Telemedicine: Improving Access to Care of Hepatitis C

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INTRODUCTION

One of the challenges in providing treatment to increasing numbers of Hepatitis C Virus (HCV) patients is access to care. Over the past decade, the number of HCV patients in the U.S. who have progressed to serious liver disease, including the development of cirrhosis or cancer, have increased to such a large amount that HCV patients currently represent nearly 40% of all liver transplant candidates. The incidence of chronic liver disease is projected to quadruple from the year 1990 to 2015 (1), and even with the availability of people willing to donate part of their liver, transplantation is a limited and very costly option. The obvious goals of dealing with this epidemic are prevention of new infections and elimination of the disease when already present.

Recent state and federal efforts to manage HCV have been targeted at long-term correctional facilities where HCV infection is astonishingly common. Whether the reasons are cost, distance or safety, these selected groups are at risk for not receiving standard care for treatment of chronic diseases such as HCV (2). In addition, rural areas often have limited access to care while experiencing the greatest need for specialty care (3), e.g. to manage and treat HCV patients. Recently, telemedicine consultations using videoconferencing technology have become more widely available to health care recipients (4). The use of telemedicine allows increased access to medical services at urban or rural area hospitals, ambulatory care settings and correctional facilities.

The University of California (UC) Davis’ Telemedicine program in Sacramento (3) is ranked among the top 10 in the country. Since 1996, it has expanded its referral network throughout all of California and provides thousands of teleconferences, including hepatology teleconsultations (Figure 1, UC Davis Telemedicine Referral Network).

METHODS

Over a two-year period, 103 HCV consultations took place via telemedicine technology at UC Davis. Each consult was performed using high resolution videoconferencing equipment, including high resolution video cameras and monitors and an interfacing program for video connections between terminals. The telemedicine network structure is arranged similarly to the diagram in Figure 2. Each site complied with the Multimedia Conferencing Standards set by the Institute of Electrical and Electronic Engineers (IEEE). Several types of connections were used to connect to UC Davis for telemedicine consultations, including T1, frame relay and Integrated Services Digital Network (ISDN).

Telemedicine Clinical Referral Guidelines were developed and used to ensure all necessary clinical infor-
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![Image of UC Davis Telemedicine Referral Network](image)

**Figure 1.** UC Davis Telemedicine Referral Network

Information was received and reviewed prior to the consult. Typically the consultation was expedited by having the relevant medical information available prior to the videoconference.

Requirements for hepatology consultation included the submission of preliminary laboratory tests, including a comprehensive chemistry panel (liver and kidney functions), a complete blood count, coagulation parameters, thyroid function, and the confirmation of HCV with viral load and genotyping. If available, but not necessary for the first consultation, ultrasound reports or other abdominal imaging procedures and liver biopsy reports were also collected. For liver transplantation evaluation, additional information was required pertaining to the availability of a phone, transportation, and abstinence from alcohol or illicit substances.

Patient consent was obtained after an explanation of the more technical aspects and nature of the telemedicine consultation, as opposed to the traditional face-to-face consultation. A telemedicine coordinator at the primary care site arranged the consultation and transmitted the relevant information regarding the history and physical examination data to the UC Davis Telemedicine Program, where the specialist consultant had the chance to review the information prior to the visit. Primary care providers were invited to participate in the consultation and actually perform the physical exam as requested by the specialist. This participation added a distance education component to the consultation through collaboration with the individual primary care provider during the consultation. Occasionally, "patient exam" cameras were used by the practitioner to magnify the details of skin changes (i.e. for important signs of chronic liver diseases, such as "spider angiomas," or "palmar erythema").

After each telemedicine consultation, patients and present providers at select clinics were given satisfaction surveys to complete in order to assess their satisfaction and the efficacy of telemedicine. Five-Point Likert scales (5 = “Excellent”; 4 = “Very Good”; 3 = “Good”; 2 = “Fair”; 1 = “Poor”) were used for both surveys. In addition, patients were also able to indicate their willingness to use telemedicine again in the future and whether they would prefer to use telemedicine locally or travel to a non-local specialist. Presenting providers were also asked if there were any technical difficulties during the consultation and if they would recommend using telemedicine for this type of patient in the future.

**RESULTS**

Five clinics returned 22 patient surveys and 20 provider satisfaction surveys. Satisfaction results were high on both the presenting provider and the patient satisfaction (continued on page 21)
surveys (Figure 3,4). All patients indicated that they would definitely use telemedicine in the future. A few explanations for these responses included the inability to travel due to pain, convenience/less travel and the ability for the present provider to explain the patient’s situation to the specialist. Only 27% of the respondents indicated that they would prefer a non-local visit to seeing a specialist over telemedicine. Presenting providers recommended the use of telemedicine for all similar patients in the future.

DISCUSSION

After initial reluctance from primary care providers’ wanting to directly manage the treatment of HCV patients for fear of side effect management risks, the UC Davis Medical Center currently treats several patients, including patients with liver cirrhosis, via telemedicine with the goal to avoid or delay liver transplantation. Patient and provider satisfaction with the quality of care provided was very high.

Our role as specialists in liver disease obligates us to provide care to all our patients, including those who may be financially or geographically disadvantaged. It is also incumbent upon us to educate the general health care providers on how to make correct diagnosis, stage the severity of liver disease (by interpreting liver biopsy), decide if therapy is indicated, and appropriately manage the course of treatment. Currently, the management and treatment of HCV is performed by gastroenterologists, hepatologists, and specialists in infectious diseases, although family practitioners, internal medicine providers, county clinics, and family physician assistants and nurse practitioners are increasingly becoming involved. The reasons for these changes include: (a) a lack of available specialists; (b) newer treatments that can be administered and monitored by general care professionals knowledgeable of the side effects and their management; (c) structured “centers” with properly trained personnel may actually be more cost-effective and possibly safer; and (d) underserved areas may not have equivalent access to health care as those nearer major medical centers or academic institutions.

Telemedicine outreach to rural areas and to correctional facilities is developing as an effective and innovative modality for closing the disparity gap in the access to care. Telemedicine raises the standards of care in underserved areas by eliminating the distance barrier for many specialized forms of medical care. It improves the local quality of care, is highly rated by patients and physicians, and allows specialist consultation in their patients’ communities or institutions. Telemedicine also saves money and time spent traveling to large urban areas or major medical centers (3) and encourages the participation of the primary care provider in the direct care of the patient (5). Very often the benefit of the consultation extends far beyond the individual patient. Through participation in videoconferencing, the primary care physician can collaborate with and learn from the specialists about the current management of specialized diseases. In addition, Medicare/Medi-Cal and many other insurance carriers reimburse for these services (4). The HCV community should approach this modality of care with an open mind and evaluate the potential advan-

Figure 2. Communication bandwidth varies from Telco connection type. Typically 384K is required for telemedicine consultations.
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Figure 3. Post-telemedicine consultation clinical provider mean satisfaction scores (N = 20; mean value ± SEM; five-point Likert scale: 5 = “Excellent”; 4 = “Very Good”; 3 = “Good”; 2 = “Fair”; 1 = “Poor”)

Advantages and long-term benefits of linking the local primary care provider to specialty care.

Using this model of care, distance from where the patient resides must be considered in accepting a telemedicine referral. There are cases in which the specialist will require an in person follow-up appointment. Generally, patients seen over video at UC Davis live in the greater Northern California region. As Figure 1 shows, there are over 60 telemedicine locations in California, which provide patients in their areas access to specialty care not available locally.

Figure 4. Post-telemedicine patient mean satisfaction scores (N = 22; mean value ± SEM; five-point Likert scale: 5 = “Excellent”; 4 = “Very Good”; 3 = “Good”; 2 = “Fair”; 1 = “Poor”)

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Disclosure

This Guest Editorial was adapted from an article appearing in the September 2002 issue of the HCV Advocate “Medical Writers’ Circle.”

Dr. Rossaro is a member of the HCV Advocate Medical Writers’ Circle, a publication of the Hepatitis C Support Project (HCSP)/HCV Advocate web site. Members of the HCV Advocate Medical Writers’ Circle are experts in the field of liver disease who partner with HCSP to help educate and support medical providers and the HCV community.

HCSP is a registered non-profit advocacy organization. The mission of HCSP is to offer support to those who are affected by HCV, and hepatitis B virus (HBV), including hepatitis coinfections. Support is provided broadly, through information and education as well as access to support groups. The Project seeks to serve the hepatitis community as well as the general public.

Visit the HCV Advocate web site at www.hcvadvocate for regularly updated information on HCV, HBV, and hepatitis coinfections.

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References