—including hospitals, clinics, medical universities, public health departments, health ministries, and training centers. Each of these has adapted the LRC model to fit its own mission and functions, whether related to clinical practice, education, community health promotion, research, or healthcare policy-making.

The central goal of the LRC project is to promote improved healthcare practices and behaviors by increasing access to health information. For health professionals to diagnose, treat, and prevent disease effectively, access to the most current research and information is critical; in isolation from the ever-changing body of clinical research, practices become outdated and healthcare quality declines. Similarly, policy-makers, educators, and public health professionals can significantly improve their work by learning from the methodologies and practices of others. By taking advantage of the capabilities of the Internet, healthcare institutions can now access more information—and more importantly, current information—than was previously available to them and at a fraction of the cost of maintaining journal subscriptions.

The LRC model is remarkably simple and one that is relatively easy to replicate and adapt. It involves two capacity-building components. The first is technological, involving the establishment of one or more dedicated computer workstations with Internet access. The second and equally important component is the staffing resource embodied by the LRC manager, known as the information coordinator. This individual holds the key to the successful implementation of the LRC model. The information coordinator provides the essential leadership to promote the widest possible use of the LRC, to provide training and resources to colleagues, to work closely with the institutional administration, and to continuously develop his or her own knowledge and skills. In combination, these two components—dedicated resources and appropriate personnel—provide the necessary elements for successful application of information and communication technologies to healthcare improvement.

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This report provides specific guidelines and recommendations that can be applied wholly or in part by healthcare institutions worldwide that are seeking to adapt the LRC model to improve the quality of healthcare they provide. These recommendations are broken down into seven categories, representing the different ways that information and communications technologies can impact health.

For more detailed information about the LRC model, training resources, and other project components, please visit the AIHA Web site at www.aiha.com.

Broaden Access to Resources

The core function of the Learning Resource Center is to improve the access of health professionals to healthcare information resources. LRCs have devised a variety of strategies to engage institutional staff in active learning and to increase their demand for information. These approaches have helped staff to learn about new prevention, diagnostic, and treatment methods; resolve complicated patient cases; communicate with colleagues in other regions; and improve their healthcare knowledge and technical skills.

DELIVER STRUCTURED TRAINING COURSES

An important part of improving health professionals' access to information is providing them with the skills they need to search for information and apply it appropriately to their practice. Whether conducted one-on-one or in small groups, LRCs provide training courses on a range of topics, including basic computer skills, Internet searching, critical appraisal of medical literature, and database design. LRC training sessions are often based on staff needs assessments, emphasizing new or particularly useful topics. Many LRCs organize formal classes to provide staff with both theoretical knowledge and practical skills, issuing certificates of achievement upon course completion. Some LRCs (for example, in Azerbaijan, Belarus, Georgia, and Ukraine) have even started to market themselves as English-language training resource centers, offering educational software, on-line courses, and videotapes for interested staff.

DEVELOP A PROACTIVE INFORMATION DISSEMINATION STRATEGY

Most LRCs have moved beyond simply posting information on an LRC bulletin board to advocate the use of information resources among staff. Some information coordinators use daily or weekly staff meetings to announce new resources, distribute relevant articles or present literature reviews on specific clinical cases. Some LRCs compile materials on specialized medical topics and disseminate them to relevant departments. Others have been collaborating with institutional or regional medical associations, supplying them with current literature and other resources. In institutions with local area networks, LRCs post information on shared network drives, providing access to health resources from staff workstations. Similarly, several LRCs have established libraries of both print and electronic resources to serve as the official repository of healthcare information



Photo: Irina Carnevale

One of the most basic but important steps in managing the LRC is to establish a routine that fits the unique needs of the institution.

for their institutions. LRCs in Georgia and Kyrgyzstan have set up electronic mailing lists to disseminate information on family practice and emergency medical services to interested staff and other local healthcare professionals.

ADAPT THE LRC MODEL TO MAXIMIZE ACCESS

One of the most basic but important steps in managing the LRC is to establish a routine that fits the unique needs of the institution. First and foremost, this involves posting office hours and ensuring that the LRC is always open during those hours. It also includes establishing clear procedures for receiving and responding to information requests, providing written instructions for the use of on-line databases and CD-ROMs, updating the bulletin board, and keeping a structured list of Internet bookmarks. These processes not only keep the LRC running smoothly, but also set expectations for staff who learn to rely on the LRC when they need to find a particular piece of information. In addition to these standard LRC procedures, some Centers have come up with innovative strategies to maximize access. For example, in Estonia and Ukraine, LRCs located in large hospitals have nominated information coordinators for each major department to better organize information dissemination activities, fulfill information requests, and update institutional Web sites. In another example, an LRC in Bishkek, Kyrgyzstan, has devised a schedule to share its unlimited Internet access with other departments at the institution. During early morning or late evening hours, each designated department can log on to the Internet using a dial-up connection.

ENLIST VOLUNTEERS

To keep the LRC open during office hours and to help with other LRC activities, medical student or youth volunteers can be a tremendous resource. One LRC in Yerevan, Armenia, has begun recruiting senior-year students from the local medical college to help manage LRC responsibilities. This arrangement has benefited both the LRC and the students, who, as potential recruits, became familiar with the institution and its internal processes. Young LRC assistants can also serve as opinion leaders among their peers, advocating the use of technology and information. LRCs in Belarus, Romania, Russia, and Ukraine have successfully involved teenagers in technical projects as well as health promotion outreach activities.

Promote Evidence-based Practice

Access to up-to-date information alone is often not enough to ensure meaningful changes in healthcare practices. A critical appraisal of the medical literature is required in order to verify the validity of presented evidence and its relevance to local conditions. In recognition of this need, LRC staff have been acquiring skills in the area of evidence-based practice (EBP), which provides a set of principles for objective evaluation of healthcare information and aims to ensure effective integration of research evidence with practice. Successful implementation of EBP is a laborious process that requires a variety of institutional mechanisms and significant administrative support to ensure lasting changes. Many LRCs have acted as change agents at their institutions by introducing EBP and mobilizing staff and management to validate their practices and improve the effectiveness of health services.

ESTABLISH AN ONGOING CAPACITY FOR QUALITY IMPROVEMENT

The creation of continuous quality improvement committees and working groups that regularly review practice standards and monitor compliance can be an effective mechanism for the integration of EBP into practice. The establishment of such groups reflects the institutional commitment to a systematic process of evaluating the effectiveness of medical practices and capacity to implement change. A number of such committees in Azerbaijan, Croatia, Russia, Tajikistan, and Ukraine regularly review relevant topics using EBP resources available at the LRCs. Many institutions have established temporary working groups in conjunction with the LRC Practice Standard Review (PSR) process. (The PSR is a critical review of published evidence for a particular practice, and its comparison with the current practice at the institution. AIHA requires LRCs to conduct two PSRs each year.) Such working groups usually involve deputy chief administrators, hospital epidemiologists, and information coordinators as well as medical specialists for the topic being studied. The need to evaluate the evidence and determine its relevance to local practice exposes involved staff to the principles of EBP and integrates them into the implementation process.



Photo: Suzanne E. Grinnan

Effective evidence-based healthcare is impossible without careful consideration of the unique preferences, concerns, and expectations of each individual patient. As the key figure of the healthcare system, the patient has the right to participate in the decision-making process and to be fully informed about his or her treatment options.

INTEGRATE EBP INTO EXISTING INSTITUTIONAL PROCESSES

Instead of creating an EBP implementation strategy from scratch, it is often easier to try to integrate it with already existing procedures and committees. This can include processes like continuing medical education courses, thematic conferences, and reviews of institutional guidelines. For example, in Vladivostok, Russia, the intra-institutional physician certification process requires medical staff to use EBP resources in order to be considered for re-certification. Similarly, the institutional mortality review committee involves a literature review as an integral component of each case's discussion. By incorporating EBP resources and methodologies into institutional processes, healthcare institutions can make the process of learning and applying EBP principles much easier, especially those resistant to change.

PROVIDE EBP TRAINING TO STAFF

Evidence-based changes in healthcare practice require skilled and knowledgeable staff. To introduce these skills, many LRCs have organized training sessions and lectures for medical staff at their institutions. They usually work with a specific group—residents, physicians, or nurses—to introduce appropriate and relevant resources and teach the principles of EBP. Some LRCs engage enthusiasts at their institutions to teach others the fundamentals of EBP. In some cases, persuasive examples, creativity, and extra effort are required to bring staff to realize the importance of the EBP approach. For example, in Schuche, Russia, the information coordinator together with a group of hospital staff has organized an educational campaign to convince hospital administration and the head of clinical laboratory to adopt a new diagnostic procedure. The group provided a comparative review of all diagnostic methods for bacterial vaginosis, conducted a presentation on sepsis, and disseminated evidence-based information on the efficacy and cost-effectiveness of the Gram stain method. After the new procedure had been adopted and the laboratory staff has been trained, the information coordinator developed step-by-step reference sheets for the lab staff.

INVOLVE PATIENTS IN CARE DECISIONS

Effective evidence-based healthcare is impossible without careful consideration of the unique preferences, concerns, and expectations of each individual patient. As the key figure of the healthcare system, the patient has the right to participate in the decision-making process and to be fully informed about his or her treatment options. A number of LRCs are providing evidence-based health information to patients using several new consumer health Web sites, which incorporate EBP content into educational materials for the lay reader. For example, using LRC EBP resources, the staff of the rheumatology department in a large hospital in Vladivostok, Russia, is seeking to educate patients by providing them with a “protocol of informed consent.” This document, adapted to individual diagnoses, explains disease etiology, treatment goals, patient and physician responsibilities, and lists a variety of treatment options and their costs. Together, the patient and the physician decide on a course of treatment, sign the document, and keep a copy for their records. Over the course of several years, this innovative process has created better informed and more involved patients who feel empowered by their healthcare system.

INTEGRATE EBP INTO MEDICAL SCHOOL CURRICULA

As important as it is to introduce EBP to practicing physicians, critical appraisal skills and EBP training need to be an essential part of the educational process for all medical professionals. The integration of such training in medical schools, residency, and continuing medical education programs can instill the necessary skills and knowledge for future practical work. LRCs located within educational institutions in Croatia, the Czech Republic, Moldova, Kazakhstan, and Ukraine have been making efforts to introduce EBP as a new subject or incorporate EBP principles into curricula for such disciplines as preventive medicine, family practice, and pediatrics. Some institutions that offer residency training programs have included information technology and EBP training as part of their regular curricula. The School of Public Health in Kazakhstan, which offers postgraduate and continuing medical education to health managers, incorporated the LRC Practice Standard Review (PSR) as a required project for its students. Using LRC online and database resources, students search and critically appraise medical literature to develop PSRs on such topics as nosocomial infections, sanitary inspection of railway transport, and medical and social disability policies.

PROMOTE EBP THROUGH OPINION LEADERS

The involvement of institutional or community opinion leaders in EBP-related activities can lead to wider acceptance and dissemination of the EBP approach among other health professionals. In Olomouc, Czech Republic, a multi-disciplinary EBP working group consisting of university faculty, hospital physicians, scientists, students, and information professionals has been established to promote EBP in the academic medical field and to collect, select, and develop training materials on EBP for undergraduate and postgraduate education. The working group members have organized several lectures on EBP at the local university, conducted a workshop “How to Read Articles in Biomedical Journals” for medical students, made presentations on evidence-based resources for epidemiology and hematology, arranged and moderated an EBP panel for an international pediatric conference, and presented a poster at an international health libraries conference in Germany. In another example, an LRC in Kosice, Slovakia, has been actively supporting the work of the East Slovakian Open Medical Club, which brings together a group of physicians who are promoting evidence-based medicine in clinical practice. In addition to teaching other physicians to use evidence-based resources at their hospitals, Club members have participated in discussions on the National Radio about new intervention strategies in neonatology and general anesthesiology.

TRANSLATE KEY DOCUMENTS INTO LOCAL LANGUAGES

As a relatively new approach in modern healthcare, EBP literature hasn't yet fully penetrated all countries and languages of the NIS/CEE. To help alleviate this problem, some LRCs have been taking on the task of translating major EBP documents into local languages and distributing them among health professionals. Such documents include clinical practice guidelines, key articles, Cochrane Hot Topics, and systematic reviews.

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Serve Local Communities

Access to health information is important not only for medical professionals, but also for patients and the population as a whole. In recognition of this, many LRCs have been working actively within their local communities to disseminate current health information among patients and public organizations. Using educational brochures, posters, newspaper inserts, and other information dissemination methods, LRCs have helped to raise awareness and understanding of health issues, which can lead to healthier lifestyles, effective self-management of chronic diseases, and early detection of life-threatening conditions. Additionally, many LRCs have formed alliances with key actors in the community to reach different patient and community groups.



Courtesy of the Korsakov LRC.

INVOLVE THE LRC IN COMMUNITY HEALTH PROMOTION CAMPAIGNS

Health promotion and disease prevention efforts often require a proactive approach to information dissemination. The staff of several LRCs regularly visit local schools with interactive lectures and presentations that educate teenagers about reproductive health issues, the dangers of tobacco, alcohol and drugs, and the importance of physical activity for cardiovascular health. The LRC in Kurgan, Russia, has developed what it calls a “Mobile LRC,” which, among other things, has visited a summer camp to conduct training sessions for adolescents and to provide students with information on sexually transmitted infections (STIs) and first aid techniques. In Astana, Kazakhstan, the LRC supplies printed information resources on health promotion and basic emergency care procedures to local clubs dedicated to supporting various social groups, including the elderly, future parents, adolescents, and cardiology patients. Similarly, an LRC in Romania is providing educational resources on family planning, STI prevention, infertility, and healthy lifestyles to local clubs for teenagers and expecting couples.

DEVELOP IN-HOUSE PUBLICATIONS

Several LRCs have been reaching local communities with their own publications. In Korsakov, Russia, the LRC publishes a hospital newspaper, *Pulse*, which features regular columns for hospital news, developments in Russian and international healthcare, and articles on prevention, diagnosis, and treatment of various medical disorders. Distributed to the patients and staff of all healthcare institutions in the region, *Pulse* is pre-

pared by the LRC staff in collaboration with local clinicians, who contribute articles and reports using Internet research.

COLLECT PATIENT INFORMATION REQUESTS

To address individual health concerns, some LRCs have set up procedures to collect information requests directly from patients. In Schuche, Russia, the information coordinator has placed an envelope on the wall of the gynecology ward inviting patients to submit their health-related questions in writing. All answers, printed and arranged into binders, are available for review in the common area of the ward. Other LRCs are making their facilities available to patients and community members to search for health information on the Internet, and some organize viewings of educational videotapes for specific groups of patients.

FACILITATE GREATER PATIENT INTERACTION

Patient education efforts can significantly benefit from physician-patient electronic interaction and through the use of information technology. In Iasi, Romania, the LRC staff has developed an institutional Web site (eld.necomm.ro), which provides educational information and offers patients an opportunity to sign up for prenatal classes, make appointments with physicians, and ask confidential medical questions on-line. To reach the teenage population, the LRC has also created a specialized Web site with educational resources for this group and a contact form for adolescents to ask health-related questions. Additionally, each physician at the institution has a personal e-mail address for regular communication with patients.

CREATE PORTALS FOR LOCAL LANGUAGE CONTENT

To reach a wider audience, several LRCs have created comprehensive Web sites offering native-language resources to patients and health professionals. In Donetsk and Odessa, Ukraine, two Web sites (www.trauma.donetsk.ua and www.mednet.odessa.ua) developed by information coordinators have become national healthcare portals that include information about regional healthcare providers, articles on different medical specialties, a drug index, links to on-line journals, and other resources. Additionally, some institutions offer free consultation services through their Web sites. In Kazakhstan and Ukraine, pediatric and trauma specialists have been consulting patients seeking healthcare advice on-line (pediatrics.med.kz and www.telemed.org.ua).

COOPERATE WITH LOCAL MASS MEDIA

Collaboration with local newspapers and television stations offers a tremendous opportunity to educate the public on health issues and promote healthy life styles. Several LRCs regularly work with their local print media to inform the public about a variety of health-related issues. Newspapers in the Russian cities of Kurgan, Schuche, and Korsakov periodically publish editorial columns, articles, and full-page inserts on such topics as family planning, women's health, and seasonal disease prevention. Several other LRCs have provided information support for television and radio appearances by LRC staff and their institutional colleagues.

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JOIN FORCES WITH NGOS

Close collaboration with non-governmental and public associations provides opportunities for targeted dissemination of resources and stronger ties to the community. Several LRCs in Kazakhstan, Russia, Slovakia, and Ukraine have been assisting local humanitarian assistance, health promotion, youth, and social services organizations with a variety of tasks. They help develop educational materials and presentations, research bylaws and operational information, lease presentation equipment, and establish contacts with partner organizations in other countries. Some LRCs have joined forces with NGOs to publish health information in the local press and to participate in community health promotion actions.

TEAM UP WITH LOCAL LIBRARIES

The lack of modern technical and information infrastructure at many NIS/CEE libraries provides an opportunity for closer collaboration between medical libraries and LRCs. The combination of the up-to-date information resources and technology available at the LRCs and the stature and readership base of medical libraries offers a potential to provide current knowledge resources to a wide audience. A few LRCs are taking steps in this direction. LRCs in Samara, Russia, and Uzhgorod, Ukraine, for example, have each placed a donated computer at a regional medical library and connected it to the local area network, thus integrating LRC databases and other resources with the library's catalogue.

COLLABORATE WITH OTHER ORGANIZATIONS

Forming relationships and alliances with other local organizations, including government entities, can further strengthen outreach efforts. LRCs in Romania, Russia, Slovakia, Turkmenistan, and Ukraine are cooperating with local departments of health and education, other healthcare institutions, and Ministries of Health by conducting policy and treatment research, sharing information resources, and leasing presentation equipment for regional conferences and meetings.

DISSEMINATE INFORMATION THROUGH LOCAL INTERNET NEWSGROUPS

Utilization of local electronic media is another venue for patient education. In Sarov, Russia, the information coordinator regularly participates in local Usenet newsgroups to answer medical questions, to dispel common misunderstandings about health issues, and to inform participants about the importance and advantages of evidence-based practice. These regular discussions have provided an important outlet for patient education, especially because newsgroup participants represent the most active strata of society, those who are more inclined to talk about news or opinions with others.

Strive Toward Sustainability

Given current economic conditions in NIS and CEE countries, the ability to maintain access to healthcare resources after AIHA funding ends is a critical issue for most Learning Resource Centers. Many LRCs have been exploring different options that will enable them to continue to maintain Internet access and other basic LRC functions.

ENGAGE CHIEF ADMINISTRATORS

One of the key factors in the success of any sustainability approach is the support of institutional leadership. Many chief administrators have become proponents of information resources and technologies after having witnessed their positive impact on clinical effectiveness, cost savings (in areas such as purchasing and efficient use of drugs), and staff training. Demonstration of these real clinical and economic benefits can help to build stronger ties between LRCs and the administration, ensuring greater support for future LRC sustainability.

INTEGRATE THE LRC INTO THE INSTITUTION

The most desirable outcome for LRC sustainability is the complete integration of the center into the financial, staffing, and organizational structure of the institution. For this to happen, the institution must assume full ownership of the LRC and adapt its functions to the needs of the organization and its staff. For example, in Tashkent, Uzbekistan, the LRC became the basis for a new scientific department responsible for data analysis, international relations, training, and new technologies. These activities utilize various LRC resources and functionalities, and the institution fully covers the costs of staff, supplies, and equipment. A number of institutions have fully or partially incorporated LRCs into their organizational structures, absorbing the cost of supplies, equipment, staff, and the Internet into their budgets.

APPLY FOR GRANTS

Grant funding is another avenue for continued support of LRC functions and activities. To benefit the LRC, grant applications can be submitted on behalf of the LRC itself or as part of an institution-wide project. Several LRCs have received direct grant funding to set up local area networks and purchase equipment and supplies. Other LRCs in the Czech Republic, Georgia, Kazakhstan, Ukraine, and Uzbekistan have benefited from institutional grant applications.



Photo: Peter Krcho

In support of special projects, some LRCs have sought out local strategic partners, which have the ability to offer financial or intellectual assistance.

These LRCs participated in proposal writing and research in the initial stages of the projects and offered their communications, software, information resources, and analytical capabilities to support the broader goals of the grant project. In return for their involvement, LRCs received funds for equipment and supplies purchases. Most of these institutional grants have focused on project development, data collection, or research. For community outreach and development projects, several institutions are collaborating with NGOs and other local groups to create comprehensive, community-wide health promotion programs.

OFFER PAID OR BARTER SERVICES

To help recover the costs of supplies and other expenditures, many LRCs have turned to paid services or barter. Paid services can include information searches, photocopying, printing, presentation preparation, Web hosting, and equipment and room rentals. Many LRCs have also provided professional services, including Web design, programming, desktop publishing, and translation. In Kutaisi, Georgia, the LRC offers students from the local medical college an LRC subscription service, which covers Internet and access to e-mail, CD-ROMs, and a number of other resources. In some countries and regions, where paid services at healthcare institutions are disallowed, LRCs have turned to barter, asking outside patrons to provide paper, diskettes, or other supplies in return for LRC usage.

FIND STRATEGIC PARTNERS

In support of special projects, some LRCs have sought out local strategic partners, which have the ability to offer financial or intellectual assistance. In Zadar, Croatia, the LRC has been collaborating with a local IT company to set up an institution-wide health information system. Similar efforts have been made in Albania and Romania, where LRCs have been working with local software firms and universities to enlist their expertise in various IT projects. Another approach that some LRCs have tried is to request donations of information resources or equipment from large international companies. Using such methods, one LRC in Bishkek, Kyrgyzstan, has been receiving free quarterly updates of MEDLINE on CD-ROM from SilverPlatter.

COLLABORATE WITH INTERNET SERVICE PROVIDERS

By keeping a close eye on the costs and options offered by local Internet service providers (ISPs), many LRCs have been able to reduce their monthly Internet costs by switching providers or renegotiating their rates. In a few cases, institutions receive free Internet access in return for agreeing to place the ISP's satellite equipment on their building rooftops. Good relations with Internet service providers can also ensure quick and efficient technical support. Some LRCs, for example, have been able to receive free assistance for special events such as videoconferences. One LRC in L'viv, Ukraine, has become an Internet service subprovider, offering the best quality Internet connection in its city district. Per the terms of the agreement with the ISP, as the number of subscribers increases, the LRC will be able to make its own Internet connection costs self-sustainable.

ESTABLISH SATELLITE LRCS

While creation of satellite LRCS represents a good information dissemination approach, it is also an important sustainability strategy. In Azerbaijan, Georgia, Kyrgyzstan, Russia, and Uzbekistan, several institutions have established replication sites at their affiliates in order to extend Internet access and information support to more staff. In these cases, the original LRCS serve as leaders and trainers, sharing their expertise and resources to create similar capabilities at other locations. In each of these cases, the institutions themselves initiated the LRC replication processes, indicating the need and showing support for the services LRCS provide. Having made significant investments in the satellite LRCS, these institutions are likely to continue supporting their Centers even after AIHA funding ends.

Support Telemedicine



Photo: Peter Krcho

By helping to disseminate the latest advances in health research, the rise of electronic communications has had a considerable impact on modern medicine. From simple e-mail-based requests to live videoconsultations, practically all LRCs have participated in some form of telemedicine. LRCs have played a critical role in helping health professionals reach out to the international medical community and in providing technical support for medical data conversion. The most experienced LRCs recommend the following methods for more successful and efficient teleconsultations.

TRAIN STAFF TO DESIGN TELECONSULTATION REQUESTS

While LRC staff usually assist physicians in the composition of telemedicine requests, it is important to teach staff some of the basic consultation principles that they should use when composing their own requests or when responding to others. The basic tenet of patient confidentiality, proper request formulation, inclusion of sufficient data, and “netiquette” concerning image attachments should be explained to all staff who are involved in

teleconsultations. A complete set of guidelines developed by AIHA based on the experiences of the LRCs is available on AIHA’s Web site (see Tech Topic No. 27: Teleconsultation).

PREPARE AHEAD OF TIME

For live video or teleconferences, preparation work is a crucial element of a successful consultation. To make the process more efficient, all participants need to have received and reviewed the meeting agenda as well as all supplementary information, including images, prior to the conference. The meeting also needs to have a designated facilitator responsible for following the agenda and soliciting input from participants.

CONDUCT LITERATURE SEARCH PRIOR TO CONSULTATION

A search of the literature prior to holding a teleconsultation offers a more comprehensive approach to the resolution of complicated patient cases and may also save time. For example, one LRC in Bishkek, Kyrgyzstan, routinely conducts literature reviews prior to teleconsultations, and in some cases, the research helps to resolve patient case mysteries without protracted teleconsultation processes.

Enhance Medical and Nursing Education

Advances in computer and information technologies over the last decade have widened the horizons for medical education. LRCs located in medical colleges and universities throughout the NIS and CEE have capitalized on these new developments and have begun to incorporate software and on-line training into their educational programs. From MS Power Point presentations to Flash-based interactive training modules, many LRCs have begun to change educational practices at their institutions.

DEVELOP ELECTRONIC TRAINING RESOURCES AND GUIDES

Supplementing traditional education with electronic resources can help enhance the learning experience. An LRC in Almaty, Kazakhstan, has created a series of electronic books for upper-level medical college students in pedagogy and anatomy that cover over 40 hours of training and offer additional resources for further study. Several other LRCs have developed self-training modules on the use of computer equipment and information resources available at the LRCs. These materials are made available to staff electronically and in paper format.



Photo: Irina Carnevale

CREATE INTERACTIVE TRAINING PROGRAMS

Interactivity has been viewed as one of the biggest advantages in computer-based education. In addition to making the learning process more interesting, interactive programs can provide a more guided approach to learning compared with the use of textbooks alone. Two LRCs in Tbilisi, Georgia, have been designing Flash-based interactive modules in chemistry and emergency medical services, significantly enhancing the learning experiences of course participants. These modules are now used as part of their standard training curricula.

DESIGN DISTANCE LEARNING COURSES

To help reach a wider audience and to make healthcare education available in remote locations, a few LRCs have been assisting their institutions in the development of distance learning programs. Their involvement ranges from research on instructional design to the implementation of distance education technologies. In Kazakhstan and Romania, for example, educational institutions have begun developing distance learning programs in public health and health management to expand their graduate and postgraduate programs.

Develop Health Information Systems

The availability of modern computer equipment and access to current health information have transformed many LRCs into healthcare informatics departments for their institutions. While AIHA does not expect every institution to be able to develop a health information system (HIS) at this time, through trainings and study tours LRCs have been encouraged to adopt appropriate technologies that would simplify and facilitate healthcare delivery. Reflecting the different technological infrastructures of their institutions, many LRCs have been able to support at least some degree of informatization at their institutions—from local area network development to use of palmtop devices to full-scale corporate health information systems.

ESTABLISH A LOCAL AREA NETWORK

As the first step toward more efficient use of computer technologies, many LRCs have created local area networks at their institutions. This process has not only significantly improved data and resource sharing among staff, but has also simplified computer management tasks for the LRCs. Additionally, several LRCs have spearheaded the process of integrating networks among several departments, creating corporate information networks for their institutions.



Courtesy of Bobur Shukurov.

PREPARE A PLAN FOR A HEALTH INFORMATION SYSTEM

For those institutions and health informatics departments that decide to embark upon the development of electronic patient records and other components of health information systems, it is important to create an action plan that outlines all steps and implementation aspects of the proposed task. This plan can serve as a long-term blueprint and ensure continuity for everyone involved in this extensive process. The LRC in Zadar, Croatia, has been following this approach in the development of a health information system for a large regional hospital. In addition to providing a detailed description for each proposed measure, the implementation

plan includes an executive summary that briefly outlines steps, costs, and benefits of the health information system for administrative decision-making and staff review. To help other LRCs, the Zadar information coordinator has prepared a guide to information systems development based on his hospital's experiences. (This guide will be available on AIHA's Web site in summer 2003.)

USE AVAILABLE SOFTWARE PRODUCTS WHEN APPROPRIATE

Although some institutions choose to develop their own health information databases, this process is usually labor—and time—intensive. For many applications, there are software products available on the market for the development of both large-scale corporate health information systems (HIS) and individual HIS components, such as electronic patient records and financial management databases, that can be used as stand-alone applications and then integrated into an institution-wide system at later stages. Institutions in the Russian cities of Kurgan and Samara chose to purchase packaged software, which was modified to fit their processes and needs to create full health information systems.

ADAPT INFORMATION SYSTEMS TO INSTITUTIONAL PROCESSES

Information flow and internal institutional processes need to be taken into account for the development of a health information system. This can be achieved by carefully analyzing existing paper flow and patient routes within the institution and by defining specific tasks for programmers, physicians, and health managers to elaborate together. Prior to the full implementation of the health information system or any of its components, involved staff should consider conducting usability tests for physician-nurse teams to observe the functionality of the system and to make necessary adjustments. Institutions in Croatia and Ukraine have applied these principles in developing their health

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