

## LEADERSHIP & PROFESSIONAL DEVELOPMENT

### Implementation of an Oncology Continuing Education Course for Nurses in Nicaragua

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In January 2004, I was the first graduate student with a specialty in oncology from George Mason University in Fairfax, VA, to go to Nicaragua. My goal was to learn how cancer care was delivered in a developing nation that continues to struggle with basic healthcare delivery. The clinical experience brought me to two hospitals, Hospital Bautista, a nonprofit private hospital, and Hospital Berta Calderon, a public hospital. Both hospitals have busy oncology units, and the nurses provided me with a review of their practice regarding chemotherapy administration. They also demonstrated the procedures they used to mix and administer chemotherapy. From the discussions and my observations, I could see that the nurses had not been trained adequately in safe handling of chemotherapy. They had never had a class or any formal instruction about chemotherapy preparation or administration. They did not use any special precautions or protective equipment (e.g., gloves, gowns, face and eye shields) when mixing chemotherapy. The rooms where medications were mixed lacked any type of ventilation. Some of the nurses stated that they had experienced hair loss and skin changes since working with chemotherapy. The nurses said that they had no access to information related to chemotherapy. Their primary source of information came from

medication package inserts, which are written in English and, therefore, were difficult to understand.

In regard to patient care, the Nicaraguan nurses told me that they were unsure what information was provided to patients, because they assumed that physicians appropriately instructed patients. When they were asked about the side effects of chemotherapy, they listed nausea, hair loss, headache, and hypotension. The nurses had no understanding of how chemotherapy works and why it is effective against cancer cells. Additionally, they did not seem to understand concepts such as myelosuppression and nadir. The nurses were familiar with mucositis but did not know what caused it or how it should be treated. Moreover, they believed that all people with cancer have problems with depression and that they, as nurses, could do nothing to relieve depression.

While on the nursing unit, nurses were told about the importance of using personal protective equipment when mixing and administering chemotherapy and the potential side effects of exposure to chemotherapy, but more education was needed. Upon returning to the United States, I submitted an educational grant to the ONS Foundation, and funds were awarded. The primary goal was to increase the knowledge of Nicaraguan nurses

about oncology care and the safe administration of chemotherapy. The objective was to make the nurses aware of strategies to avoid hazardous exposure to chemotherapy and the types of personal protective equipment they should use to keep themselves safe. The grant provided funds for the development of a video or DVD discussing safety measures necessary when mixing and administering chemotherapy and the purchase of a DVD player. A three-ring binder was developed with information in Spanish about management of the side effects of chemotherapy. Most importantly, the grant enabled me to return to Nicaragua as an instructor to present the information with the assistance of an interpreter.

Nicaragua, a country of 5.5 million people, is ranked as the second poorest country in the Western Hemisphere (U.S. Department of State, 2005). In 2004, the annual per capita expenditure on health care was \$206 compared to \$5,274 in the United States (World Health Organization, 2006a, 2006b). The average income per family in Nicaragua in 2004 was \$710 per year (World Bank, 2004). According to the National Quality of Life Survey conducted in 1998 by the National Statistics and Census Bureau, 47.9% of the population live in poverty and 17.3% live in conditions of extreme poverty (Pan American Health Organization, 2003). The present unemployment rate in Nicaragua is 22%, and the underemployed rate is 36% (U.S. Department of State). In 2005, the Pan American Health Organization reported that Nicaragua's cancer death rate was 101.7 per 100,000, a 4.2% increase from 1997, when

#### Leadership & Professional Development

This feature provides a platform for oncology nurses to illustrate the many ways that leadership may be realized and professional practice may transform cancer care. Possible submissions include but are not limited to overviews of projects, interviews with nurse leaders, and accounts of the application of leadership principles or theories to practice. Descriptions of activities, projects, or action plans that are ongoing or completed are

welcome. Manuscripts should clearly link the content to the impact on cancer care. Manuscripts should be six to eight double-spaced pages, exclusive of references and tables, and accompanied by a cover letter requesting consideration for this feature. For more information, contact Associate Editor Paula Klemm, DNSc, RN, OCN®, at klemmpa@udel.edu or Associate Editor Paula T. Rieger, RN, MSN, CS, AOCN®, FAAN, at ptrieger@pdq.net.

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mortality from cancer was reported as 97.6 per 100,000 (Pan American Health Organization, 2005).

Two articles have been published about nursing education concerning oncology or chemotherapy administration in Nicaragua or any developing country. Faculty members from the School of Nursing at Duquesne University in Pittsburgh, PA, have worked with Nicaraguan nurses regarding their role as leaders in improving breast and cervical cancer outcomes for Nicaraguan women (Lockhart, Cunningham, Benavidas, & Mercado, 2003).

Since 1996, a group of nurses from the Nursing International Outreach Program at St. Jude Children's Research Hospital in Memphis, TN, have been working with medical centers in Mexico and Central and South America to improve the specialty training of nurses in pediatric oncology. In 1999, the program established the International Training Center for Hematology-Oncology Nurses in Latin America (Donahue, Wilimas, Urbina, de Grimaldi, & Ribeiro, 2002). As of April 2006, 117 nurses from Honduras, Venezuela, Colombia, Chile, Nicaragua, Costa Rica, Panama, Mexico, Peru, Dominican Republic, Guatemala, Ecuador, and El Salvador completed the program. The director of the program at St. Jude said that institutional changes have been made. Of importance is that several hospitals in Central and South America have installed biologic safety cabinets and hired pharmacy technicians to reconstitute chemotherapy (N. Donahue, personal communication, April 5, 2006).

Nicaragua, like many developing countries, lacks appropriate resources for nursing education. Most nurses in Nicaragua graduate from a three-year program and subsequently complete post-RN courses that accredit them as *licenciadas*, the equivalent of an associate degree in nursing. In 1998, the Polytechnic University of Nicaragua (UPOLI) started a baccalaureate program. However, the program is relatively new. Presently, Nicaragua and surrounding countries do not have many nurses with bachelor of science in nursing degrees. Lydia Zamora, RN, MSN, the vice rector of UPOLI, said that nurses in Nicaragua earn about \$100 dollars a month. Unfortunately, little incentive exists to pursue nursing as a career because of the working conditions, salary, and limited social recognition as a discipline. Additionally, nurses have limited opportunities for continuing education (L. Zamora, personal communication, February 13, 2005).

## Goals of the Educational Program

The primary purpose of the educational project was to increase the knowledge of Nicaraguan nurses providing cancer care and administering chemotherapy. The objective was to give the nurses the information needed to understand the potential consequences to their health from exposure to chemotherapy

and to provide information concerning personal protective equipment needed to keep them safe when handling chemotherapy. Another goal was to increase the safety of patients receiving chemotherapy. If nurses have a greater understanding of safety considerations when administering chemotherapy, as well as potential side effects of the drugs, then patient safety can be improved.

## Program Overview

The educational program was divided into two parts. The first half consisted of a lecture, given by me with the aid of a Spanish interpreter, on safe handling and administration of chemotherapy. The lecture covered the following topics.

- Definition of hazardous drugs
- Risk of occupational exposure
- Potential points of exposure
- Symptoms of acute and chronic exposure to hazardous drugs
- Personal protective equipment
- Work area when mixing chemotherapy
- Proper administration of chemotherapy
- Extravasation
- Disposal of chemotherapy
- Management of spills

Throughout the lecture, I simulated proper techniques when mixing, priming, and administering chemotherapy.

Before going to Nicaragua for the presentation, I produced a DVD with Manuel Suarez, RPh, MS, in Spanish titled "Manejo Seguro de Medicamentos para la Quimioterapia," or "Safe Management of Chemotherapy." The DVD was based on recommendations from the Oncology Nursing Society's *Safe Handling of Hazardous Drugs* (Polovich, 2003). The DVD covered material discussed in the lecture (see Figure 1). The DVD also included simulations of proper techniques to use when mixing, priming administration tubing, and administering chemotherapy. The DVD was shown to the nurses, and all major points were reviewed. The DVD and DVD player provided nurses with access to the information given in the lecture at any time.

The second half of the program consisted of a lecture by me, with the aid of a Spanish interpreter, about potential side effects of chemotherapy and management of the side effects. The topics discussed were

- Overview of the role of nurses caring for patients receiving chemotherapy
- Pathophysiology of cancer and the goal of cancer therapy
- Myelosuppression
- Fatigue
- Pain
- Gastrointestinal complications
- Mucositis
- Anorexia
- Depression.

I assembled a binder containing all of the information (in Spanish) that I covered in the second half of the program. The information was obtained from the American Cancer

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- Characteristics of cancer cells
  - Symptoms of acute and chronic exposure to hazardous drugs
  - Potential points of exposure
    - Inhalation
    - Direct contact
    - Accidental ingestion
    - Needle stick
    - Work area
  - Personal protective equipment
    - Gloves
    - Gowns
    - Eye and face protection
  - Proper preparation of hazardous drugs
  - Disposal of hazardous drugs
  - Management of spills
  - Safe practices to follow when administering chemotherapy
  - Extravasation: how to prevent and manage it
  - Disposal of hazardous drugs
  - Management of spills
- 

**Figure 1. DVD Content**

Society, the Oncology Nursing Society, and the National Coalition of Cancer Survivorship. Each nurse was given a binder so that he or she always would have access to the information.

## Program Evaluation

Twenty-nine Nicaraguan nurses from three hospitals and one school of nursing participated in the course. The average experience of the nurses was 9.83 years; 55% prepared chemotherapy and 72% cared for patients receiving chemotherapy. All participants spoke Spanish, and a translator was provided by the hospital. I developed a 30-question knowledge test that I administered before and after the program. Questions for the test were derived from information in *Core Curriculum for Oncology Nursing* (Itano & Taoka, 2001). The Flesch-Kincaid reading level for the test was eighth grade.

Pretest scores ranged from 3%–80% ( $\bar{X} = 51\%$ ). Post-test scores ranged from 60%–87% ( $\bar{X} = 75\%$ ), a 24% improvement that was statistically significant ( $p < 0.001$ ). The educational program was successful in improving Nicaraguan nurses' knowledge about safe handling and administration of chemotherapy, as well as potential side effects of cytotoxic agents.

## Discussion

The oncology nurses who participated in the program now have the knowledge needed to keep themselves safe when mixing and administering chemotherapy, and they also possess vital information to share with their patients about the management of potential chemotherapy side effects. Increased knowledge is the foundation of change. However, the true success of the educational program will be demonstrated through changes in

practice. I will return to Nicaragua and observe oncology nurses in the hospitals to see whether they are instituting the necessary changes to protect their safety and the safety of their patients. I also will observe whether the nurses are instructing their patients and other nurses about potential chemotherapy side effects and their management.

Simulation and demonstration by the instructor were helpful in developing understanding of safe handling of chemotherapy; however, greater understanding could have occurred if each participant had been able to demonstrate the skills learned. A skills checklist was developed, and the initial intention was that each participant would show understanding and mastery of the skills. Because 29 people participated with only one instructor, observation of each skill for each participant was not possible. The skills checklist was reviewed with each participant, and verbal answers were given about how each skill should be preformed.

## Implications

Cancer is on the rise in developing countries (World Health Organization, 2003). Not all oncology nurses in developing countries have access to necessary information about the cytotoxic effects of chemotherapy, nor are all of them educated about proper handling and administration of chemotherapy. They do not have the information or the resources to obtain knowledge concerning what to teach their patients about potential side effects of chemotherapy and how to manage them. Through an inexpensive program consisting of a DVD, a DVD player, a binder with information about side effects and management of chemotherapy, and a

lecture by a certified oncology nurse who had successfully completed the ONS Chemotherapy Biotherapy Trainer Course, Nicaraguan nurses significantly increased their oncology knowledge about how to be safe when mixing and administering chemotherapy. Additionally, they now are equipped with information to assist their patients to understand the potential side effects of chemotherapy. The nurses were enthusiastic participants and asked many questions. They made it clear that they are in need of basic information about all aspects of cancer. They requested more information about cancer prevention, new cancer drugs, the disease process, and treatment of a variety of cancers. With cancer rates rising in the developing world, this type of basic educational program has the ability to provide a link to nurses and to be the foundation of a dialogue that will continue to increase knowledge about cancer, chemotherapy, and patient safety for oncology nurses in developing countries.

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