Making HIV programmes work: The Heineken workplace programme to prevent and treat HIV infection 2001-2010
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Chapter 3:

Database-supported Teleconferencing: An Additional Clinical Mentoring Tool to Assist a Multinational Company HIV/AIDS Treatment Program in Africa.
Database-Supported Teleconferencing: An Additional Clinical Mentoring Tool to Assist a Multinational Company HIV/AIDS Treatment Program in Africa

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Background: The lack of human resources for health is presently recognized as a major factor limiting scale-up of antiretroviral treatment (ART) programs in resource-limited settings. The mobilization of public and private partners, the decentralization of care, and the training of non-HIV specialist nurses and general practitioners could help increase the number of HIV-infected patients receiving ART. In addition to other forms of training, scheduled teleconferences (TCs) have been organized to support a comprehensive HIV treatment program delivered by a private company’s health team. Objective: To describe the role of the TC as an additional tool in mentoring a company’s health care workers (HCWs). Method: For this study, all TC reports were retrospectively reviewed and the questions classified by topic. Participating Heineken physicians evaluated the technical quality and scientific relevance of the TCs through an anonymous survey. Results: From October 2001 to December 2003, 10 HCWs working in 14 operating companies in 5 African countries raised 268 problems during 45 TCs. A total of 79 questions (29%) were asked about antiretroviral (ARV) therapy, 53 (20%) about the diagnosis and treatment of opportunistic infection, 43 (16%) about ARV toxicity, 40 (15%) about care organization and policy, 32 (12%) about laboratory or drug supply, and 21 (8%) about biological parameters. The mean TC attendance rate was 70%. The level of satisfaction among local company physicians was 65% for logistics, 89% for scientific relevance, 84% for applicability of advice, and 85% overall. The most common complaints concerned the poor quality of the telephone connection and language problems for francophone participants. Conclusion: Database-supported teleconferencing could be an additional tool to mentor company HCWs in their routine care of HIV-infected workers and family members. The role and cost-effectiveness of telemedicine in improving health outcomes should be further studied. Key words: antiretroviral therapy, clinical mentoring, developing countries, electronic database, HIV/AIDS, private sector, teleconference

The majority of the world’s HIV-infected patients live in Africa, where access to treatment remains very limited.1 Financial resources are no longer considered as the major immediate obstacle to care. On the contrary, the lack of human resources for health has been recognized as another serious constraint to scale-up antiretroviral treatment (ART) programs.2 The mobilization of public and private human resources for health and the decentralization of...
care to incorporate non–HIV-specialist nurses and
general practitioners using simplified and
standardized treatment guidelines and user-
friendly recording and reporting systems could
help increase the number of HIV-infected patients
accessing ART. The provision of training and
support to these non–HIV-specialist health care
workers (HCWs) and quality control programs for
ART-delivering facilities are essential to ensure
effective and safe use of antiretroviral drugs. In
2001, Heineken International B.V. (Heineken)
decided to offer voluntary confidential HIV
counseling and testing (VCCT); diagnosis,
treatment, and prophylaxis of opportunistic
infections (OIs); and antiretroviral treatment to the
workers and their families in Heineken’s African
operating companies (OPCOs) through company
HCWs including physicians and nurses. In this
endeavor, Heineken was assisted by PharmAccess
Foundation (PharmAccess), a nongovernmental
organization that supports integrated HIV/AIDS
prevention, care, and treatment programs in
Africa. Company HIV policy and HIV care
guidelines written in collaboration with
PharmAccess, which take into account the
specificity of the OPCO’s context and the relatively
greater availability of resources in the company,
were provided to the HCWs.

To assist local company HCWs in their routine
HIV care, a clinical database designed to guide
physicians and nurses through all required physi-
ical and laboratory exams was implemented. It is
replicated to and synchronized with Heineken’s
central database, thus allowing distant case moni-
toring. In addition, a schedule of teleconferences
(TCs) every 2 weeks was organized to answer com-
pany health team’s practical and theoretical ques-
tions. There is little field experience with the use of
telemedicine to support an HIV/AIDS treatment
program in the developing world, and its use and
effectiveness is still debated. We describe and as-
sess the distant consultations for individual case
management and HIV medicine in general in our
pilot project.

OBJECTIVE OF THE STUDY

This article reports on the most frequent prob-
lems raised during bimonthly TCs by a company’s
health care teams taking care of HIV-infected
workers and family members, based on a retro-
spective review of TC reports. Further, it assesses
the use, relevance, applicability, and limitations of
a regularly scheduled, central database-supported
TC to solve specific clinical issues, based on attend-
dance records and the results of a survey of partici-
pating company physicians. Finally, we discuss re-
meote consultations as an additional way to provide
clinical mentorship to the company’s HCWs.

METHOD

The Health Care Team

The health care team of an OPCO typically con-
sists of one general practitioner assisted by one or
more nurse(s) depending on the number of work-
ers and their dependents attending the facility. On
some OPCO sites, there is only a nurse working.
He/she is always under the responsibility of the
country company medical doctor. All HCWs par-
cipate in HIV care including HIV VCCT and ART.
They provide general health care for OPCO’s
workers and their dependents (spouses and chil-
dren) free of charge.

Training and Mentoring the HCWs

HCWs are trained in aspects of occupational
medicine relevant to the brewery business and
general medicine. In addition, they received spe-
cific HIV-care education. This consisted of a few
days’ local didactic session. Physicians were sent to
Europe or to other sites in Africa for a 2-week
offsite clerkship. PharmAccess consultants per-
form an annual onsite mentoring visit. During the
onsite visit, all HIV-infected patients are reviewed
together with the local HCWs. An onsite visit can
be prompted by the identification of a specific
problem in one OPCO. Every 2 years, Heineken
provides a refresher course for the company medi-
cal doctors; this refresher includes HIV compre-
hensive care.

The Teleconference

TC participants include one representative of
each HCW team (usually the physician) involved
in the program at each OPCO, a PharmAccess spe-
cialist in HIV medicine, a PharmAccess laboratory
specialist/project manager, and the medical advi-
sor of Heineken International Health Affairs. Ques-
tions are submitted by email, 24 hours in advance, and sent to all participants. It is also possible to send pictures electronically. The centralized database is used to share all clinical and biological data concerning a specific case. When a particular case is under discussion, the electronic file of the patient is accessed by all TC participants to review clinical, laboratory, and paramedical investigations. Confidentiality is insured by using an anonymous coding.

TCs are conducted in English. All participants are invited to ask questions, and the answers are formulated with everyone’s input. The duration of the TC is 1 hour. A written summary of each TC is sent to all participants within 2 weeks. Summaries are approximately 900 words long and are written in a question-and-answer format. Files (e.g., guidelines, comments) or Internet links of interest are sometimes attached to the written summary. All TC summaries posted are available on the webserver of the company and can be searched using a list of key words.

The annual cost of the TC has been estimated at approximately 15,000 Euros for communications. In addition to telephone costs, other expenses include the time spent by participants preparing questions, attending the TC, and writing the TC report. The electronic and communication network is part of the company’s information system and is used for many other administrative and business purposes.

Analysis of the TC Content

All written TC summaries from October 2001 until December 2003 were retrospectively reviewed. The questions raised by company HCWs were analyzed and classified by topic.

TC Participation

Conference participation was assessed based on TC reports. The attendance rate was calculated by comparing the number of local company HCWs actually attending the TC with the number of expected participants (i.e., one representative of HCW’s team at each site managing HIV-infected patients). As the number of sites involved in the project increased with time, once a local HCW attended a TC, he/she was expected to attend all the following TCs.

Physicians’ Assessment of the TCs

In February 2005, a questionnaire in English and French was distributed to all participating company physicians while they were attending a refresher training course on HIV/AIDS. The questionnaire contained multiple-choice questions and a visual scale to assess satisfaction/dissatisfaction. A series of survey items concerned TC logistics, including the timing and frequency of TCs, the quality of the connection, and the performance of the telecommunication company. Physicians were also queried about the regularity of their attendance and the factors that influenced it. To assess the usefulness of TCs, the survey recorded respondents’ opinions regarding how easily questions could be asked during TCs; the usefulness of sharing concerns with colleagues; the lessons learned during the TCs; the clarity, applicability, application, and relevance of the answers; and whether the written summaries were used. Physicians could also add comments and suggestions. We did not specifically ask the respondents to compare the benefit of TCs with that of alternative training methods.

RESULTS

The HIV-Infected Workers and Family Members

From September 2001 until August 2006, more than 5,000 employees, 2,700 spouses, 800 children, and 350 retired employees were offered HIV VCCT on 15 sites in five OPCOs in Africa. There were 354 workers and family members who have been diagnosed with HIV infection, of whom 227 are currently taking ART. Their clinical and biological evolution is comparable to that of other reported African cohorts of antiretroviral (ARV)-treated patients. The mean number of HIV-infected workers and family members presently attending each OPCO health facility is 24 (range, 3–57) people.

TC Participants and Attendance

The number of participants is increasing as new OPCOs are enrolled in the ART program around the world. There is only one representative of each site health care team attending the TC, usually the medical doctor, although all nurses and medical doctors working at a specific site provide care to
HIV-infected workers and family members. At the end of 2003, the TC included 10 HCWs working on 14 sites in five African countries (Rwanda, Burundi, Nigeria, Republic of Congo, and the Democratic Republic of Congo). This increased to 15 HCWs from five countries at the beginning of 2005. Fifteen medical doctors were met during a refresher course and interviewed about the TCs. Fourteen out of the fifteen physicians attended the TC “always or usually.” The most frequent reason for not attending the TC was not being reached by the operator. Mean level of TC attendance was 70% (range, 37.5% to 100%).

**Issues Raised at the TCs**

From October 2001 to December 2003, 10 HCWs involved in the HIV care program participated in 45 TCs. During the course of these 45 TCs, participants raised a total of 268 questions, summarized in Table 1.

The number of questions sent in advance was approximately 50%. In a later phase, no more questions were sent in. The cited reason for this decreased response was time constraints.

**Evaluation of TC Quality**

Half of the participants felt that holding the TC once a month would be enough. Sound quality of the line was adequate for only 4/15, with 10/15 experiencing occasional breaks in communication. The majority used a cell phone.

Eleven of fifteen physicians qualified the TC summary as very useful and read it “always.” Level of satisfaction among the local physicians was 65% for technical aspects, 89% for scientific matters, 84% for applicability of the advice, and 85% in general. The most common complaints involved poor quality of the line (6/15) and language problems for the French speakers (6/15). The results of the company physicians’ survey are reported in Table 2. Potential advantages and disadvantages of a database-supported TC are described in Table 3.

**An Example of a Real Case Discussed at the TC: Patient AM8533**

A 34-year-old woman, spouse of an HIV-infected worker, was diagnosed as HIV positive in March 2005 and enrolled in the program. Initial clinical examination was normal and her CDC status was A. Her baseline CD4 count was 210 cells/µL, and the viral load was 4.7 log_{10} copies/mL. She was started on stavudine/lamivudine/nevirapine in

### Table 1. Questions raised during TC, classified by general and specific topic

<table>
<thead>
<tr>
<th>General topics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARV therapy</td>
<td>79 (29)</td>
</tr>
<tr>
<td>OI/clinical concerns</td>
<td>53 (20)</td>
</tr>
<tr>
<td>Drugs toxicity</td>
<td>43 (16)</td>
</tr>
<tr>
<td>Care organization and policy</td>
<td>40 (15)</td>
</tr>
<tr>
<td>Drug and laboratory supply</td>
<td>32 (12)</td>
</tr>
<tr>
<td>Laboratory parameters</td>
<td>21 (8)</td>
</tr>
</tbody>
</table>

**TOTAL** 268 (100)

<table>
<thead>
<tr>
<th>Specific topics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment guidelines</td>
<td>18 (7)</td>
</tr>
<tr>
<td>ARV therapy failure</td>
<td>26 (10)</td>
</tr>
<tr>
<td>ARV therapy dosage/combination</td>
<td>9 (3)</td>
</tr>
<tr>
<td>Mother-to-child transmission prophylaxis</td>
<td>10 (4)</td>
</tr>
<tr>
<td>Adherence/counseling</td>
<td>16 (6)</td>
</tr>
<tr>
<td>OI diagnosis</td>
<td>22 (8)</td>
</tr>
<tr>
<td>OI treatment</td>
<td>20 (7.5)</td>
</tr>
<tr>
<td>Clinical evolution unspecified</td>
<td>9 (3)</td>
</tr>
<tr>
<td>Vaccination</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Drug-drug interactions</td>
<td>9 (3)</td>
</tr>
<tr>
<td>Drug toxicity AZT</td>
<td>11 (4)</td>
</tr>
<tr>
<td>Drug toxicity d4T</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Drug toxicity 3TC</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Drug toxicity ddi</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>Drug toxicity nevirapine</td>
<td>6 (2)</td>
</tr>
<tr>
<td>Drug toxicity efavirenz</td>
<td>10 (4)</td>
</tr>
<tr>
<td>Drug toxicity protease inhibitor</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Drug toxicity general</td>
<td>4 (1.5)</td>
</tr>
<tr>
<td>Care organization</td>
<td>12 (5)</td>
</tr>
<tr>
<td>Heineken policy</td>
<td>12 (5)</td>
</tr>
<tr>
<td>Use of database</td>
<td>16 (6)</td>
</tr>
<tr>
<td>Drug supply</td>
<td>16 (6)</td>
</tr>
<tr>
<td>Laboratory supply/issue</td>
<td>16 (6)</td>
</tr>
<tr>
<td>CD4 enumeration</td>
<td>9 (3)</td>
</tr>
<tr>
<td>Viral load determination</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Blood chemistry; lipids</td>
<td>2 (1)</td>
</tr>
<tr>
<td>HIV serology; HIV testing</td>
<td>4 (1.5)</td>
</tr>
<tr>
<td>Other laboratory parameters</td>
<td>3 (1)</td>
</tr>
</tbody>
</table>

**TOTAL** 268 (100)

Note: TC = teleconference; ARV = antiretroviral; OI = opportunistic; AZT = zidovudine; d4T = stavudine; 3TC = lamivudine; ddi = didanosine.
Table 2. Physicians’ evaluation of the TCs

<table>
<thead>
<tr>
<th>Parameter analyzed</th>
<th>Frequency of the TC</th>
<th>Frequency OK/ too frequent: 8/7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Timing of the TC</td>
<td>Convenient/inconvenient: 13/1*</td>
</tr>
<tr>
<td></td>
<td>Quality of the telephone line</td>
<td>Good/poor/very poor: 4/9/2</td>
</tr>
<tr>
<td></td>
<td>Operator calling</td>
<td>Reachable: always/often/rarely: 7/7/1</td>
</tr>
<tr>
<td></td>
<td>Line interruption</td>
<td>Broken line: sometimes/never: 10/5</td>
</tr>
<tr>
<td></td>
<td>Telephone equipment used</td>
<td>Phone: cell/office: 10/4&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Frequency of attendance</td>
<td>Always/usually/sometimes: 7/7/1</td>
</tr>
<tr>
<td></td>
<td>Opportunity to ask questions</td>
<td>Easy to ask: yes/no: 12/3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Usefulness of sharing other’s experience</td>
<td>Always/sometimes: 12/3</td>
</tr>
<tr>
<td></td>
<td>Applicability of TC</td>
<td>Yes/no: 15/0</td>
</tr>
<tr>
<td></td>
<td>Clear answer to a specific question</td>
<td>Yes/no: 15/0</td>
</tr>
<tr>
<td></td>
<td>Implementation of the advice</td>
<td>Always/usually/sometimes: 9/5/1</td>
</tr>
<tr>
<td></td>
<td>Relevance of TC</td>
<td>Relevant/theoretical/not relevant: 13/1/1</td>
</tr>
<tr>
<td></td>
<td>Usefulness of summary</td>
<td>Very/quite: 11/4</td>
</tr>
<tr>
<td></td>
<td>Read the summary</td>
<td>Always/sometimes/never: 11/3/1</td>
</tr>
</tbody>
</table>

<sup>Note: TCs = teleconferences.<sup>

<sup>*One answer missing.  
<sup>*No, due to language difficulties.

Table 3. Advantages and disadvantages of database-supported teleconferencing

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Immediate solutions provided</td>
<td>• Cost</td>
</tr>
<tr>
<td>• In-depth analysis of individual cases based on electronic patient’s file</td>
<td>• Technical challenges</td>
</tr>
<tr>
<td>• Interacting and sharing experiences with other HCWs attending the TC</td>
<td>• Need to fill in an electronic database</td>
</tr>
<tr>
<td>• Long-term and ongoing relationship between mentors and HCW team</td>
<td>• Computer literacy requested</td>
</tr>
<tr>
<td>• Possible link with other support (database, website, …)</td>
<td>• Provision of North-South instead of South-South mentorship</td>
</tr>
<tr>
<td>• Identification of knowledge gaps</td>
<td>• Impossibility to measure direct effect on clinical outcome</td>
</tr>
<tr>
<td>• Possible integration in a larger frame of education</td>
<td>• Mainly physician driven</td>
</tr>
<tr>
<td>• Other</td>
<td>• No large-scale study to assess its cost effectiveness</td>
</tr>
<tr>
<td></td>
<td>• Language constraints</td>
</tr>
<tr>
<td></td>
<td>• Other</td>
</tr>
</tbody>
</table>

<sup>Note: HCWs = health care workers; TC = teleconferences.</sup>

March 2005. The patient was diagnosed pregnant in April 2005. In September 2005, 6 months after starting therapy, the CD4 count was 298 cells/µL and the viral load was 4.3 \( \log_{10} \) copies/mL. She delivered in November 2005. The viral load immediately before delivery was 4.3 \( \log_{10} \) copies/mL. Her child had not been tested as of August 2006. In July 2006, her CD4 count was 140 cells/µL and the viral load was 5.1 \( \log_{10} \) copies/mL. The OPCO physician changed therapy to the second-line treatment: tenofovir didanosine/boosted-lopinavir. The issue raised at the TC was an elevation in blood amylase level at two times the upper limit of normal. TC participants accessed the electronic file of
the patient using the patient’s code number. Biological analysis performed on August 12, 2006 showed increased amylase level of 176 IU/L, liver function and renal function tests as normal, and haemoglobin at 7 g/dL.

In the patient file, the recorded dosage of didanosine was 400 mg daily in addition to tenofovir. The patient weighed 50 kg. It also appeared that the patient presented with chronic cough, fever, and weight loss for more than 1 month. Three sputum smears were reported negative for acid fast bacilli. Pleural effusion was present on a recent chest radiograph. No decision was made to start anti-TB treatment. Discussion between country doctors from different OPCOs highlighted the possibility of sputum smear-negative pulmonary tuberculosis (TB). The referent PharmAccess physician underlined the drug-drug interaction between tenofovir and didanosine possibly causing pancreatitis and hence the raised amylase level. The expected drug-drug interactions between ART and anti-TB treatment were discussed. Difficulties in adherence were reviewed. The final decision was to start anti-TB treatment, to alter ART, to identify a treatment supporter, and to test the child for HIV. In this particular OPCO, the medical team cares for fewer than 15 patients, none of them previously receiving the tenofovir/didanosine combination and none of them suffering TB-HIV co-infection.

**DISCUSSION**

The questions raised during the TCs, and encountered in this particular case report, reflect the difficulties of comprehensive HIV therapy for non-infectious disease specialists. The definition and management of ART failure can be complex. The diagnosis and treatment of OIs and in particular TB are difficult. Serious toxicity of ARV drugs is another frequent concern in HIV care. Our case report illustrates the important interventions that can be provided for an individual case management during a database-supported TC and the potential lessons learned by all TC participants in various fields of HIV care.

Provision of ART by untrained HCWs carries the risk of improper use of antiretroviral medications, which could lead to the development of drug-resistant HIV strains and the loss of patient lives. It has effectively been shown that a physician’s expertise in HIV care directly affects the prognosis of patients on ART. General practitioners and physicians who have less HIV/AIDS experience are less likely to provide HIV care of optimum quality. It is now recognized that the shortage in health human resources in general and the lack of HCWs trained in HIV care in particular are the biggest challenges to scale-up ART programs. Large-scale and well-designed HIV-care training plans integrated in the global health system of a country should be considered as a priority.

General practitioners who develop specialized expertise are able to provide care of a quality comparable to that of HIV/AIDS specialists. In the Ivory Coast, doctors caring for a significant number of HIV-infected patients were shown to be well informed about ART, OI prophylaxis, and prevention of mother-to-child transmission. The various methodologies to provide training and continuing medical education as well as their respective merits have been reviewed. Recent developments in electronic and communication technologies offer new possibilities for remote education and exchange of information even in developing countries. Distant consultations using several media and support tools are one of the possible ways to provide remote clinical mentorship to HCWs. However the benefit of using communication and/or electronic technologies to support the health care system is still debated. Some programs have already developed a consultation system that permits nonspecialist providers to ask questions to experienced physicians through phone calls, websites, or emails.

To optimize the quality of care in the Heineken HIV/AIDS treatment program, we have used several tools to provide training, continuing medical education, and mentorship to the health teams in the OPCOs. Database-supported teleconferencing is one of the tools to provide remote support. Concerns expressed by the Heineken health care teams in routine clinical care of HIV-infected workers and their families are similar to those raised by physicians accessing a web-based remote consultation. A help-line had already proved useful for clinicians in charge of HIV-infected people who were not AIDS experts and had no ready access to expert consultation. Other authors reported that most of a vast array of clinical problems could be solved with one or a few telephone exchanges. The advantages of our database-supported TC over writ-
written answers to the more frequently asked questions is another way to help physicians. Further developments in telemedicine are needed as well as studies to better clarify its role to support HCWs and its cost-effectiveness in larger ART programs compared to other training tools.

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