

Canadian Journal of Cardiovascular Nursing

Revue canadienne de Nursing cardiovasculaire



In this issue:

Recalibrating time and space: Women's challenges of living with heart failure

The researchers encouraged seven women to talk about their everyday challenges with living in the community with heart failure. The findings of this research may be used to assist women in planning ahead by considering some of the decisions that others make while taking on a new path in response to the symptoms associated with heart failure.

Les chercheur(e)s ont encouragé sept femmes souffrant d'une insuffisance cardiaque à parler de leurs défis quotidiens dans la communauté. Les résultats de cette recherche peuvent être utilisés pour aider d'autres femmes à planifier le cours de leur vie en considérant les décisions que d'autres ont prises pour répondre aux besoins associés aux symptômes de l'insuffisance cardiaque.

Effects of a self-care program on the health-related quality of life of pacemaker patients: A nursing intervention study

A randomized, controlled trial of a nurse-led intervention was conducted to evaluate the effects on HRQoL of a 10-month self-care program for pacemaker patients. While no significant differences in HRQoL were found, the authors concluded that it is important to actively include pacemaker patients in a self-care program while still in the acute phase in the hospital.

Un essai clinique aléatoire a été mené pour évaluer les effets sur la santé de patients avec un stimulateur clinique sous un programme d'auto soins de 10 mois comparé à un programme de soins donnés par une infirmière. Bien qu'aucune différence significative n'a été identifiée sur la santé du patient, les auteurs concluent qu'il est important d'activement intégrer les patients avec un stimulateur clinique dans un programme d'auto soins alors même qu'ils(elles) soient toujours en phase aiguë à l'hôpital.

Bedside nurses removing epicardial pacer wires: From concept to practice

Epicardial pacer wires inserted at the time of cardiac surgery are traditionally removed prior to discharge by physicians. The development, implementation and evaluation of a project in which all nurses on a post-operative cardiac surgery unit remove these wires are discussed.

Les fils épicaudiques de stimulateur insérés pendant la chirurgie cardiaque sont normalement retirés avant que le médecin autorise le congé du patient. Le développement, l'implantation et l'évaluation d'un projet sous le lequel tous les infirmières sur une unité post-opératoire cardiaque seraient en mesure d'enlever les fils épicaudiques est en discussion.

NURSE: Nitroglycerin Use: Revisiting Strategies for Efficacy

The aim of this study was to explore patients' knowledge and use of sublingual nitroglycerin. Knowledge deficits were evident concerning the proper dosage and administration of SLN even in patients with a longstanding history of angina. Many were unaware of SLN prophylaxis and the concomitant use of topical nitrates.

Le but de cette étude était d'évaluer les connaissances du patient quant au dosage et à l'utilisation de nitroglycérine sublingual (SLN). Un manque de connaissance concernant le dosage et l'administration du SLN était évident et ce même pour des patients avec une histoire de crise d'angine de longue date. Plusieurs ignoraient que la prophylaxie SLN pouvait être prise en même temps que le nitrate topique.

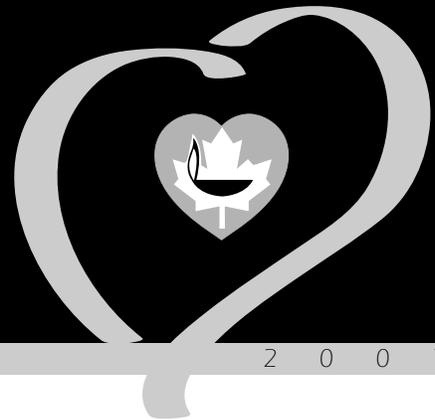


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For information on content, please contact: Kirsten Woodend, RN, MSc, PhD, Editor

University of Ottawa, Faculty of Health Sciences,
School of Nursing, 451 Smyth Rd., Room 3045,
Ottawa, ON K1H 8M5
Phone: (613) 562-5426, Fax (613) 562-5443
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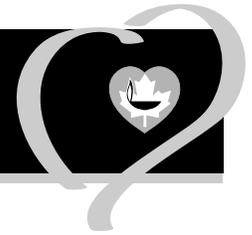
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The interface of cardiovascular nursing and health care technology

A. Kirsten Woodend, RN, MSc, PhD, Editor

The nursing literature is rife with articles discussing the role of technology in nursing, nurses' responses to technology and the compatibility of technology with humanistic care in nursing. More recently, there has been a strong focus on nurses, information technology and patient safety. In this issue of CJC/N, two of the contributors write about technology and its effect on nursing practice and patient care. Epicardial pacing wires (Clarke, 2007) and pacemakers (Malm, Karlsson & Fridlund, 2007) fit right in with my idea of what technology is.

Sandelowski (2000) pointed out that few nurses would now think of telephones, thermometers, bedpans, charts or intercom systems as technologies, never mind revolutionary ones. Thermometers and telephones both transformed nursing care in the 19th and early 20th centuries. Thermometers began as tools of physicians and researchers, were eventually entrusted to nurses and then became household items; telephones started as household items and became tools of physicians and nurses. Telephones as a technology are still transforming the face of nursing care with the increase in telenurse projects and centres.

Most Canadian nurses work in environments that could be considered to be moderate or high in the use of technology (Arthur, Pang & Wong, 2001). Arthur et al. studied an international sample of 1,957 nurses to determine the relationship between nurses' exposure to technology in their work environments and the caring attributes of those nurses. It turns out that technology, if anything, enhances caring attributes including caring involvement and caring communications.

The CNA, in its report *Toward 2020 Visions for Nursing* (2006), uses the term technology to mean tools and/or high-technology and predicts that "Technology will be a major influence on the role of nursing as nursing becomes more comfortable and expert in workplace technology, including advances like artificial intelligence" (pp. 80). Would we consider most of the

technology with which we interact in our work environments, and with which we are likely to interact in the future, to be nursing technology? In cardiovascular nursing, especially in the acute care sector, a large proportion would be considered medical.

Barnard (1996) carefully reviews definitions and understandings of technology and nursing technology. He concludes by saying that we, as nurses, tend to view technology as the tools and machines with which we work and that this definition is inadequate. Technology is also the knowledge we have about a tool or machine and how to use it, and the term can also be used to describe complex patterns of human activity. In a later paper, Barnard (2001) points out that we (nurses) think of technology as depersonalizing and dehumanizing both patients and the care we provide to them and that nurses see themselves as responsible for making sure that humane care is maintained in increasingly technological environments. Maybe the more technology there is the more we try explaining, in part at least, the findings in the Arthur (2001) study. Defining technology as "high-technology" leads us to view it and humane caring as separate and competing and to "see ourselves as the mediators between [these] two seemingly irreconcilable and disparate forces" (Barnard, 2001, pp. 323).

I got a bit of a surprise when I checked out the definition of technology in the **Oxford English Dictionary** (OED online). According to it, technology is "A discourse or treatise on an art or arts; the scientific study of the practical or industrial arts." The OED's definition of high technology is a bit closer to what I and many nursing authors/researchers envision technology to be; it is a term applied "to a firm, industry, etc., that produces or utilizes highly advanced and specialized technology, or to the products of such a firm." So, as Barnard (1996) pointed out, we tend to use a narrow definition of technology, one that is more compatible with a medical science rather than a nursing perspective. Alexander

(2001) proposes "nursing technology is the nursing care processes used to change the status of an individual from a patient to a person no longer requiring nursing care" (pp. 778). Seen this way, nursing technology could be considered to be the sum of the work of the team of nurses engaged in this process, including the nursing knowledge and activities that comprise the nursing care processes in which we engage.

Clearly, we have more work to do when it comes to understanding and agreeing upon what nursing technology is. Every one of the 75 references to technology in the CNA's *Toward 2020* report uses the term to mean technology in the sense of tools and/or high technology. Are we short-changing ourselves as nurses when we restrict ourselves to this narrow definition of technology as we envision and plan our future in an increasingly technologically advanced environment? ♥

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CCCN Research Grant

The purpose of this grant is to provide 'seed money' for research projects pertaining to cardiovascular nursing in Canada. A maximum award of \$5,000 is available. Funds will be allocated at the discretion of the National Research Committee.

Applicants must be: Canadian citizen or permanent resident of Canada, a current member of CCCN, and a provincial or territorial council member.

All grant applications will be peer reviewed for relevance and scientific merit. Applicants will be notified of their standing in September 2007. Awardees will be introduced at the Annual Meeting, to be held in Quebec, QC, October 2007.

For application forms and guidelines, visit our website at: <http://www.cccn.ca/forms/forms.cfm>

Submission deadline: March 31, 2007

List of reviewers

I would like to thank all of the people who have taken the time to review manuscripts for the Canadian Journal of Cardiovascular Nursing in 2005 and 2006. The continuing success of the Canadian Journal of Cardiovascular Nursing depends of the dedicated work of peer reviewers who freely share their time, energy, and cardiovascular nursing knowledge in guiding the editorial decisions about what should be published in this journal.

2005

Annie Perrault, Charlene Lester, Cynthia Mannion, Darlene Rebeyka, Diane Groll, Faye Lazar, Ginette Coutu-Wakulczyk, Jacque Wrightson, Joanne Morin, Marlene Adam, Marlene Dohahue, Michael McGillion

2006

Anita Ytsma, Ann Stolarik, Annette Bradfield, Charlene Lester, Sylvie Cossette, Dianne Groll, Dorothy Morris, Evelyn Kerr, Faye Lazar, Ginette Coutu-Wakulczyk, Jennifer Kryworuchko, Lori Rietze, Lorna Estabrooks, Lynne Young, Rachael Ramsamujh, Wendy Young

If you are interested in becoming a peer reviewer for the Canadian Journal of Cardiovascular Nursing, please contact the editor.

2006 CCCN Scientific Sessions a huge success

The 2006 Scientific Sessions and Annual General Meeting in Vancouver were another huge success, attracting 664 CCCN delegates.

Abstract submissions for the conference totalled 189, with acceptance of 60 oral presentations, 46 poster presentations and 10 workshops. In addition, the pre-conference session on the topic of heart failure attracted more than 100 participants.

Evaluations of the conference submitted by the delegates revealed that all oral and workshop sessions were good to excellent, as were the keynote/plenary speakers. See the October 2006 *CJCN* for details on speakers and topics.

The CCCN would like to thank Sandy Barabé, Local Planning Chair; Natalie Nichols, Professional Education and Conference Chair; Diane Tapp, Research Chair; and all other volunteers and staff who contributed to another successful conference. We would also like to thank our gold sponsor, General Mills, and our silver sponsors, Edwards Lifesciences, Actelion and Boston Scientific, for their tremendous support.

We hope to see you in Quebec City, Quebec, from October 21-23, 2007, for another great conference and opportunity to network with cardiovascular nurses from across Canada. ♥

Les séances scientifiques 2006 du CCINC connaissent un énorme succès!

Encore une fois, les séances scientifiques et l'assemblée générale annuelle ont connu un énorme succès. En 2006, 664 délégués du Conseil canadien des infirmières(iers) en nursing cardiovasculaire se sont réunis à Vancouver pour y prendre part.

Le nombre de communications soumises pour les séances scientifiques a atteint 189, et les communications retenues se composaient de 60 exposés oraux, 46 présentations sur affiches et 10 ateliers. De plus, l'atelier préconférence portant sur l'insuffisance cardiaque a attiré plus d'une centaine de participants.

Les évaluations remises par les délégués ayant assisté aux séances scientifiques ont révélé que tous les exposés oraux et ateliers ont été jugés bons à excellents, tout comme le conférencier d'honneur et les conférenciers pour la séance plénière. Vous trouverez de l'information plus détaillée concernant les conférenciers et les sujets abordés dans le numéro d'octobre 2006 de la Revue canadienne de nursing cardiovasculaire.

Au nom du CCINC, nous souhaitons remercier Mme Sandy Barabé, présidente du comité de planification local, Mme Natalie Nichols, présidente du Comité de la formation professionnelle et du Comité de la conférence et, Mme Diane Tapp, présidente du Comité de la recherche, ainsi que tous les autres bénévoles et tout le personnel qui ont collaboré pour assurer le grand succès de ces séances. Enfin, nous souhaitons remercier notre commanditaire « Or », la société General Mills, et nos commanditaires « Argent », les sociétés Edwards Lifesciences, Actelion et Boston Scientific, pour leur soutien extraordinaire.

Nous espérons avoir le plaisir de vous rencontrer à Québec, du 21 au 23 octobre 2007, pour un autre congrès très prometteur où vous profiterez d'une excellente occasion de réseautage avec des infirmières et des infirmiers œuvrant dans le domaine cardiovasculaire partout au Canada. ♥

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In 1994, CCCN established an award of Clinical Cardiovascular Nursing Excellence to recognize a CCCN member in good standing who exhibits outstanding clinical practice with direct client contact. Nominations may be submitted by any CCCN member. The final selection will be based on the criteria below and made by the CCCN Board of Directors.

The nominee should be someone who is:

- dedicated to maintaining a high standard of clinical practice
- an effective collaborator and one who demonstrates interpersonal skills with clients, colleagues and other groups and organizations
- a positive role model for others, and
- committed to the goals of CCCN and works on its behalf.

Baxter Award of Excellence for Leadership in Cardiovascular Nursing

This award has been established to recognize a CCCN member in good standing who exhibits outstanding leadership skills in cardiovascular nursing.

The nominee should be someone who:

- through their vision is advancing the practice of cardiovascular nursing
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- builds and fosters a dynamic team, and
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Cardiovascular Nursing Research Excellence Award

CCCN has established an award of Cardiovascular Nursing Research Excellence to recognize a CCCN member in good standing who has conducted outstanding cardiovascular nursing research. Nominations for this award must be supported by at least three people, one of whom MUST be a CCCN member. The final selection will be based on the criteria below and made by the CCCN Board of Directors.

The nominee should be someone who:

- has conducted and published high quality cardiovascular nursing research
- has mentored others to appreciate and/or assist in the research process
- is a positive role model for others, and
- is committed to the goals of CCCN and works on its behalf.

Submission deadline: March 31, 2007

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Recalibrating time and space: Women's challenges of living with heart failure

Brenda Paton, RN, PhD, Judy Backlund, RN, MN, Monica Barnes, RN, MN, and Lorraine Thirsk, RN, MN, PhD(Student)

The progressive and demanding nature of heart failure has a significant impact on the daily life of all individuals. Gender-related differences exist in diagnosis, management and home-based support, whereby women's needs have been either managed less aggressively or overlooked. Minimal research has been conducted on the everyday challenges for women who are living in the community with heart failure. The researchers of this interpretive research encouraged the seven women who volunteered for this study to talk about their day-to-day challenges. The interviews were interpreted through a process informed by Heideggerian

hermeneutics, whereby the three themes of recalibrating time and space, balancing pathways of wishing and hoping and practicality, and acknowledging loss in persevering through uncertainty were uncovered. The findings of this research may be utilized in assisting and preparing women to think and plan ahead by considering some decisions others make while taking on a new path in responding to the symptoms associated with heart failure.

Key words: heart failure, women, interpretive phenomenology, discharge preparation

Address for correspondence: Brenda Paton, RN, PhD, Assistant Professor, Faculty of Nursing, University of Calgary, Calgary, AB. Telephone: (403) 204-0581, e-mail: bpaton@ucalgary.ca

Background

The prevalence, mortality and morbidity of people with heart failure have increased over the past decade and this trend is expected to continue (Bennett, Hays, Embree, & Arnould, 2000; Clark & Lan, 2004; Jaarsma, 2002; Matura, 2002). The progressive nature and pharmacological management of heart failure leave many of these patients encountering and responding to troublesome symptoms that challenge quality of life and increase the potential for re-hospitalization and mortality (Bennett, Cordes, Westmoreland, Castro, & Donnelly, 2000). Individuals with heart failure experience frequent fluctuations in health status requiring personal and pharmaceutical adjustments to manage symptoms and continue with the day.

Jaarsma (2002) and Stromberg and Martensson (2003) identify that the life situations for men and women with heart failure are different. Women with heart failure tend to ascribe more positive meanings to their illness, but their quality of life is diminished. Schall and Flannery (2005) identify the etiology, management and quality of life of women diagnosed with heart failure needs further evidence-based research, and that the findings of this research should be incorporated into preparing and supporting women to remain independent in the community.

The aim of this interpretive research was to highlight the everyday challenges women living in the community with heart failure experience and how they make sense of and work through these challenges. Specifically, the research question was: "What are the day-to-day challenges encountered by woman living in the community, medically diagnosed with heart failure?"

Literature Review

The increasing prevalence of individuals with heart failure as a consequence of the aging population and improved survival rate for patients with acute coronary syndrome is well-documented. Some sources report that the diagnosis of heart failure is the most commonly identified primary medical diagnosis of patients admitted into the acute care hospital (Liehr, Leaverton, Yepes, Frazier, Fuentes, 2003; Stromberg, 2002). Several studies report that individuals with heart failure experience social isolation, depression, sleep deprivation, malnutrition, fatigue and anxiety, which are directly associated with non-compliance, inappropriate self-care, re-hospitalization and mortality (Bennett, Cordes, et al., 2000; Brostrom, Stromberg, Dahlstrom, & Fridlund, 2003; Scott, Setter-Kline, & Britton, 2004; Moser, 2002; Neily, et al., 2002; Thomas, Friedmann, Khatta, Cook, & Lann, 2003). As the percentage of women participating in these studies is small, the experience of women and the gender-specific knowledge that nurses use to support and educate women for discharge may be inaccurate (Costello & Boblin, 2004; Ekman, Boman, Olofsson, Aires, & Swedberg, 2005; Stromberg & Martensson, 2003).

Women diagnosed with heart failure are identified as older with more co-morbidities, especially diabetes, more significant consequences on social alterations and higher family responsibilities than men (Jaarsma, 2002; Stromberg & Martensson, 2003). The inability to perform household tasks, support others and the feeling of being a burden to others have been identified as unexpected lifestyle changes women find more difficult to accept (Jaarsma, 2002; Martensson, Karlsson, & Fridlund, 1998).

Women have higher rates of hospital re-admissions due to the higher prevalence of heart failure in older populations and the diagnosis of heart failure at an older age than men (Jaarsma, 2002; Schall & Flannery, 2005). This could also be related to the differences in diagnostic testing and pharmacological management between women and men, whereby women are shown to be managed less aggressively. Women have fewer diagnostic tests such as echocardiography and are prescribed fewer ACE-inhibitors (Jaarsma, 2002), both of which have positive consequences on quality of life, frequency of hospitalization and survival. Diagnosis of heart failure is further complicated by variations in symptom sensations and symptom descriptions by women, whereby women describe and experience symptoms less sharply, more vaguely and with more diversity than men (Ekman et al., 2005).

Discharge planning focuses on minimizing symptoms and improving quality of life through measuring daily weight, reducing salt, alcohol and fluid intake, reducing possibilities for infection, encouraging exercise tolerance and cessation of smoking (Stromberg & Martensson, 2003). The importance of focusing on symptom management cannot be overlooked. However, one questions whether this focus overlooks what women need to know prior to discharge, particularly given that research has focused predominately on the diagnosis, treatment and management of men. The nature of the experience of heart failure for women is unclear and, more specifically, the impact this experience has on women's quality of life is not well-understood or utilized in discharge planning. In the absence of this knowledge, registered nurses may overlook discussing ways to respond to gender-specific challenges that could more effectively prepare women to return confidently and remain independent in the community.

This research was conducted with the assumption that the progressive and somewhat demanding nature of living with a chronic and terminal illness such as heart failure has a significant impact on women's lives and that conventional discharge teaching may have overlooked the unique challenges women encounter. To add clarity and insight to how nurses can prepare women for discharge with heart failure for the challenges they may face, first-hand experiences were sought from the women themselves. By using an interpretive phenomenological research approach inspired by the work of Heidegger (1927/1962) and nurse scholars (Benner, 1994; Diekelmann, 2001), the researchers strived to create clinical knowledge particularly helpful for supporting discharge planning for women by illuminating everyday challenges and getting nurses to consider these in preparing women for discharge.

Research Method and Design

Interpretive phenomenology illuminates the subjective and contextual realities of women with heart failure, revealing commonalities. The goal of this research approach is to both understand what is revealed and how individuals create meaning and sort out salient options in the world as it already exists, in which the person is already engaged (Diekelmann, 2005). "Being-in-the-world" is understood through engaged realities accessed through conversations between the researcher and participant that enable thinking and new understandings to be revealed (Heidegger, 1927/1962). The text, which is the participant's description, is reflective of the women's context and the level of engagement between the interviewer and participant. The interviewer thinks with the participant, asking and questioning to create understanding and meaning. Although questioning is viewed as the essence of scholarly work, knowing is understood as tentative and problematic (Ironsides, 2005). Hence, consistent with interpretive inquiry, the findings of this research remain open to re-interpreting.

The researchers' aim is to listen, to think and to offer potential understandings of the participant's story or text or, as Gadamer describes, "to play" by moving back and forth within the text (Gadamer, 1960/1989 in Ironsides, 2005, page xv). Playing within the text is purposeful in creating understanding in which all interpretation is grounded (Heidegger, 1927/1962). Given the focus of this research, to be one of revealing understandings through the experiences of women who are historically, socially and contextually situated, the use of interpretive phenomenology as a research method is appropriate (Diekelmann, 2005).

Participants

This research comprises seven women living in a large urban centre. Inclusion criteria included the medical diagnosis of heart failure and the identification that there was no current need for support from either the acute care setting or the outpatient heart failure clinic. Three of the women were married, two divorced and two widowed. The participants ranged from 47 to 75 years of age. Women who were married described themselves as economically stable, as did one woman who was widowed. The other three identified that they were unemployed and on social assistance. The time of diagnosis with heart failure ranged from 1983 to 2000, a time span of two years to 18 years. All participants had been involved with the Heart Failure Clinic within six months of this interview. The co-investigator who was the clinical coordinator for cardiology brought the research up with the potential participants using the stated inclusion criteria. The participants were contacted by the primary investigator who was not involved with the initial phase of the recruitment. The primary investigator reviewed the purpose,

significance, commitment and ethical considerations of the research, answered questions posed by the potential participants and sought voluntary consent.

Ethical Considerations

The researchers obtained approval from the Conjoint Health Research Ethics Board and each participant signed an informed consent. The co-investigator for this research is the clinical coordinator for the heart failure clinic in the region and the primary investigator has an extensive cardiac clinical background. This enabled access to appropriate resources in the event unexpected emotional upset and distress were experienced by the participants. None of the participants required access to these resources.

The participants were advised that pseudonyms would be used in all reports, transcripts and publications/presentations that evolve from the findings of this research. The raw data were not, in any place, connected to a name. All audiotapes and hard copies of the transcripts were locked in a cabinet in the primary investigator's locked office. Transcripts were sent to the primary investigator via e-mail attachment accessible only by the primary investigator and password-protected. The primary investigator, co-investigator and research assistants had access to the transcripts through the data analysis phase. Following this phase, all raw data were returned to the primary investigator, whereby they were placed in a locked cupboard in the primary investigator's locked office. Involvement in the research was voluntary and the right to withdraw from the study at any time, without penalty, was ensured. The participants did not receive any financial reward for participation in this research.

Data Collection Process

Following informed consent, the participants were individually interviewed by the primary investigator and co-investigator at their homes. Interviews were unstructured, whereby the researchers started the interview with a grand tour question, "Could you describe an average day and some of the challenges that you have encountered?" Probes included "How did this affect your plans?" and "How did you respond or resolve the challenge?" Each interview took approximately one-and-a-half hours, depending on the participant's desire, comfort and ability to talk. Each interview was audiotaped with the participant's consent and all audiotapes were transcribed by a typist who was not involved in the research in any other way or the health sector, and who signed a confidentiality agreement. Each participant spoke as long as she chose, until she identified she had said everything she wanted to. All participants were given the opportunity to have another interview and/or contact the researcher/s by telephone during the data gathering and interpreting phase. All participants were given the option for a second interview. They all identified that they had said everything they wanted to

in the one interview. The primary and co-investigator for this research acknowledged that more interviews with these participants may have presented a broader range of rich descriptions. However, in working through the stories, the understandings that were revealed were represented in all of the participants' experiences.

Data Interpretation

As in all qualitative research studies, data collection and interpretation occurred to a degree, simultaneously. The audiotapes were transcribed at the end of each interview and the primary and co-investigator met bi-weekly to monthly to first talk about how the interviews went, then to bring out initial understandings, commonalities and diversities in the text. The primary and co-investigator read the text individually and collectively, working through what was being said and identifying similarities between the parts of different texts. As well, two research assistants were employed and, under the guidance of the primary investigator, read through the transcripts to identify their interpretations of what went on in the situation and the process the participants went through to make sense and move on. The primary investigator coordinated meetings with the co-investigator and research assistants who were both master-prepared registered nurses with clinical expertise in chronic illness, mental health and qualitative research. Through questioning and probing of the text, understandings were revealed, yet these again remain open to future interpretations (Ironsides, 2005). This questioning called for a return to and between each of the participant's text, predominately done by the primary investigator with the purpose of coming closer to understanding the nature of the challenge and how the participant made sense of and responded.

Interpretations

The three themes of recalibrating time and space, balancing wishing and hoping and acknowledging loss, and persevering through personal, social and practical uncertainties evolved from the interpretive analysis. The prevalence of co-morbidities and the challenges these women voiced in reaching their medical diagnosis of heart failure were significant.

It is well-documented that women with heart failure are characterized with a high prevalence of co-morbidities and decreased quality of life (Humphrey, 2005; Luttik, Jaarsma, Veeger, & van veldhuisen, 2005). Indeed, five of these seven women had co-morbid conditions that were identified as diabetes, human immuno-deficiency virus, arthritis, asthma and heart block. Given this, everyday challenges were represented within the context of living with heart failure as inseparable from other co-morbidities.

In all of the interviews where women identified co-morbidities, they spoke about their co-morbid diagnosis prior to creating meaning within the context of the

diagnosis of heart failure. For example, one woman with insulin-dependent diabetes mellitus described how she managed her high glucose levels, previously identifying readings between 38-44mmol/l. Although she watched her diet and attempted to exercise as her heart failure allowed, she described how she used a teaspoon of cinnamon in her tea every morning to reduce her glucose levels. She described situations where her glucose levels were so elevated that she was fearful of being able to get medical assistance, because she was largely on her own, when the symptoms evolved. This woman was able to notice when her diabetes was not being controlled properly, but felt fearful as to her ability to notice changes that she should relate to increased severity of heart failure.

Another woman with complete heart block showed the interviewer pictures of her pacemaker and pamphlets on what the surgery and monitoring involved. In this description, she talked about living on her own, highlighting her fearfulness of progressive symptoms of heart failure, such as increased congestion and dyspnea. As she spoke, she pointed to her environment – a three-leveled townhouse. She described how she sometimes needed to sit on the stairs on the way up to her bedroom, she couldn't get downstairs to do her laundry and she couldn't go for walks because of the snow on the sidewalks as she feared falling and not being able to get up. She talked about her shortness of breath, and how she "slept" fearfully on the stairway. She described her inconsistent meals due to lack of motivation, strength and energy and her severed relationships with her daughters, her broken marriage as a consequence of her husband's long history of alcohol abuse and her own social isolation. Finally, she described her closest relative as living in Manitoba and the sadness she experienced in not being able to get to Manitoba for an 80th birthday party.

The meaning attributed to heart failure was considered within the context of co-morbid conditions and often dynamic social circumstances. They were fearful in their ability to "get help when it was needed". Fear was related to not yet living through complications; this 'lived' knowledge gained only through experience was needed in remaining confident and independent in noticing and responding to 'new' symptoms. By putting into perspective the self-management of existing conditions, such as controlling glucose levels and heart block, they could position the diagnosis of heart failure within themselves.

Consistent with recent research findings, the diagnosis of heart failure was not the first diagnosis, which is reflective of the confusion in symptomatic diagnosis between men and women (Ekman, et al., 2005). The understanding of a particular set of symptoms as universal may have limited some of these women from seeking and/or coming to terms with the diagnosis. This is reflected as statements like "I'm a woman and women don't have heart failure" were

reiterated throughout interviews. For these women, initial diagnosis included conditions such as asthma, pneumonia and pancreatitis. One young woman was diagnosed with heart failure after surgery for an urgent aortic valve replacement following a collapse while playing tennis. This woman did not notice any symptoms prior to the collapse. However, as her recovery from surgery was slow and accompanied with extreme fatigue and shortness of breath, further diagnostic testing revealed left ventricular heart failure.

The influence of contextual realities, the progression of symptoms, the perception of one's prognosis considering co-morbidities and the ability to create meaning influenced the understanding of this diagnosis. Family support, economic stability and health care access impacted the ease of taking on a new pathway.

Recalibrating time and space as a cognitive and insightful process: In describing their everyday challenges, these women described the thought process they moved through to deliberate activities. This cognitive process of deliberation was characterized with a sense of "going around and around", a "quandary" and an internal "struggle" to limit or combat fatigue and shortness of breath with the intention of getting through the work. The morning ritual, which involved the process each woman went through to prepare herself for the day, brought particular challenges around dyspnea, ability, need and necessary activities for the day. As many of the participants identified, they "Never had to worry about it before, but now I have to" and the unbending nature of the symptoms serve to remind them of their limitations. As Angela described, "I am really not all that short of breath until I do things quickly. This morning, for example, I forgot what time it was. I was reading even though I had set my alarm for seven and I had to hurry up with my shower and dressing and then my heart began beating too fast and I was out of breath...every day it's I have to remind myself to take things slowly actually having to talk to myself to do this slower than what I have been used to. I cannot get away with it...I am always reminded!" The shortness of breath experienced by these women was uncompromising. Another woman, Lisa, identified how she "just knows to do things slowly. I have two-minute showers; I don't have to stand there for long. When it comes to housework, I just do little chunks. I'll do the dishes and then sit down. It annoys the heck out of me. So I swallow a lot!"

In recalibrating time and space, these women moved through an internal and often exhausting, yet determined, process of thinking to discern the relationship between the activity and the physiological symptoms of heart failure, such as shortness of breath. Barb identified this process as a "screaming up and down, a back and forth, a slowly going up and slowly going down", and Lisa and Sharon identified this as an internal "and exhaustive quandary", or "nagging". This cognitive

process highlights the unique knowing acquired as these women strived to live in a manner that preserved a sense of dignity, independence and self-worth. In coming to terms with the reality that 'is', each of these women created a space for thinking, positioning their illness into their everyday existence.

Balancing pathways of wishing and hope and imagination and practicality as reality: In the process of creating meaning in living with heart failure, these women described how they envisaged their lives to go. Descriptions of past patterns and how life was envisaged at this time were vividly, enthusiastically and sometimes regrettably expressed or wished for. One woman described how she imagined her life unfolding: *"growing old and living very comfortably, raising my children, having lots of grandchildren coming in for Christmas dinners and everything like that. Having an active life, playing tennis... I thought I would play tennis until I was 80 years old, it was wonderful, I love the game. Providing everything for the children, making sure they had money for education, and they would have, but when we split up, it all changed. I pictured myself continuing to teach music, having a studio of kids and just having the cream of the crop. I didn't want any students who wouldn't produce, you know. I had to cancel some contracts when I really started to have some problems. That was painful... this life is not at all what I would have pictured. Never, ever, ever... That's the hardest thing".* In remembering what was and the wishes associated with this memory, the participants revealed a sense of disappointment. The future was now known as different, and wishing and hoping took on new understandings.

Wishing was understood in relation to what was and cannot be in the present or future; whereas hoping was understood in relation to what currently 'is' and what could be. Wishing statements were always in a past tense; hope statements were future orientated. The greater the discrepancy between wishing and hoping, the more challenging the process of making sense and responding in a way that preserved self-worth and dignity. Hope was understood in relation to the acknowledgement of the unpredictability and personal vulnerability of the future. Continued family support, economic stability and access to health care services stood out as dominant factors in the ability to balance wishing (a past reflection on a previous life envisaged) and be realistic with hoping. As one woman, Sharon, identified *"I am so blessed, my kids would do anything to help me, and they do"* and another woman who comments *"my husband does all the shopping and we are financially ok... and getting to the doctors is not a problem"*. Other support modalities recruited by these women included spiritual support, home-care nurses and cardiac clinics.

The challenges that women encountered who were not supported financially were disheartening. This stood out particularly in relation to health care access and ability to

get to appointments, and the need to go grocery shopping. These activities were identified as extremely difficult, especially in large cities where social assistance does not cover transport for appointments and the cost to access these services is too great. *"I receive \$850.00 per month, which is really impossible to live on, of course! So I try to supplement this – I don't have enough money for groceries, so I cook for a friend and she supplies all the ingredients and I make the food and I eat some. I teach a little violin, not much, most of it for groceries and things... you know they bring me food. I can't walk down to the store because I am too short of breath, so I rely on friends to stop by and ask me if I need anything. I have some good friends, but they are incredibly busy ... much of the time I am really worried financially because if I get sicker and I can't do the things, even like teaching people, I don't have enough money to make it every month... there have been times that I have needed to go to the doctor and I can't get there, so I have to cancel. I have had to cancel appointments for x-rays and ultrasounds because I just can't get there"*. These challenges are significant. Three of the seven women who were interviewed for this research were on their own with minimal family support and were economically compromised.

There is a clear distinction between the "haves and have-nots" (Kinch & Jakubec, 2004). This declaration is not new, but rather clarifies the need to consider the relevance of social, economic and the accessibility of health care services for marginalized groups. As importantly, it calls to question the notion of compliance, as not only a simple self-maintenance goal, but a complex choice, influenced contextually by socio-cultural and economic conditions.

In understanding a future path and hoping for particular characteristics, these women positioned themselves in relation to their heart failure. That is, they created a relationship with the diagnosis, and often within or alongside co-morbid conditions. For those women who positioned the illness within their essence, there was a sense of acceptance; for others there was a sense of resistance. Internalizing the illness was associated with recognizing the impact the diagnosis had on their life as all-encompassing. Comments such as *"taking it slowly everyday"*, *"noticing a hill where no one else does"* and *"pausing on the stairs"* represent the intrusion of this illness on their lives and the self-examination this illness asks. Simply worded, the illness asked these women to take on a new direction without a compass.

Each woman discussed the challenge of breathing and the attempt to ease breathing was inherent to every activity, including transportation and independence. In making sense of this 'breathing' challenge these women continued by rethinking their actions and responding by preserving the energy needed for breathing. One woman described this challenge as a

"heart war" whereby the goal was to establish a pattern in life they can live with and remain independent, knowing this pattern is dynamic.

The reality of living with heart failure was in creating meaning of a future that will unfold differently, balancing wishing and hoping with a sense of self-worth and independence, which was tempered by contextual practicalities. Persevering through the uncertainty inherent in the 'newness' of the pathway is a reflection of how the person had positioned herself with the illness, an acknowledgement of why life is important to live and an appreciation of the dynamic psycho-social influences that impact decision-making.

Acknowledging loss as persevering through uncertainty:

As these women described their everyday challenges, they moved through a process of connecting their past into the future, not yet lived, but clearly and rationally imagined within the parameters of uncertainty. This process could be understood as reflective living whereby the diagnosis of heart failure prompted, requested, and even demanded self-reflection and change. These women had to pay attention to what was obvious, such as shortness of breath and fatigue, but also in taking on a new direction they had to make decisions around what was important. Comments like *"I used to be energetic"* and *"I never had to worry before, now I have to"* speak to loss and the uncertainty about how their symptoms would show up. Familiar patterns were somewhat put aside as they noticed new, essentially uninvited changes to patterns in their breathing and daily activities. Some women described coming to terms with these changes as feeling as though they were going *"round and round"* and *"back and forth"*.

One woman, Barb described her frustration in acknowledging loss and her courage to find freedom within the constraints of her symptoms: *"I was really angry because I couldn't do what I wanted to do, go places I wanted to go and I always walked and then I couldn't walk and it just drove me nuts. So I had to learn to live with it [heart failure]...But I am stubborn and I said 'if I can't do that I will do the best I can with what I have', so that is what I am doing. I have developed a new philosophy of one day at a time. I still have freedom. I still have freedom!"* This positioning of oneself with the illness enabled a sense of freedom so that *"Now I can live"*, and a confidence in acknowledging and listening to oneself because *"who knows my body better than me"*.

In acknowledging loss and working through uncertainty, these women identified a feeling of gratefulness about their own situation. As one woman commented, *"I am so lucky... I have heard of more people than not who have died with this"*. Several of the women commented about the situation of "others", referring to those who had died from cancer, myocardial infarctions and heart failure.

In acknowledging loss, these women clarified their hopes and created comfort within their own uncertainty. The notion of recalibrating was understood at one level as getting through everyday activities in relation to time and space. At a deeper level, recalibrating called for thinking about relationships, spirituality and acceptance of uncertainty as inherent to everyday living. As Judy comments, *"I have so much to live for, my grandchild, and I have two beautiful daughters and the oldest one has just completed her masters on Monday... those are the roses she left for me and, of course, my other daughter gave me my grandchild. I live to be with others, my garden and my flowers. I like digging in the dirt. I look at what I do have... there are always people that are worse off than me."* And Monica identifies *"this has made me re-establish my priorities, and I know I can do this. Life is uncertain, but I have a very close family and we can live through these uncertainties together."*

Discussion and Implications for Nursing

Heart failure is a chronic, debilitating and terminal illness, yet minimal understanding has been articulated on the physical, emotional, social and economic distress individuals with heart failure experience (Scott, 2001). Although there is variability in the socio-economic status of these women, they were consistent in their desire to be in relationships, supporting family and friends. In supporting the self-esteem and independence of women living in the community, it is important that discharge planning include strategies to continue to be in relationships and enable women to continue with this important role.

This research clearly reveals the need for women to attain a level of psychosocial stability. Recent qualitative research on the experiences of men and women with heart failure also identify that the psychosocial impact of heart failure outweighs the physical impact (Costello & Boblin, 2004). Nurses, in their privileged position of contact with patients and families, can make overt the significance of the situation women are in as their lives move in a different direction than expected. Observing patients and their significant others, as well as direct questioning, can give nurses a sense of what patients expect from themselves and believe others expect from them. The development of a reflective living journal for women may assist with identifying the consequences of existing conditions on relationships and in creating meaning.

The three themes of this research could be used to create a discharge planning framework. Registered nurses could be central in guiding women through the process of recalibrating, balancing, and acknowledging loss. The individuals' perceptions of the core element of 'uncertainty' could be explored within this discharge planning framework.

Time is, without question, a scarce commodity in a front-line nurses' day. Fortunately, nursing knowledge can be applied in very brief encounters with patients and families. Noticing the language used by a woman with heart failure can give clues to the patient's conceptualization of her relationship with the chronic illness and an opportunity to invite reflection. Patients may refer to the disease and symptoms as something to "fight" or by which they will "avoid being beaten". By asking women to take notice of what tells them when it is time to take a break and when it is time to push on, a new perspective of living with heart failure might be introduced while simultaneously embedding the suggestion that wisdom will develop.

The space between wishing and hoping is significant in women's experience of living with heart failure. Women and their significant others might like to consider, in the context of the illness, what dreams for the future can remain, either in their original form or in a different way. The woman who had expected she would teach musical protégés, for example, might be asked how she has managed to keep music in her life while relinquishing her role as a tutor. In this setting, as in many areas of health care, nurses may be the initiators of important conversations about living with loss.

Economic stability is a challenge for people living with chronic illness. As previously discussed, there is clear disparity between individuals who are economically stable and those who are not (Clark & Lan, 2004; Kinch & Jakubec, 2004). This needs to be considered on an individual basis whereby access and transport to health care and basic needs, diagnostic tests and pharmaceutical adjuncts that are essential for community living and quality of life are mindfully considered in preparing for successful discharge. This is a reminder of the importance of questioning what may be taken for granted about the context from which women come and to which they will return.

Front-line nurses in hospitals, specialty clinics, and community are in the privileged position to hear "insider knowledge" of how women have learned to live best with the challenges of heart failure. Collecting this insight, informally or in a structured way can create an archive of wisdom to inform nursing practice and to be shared with other women living with heart failure.

Implications for Research

Frank (1991, p. 129) brings forward the need to consciously consider the "the rights of the living". To do this, it is essential that nurses understand women contextually and then prepare for discharge contextually. More research is needed about the context in which women with heart failure are living 'unwell' and how this context influences their everyday decisions, their access to self-care modalities and their ability to sustain

themselves. Longitudinal studies are rather uncommon in the investigation of self-care decision-making (Paterson, 2001), yet this research approach would offer valuable insight into the ability to make sense of everyday challenges, the learning of one's body's patterns of response, the context of decisions and the perceptions of expertise over time. This understanding would be valuable for clinical educators who develop strategies for assisting registered nurses and licensed practice nurses for preparing patients for discharge.

An extremely relevant research could explore nurses' perceptions of how women live with heart failure. It seems particularly relevant that the nurses' perceptions of what it is like to live with heart failure have direct impact on the time, direction, thoughtfulness and evaluation of this intervention on patient wellness following discharge.

All of the women in this study described the challenging process they went through to essentially get a medical diagnosis. All received different medical diagnosis than heart failure. Although the criteria appear straightforward, more research could be conducted on the symptoms experienced by women, and the descriptors used by women to describe their symptoms. This would enable quicker diagnostic procedures, pharmacologic and lifestyle management and enhance a higher quality of life for a longer period.

The three understandings of recalibrating time and space, balancing pathways and acknowledging loss are not well-discussed in the nursing literature on heart failure. More research to clarify the relevance of these themes would better address discharge planning strategies.

Conclusion

This research revealed three themes described within the notion of uncertainty, beneath the everyday challenges of women with heart failure. These included recalibrating time and space, balancing pathways and acknowledging loss. Uncertainty was identified as central to living with heart failure. A conceptual framework created from these three themes, encompassing the core element of uncertainty could offer a starting point for women in similar situations to describe to the nurse how they envisage their activity level to be, how they envisage their future and the disparity between what 'is' and what 'was'. In clarifying these disparities, the nurse and patient could consider strategies to respond to some of the challenges and mobilize support systems that may better accommodate adjustment.

This research encourages registered nurses and other health care providers to reconsider discharge preparation by giving relevance to gender-specific

particularities and the challenges of women as described within three themes which encompass the notion of uncertainty. ♥

About the Authors

Brenda Paton, RN, PhD, Assistant Professor, Faculty of Nursing, University of Calgary, Calgary, AB.

Judy Backlund, RN, MN, Clinical Coordinator, Heart Failure Clinic, Calgary, Health Region, Calgary, AB.

Monica Barnes, RN, MN, Mental Health Consultant, Calgary Health Region, Calgary, AB.

Lorraine Thirsk, RN, MN, PhD(Student), Faculty of Nursing, University of Calgary, Calgary, AB.

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Effects of a self-care program on the health-related quality of life of pacemaker patients: A nursing intervention study

D. Malm, RN, PhD Specialist Nurse, J.-E. Karlsson, B. Fridlund

An experimental, multi-centre, randomized study with a nurse-led intervention was conducted with the aim of evaluating the effects on HRQoL of a 10-month self-care program for pacemaker patients. In the present study, there were no significant differences in HRQoL when comparisons were made between the experimental group and the control group.

Results show two main findings for patients in the self-care program ($n=97$; mean age 71 years): a significantly better HRQoL in terms of experiencing the symptoms that were the reason for pacemaker implantation, as having decreased or disappeared, and a higher level of perceived exertion in a 1½-minute stair test compared with patients who had

standard checkups ($n=115$; mean age 73 years). It is important to actively include pacemaker patients in a self-care program while still in the acute phase in the hospital. Health care professionals should support the patient in a kind and professional manner by providing clear, relevant information, and planning a self-care program based on the nurse's assessment of the patient's needs. To enable patients to manage their life situations, training and continued education for health care professionals is necessary so that their efforts are based on a holistic approach to nursing care and recognition of the patient perspective, with emphasis on developing education and counselling for women, patients with atrial fibrillation/sick sinus disease, and patients whose pacemakers have ventricular pacing.

Address for correspondence: Dan Malm, RN, PhD Specialist Nurse, Department of Cardiology, County Hospital Ryhov, S-551 85 Jönköping, Sweden. Tel: +46 36 32 19 87; Fax: +46 36 32 20 55; E-mail: dan.malm@lj.se

Introduction

In recent years, the advantages of increasingly advanced pacemaker systems have been questioned in relation to expected health-related quality of life (HRQoL) for the often older patient, and the costs involved in the increasingly high technology related to treatment. Further, subsequent randomized trials do not show any differences between ventricular and physiological pacemakers in terms of cardiovascular death or stroke (Dretzke et al., 2004; Kerr et al., 2004). However, with physiological pacing there is a persistent significant reduction in the development of atrial fibrillation, although there is a threefold higher perioperative complication rate with this system (Kerr et al., 2004; Schmidt et al., 2003). The choice of treatment, therefore, has both advantages and disadvantages for the patient, and the way in which personnel inform the patient about the treatment, which, as a rule, is life-long, can affect the patient's HRQoL (Bonomi, Patrick, Bushnell, & Martin, 2000; Rankin & Stallings, 2001).

Patient education and support are essential for enhancing self-care abilities, improving outcomes and decreasing unnecessary hospitalizations. In nursing education today, teaching and providing information to patients and relatives are of central importance (Rankin & Stallings, 2001). Since the majority of pacemaker patients are elderly, information should be individualized. The nurse's educational material should be delivered in small increments so that it becomes an integral part of the elderly patient's self-care since cognitive efficiency declines when people grow old (Linde, Ryden, & Bocray,

2000; Rankin & Stallings, 2001). Although HRQoL in pacemaker patients has been investigated and discussed both from medical and nursing perspectives, physiological and technological treatment have been the primary focus of evaluation, rather than medical and psychosocial responses to the technology.

Health-Related Quality of Life in Elderly Pacemaker Patients

Since the early 1970s, researchers studying quality of life (QoL) in pacemaker patients from physiological and technological perspectives have found that implantation of a permanent pacemaker improves QoL (Amikam, Lemer, Roguin, Peleg, & Riss, 1976; Lamas et al., 1998; Malm, Svensson, Karlsson, & Fridlund, 2003). Over the past three decades, QoL in elderly pacemaker patients has been the subject of a number of surveys, and descriptive and randomized clinical trials have compared different treatments with more sophisticated pacemaker and electrode devices.

Descriptive trials studies from the 1970s showed no evidence of new episodes of myocardial infarction among pacemaker patients during the follow-up period. It was concluded that even in the most advanced age groups, implantation of a pacemaker significantly prolongs life, improves QoL, and has a low operative risk (Amikam et al., 1976). According to experimental trials in the early 1990s, studies showed that pacemaker implantation was effective in improving symptoms and reducing the mortality rate in elderly persons, as well as in improving QoL and

possibly preventing mental deterioration. It was beneficial not only for cardiac function, but also for brain function (Jabourian, 1995; Koide, Kobayashi, Kitani, Tsunematsu, & Nakazawa, 1994). Over the past five years, multiple randomized clinical trials have been conducted to investigate HRQoL and clinical outcomes in elderly pacemaker patients treated with ventricular (VVI) pacing as compared with dual-chamber (DDD) pacing. Furthermore, with dwindling clinical resources today, it is important to study HRQoL in an elderly pacemaker population in a reliable and straightforward manner (Malm et al., 2003). HRQoL refers to how health impacts an individual's ability to function and his or her perceived well-being in physical, mental and social domains of life (Guyatt, Feeny, & Patrick, 1993). Overall, no differences were found between the two modes, although QoL benefits were observed for DDD as compared with VVI in subgroups of patients with sinus-node disease (SND) and development of atrial fibrillation (AF) (Lamas et al., 2000; Stambler et al., 2003). However, the HRQoL benefits associated with DDD pacing as compared with VVI pacing were seen mainly in patients with sinus-node dysfunction, and a persistent significant reduction in the development of AF was found with physiological pacing (Kerr et al., 2004; Lamas et al., 1998). There is a clinical need for carefully designed prospective studies to define the benefits of dual-chamber versus single-chamber pacing in elderly patients with SND (Lamas et al., 1998).

No study with a nursing perspective has thus far specifically evaluated the effects of a nursing intervention focusing on self-care and physical capacity like exercise test, in pacemaker patients. Therefore, the objective of the present study was to evaluate the effects regarding HRQoL and physical capacity both before and after participation in a 10-month self-care program (SCP) on pacemaker patients compared to nurse-led standard checkups. The hypothesis of this study was that there would be a statistically significant difference between the pre-test and the post-test for the experimental group, with higher post-test scores reflecting the positive effect of the SCP on the participant's HRQoL.

The Self-Care Program

Nurse-led standard checkups

Patients were followed at a nurse-led pacemaker clinic and received patient information from the pacemaker nurse. The patients were given a folder entitled "To pacemaker patients" (Medical, 1995) with general information for patients with pacemakers. The information was individualized regarding physiology, the heart rhythm that led to pacemaker implantation, and what it could be like to live with a pacemaker. Each patient received information three times on demand, for a period of five to 10 minutes on each occasion. They got information when the pacemaker was

implanted and when the pacemaker nurse checked the pacemaker system two and 10 months after implantation (Karlsson & Malm, 2002) (Figure 1).

Self-care program

The patients received an individualized SCP from a pacemaker nurse based on the "Living with a pacemaker" guidelines (Malm, Capucci, & Linde, 1997).

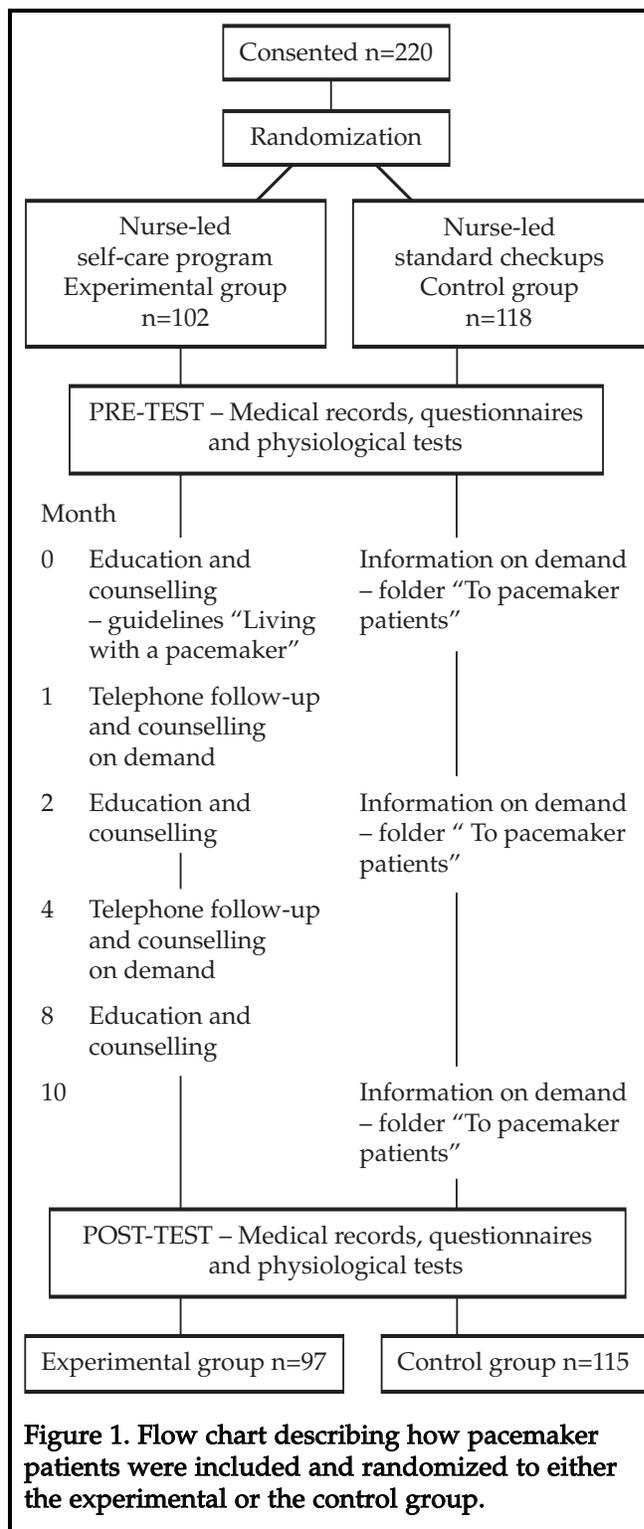


Figure 1. Flow chart describing how pacemaker patients were included and randomized to either the experimental or the control group.

To increase the patient's possibilities for self-care, the guidelines comprised three areas: aims, implementation and goals (Figure 2). Each area comprised three levels that increased as the patient obtained more knowledge. The nurse-led SCP consisted of three education sessions, the first when the pacemaker was implanted, and then the second and third at two and eight months, respectively. There was also follow-up by telephone, with counselling on demand after one and four months. The sessions took place in the hospital, and spouses were also invited to participate.

The education was planned with the aim of increasing the patient's possibilities for self-care in accordance with prevailing circumstances. Issues concerned why a pacemaker was necessary, how long the pacemaker works, everyday activities that can be done in the future, how the pacemaker is checked, and whether there is a patient association. Included were written and verbal information focusing on the elderly patient's

activities, needs and skills for self-care. In order to coach and support the patient, the pacemaker nurse also carried out standardized telephone interviews one and four months after inclusion to get an idea of the information they had obtained from the guidelines and from counselling on demand (Figures 1, 2).

Materials and Methods

Design and setting

A pre- post-test experimental randomized multicentre study with a 10-month follow-up was conducted. The setting comprised three nurse-led pacemaker clinics in southern and central Sweden, situated at two university hospitals and one county hospital.

Patient randomization and stratification

Consecutive patients were asked to take part at the time of pacemaker implantation at the participating hospitals. Immediately after consenting to participate the patients underwent blinded randomization by

	Aim	Procedure	Goals	Literature
	To give the patient knowledge about:	Together with the patient:	That the patient acquires an understanding:	Educational folder: "Living with a pacemaker"
Post-op. At the hospital, before discharge	<ul style="list-style-type: none"> • why pacemaker implantation is necessary • how the pacemaker system functions 	In the educational folder: <ul style="list-style-type: none"> • sketch in placement of the pacemaker and electrodes • write information about the pacemaker 	<ul style="list-style-type: none"> • about the reason for pacemaker implantation • about how active he/she can be up until the next appointment 	Read through pages 3-7 with the patient
2 months Repeat what was done on the previous occasion	<ul style="list-style-type: none"> • the pacemaker's base frequency • social activities the patient can engage in • interference with electrical equipment 	Give instructions about how: <ul style="list-style-type: none"> • the patient can feel his/her own pulse • we check the pacemaker via the programmer 	<ul style="list-style-type: none"> • about taking his/her pulse and also doing it • about what pacemaker check-ups will be like • about electrical equipment that can disturb the pacemaker 	Read through pages 8-10 with the patient
8 months Repeat what was done on the previous occasion	<ul style="list-style-type: none"> • interval for pacemaker follow-up • interval for replacing the pacemaker • situations in which the pacemaker clinic should be contacted 	Explain the interval for: <ul style="list-style-type: none"> • pacemaker follow-up and that we give the patient an appointment • pacemaker replacement and that "we" plan this well in advance together with the patient 	<ul style="list-style-type: none"> • about the security of being able to leave check-ups of the technical function to the pacemaker clinic • about how knowledgeable pacemaker clinic staff can always be reached by telephone 	Read through pages 11-18 with the patient
10 months	Go through the self-care program again to increase self-care possibilities			

Figure 2. Model for the self-care education program showing aim, procedure, goals as well as the time perspective.

means of a computer-generated list of random numbers. Stratification was carried out in order to make the two groups as equal as possible. The stratification was based on sex, age (≤ 64 years and ≥ 65 years), pacemaker mode (atrioventricular synchronous rate adaptive pacemakers (AAI/R, DDD/R), and ventricular rate adaptive pacemakers (VVI/R), cardiac arrhythmia, reason for pacemaker implantation (atrioventricular-block [Avb], sick sinus disease [SND] and atrial fibrillation [AF]). Patients were included if they were ≥ 18 years of age, had their pacemaker implanted on an acute or elective basis, and had stayed at the hospital for one day. Patients were excluded if they received an implantable cardioverter defibrillator (ICD)-pacemaker, had a serious disease with an expected survival of < 6 months, dementia or other mental illness, were unwilling to participate, and complete stratum. In addition, patients with a language or communication barrier were excluded.

With 120 patients in each group (experimental/SCP and control), alpha stratification was calculated to be detectable at 20% difference in the outcome variables between the two groups, pre-specifying power at 80% to detect a smallest worthwhile difference (at a two-sided alpha significance level of 5%). Of the 1,020 patients who were listed as having a pacemaker system implanted, 801 were assessed (see Figure 3). In the study, 220 patients were included and 38 patients (5%) of those 801 pacemaker patients declined to participate. Furthermore, before discharge, one patient had a stroke and two patients decided not to participate in the control group. In the experimental group, one patient had a heart mate and four patients died. Only those patients who completed both the pre-test and post-test procedures were included. The 10-month follow-up was completed by 212 patients, 97 in the experimental group and 115 in the control group (Figures 1, 3).

Instruments

Medical records

Socio-demographic and clinical characteristics obtained from medical records included sex, age, civil status and education (Table 1). Pacemaker information comprised pacing modes, ECG at implantation, symptoms at implantation, CHD and medical treatment.

Six-minute walk test

The six-minute walk test (Guyatt et al., 1984) is a physiological test to assess exercise capacity related to activities of daily living. The patients were asked to walk at their own maximal pace along a 50-metre-long hospital corridor, covering as much ground as they could during the allotted time without running. Encouragement was standardized (Guyatt et al., 1984). The distance covered in six minutes and heart rate and oxygen saturation were recorded before and immediately after the test. Heart rate

and oxygen saturation were recorded using a MicroO2 (Siemens MicroO2, Danvers, USA). Perceived exertion was rated on a Borg scale before and immediately after the test (Borg, 1982).

One-and-a-half-minute stair test

The one-and-a-half-minute stair test is a physiological test to assess exercise capacity related to maximum capacity in activities of daily living. The patient was asked to climb stairs for one-and-a-half minutes at a rate of about one step per second. After recovery, when resting heart rate had returned, the patient was asked to go down stairs for one-and-a-half minutes at a rate of about one step per second.

This was done following the six-minute walk test, and encouragement was standardized (Guyatt et al., 1984). The distance covered in one-and-a-half minutes of climbing stars and one-and-a-half minutes of going down stairs, and heart rate and oxygen saturation were recorded before the test, every 30 seconds during the test, and immediately afterwards. Heart rate and

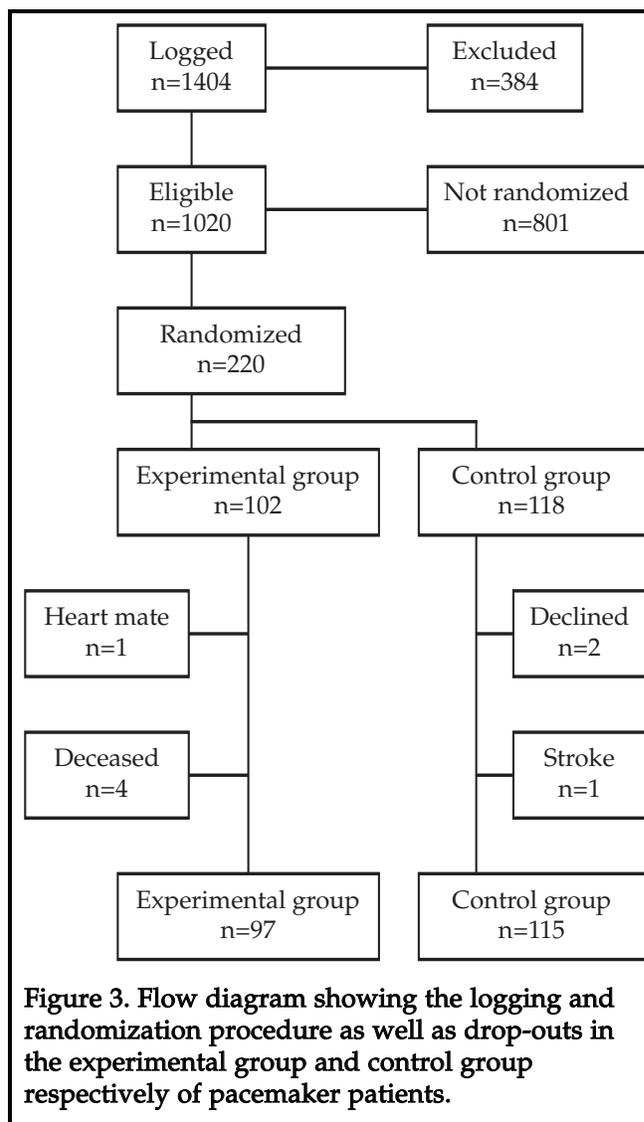


Figure 3. Flow diagram showing the logging and randomization procedure as well as drop-outs in the experimental group and control group respectively of pacemaker patients.

oxygen saturation were recorded using a MicroO2 (Siemens MicroO2, Danvers, USA). Perceived exertion rated on a Borg scale was recorded before and immediately after the test (Borg, 1982).

Euro-QoL (EQ-5D)

EQ-5D is a multidimensional questionnaire for assessment of HRQoL. The EQ-5D has been found to be acceptable, feasible, valid and reliable in several population studies (Hurst, Kind, Ruta, Hunter, & Stubblings, 1997; van Agt, Essink-Bot, Krabbe, & Bonsel, 1994). In accordance with the EQ-5D, the classification of health status was defined in terms of five dimensions: mobility, self-care, usual activity, pain/discomfort and anxiety/depression.

Each dimension was rated using a three-point, ordered, categorical scale. The categories were: no problems (1), some problems (2), and extreme problems (3). The patient could be classified into 243 different health states and each state has a preference value or score obtained from a sample of the general population (Brooks, 1996; Group, 1999). A sixth question about the general level of health compared with the past 12 months completed the first part of the instrument. The second part, the 100-point visual analog scale, is used to rate the current health of the patient (100 indicates the best and 0 the worst imaginable health state). The internal consistency reliability according to Cronbach's alpha coefficient was 0.72.

Psychological General Well-being Scale (PWBG)

PWBG is intended to measure the individual's QoL or self-representations reflecting a sense of subjective well-being or distress. The reliability and validity are well-documented (Naughton & Wiklund, 1996). The instrument is composed of six dimensions: anxiety (five items), depressed mood (three items), positive well-being (four items), self-control (three items), general health (three items) and vitality (four items). PWBG consists of 22 items on a six-point Likert scale ranging from 0 to 5 and the index has a maximum score of 132 and a minimum of 22. The higher the value, the better the well-being of the patient (Dupuy, 1984). The internal consistency reliability according to Cronbach's alpha coefficient was 0.94.

Subjective Consequences of Pacemaker Therapy (SCOP)

SCOP is a semi-structured questionnaire concerning subjective consequences of pacemaker therapy with five disease-specific questions for older patients with pacemakers (Mickley, Petersen, & Nielsen, 1989). These are: What symptoms do you have that indicate that you received a pacemaker? Do you have any physical discomfort from the pacemaker? Do you feel anxious or insecure because you have a pacemaker? Has pacemaker therapy affected your sex life or your quality of life? Are your symptoms that resulted in need of the pacemaker: a) gone; b) still present; c)

present to some extent; d) unsure? The choice of responses was mainly dichotomous, why the internal consistency reliability could not be determined.

Data collection

The study co-coordinators informed the patients, both verbally and in writing, about the aim of the study, as well as about the possibility of discontinuing their participation at any time without giving a reason. They were also informed that all material would be treated confidentially. Permission was obtained from the ethics committees at the Universities of Linköping and Stockholm, Sweden. A qualified pacemaker nurse at each hospital acted as study co-coordinator. These nurses contacted the patients, entered patients into the study, administered the questionnaires, and directed the intervention program. The day after pacemaker implantation, while still in the hospital, patients answered the SCOP, EQ-5D and PWBG questionnaires. The study co-coordinators also administered the six-minute walk test and the one-and-a-half-minute stair-climbing test before the beginning of the nurse-led intervention program, as well as at the 10-month follow-up in the hospital.

Statistical analysis

Sub grouping was done according to gender, age (≤ 64 , ≥ 65), ECG (Avb, AF, SND), and mode (DDD/R*, VVI/R). Patients with inhibited pacemakers (AAI/R) were included in the dual-chamber pacing (DDD/R) group. The control and experimental groups were compared using Student's t-test for normally distributed continuous variables. The Mann-Whitney U test was used for non-normally distributed continuous variables. A P-value < 0.05 was considered significant (Altman, 1991).

Results

There were no significant differences in HRQoL when comparisons were made between the experimental SCP group and the control group. When comparisons were made between stratified groups the patients in the experimental SCP group had a significantly higher HRQoL in that symptoms like dizziness and syncope had decreased or disappeared. Another main finding concerned the one-and-a-half-minute stair test and perceived exertion; patients in the experimental group had a significantly higher HRQoL than patients who had standard checkups.

There were no significant differences in baseline demographics between the groups (Table 1, page 20). As shown in Table 2 (page 21), neither the experimental SCP group nor the control group had a significant improvement in HRQoL between baseline and the 10-month follow-up. Overall, the SCP was well-tolerated, and no serious adverse events occurred while exercising. There was significant improvement in symptoms in the experimental SCP group compared to

the control group between baseline and the 10-month follow-up in the stratified groups according to age: ≤ 64 years ($p=0.016$); ECG rhythm: Avb ($p=0.015$); and pacemaker mode: DDD/R ($p=0.004$) (Table 3, page 22). Perceived exertion in the one-and-a-half-minute stair test improved significantly in the experimental SCP group compared to the control group in the stratified groups according to sex: men ($p=0.016$); age: ≥ 65 years ($p=0.006$); ECG rhythm: AV-block ($p=0.001$); and pacemaker mode: DDD/R ($p=0.003$) (Table 4, page 22).

Discussion

Methodological issues

This experimental multicentre study had a randomized design with predefined strata. The two groups were well balanced at randomization and there were no significant differences between the groups (Table 1). In order to evaluate the patients' HRQoL in the best way, a combination of instruments was used, an approach Stofmeel, Post, Kelder, Grobbee, and van Hemel (2000) consider necessary in order to obtain correct results.

Table 1. Baseline demographic and clinical characteristics of the pacemaker patients randomized to the experimental group (n=97) and the control group (n=115). No significant differences were found for any of the variables.

Characteristics	Total	Experimental	Control	diff/mean	P
Sex				.02	.80
Male %	62	62	63		
Mean age (range/S.D.)	72.4 (22-93/13.3)	71.1	73.5	.09	.11
Female %	38	38	37		
Mean age (range/S.D.)	72.4 (25-94/12.05)	71.4	73.2	.10	.52
Civil status %				.08	.26
Living with a partner	74	70	76		
Education				.02	.17
Years, mean (range)	9.70 (3.5/6-22)	9.75 (3.4/6-18)	9.65 (3.7/6-22)		
Symptoms %				.19	.86
Syncope	39.1	44.0	39.0		
Dizziness	25.1	22.0	25.0		
Shortness of breath/heart failure	14.9	14.0	16.0		
Asympt (ECG cause)	12.6	7.0	15.0		
Chest pain, fatigue and uncoded	8.3	13.0	5.0		
ECG %				.08	.55
Sick sinus disease	35	38	36		
AV-Block	44	40	47		
Atrial fibrillation	21	22	17		
Pacing mode %				.07	.31
DDD/R	65	69	74		
VVI/R	29	27	24		
AAI/R *	6	4	2		
CHD %					
AMI	21	20	22	.02	.70
Heart failure	37	35	38	.04	.52

* Patients with inhibited pacemakers (AAI/R) were included in the dual-chamber pacing (DDD/R) group.

Furthermore, the EQ-5D and PGWB, which is a general HRQoL instrument with well-documented reliability and validity (Dupuy, 1984; van Agt et al., 1994), would be expected to function well as it is designed to measure subjective HRQoL in the elderly, irrespective of health condition. With these well-known instruments it should also be feasible to measure HRQoL in younger pacemaker patients. Finally, problems with living with a pacemaker (e.g. symptoms, physical discomfort and anxiety) were taken from the specific pacemaker instrument SCOP (Mickley et al., 1989).

In any study of the impact of a course of action on education, a placebo effect must be considered. This is associated with the increased attention patients receive, they have been selected and understand, consciously or unconsciously, what the researchers expect of them. Although there may be a placebo effect associated with undergoing an intervention, this does not account for the benefits found in the experimental group as well as in the control group. It might also be argued that even if there was a placebo effect, the outcome was nevertheless beneficial if patient perceptions of HRQoL

Table 2. Differences in HRQoL and exercise between the experimental group (n=97) and the control group (n=115) and exercise between the experimental group (n=56) and the control group (n=67)

	Experimental		Control		p value
	pre	post	pre	post	
HRQoL ^a					
EQ-5D (mean)					
Mobility	1.35	1.38	1.31	1.41	.93
Self-Care	1.06	1.07	1.08	1.06	.55
Usual					
Activities	1.27	1.27	1.28	1.15	.09
Pain/Discomfort	1.68	1.56	1.66	1.57	.99
Anxiety/Depression	1.38	1.40	1.26	1.32	.32
State of health past 12 months	2.03	1.69	2.00	1.70	.75
EQ VAS score (mean)	61.45	68.04	62.43	69.57	.73
EQ-index	0.745	0.750	0.755	0.751	.69
PWBG (mean)					
Anxiety	17.10	19.57	18.42	10.23	.21
Depressed mood	11.31	12.43	12.05	12.89	.63
Positive well-being	10.60	11.99	11.04	12.41	.75
Self-control	11.49	12.36	11.96	12.31	.18
General health	8.80	10.93	9.17	11.10	.49
Vitality	10.22	12.22	10.66	12.86	.65
PGWB-index	69.49	75.95	73.30	78.22	.49
EXERCISE ^b					
Six-minute walking test, metres (mean)	348	386	360	396	.54
Heart rate per minute, at rest, 6-min walking (mean)	67.1	67.1	71.9	67.1	.68
Heart rate per minute, max, 6-min walking test (mean)	85.6	90.3	91.9	90.1	.13
1½- minute stair climbing test perceived exertion (Borg scale 6-20)	14.56	15.51	14.26	13.74	.51
Heart rate per minute, at maximum stairs test, (mean)	101.9	102.2	112.6	106.8	.07

^a students *t*-test, ^b Mann Whitney U-test *p*-value < 0,05 taken as significant

were improved. When the results were compared, it was found that the concurrent validity between EQ-5D and PGWB was satisfactory, but a discriminate validity has also been desirable. Furthermore, Cronbach's alpha was 0.72 for EQ-5D and 0.94 for PGWB, which means that responses can be considered reliable for the instruments (Altman, 1991).

Intervention issues

There were no significant differences in HRQoL when comparisons were made between the groups. On the other hand, when comparisons were made between stratified groups, there were significantly better effects for the experimental SCP group with regard to symptoms and exercising.

Symptoms

Socio-demographic data and clinical characteristics

Studies have been characterized by an inordinate and probably disproportionate focus on return to work as a measure of HRQoL, and work has been used almost as a surrogate for HRQoL. Patients aged ≤ 64 years in the experimental SCP group had a significant improvement in fewer symptoms ($p=0.016$), see Table 3. Return to work may be an important component of health for pacemaker patients aged ≤ 64 years, since the symptoms leading to pacemaker implantation (fainting or severe dizziness) may be an obstacle or even exclude them from the meaningful leisure time and work. Patients in the

experimental SCP group obtained in-depth knowledge through the intervention, resulting in the possibility of increased understanding concerning causes and consequences of the arrhythmias that caused fainting and dizziness prior to pacemaker implantation. In a meta-analysis of patients with myocardial infarction, Mullen and colleagues (1992) found that formal, structured education increases patients' knowledge and positively influences mortality, blood pressure, exercise and diet. This also supports that pacemaker implantation and the in-depth educational efforts in the experimental SCP group resulted in a decrease in symptoms. This, in turn, involved a significantly improved HRQoL for younger pacemaker patients who could return to an active life both during leisure time and at work.

Pacemaker mode

Dual-chamber pacemakers with increasingly advanced technology have been in common use for nearly two decades, but the effect of an SCP on the HRQoL of elderly patients with this type of pacemaker has not been adequately studied. In our study, more than 60% of the pacemaker patients were aged > 70 years. Most patients get their pacemaker system in an acute situation and, as a result of increasingly improved technology and skilled care, the treatment time at the hospital is often less than a day. However, when the patients in the experimental SCP group reported that symptoms leading to pacemaker implantation had disappeared after the implantation,

Table 3. Differences in symptoms between the pre-test and the post-test according to sex, age, ECG and pacemaker mode the experimental group (n=97) and the control group (n=115)

Characteristics	Sex		Age		ECG			Mode	
	Men	Women	≤ 64	≥ 65	Avb	AF	SND	DDD/R*	VVI/R
Experimental	54.55	29.07	14.26	69.79	35.69	20.43	27.37	57.51	25.30
Control	68.84	35.34	22.44	78.29	48.40	19.55	31.23	76.39	23.63
P value	NS	NS	0.016	NS	0.015	NS	NS	0.004	NS

* Patients with inhibited pacemakers (AAI/R) were included in the dual-chamber pacing (DDD/R) group. Mann Whitney U-test p -value $< 0,05$ taken as significant.

Table 4. Difference in perceived exertion (Borg, 1982) in the 11/2-minute stair test between the pre-test and the post-test according to sex, age, ECG and pacemaker mode for the experimental group (n=56) and the control group (n=67).

Characteristics	Sex		Age		ECG			Mode	
	Men	Women	≤ 64	≥ 65	Avb	AF	SND	DDD/R*	VVI/R
Experimental	35.92	22.17	9.83	47.94	30.00	8.50	21.13	46.00	12.04
Control	25.33	16.00	8.06	33.68	17.31	8.50	15.37	31.02	10.85
P value	0.016	NS	NS	0.006	0.001	NS	NS	0.003	NS

* Patients with inhibited pacemakers (AAI/R) were included in the dual-chamber pacing (DDD/R) group. Mann Whitney U-test p -value $< 0,05$ taken as significant.

the evaluation of patients with dual-chamber pacemakers indicated improved HRQoL compared to patients with ventricular pacing ($p=0.004$) (Table 3). In the randomized CTOPP QoL of Newman and colleagues (2003), 31% of patients in the physiological pacing group and 38% of those in the ventricular group had pre-syncope, and there were no significant differences in HRQoL between the groups. However, in our study, 66% in the experimental SCP group and 64% in the control group had symptoms such as syncope or dizziness, and 40% and 47% respectively, had Avb (see Table 1). Patients in the experimental group with Avb had a significant increase in HRQoL compared to the control group, but there were differences in patients with AF or SND ($p=0.015$). This could be due to increased understanding about the symptoms leading to pacemaker implantation obtained through education and the patient's realistic situation after pacemaker implantation.

Exercise

Socio-demographic data and clinical characteristics

There was a significant improvement in perceived exertion in the stairs test in the experimental SCP group at the 10-month follow-up for pacemaker patients aged ≥ 65 years ($p=0.006$) (see Table 4). In the past, implantation of a pacemaker system in elderly patients was simply considered to be a method for preventing life-threatening brady-arrhythmias or the occurrence of syncope attacks, without considering the exercise needs of this elderly population (Helgeson & Taylor, 1993). We have demonstrated significant improvements in capacity on the perceived exertion stairs test that are related to the type of tasks that mobile, elderly pacemaker patients undertake during normal daily activities. Oldroyd, Rae, Carter, Wingate, and Cobbe (1991) have shown that dual chamber pacing in patients aged ≥ 65 years who have an active lifestyle, Avb, and normal sinus node function, results in improved cumulative workload and total exercise time, but no evaluation has been done regarding benefits in terms of symptoms. On the other hand, recent studies of HRQoL in older patients show no differences between DDD and VVI with sensors (Deharo et al., 1996; Dretzke et al., 2004; Hargreaves, Channon, Cripps, Gardner, & Ormerod, 1995), and no relationships between six-minute walk test performance and any domain of the HRQoL (Verrill, Barton, Beasley, Lippard, & King, 2003).

In our study, the exercise test was a one-and-a-half-minute stair test with perceived exertion, and this is much more strenuous than the six-minute walk test. Hage, Mattsson, and Stahle (2003) have shown that even a short period of training after a coronary event has positive effects on the activity level that persists three to six years later. Our SCP was successful in this respect. The experimental SCP group was more physically active than those in the control group, who had received information during a standard check-up.



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Men in the experimental SCP group showed significant improvement in perceived exertion on the stair test at the 10-month follow-up ($p=0.016$) (see Table 4). In a study on cardiac rehabilitation, the patients' evaluations of their recovery were positively correlated with their level of physical performance, but the level of physical performance achieved was, unfortunately, not correlated with the nurses' ratings of physical recovery (Helgeson & Taylor, 1993). This suggests that patients base their evaluation of recovery on physical performance while nurses do not, which can have the effect of making the physiological tests less decisive. Then, tests like the six-minute walk can be too weak to measure physical exertion in relatively healthy men who have had pacemakers implanted. Our study shows the importance of having men performing a strenuous physical test to demonstrate that they can do the same heavy work after pacemaker implantation. It is well-known that power and control are integral aspects of the traditional male gender role that are challenged by heart disease. In a study by Helgeson and Taylor (1993) it was found that men who had suffered heart attacks had symptoms but refused to admit them, because symptoms signified weakness, and that was not in accord with the masculine role. They also refused to seek help for the symptoms, since that would have interfered with their work, which was their primary route to affirming their masculine identity (Helgeson & Taylor, 1993). It is consequently important that men with pacemakers perform the stair test before hospital discharge so that they will be able to do the activities they want to do in their own social context without worrying about symptoms that resulted in pacemaker implantation.

Pacemaker mode

Appropriately programmed pacemakers improve exercise capacity and HRQoL. The effects of over- and under-programming of rate response in both dual and single chamber activity sensor rate adaptive pacemakers have been assessed subjectively by visual analog scales and specific activity questionnaires, and objectively by graded treadmill testing and the performance of standardized daily activities (Sulke, Dritsas, Chambers, & Sowton, 1990). In contrast to the finding of no significant effects on HRQoL, we were able to show significant changes in perceived exercise capacity in the one-and-a-half-minute stair test after the intervention. The patients in the experimental SCP group with dual-chamber systems had a significant improvement in perceived exertion on the stairs test ($p=0.003$) compared to patients with ventricle-chamber systems (see Table 4). Care of the elderly covers a wide spectrum and age, as such, should not constitute a barrier to cardiac care when implantation of a pacemaker system is indicated, even in patients aged 90 years with life-threatening Avb (Franke, 1982).

Elderly patients with documented symptomatic bradycardia often benefit from pacemaker implantation, as evidenced by a reduction in recurrent events and improved QoL. Although dual-chamber pacemakers, particularly those with rate responsiveness, provide more physiologic pacing than single-chamber ventricular devices, the superiority of dual-chamber pacemakers in reducing major clinical events has not been demonstrated (Faddis & Rich, 2002; Hoijer, Brandt, Willenheimer, Juul-Moller, & Bostrom, 2002). This is in accord with earlier studies where physical capacity of patients with dual-chamber systems was compared with that of patients with ventricle-chamber systems (Deharo et al., 1996; Dretzke et al., 2004; Sulke, Chambers, Dritsas, & Sowton, 1991). In later studies, small differences in physical capacity were found between the systems when physical tests were carried out to evaluate if physical capacity is dependent on the pacemaker system (Lamas et al., 2000; Lopez-Jimenez et al., 2002; Newman et al., 2003). This may be because the physical tests used were usually the six-minute walk test (Garrigue et al., 1998) or tests where the patient estimates his/her physical capacity without any comparison with attained physical results (Newman et al., 2003). In later studies where biventricular pacing systems were shown to be superior to ventricle-systems and the six-minute walk test was used, the patients have been older or have had heart failure (Braunschweig, Linde, Gadler, & Ryden, 2000; Garrigue et al., 2002). This can indicate that our results have more credibility, since the stairs test was much more decisive for an older, but otherwise relatively healthy, pacemaker population. As it is important for elderly pacemaker patients to have a physically active lifestyle, it is essential to provide opportunities for making this possible (Adams, Cline, Hubbard, McCullough, & Hartman, 2006). One way is to have patients performing a one-and-a-half-minute stair test before hospital discharge. Successfully performing a strenuous physiological test under supervision may reduce the patient's anxiety and promote possibilities for good self-care. The greatest effects of exercise training have been shown very early after participation in an exercise program (Adams et al., 2006; Dorn, Naughton, Imamura, & Trevisan, 1999), but positive effects after a coronary event have also been demonstrated three to six years later (Hage et al., 2003).

Further, when arrhythmia was the reason for pacemaker implantation it can be concluded that those with Avb in the experimental group increase their perceived exertion in the stair test ($p=0.001$) (see Table 4). Since the number of implanted pacemakers with DDD/R-mode or VVI/R-mode showed no significant differences in the pre- or in the post-test, the reason that the experimental group with Avb perceived their stairs test as better than the control group could be more appropriate

programming (Table 4). Several studies have shown improved cardiac output and exercise tolerance with rate response pacing in both ventricle-chamber and dual chamber systems, but these evaluations have always been with optimally programmed pacemakers (Braith et al., 2000; Ma et al., 1996). Sulke et al. (1990) compared under- and over-programming of activity sensor modulated rate responsive pacemakers, both dual and single chamber, with appropriate programming. They also evaluated the effect of such programming using proven protocols in a double-blind crossover study design. They found that general HRQoL was poorest in over-programming in both dual- and single-chamber modes when patients had Avb, despite objective improvement in exercise capacity (Sulke et al., 1990).

Conclusion

This nurse-led self-care intervention designed to improve HRQoL in pacemaker patients (n=212; mean age 72 years) had no significant overall effects. However, there were significant differences in symptoms and exercise capacity between stratified groups. In male patients ≥ 65 years with Avb and a pacemaker system with DDD/R mode, the self-care program seemed to have a positive influence on physical capacity, and patients ≤ 64 years with Avb and a pacemaker system with DDD/R mode had a significant improvement in HRQoL. Patients should, early after pacemaker implantation, be informed about the cause of the pacemaker need and it is even more important for the patient to be told that the symptoms will disappear. Our study has shown that self-care deficits do not arise if the patient uses this SCP. Optimal self-care can be attained when nurses apply their technical and pedagogic skills and have a genuine interest in the patient's HRQoL, thereby making it possible to better meet patient needs.

Clinical and research implications

It is important for elderly pacemaker patients to be actively included in an SCP while still in the acute phase in the hospital. As soon as a few hours after pacemaker implantation, health care professionals can support the

patient by providing clear and relevant information in a kind, professional manner, and planning the self-care program based on the nurse's assessment of the patient's needs. To increase the patient's HRQoL, frequent contacts with health care professionals at the pacemaker clinic may be helpful. Keeping in mind that most of these patients are old, the use of telephone support, for instance every other month the first year, could be used. This is important for those with physical impairments. Our study has demonstrated the importance of an SCP with a stair test, even for elderly patients, rather than simply informing them about the importance of education and exercise training.

To enable patients to manage their lives, training and continued education for health care professionals is required so that their efforts are based on a holistic approach to nursing care and recognition of the patient's perspective, with emphasis on developing patient education and counselling for women, patients with AF/SND, and patients whose pacemakers have a VVI/R system. However, further studies will be necessary to evaluate the long-term effects of such a program. It would also be of interest to use a qualitative method to obtain more in-depth knowledge about the symptoms of pacemaker patients and how the experience of performing a strenuous stair test before hospital discharge influences their HRQoL later in life. ♥

About the Authors

D. Malm, RN, PhD Specialist Nurse, Department of Cardiology, County Hospital Ryhov, Jönköping, Sweden, Department of Primary Health Care, Göteborg University, Göteborg, Sweden, School of Health Sciences, Jönköping University, Jönköping, Sweden.

J.-E. Karlsson, Department of Cardiology, County Hospital Ryhov, Jönköping, Sweden.

B. Fridlund, Department of Primary Health Care, Göteborg University, Göteborg, Sweden, School of Social and Health Sciences, Halmstad University, Halmstad, Sweden, Department of Nursing, Lund University, Lund, Sweden.

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Bedside nurses removing epicardial pacer wires: From concept to practice

Lorraine Clark, RN, BN, MHS

Epicardial pacer wires inserted at the time of cardiac surgery are routinely removed prior to discharge. Traditionally, in most centres in Canada, this task has been carried out by physicians. Delays in discharge, insufficient patient preparation and inadequate monitoring practices post-wire removal have led to a need for a change in practice. The aim of this article is to

present the development, implementation and evaluation of a project in which all bedside nurses on a post-operative cardiac surgery unit remove patients' epicardial pacer wires.

Key words: epicardial pacer wires, removal, bedside nurses, medical directive

Address for correspondence: Lorraine Clark, RN, BN, MHS, Clinical Manager, Heart Institute AM Care Clinics, PAU/SDA, Pacer/Defibrillator Clinic and Communication Centre, Ottawa, ON. Phone: (613) 798-5555, ext. 16450. Fax: (613) 761-4212, E-mail: lclark@ottawahospital.on.ca

Temporary epicardial pacer wires placed during cardiac surgery are used to diagnose and treat rhythm disturbances postoperatively. The pacer wire is a Teflon insulated stainless steel wire (Johnson, Brown, & Alligood, 1993). These wires are positioned according to physician preference but, generally, patients have both atrial and ventricular wires placed at the end of surgery (Lynn-McHale, Riggs, & Thurman, 1998). Should pacing be required following cardiac surgery, these wires allow the heart to be temporarily paced by an external pacemaker.

Typically the wires are removed the morning of discharge by a physician or advanced practice nurse. Complications associated with the removal of epicardial pacer wires are rare (Wollan, 1995). The method and result of removal of these wires remains the same whether performed by a surgeon or a nurse (Wollan, 1995). Concerns regarding insufficient patient preparation, inadequate post-removal monitoring of the patient, and timeliness of removal, resulting in delays in discharge, have led to the need for a change in practice. It was felt that if nurses removed the epicardial pacer wires, the timing of removal would be known and the patient would be better prepared and monitored. The goal of this project was to have all registered nurses on a post-operative cardiac surgery unit remove patients' epicardial pacer wires in order to facilitate timely discharge and improve patient care.

This article reviews the literature on epicardial pacer wire removal and the results of a cross-Canada survey done to determine current practices in Canada. It describes the medical directive that was developed to

guide the new clinical practice. The teaching plan, its implementation and evaluation of the project are highlighted. Resulting implications and recommendations for practice are discussed.

Literature Review

There is little in the literature about the practice of epicardial pacer wire removal that supports or contraindicates bedside nurses removing epicardial wires. Wollan (1995) conducted a study over a 12-month period in which a group of five nurses were safely and successfully taught to remove patients' temporary epicardial wires. She identified two advantages to having nurses remove patients' pacer wires. First, the patient's discharge was not delayed increasing patient satisfaction. Second, expanding the nurses' skill set increased the nurses' job satisfaction. In their article on complications of epicardial pacing wire removal, Johnson, Brown and Alligood (1993) allude to the fact that nurses in some institutions in the United States are removing temporary pacing wires, but there is no discussion regarding the process or the outcomes of this nursing practice.

Several U.S. state licensing boards have declared that the removal of epicardial pacer wires is within the scope of practice of a registered nurse. In North Carolina, this was acknowledged as early as 1986 (North Carolina Board of Nursing, 2004) and, more recently, by South Carolina in 2004 (South Carolina LLR, 2004). In Canada, several of the provincial nursing associations have made similar statements, for example, Newfoundland and Labrador in 2004 (Association of Registered Nurses of Newfoundland and Labrador, 2004).

Cross Canada Survey

Due to the lack of information available in the literature about the practice of epicardial wire removal in Canada, the decision was made to conduct a survey of Canadian cardiac centres to gain information on current practice. To support the proposed change, information about determining who removed the epicardial pacing wires, when they are removed and what practices exist for monitoring a patient following removal was gathered.

The survey, developed by the clinical manager (CM) and the clinical nurse educator (CNE), was conducted by telephone. A single individual, the CNE, made the calls in order to ensure consistency of posing questions and interpreting responses.

A total of 12 cardiac centres across Canada were contacted. In most cases, it was the clinical nurse educator who was contacted and provided the information. In the majority of centres, physicians were still removing the wires. Four centres had either the physician or advanced practice nurses (APN) remove wires and only one centre across Canada stated that bedside nurses were removing the wires. Table 1 outlines the statistical responses to the questionnaire. The data collected indicated that there was no set time to remove the wires or consistent practice on monitoring of patients following removal.

Although there was only one centre in Canada indicating that bedside nurses removed epicardial pacer wires, the literature clearly advocated that nurses could safely remove patients' wires. With approximately 1,500 surgeries (University of Ottawa Heart Institute, 2004) performed annually at our institute, it was felt that nurses would have ample opportunity to become proficient in removing epicardial pacer wires.

Medical Directive

A medical directive to guide nurses' practice was developed in collaboration with the cardiac surgeons, the CM and the CNE. The College of Nurses of Ontario (2000) states a medical directive may be implemented for a patient population when specific conditions are met and specific circumstances exist. Inclusion criteria and exclusion criteria required to guide appropriate patient selection and the safe practice of the bedside nurse were established. If no exclusion criteria were met and if the patient was ready for discharge within 24 hours, the nurse could then follow the instructions to remove the wire. The instructions were developed using the past practice of surgeons and the existing literature on the removal of temporary pacer wires. Wollan (1995) developed standards of nursing care that were applicable to our patient population. Skin cleansing, the actual wire removal process, the need for bed rest and the monitoring of the patient's vital signs both pre- and post-procedure were all deemed necessary and, therefore, included. Figure 1 provides the completed medical directive.

Teaching Plan

Method

After the medical directive was developed and approved, the next step was to prepare the teaching plan to educate bedside nurses. The CM and the CNE collaborated to develop the plan. Initially, the CM and CNE were trained by a cardiac surgeon to remove the temporary pacer wires. A "dummy" chest was created to simulate a patient's chest in order to provide a mock environment in which nurses could see how and where the wires were inserted and how to safely remove them. The medical directive was used to provide the step-by-step instructions for the bedside nurse. A five-step plan was developed that required the nurses to review the medical directive, to observe a wire removal

Questions n = 12				
Who is responsible for removing wires at your facility?	MD only 58%	MD or APN 33%	Staff RN 8%	
Are wires pulled or clipped at your facility?	Pulled 92%	Pulled and/or Clipped 8%		
When are wires typically removed?	Day 3 post 17%	Day 4 post 42%	Day before d/c 25%	Day of d/c 17%
What is routine care after the wires have been removed?	Bed rest 15 mins to 1 hr 84%	Vital Signs pre and post q 15 min 33%	Vital Signs pre and post q 30 min 42%	No Vital Signs 25%

on the dummy chest, to practise the procedure on the dummy chest, to observe the CM or the CNE remove a patient's wire and then be observed removing at least two patients' temporary pacing wires.

Implementation

Following the set plan, the CM and CNE began the teaching process with the bedside nurses. This process took approximately 30 minutes with each individual nurse. Once educated and observed by the CM or the CNE and deemed competent, the bedside nurses were able to remove patients' temporary epicardial wires on their own. The CM and CNE were available to provide additional support or guidance if the nurses requested it.

Within one month, all 45 nurses had successfully completed the teaching sessions and had demonstrated the process of wire removal on an actual patient. With the support of their colleagues, all nurses

on the unit were independently removing the epicardial pacer wires two months following the educational sessions.

Evaluation

Chart Review

Six months after bedside nurses began to remove patients' epicardial pacer wires, an evaluation of the project and its processes was undertaken. There were no adverse incidents during this six-month period. A retrospective chart audit was determined to be the best method to verify if practices were being followed. An evaluation questionnaire developed by the CM included indicators such as the presence of a physician's discharge order, the time of epicardial wire removal, the documentation of vital signs before and after wire removal, the presence of appropriate documentation in the chart and an indication of whether the epicardial wires had been clipped.

Figure 1. Medical Directive: Temporary Pacing Lead Removal

Inclusion Criteria

- Patients on a post-operative cardiac surgery unit who are ready for discharge within 24 hrs.

Exclusion Criteria

- Arrhythmia requiring telemetry monitoring
- Pacer wire site appears infected, with purulent drainage present
- Prior indication by surgeon that wires are not to be removed (i.e. due to difficult insertion, suturing, etc.)
- INR > 3.0

Instructions

1. Temporary pacing leads should be removed on the day before discharge.
2. Lie patient flat in bed or head of bed at 30° if unable to lie flat
3. Measure blood pressure and heart rate prior to removal.
4. Clean skin around wires with chlorhexidene.
5. Identify loop of pacing wire that anchors it to the skin and divide with scissors.
6. Once the wire inserted into the epicardium is identified and secured, use a smooth continuous pulling motion with gentle traction until release from the epicardium is felt.
7. Inspect the tip for any epicardial tissue and the intactness of the wire. Scant tissue fragments may be present. If tip is not intact, save the wire and notify the cardiac surgeon.
8. If resistance is encountered with traction, cut at skin level and notify MD.
9. Clean area with chlorhexidene and cover with band-aid. Patient should remain lying flat for 10 to 15 minutes.
10. Measure blood pressure and heart rate post-removal.
11. Notify MD if there is excessive bleeding at the wire site, heart rate increases more than 20 bpm or blood pressure drops more than 20 mm Hg, or any new symptoms of dizziness, pain or palpitations.
12. Document procedure and patient response.

University of Ottawa Heart Institute, 2003

Results

A total of 166 charts were reviewed for evaluation purposes. The chart audit revealed some interesting observations on the processes involved with the removal of the wires. In speaking with staff after the completion of the audit, it became apparent that although they knew they didn't require an order to remove the wires, they were uncomfortable removing the wires without an indication of a patient's pending discharge the following day. This would explain why wires were not removed on the evening prior to discharge.

The steps for temporary wire removal were clearly outlined in the directive and easy to follow in practice, but the variation in documentation indicated that staff was unclear about the exact expectations with respect to documentation, specifically the requirements to chart a patient's vital signs both pre- and post-wire removal. The number of wires clipped was of interest to the surgeons as previously, when the physicians were removing the wires, there was no clear indication of exactly how many, if any, had been clipped. Table 2 provides the specific results of the chart audit.

Questions n=166	YES	NO
Is there a discharge order?	50%	50%
Were the pacer wires removed the evening before discharge?	42%	58%
Was documentation done?	76%	24%
Were post-removal vital signs documented?	41%	59%
Were wires clipped?	9%	
If so, which ones?	6 atrial wires, 9 ventricular wires	

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Implications and Recommendations for Practice

The implementation of this change for bedside nurses has resulted in an expansion of their professional practice. All nurses on the post-operative cardiac surgical unit have been educated and are safely removing epicardial pacer wires. There are two main processes that must be addressed as a result of the evaluation of this project.

First, the physicians must be reminded of the necessity to indicate the intended discharge date on a patient's chart. This will allow for the proper preparation of the patient followed by the timely removal of the epicardial pacer wire. Second, the nurses must be aware of the monitoring requirements as well as the documentation standards required with this procedure. Annual recertification of the nurses will be undertaken with the staff in order to ensure complete understanding of their roles and responsibilities.

Conclusion

Bedside cardiac surgery nurses can safely and efficiently remove patients' epicardial pacer wires. Providing the nurses with education and clinical support ensures they are capable and competent to assume this responsibility. A medical directive is a safe and effective tool to use to guide the procedure as both inclusion and exclusion criteria are set, which safeguards the process. A planned time of removal by the nurse allows the patient to be better prepared and prevents unnecessary delays in discharge. Adding this change to the bedside nurses' day-to-day responsibilities enhances their professional role and maintains quality patient care. ♥

About the Author

At the time of writing, Lorraine Clark, RN, BN, MHS, was Clinical Manager, H3, University of Ottawa Heart Institute, Ottawa, ON. She is now Clinical Manager, Heart Institute AM Care Clinics, PAU/SDA, Pacer/Defibrillator Clinic and Communication Centre, Ottawa, ON.

NURSE: Nitroglycerin Use: Revisiting Strategies for Efficacy

Natalie Nichols, RN, BA, MN, CCN(C), Debbie Oldford, RN, MN, CCN(C), and Sandra Duke, RN, MN, CCN(C)

Sublingual nitroglycerin (SLN) is front-line therapy for the treatment of episodic stable angina discomfort. Anecdotal evidence gathered by advanced practice nurses in a cardiac pre-assessment clinic suggested that SLN was often overlooked by health care professionals as an integral component of angina self-management. A brief questionnaire exploring patients' knowledge and use of SLN was subsequently administered to 300 patients.

Information gathered from the questionnaire indicated that patients are not consistently prescribed SLN for suspected or confirmed coronary artery disease. Knowledge deficits were evident concerning the proper dosage and administration of SLN, even in patients with a longstanding history of angina. Many were unaware of SLN prophylaxis and the concomitant use of topical nitrates. This paper will discuss practice implications for optimizing SLN therapy in angina self-management.

Address for correspondence: Natalie Nichols, RN, BA, MN, CCN(C), Queen Elizabeth II Health Sciences Centre, Room 6248-1796 Summer St., Halifax, NS B3H 3A7 E-mail: natalie.nichols@cdha.nshealth.ca

Introduction

Sublingual nitroglycerin (SLN) for the management of angina has been available since 1879 and is one of the most widely prescribed and refilled medications in Canada (IMS, 2002; Parker & Parker, 1998). Despite significant pharmaceutical advances and medical research, SLN continues to be front-line therapy for the treatment of episodic angina discomfort (Kimble & Kunik, 2000). Anecdotal evidence gathered while working as advanced practice nurses in a cardiac pre-assessment clinic suggested that many patients with suspected or confirmed ischemic heart disease were not prescribed SLN, and those who were given prescriptions did not receive comprehensive instructions regarding proper usage.

A brief questionnaire was administered to a convenience sample of 300 outpatients to ascertain how many were actually prescribed SLN, who had performed the patient education for the medication administration and participants' general knowledge about SLN use. Information obtained from these questionnaires was subsequently reviewed to determine areas of intervention for both practice and policy and disseminated to other health professionals who care for patients with coronary artery disease (CAD).

Review of the Literature

Bailie and Kay (1988) investigated hospitalized patients' knowledge of SLN using a questionnaire targeting the mechanism of action, dosage, administration and storage, side effects and actions taken if side effects occurred. Fifty patients, 28 men with a mean age of 62 years, and 22 women with a mean age of 67.4 years, were studied. Mean time of treatment with SLN was 5.5 years. The authors discovered that only 15 patients could recall receiving information about using SLN tablets, six knew the mechanism of action, and half of

the participants were aware that SLN could be used prophylactically. Knowledge of dosing, storage and side effects was poor. Eighty-eight per cent of patients did not know the maximum dose, with several thinking the maximum dose over a 15-minute period was greater than eight tablets. The investigators postulated that this knowledge deficit was related to the absence of a maximum dose on the bottle and that pharmacists or physicians may not always communicate this information to the patient. No questions were asked related to who provided patient education or if patients recalled receiving written or oral information (Bailie & Kay, 1988).

McMahon, Clark and Bailie (1987) interviewed 154 patients to determine who provided patients with drug information. SLN was one of several drugs targeted for their study. Patients were asked whether they had been provided verbal or written information, who provided the information and what types of information they requested. The authors found that more than 90% of patients were given information about treatment regimens, with physicians and pharmacists providing the majority of this information. Nurses were rarely identified as a primary source of information. Fifty-five per cent of patients were instructed regarding the best method of use and a third were informed about potential side effects. Only 14% of patients recalled receiving written information, but 74% stated that this information would be of value to them.

Kelly (1988) utilized a randomized, prospective design to study patient compliance in the first-time use of SLN. In his family practice, he noted that patients would continue to report angina symptoms, however, they admitted that they had not used their SLN. Reasons cited for not using their medication included: the angina was brief or not severe, they were afraid, or were having difficulty accepting their diagnosis. Kelly postulated

that receiving the first dose under physician supervision would be reassuring and might assist in overcoming psychological barriers. The patient would also become familiar with any side effects and have an opportunity to discuss them immediately with the physician.

Forty-four outpatients, 21 men and 23 women, were enrolled from a health maintenance organization (HMO). Fourteen physicians treated between one and six patients each. Information was gathered at an initial visit and at follow-up two to five weeks later. A demonstration dose of SLN was administered to 20 patients during the office visit in which the diagnosis of angina was made in the absence of symptoms. Eighteen patients did not receive it and six patients were excluded due to hospitalization or study protocol violations. Six patients experienced side effects with one of these patients fainting. The most notable finding was that those who had received the demonstration dose were more likely to have used their SLN at least once before their return visit. However, less than half the patients had their SLN with them on the second visit (Kelly, 1988).

Bassan (1991) examined physician and patient attitudes and practices regarding the use of SLN after encountering six patients in his practice who had experienced adverse effects with self-administered SLN. Surveys were administered to a convenience sample of 112 cardiology HMO outpatients who self-reported a previous myocardial infarction (MI) and to 104 cardiologists and internists attending a large cardiology convention. A smaller sample of 17 internists and cardiologists from the same HMO as the patients were also surveyed.

The patient population consisted of 87% men with a mean age of 64 years and an average length of time post-MI of eight years. Eighty-four per cent of physicians reported they routinely prescribed SLN post-MI. Physicians surveyed identified that the benefits of SLN were a shortened episode of unstable angina, provision of diagnostic information and improved patient sense of security. Patients were asked questions regarding perceived benefits, anxiety about being without SLN, frequency of usage and knowledge of the proper use of SLN. Eighty-nine patients had SLN available when needed and the majority of patients carried it at all times. Twelve patients reported adverse reactions with headache as the most common, but one patient reported syncope. The majority of patients chose pain relief and life-saving in an emergency as the greatest benefits of SLN. Seventy-nine per cent believed that SLN generally helps. Complete relief was obtained by 45% of respondents within five minutes. Forty-five per cent of participants expressed moderate to extreme anxiety if they had forgotten their SLN. The frequency of usage was rated as frequent (weekly),

infrequent (monthly) or rare (annually). Twenty-nine per cent of patients were frequent users, 16% infrequent and 55% rarely used SLN (Bassan, 1991).

Knowledge of the proper use of SLN was evaluated by asking patients how certain they felt about how and when to use their nitroglycerin. Fifty per cent responded that they were very certain, 39% chose fairly certain and 11% revealed that they were not certain at all. Patients were also asked if they had used or would use SLN for 12 different symptoms listed on the survey. Seventy-one per cent said they had used it and 20% would use it for exertional chest pain. Sixty-eight per cent had used it and 22% would use it for non-exertional chest pain. Interestingly, many participants indicated they had used or would use it for other symptoms such as fast or strong heartbeat (39%), presyncope (36%), sudden weakness (27%), sudden dyspnea (51%), weakness or numbness in the left arm (61%), severe nausea and abdominal discomfort (29%) (Bassan, 1991).

Kimble and Kunik (2000) explored knowledge and use of SLN and cardiac-related quality of life (QOL) in patients with chronic stable angina. Research questions sought to address demographic and clinical factors that were predictive of knowledge and use of SLN according to standard patient education guidelines. The relationship between knowledge and use of SLN and QOL, and patients' typical experiences with SLN in the community setting were also examined. Cardiac-related QOL was measured using the Seattle Angina Questionnaire and the Sublingual Nitroglycerin Interview Schedule, a 69-item instrument developed for their study. Ninety-five patients with angina were interviewed in person or by telephone.

The study sample included 50 men and 45 women with a mean age of 63 years. Most participants were married and white and had received a high school diploma. The majority of respondents had a prior history of acute MI (53.7%) and angioplasty (PTCA) (89.5%) while nearly a third (30.5 %) had previous coronary artery bypass grafting (CABG). The mean length of time following diagnosis for coronary artery disease was 9.1 years. Participants recalled having received prescriptions for SLN a mean of 8.2 years prior to the interview. The mean length of time since their most recent SLN instruction was 3 ±4 years. Interestingly, 10 participants could not recall ever having received instruction about SLN use (Kimble & Kunik, 2000).

Independent predictors of poorer SLN knowledge were older age, male gender, a more recent diagnosis of CAD and poor recall of SLN instruction. Sixty-two participants lacked knowledge that SLN could be used prophylactically and 46 participants believed using SLN to prevent chest pain was not an appropriate use

of the drug. The only independent predictor of SLN use was gender, indicating that methods of SLN use in men were less consistent with standard patient education guidelines when compared with women. One-third of the participants used SLN for symptoms other than angina including rapid or slow heartbeat, palpitations, dyspnea, nervousness, dizziness or fainting (Kimble & Kunik, 2000).

Kimble and Kunik (2000) propose that care gaps may exist in the transition between acute care and primary care settings resulting in unmet educational needs, and that patients require more frequent reinforcement of SLN during routine follow-up visits. SLN use was not related to QOL. Gender differences were identified with men in relation to SLN knowledge and use. The researchers postulate that men may often rely on a significant other to help them remember or apply information and that they may be reluctant to use SLN in front of coworkers or partners.

McGovern, Mackay, Hair, Lindsay and Bryson (2001) evaluated patient knowledge and angina management for patients using SLN. Data were collected on 347 participants who presented to pharmacies in East Glasgow, Scotland. Thirty-one per cent of patients were noted to have problems with SLN administration, 39% of patients were unsure how often they would use therapy before seeking medical attention, 15% of patients would seek medical assistance after only one failed use of SLN and 10% of patients would have delayed seeking help after using three sprays of SLN in 15 minutes without relief. Twenty-four per cent of patients did not administer regular prophylactic therapy.

A qualitative study by Danish pharmacy interns examined medication- and illness-related factual knowledge, perceptions and behaviour in 123 patients with angina (Haugbolle, Sorensen, & Henriksen, 2002). The study population was gathered from 40 community or hospital pharmacies and patients were selected if they had been prescribed quick- or slow-acting nitrates. The mean age was 70.8 years, with 75 men and 48 women participating. Ninety per cent of participants had been diagnosed with angina for more than one year and 24% for more than 12 years.

A semi-structured interview guide based on theories of self-regulation of medication, coping with illness, medication use and compliance, user perspectives on medication and illness, angina, and drug-related problems was used (Haugbolle et al., 2002). They discovered that one-third of patients claimed to have no knowledge about angina, 55% had some factual knowledge and three per cent had a comprehensive understanding of their disease. Many patients lacked knowledge about how the medication functioned, 27%

lacked knowledge of how quick-acting nitrates worked and 52% were unaware of the action of slow-release nitrates (Haugbolle et al., 2002).

Medication administration was categorized into three groups: active self-regulation, unreflected non-compliance and compliance. One-quarter of the participants admitted to deliberately self-regulating their medications regularly or occasionally. All patients experienced side effects, with nitrate-induced headaches most commonly cited. The researchers suggested there was no clear relationship between perceptions of medication or illness and medication use, but noted a trend toward more active self-regulation of medication in those with a negative illness perception. They concluded that health care providers must take into account the variability of factual knowledge and illness perception when educating and counselling patients. The authors acknowledged that the large number of interviewees (70) might have affected the reliability of the results (Haugbolle et al., 2002).

The theme of illness perception in angina patients was also explored by McGillion, Watt-Watson, Kim and Graham (2004). They conducted focused group studies to determine the self-management learning needs of chronic stable angina (CSA) patients using Braden's Self-Help Model. Eleven clinicians and eight CSA patients participated. The patient population consisted of six men and two women between 44 and 70 years of age who were recruited from outpatient clinics and a cardiovascular rehabilitation centre. Clinicians who participated included five registered nurses, four nurse practitioners and two physicians. Themes that emerged were grouped into three main categories: perceived severity of illness, uncertainty and limitation.

Patients identified distinguishing angina from other types of pain symptoms as a high priority for education. They also found it difficult to decide when to seek professional help, citing symptom denial and a reluctance to burden caregivers. Often, decisions to go to the emergency room were deferred due to dislike and fear of the emergency room and doubting their own judgment (McGillion et al., 2004).

The researchers identify a lack of knowledge of CAD management as a significant cause of uncertainty. One of the dominant themes in the uncertainty category was the proper use of medications. The majority of patients stated they did not clearly understand the purpose of their medications and often felt overwhelmed and confused about medication schedules. Both patients and clinicians cited the proper use of nitroglycerin as a major knowledge gap in self-care. Clinicians reported numerous accounts of both over and under-dosing during an angina episode. Patients were also not often aware of prophylactic use of SLN. Patients were afraid of

using the nitroglycerin incorrectly and possibly causing physical harm. Clinicians identified a basic knowledge of the pathophysiology of CAD as the foundation for developing effective symptom management and prevention skills (McGillion et al., 2004).

Methods

A 20-item questionnaire was developed by the authors for a quality assurance initiative within the division of cardiology. There was no requirement for submission to the ethics board for approval. An anonymous questionnaire was given to a convenience sample of 300 participants between April and July 2002 who were pre-assessed for cardiac catheterization. Demographic data collected included age, gender, marital status, education level, date of suspected or confirmed diagnosis of CAD and medications. Participants were asked whether they had been prescribed SLN, if they used tablets or spray and how long it had been since they had last used SLN. Patients were asked if they recalled being taught how to use SLN and who had performed the patient education, which symptoms they were instructed to use SLN for (only for chest pain or did it include other types of discomfort or dyspnea), method of administration, and what to do if they did not have relief from their symptoms. Additional questions were related to SLN prophylaxis and contraindications to the concomitant use of topical nitrates with SLN (See Appendix A, page 38).

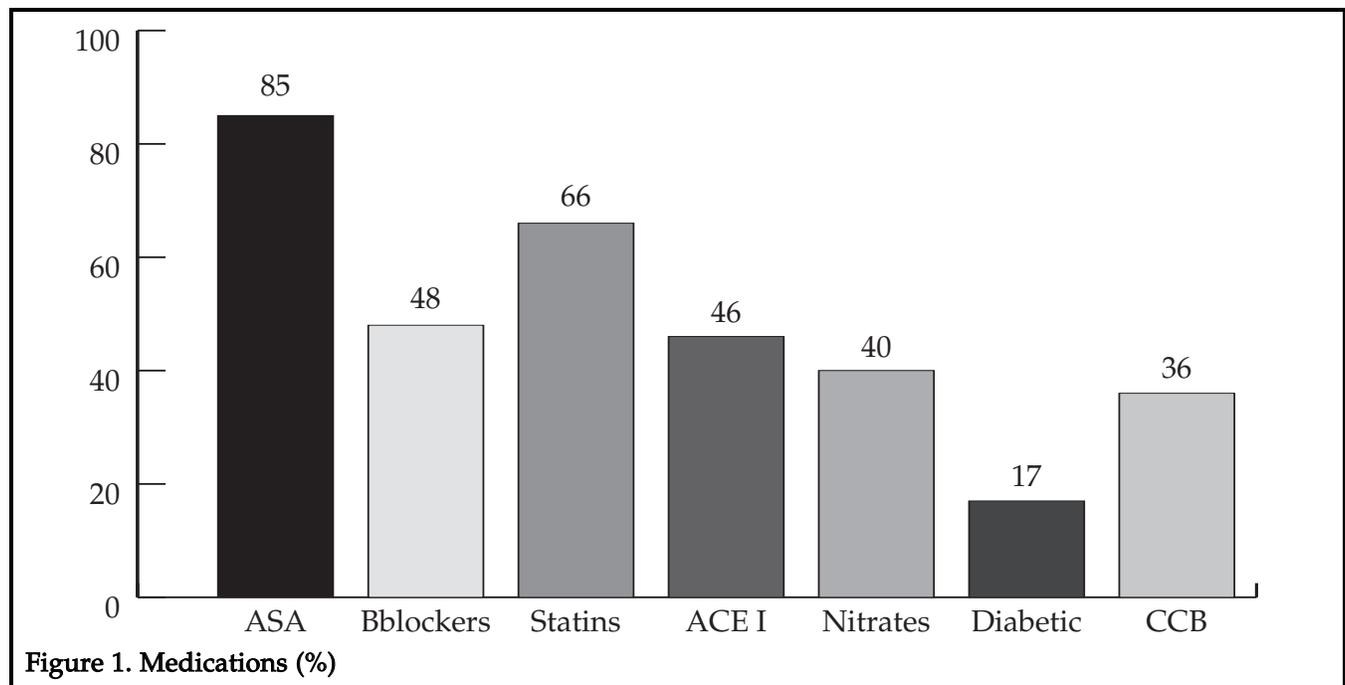
Results

The response rate was 96%. However, in the returned questionnaires, several questions were not answered or were only partially answered. The population consisted

of 65% men and 35% women between 36 and 85 years of age. Seventy-two per cent lived with a spouse or partner. Forty-one per cent had not completed high school, 29% had completed high school and the remaining 30% had attended or completed university, community college or technical/professional school. Sixty per cent of our respondents had confirmed CAD with 44% diagnosed within one year, 19% from one to three years, 10% from four to seven years, 12% from seven to 10 years and 15% greater than 10 years. Thirty-one per cent of respondents had suspected CAD. Patients' concomitant medications included: ASA (85%), beta blockers (48%), statins (66%), ACE inhibitors (46%), topical or oral nitrates (40%), diabetic medications (17%) and calcium channel blockers (36%) (Figure 1). Eighty-five per cent of patients had been given a prescription for SLN, nine per cent of patients were never given a prescription and 12% had never used SLN. Nitroglycerin spray was used by 82% of respondents carrying SLN.

Seventy per cent of patients recalled being taught how to use SLN (Figure 2). The majority of patient education was done by the physician (31%) with 22% by a registered nurse and 13% by a pharmacist. A small number of patients received education from friends, television or pamphlets. Patient education was most often in the form of verbal instruction (48%) with 13% receiving written instruction and 25% receiving both written and verbal instruction.

Patients were most frequently instructed to use SLN for chest pain and chest discomfort (75% and 61% respectively). Approximately 20% of respondents were taught to use it for arm discomfort or shortness of



breath, while only 10% were instructed to use it for throat or jaw discomfort. Sixty-nine per cent of respondents did not use SLN prophylactically. Ten per cent of patients who were prescribed topical nitrates did not use their SLN for angina symptoms while wearing a nitroglycerin patch (Figure 3, page 36).

Knowledge gaps were evident with the administration of SLN regarding the number of doses required when experiencing symptoms. While the standard dose is one spray every five minutes with a maximum of three sprays, 27% of respondents reported using two sprays each time and four per cent using three sprays each time.

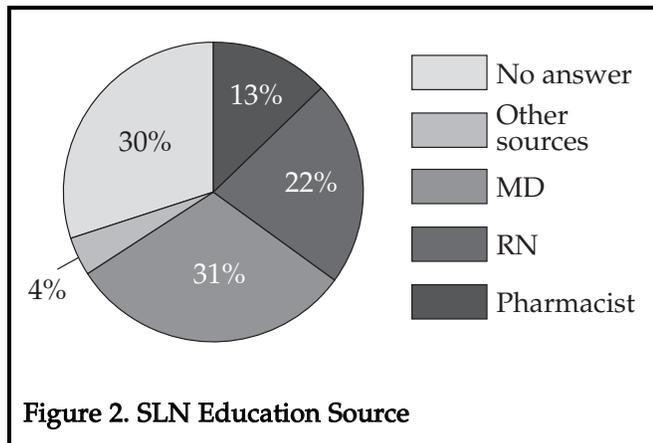


Figure 2. SLN Education Source

Many patients were unaware that they should sit or lie down when taking SLN (47%) and to rest when they experienced symptoms (43%). Only 56% of patients would have taken a second spray if the discomfort was not relieved. If the discomfort remained after three sprays of SLN, 61% knew to go to the nearest hospital or call 911 while 15% would ignore it or take another SLN.

Discussion

This questionnaire was intended to provide a brief overview of prescribing patterns, patient knowledge of SLN and information regarding patient perceptions about SLN use (Table 1, Page 37). Knowledge gathered from this initiative was intended as a preliminary to a formal research project based on the data. Demographic information revealed that this patient population was similar to those documented in the literature with the exception of a lower educational level (41% of respondents did not complete high school).

Many of our findings with regard to SLN are consistent with knowledge deficits reported in the literature related to recollection of receiving instruction about SLN, dosing (maximum dose and frequency), and prophylactic use (Bailie & Kay, 1988; Kimble & Kunik, 2000; McGillion et al., 2004; McGovern et al., 2001; McMahan et al., 1987).

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SLN provides rapid and effective relief for stable angina (Graboyes & Lown; 2003). Anecdotal information gathered suggested that not all patients were being prescribed SLN, even those with a post-MI diagnosis. Our survey revealed that 15% of patients did not receive prescriptions for nitroglycerin. Advanced practice nurses completing comprehensive health assessments can identify patients who have not been prescribed SLN as part of their CAD armamentarium. These findings may be communicated to physicians and other health care providers to ensure that patients are provided SLN as one of the mainstays of angina therapy.

Results of the questionnaire also indicated that patient education needs to be improved. Nearly a third of our respondents did not recall being taught how to use SLN. Kimble and Kunik (2000) identified a more recent diagnosis of CAD as an independent predictor of poorer knowledge of SLN. Nearly half of our respondents (43%) had been diagnosed with CAD within the last three years, which is consistent with their findings.

A majority of our patients identified physicians as the primary health care professional who provided education regarding the proper use of SLN followed by nurses and pharmacists. Clearly, this has practice implications for nurses in all areas of CAD management. McGillion et al. (2004) report that proper use of SLN was a major knowledge gap in self-care and, as nurses in outpatient and inpatient settings, it is imperative to review patient knowledge and administration of SLN on a routine basis (Kimble & Kunik, 2000).

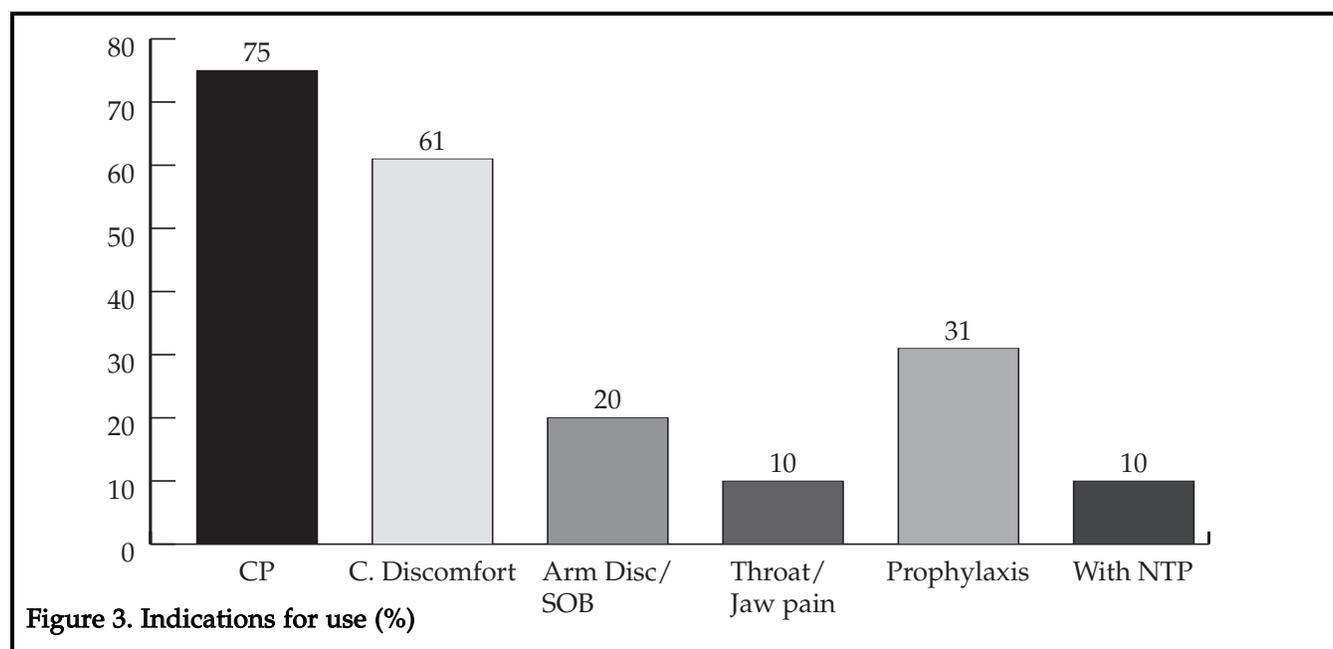
The recommendation for reviewing patient knowledge is certainly relevant in this population as the educational level was low with 40% not having completed high school. Patients may be illiterate or

have grade school reading levels. Printed pamphlets are often inadequate sources of information and patients depend on individualized instruction by the nurse in order to understand their disease process and medications (Lepczyk, Raleigh, & Rowley, 1990; Merritt, 1991). Incorporation of a demonstration dose of SLN may be a method of improving knowledge and usage of SLN (Kelly, 1988).

Nurses have the advantage of more frequent patient encounters and, thus, increased opportunities to explore patient understanding of the pathophysiology of CAD and the mechanism of action of SLN in providing relief for their symptoms. Health care professionals must not assume that patients have comprehensive knowledge of SLN even though they have been diagnosed with CAD for many years. We need to ensure that patients are using it correctly and not for non-angina symptoms such as tachycardia and dizziness (Bassan, 1991).

Health care providers must be cognizant of the language used to describe angina. Symptoms are very individualized and patients need to understand how their angina is manifested. Most of the patients knew they could use their SLN for chest pain or chest discomfort, but few were aware they could use it for anginal equivalents such as throat, jaw and arm discomfort, or dyspnea. When teaching patients about indications for SLN, nurses must use descriptors that are inclusive.

Prophylactic treatment of angina is another area that needs to be addressed. Sixty-nine per cent of respondents were not aware that they could use SLN before an activity to prevent symptoms. Parker and Parker (1998) suggest that the prophylactic use of SLN



is often overlooked and many patients can predict which activities will induce angina. The concomitant use of SLN and topical nitrates was another misconception identified. Patients need to be informed they can still use their SLN if they have symptoms while they are wearing the nitro patch.

SLN is cost-effective and, when used appropriately, may impact on health care resource utilization (i.e. decreased emergency room visits or adverse events with proper SLN administration). Advanced practice nurses need to disseminate these findings to other health care providers to ensure that patients with CAD receive prescriptions for SLN as well as comprehensive, individualized instruction regarding SLN as a mainstay of angina management. Educational opportunities are often limited in both acute and outpatient settings due to shorter hospital stay and heavily burdened family physicians.

Limitations

The questionnaire was designed to provide an overview of patient experience and knowledge of SLN and may need revision to enhance content validity. The sample was a convenience sample and, while the return rate was very high, not all the information was completed on each questionnaire. Gender and ethnic differences were not explored, but the patient population was quite homogeneous with aboriginal and ethnic minorities under-represented. A qualitative component would have been helpful in eliciting a more complete understanding of patient knowledge and use of SLN. Research funding

has been secured to facilitate a quantitative and qualitative study comparing the administration of a demonstration dose of SLN versus usual care in order to further explore patient knowledge and use of SLN.

Conclusion

The use of SLN as front-line therapy for angina must not be overlooked. As health care professionals, we have a responsibility to ensure that patients are equipped with the tools to properly utilize their medications. Nurses are uniquely situated to assess and educate patients. The provision of timely and appropriate information regarding SLN administration is essential in optimizing angina self-management. ♥

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About the Authors

Natalie Nichols, RN, BA, MN, CCN(C), Specialty Nurse Practitioner Cardiology, Queen Elizabeth II Health Sciences Centre, Halifax, NS.

Debbie Oldford, RN, MN, CCN(C), Specialty Nurse Practitioner Cardiology, Queen Elizabeth II Health Sciences Centre, Halifax, NS.

Sandra Duke, RN, MN, CCN(C), Specialty Nurse Practitioner Geriatrics, Queen Elizabeth II Health Sciences Centre, Halifax, NS.

Patients who recalled being taught how to use SLN	70%
Patients never given a prescription for SLN	9%
Patient education provided by: Physician	31%
Nurse	22%
Pharmacist	13%
Method of Patient Instruction: Verbal	48%
Written	13%
Both	25%
Patients using SLN prophylactically	31%
Patients who were not aware they could use SLN while wearing a nitro patch	10%
Patients using incorrect dosing frequencies	31%
Patients who would use a second dose of SLN if discomfort not relieved	56%
Patients unaware of concomitant angina self-management strategies such as: sitting or lying down when using SLN	47%
resting with anginal symptoms	43%

Appendix A: Using Nitroglycerine Questionnaire

Please circle the appropriate responses.

- | | |
|---|---|
| <p>1. Have you ever used Nitroglycerin? Yes No</p> <p>2. Have you been taught how to use it? Yes No</p> <p style="padding-left: 20px;">By Whom: RN MD Pharmacist Other</p> <p>3. Were the instructions: written Yes No
verbal Yes No
both Yes No</p> <p>4. Were you told to use Nitroglycerine for:
chest pain? Yes No
chest discomfort? Yes No
throat discomfort? Yes No
jaw discomfort? Yes No
arm discomfort? Yes No
shortness of breath? Yes No</p> <p>5. Do you use Nitroglycerine before
doing an activity? Yes No</p> <p>6. Do you shake the Nitroglycerine
spray container before using? Yes No</p> <p>7. Do you avoid swallowing for 10 seconds
after taking Nitroglycerine spray? Yes No</p> <p>8. Are you putting your nitroglycerine:
on the tongue? Yes No
under the tongue? Yes No</p> <p>9. Are you using:
one spray/tablet at a time? Yes No
2 sprays/tablets at the same time? Yes No
3 sprays/tablets at the same time? Yes No</p> <p>10. When you take Nitroglycerine
do you sit or lie down? Yes No</p> <p>11. If you get chest discomfort do you:
stop the activity Yes No
causing the discomfort? Yes No
rest before using Nitroglycerine? Yes No</p> | <p>12. If you rest before using Nitroglycerine,
how long do you wait? Yes No
1-5 minutes Yes No
5-10 minutes Yes No
10 minutes or longer Yes No</p> <p>13. When you use Nitroglycerine for angina
symptoms, do you repeat it if the
symptoms are not relieved? Yes No</p> <p>14. If so, do you wait:
5 minutes between sprays/tablets? Yes No
10 minutes between spray/tablets? Yes No
longer than 15 minutes Yes No
between sprays/tablets? Yes No</p> <p>15. How many times do you
repeat the Nitroglycerine? Yes No
Once Yes No
Twice Yes No
Three times Yes No
Greater than three Yes No</p> <p>16. If the discomfort remains, do you:
go to the nearest hospital? Yes No
call 911? Yes No
ignore it? Yes No
take another Nitroglycerine? Yes No</p> <p>17. Do you use a Nitroglycerine patch? Yes No</p> <p>18. If you are wearing the patch,
do you use Nitroglycerine
when you have chest discomfort? Yes No</p> <p>19. Do you ever forget to wear the patch? Yes No</p> <p>20. If yes, do you have symptoms
such as chest pain or shortness
of breath? Yes No</p> |
|---|---|

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Canadian Hypertension Education Program Recommendations - 2007

Lyne Cloutier, RN, MScN, Jo-Anne Costello, RN, MScN, ACNP, Kori Kingsbury, RN, MScN, Sandra Matheson, RN, MN, MEd, CNCC(C) CCN(C), Donna McLean RN, MN, on behalf of the Canadian Hypertension Education Program

The Canadian Hypertension Education Program has updated recommendations for the management of hypertension. This year, we have focused on the need to assess blood pressure in all Canadian adults and to regularly assess blood pressure in those with high normal values. In addition, the 2007 recommendations support the increasing evidence that hypertension can be prevented through public health interventions to reduce dietary sodium.

In 2007, a full paper on the implications of hypertension guidelines for nursing practice will be published. The full recommendations will also be available at www.hypertension.ca

For now, the important messages for 2007 are:

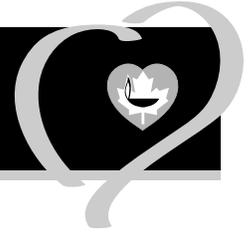
- Assess blood pressure at all appropriate visits
- Almost one-half of those with blood pressure 130-139/85-89 will develop hypertension within two years. They require annual reassessment.
- Assess global cardiovascular risk in all hypertensive patients
- Lifestyle modification is the cornerstone for the prevention and management of hypertension and CVD
- Treat to target (<140/90 mmHg; <130/80 mmHg in patients with diabetes or chronic kidney disease)
- To achieve targets, sustained lifestyle modification and more than one drug is usually required
- Strategies to improve patient adherence to lifestyle modifications and antihypertensive therapy need to be incorporated in every patient's management. ♥

Le Programme Éducatif Canadien sur l'hypertension a mis à jour ses recommandations pour la prise en charge des personnes atteintes d'hypertension artérielle. Cette année, l'emphase sera mise sur la nécessité de mesurer la pression artérielle de tous les Canadiens d'âge adulte et d'évaluer, sur une base régulière les personnes dont la pression artérielle est normale mais élevée. De plus, les membres du PECH (2007) supportent les preuves grandissantes à l'effet que l'hypertension peut être prévenue par des interventions de santé publique visant la réduction de la consommation de sodium dans l'alimentation. En 2007, un article sur les implications des recommandations pour la pratique infirmière sera publié. Les recommandations 2007 seront également disponibles à l'adresse suivante : www.hypertension.ca

Pour l'instant, les messages à retenir sont :

- Mesurer la pression artérielle chez tous les adultes lors de visites de contrôle.
- Presque la moitié des personnes dont la pression artérielle se situe entre 130-139/85-89 développeront de l'hypertension dans les deux années subséquentes. Ces personnes nécessitent une réévaluation annuelle.
- Évaluer et prendre en charge le risque cardiovasculaire global chez les personnes hypertendues.
- Les modifications du mode de vie constituent la pierre angulaire de la prise en charge de l'hypertension et des maladies cardiovasculaires.
- Traiter jusqu'à l'atteinte des valeurs cibles (<140/90 mmHg; <130/80 mmHg pour les patients atteints de diabète ou de néphropathie).
- Pour atteindre les cibles, des modifications soutenues des habitudes de vie et plus d'un médicament antihypertenseur sont souvent nécessaires.
- Des stratégies pour améliorer l'adhérence aux modifications des habitudes de vie et aux traitements médicamenteux doivent être incorporés dans la prise en charge de tous les patients. ♥

Information for Authors



The **Canadian Journal of Cardiovascular Nursing** (CJCN) publishes four issues annually – February, May, August and October – featuring articles in both French and English. CJCN welcomes original articles dealing with research findings or issues relating to cardiovascular health and illness.

The Journal provides a forum for:

- research
- literature reviews
- case studies
- discourse relevant to cardiovascular issues

Letters to the Editor in response to our articles or columns are encouraged.

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The manuscript should be sent by e-mail or on disk by mail to:

Kirsten Woodend
University of Ottawa,
Faculty of Health Sciences, School of Nursing
451 Smyth Road, Room 3247B, Ottawa, Ontario, K1H 8M5
Email: kwoodend@uottawa.ca

The manuscript should be accompanied by the following:

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Manuscripts should be typed double-spaced in a standard letter quality font. Side margins should measure 2.5 cm. The manuscript can be a maximum of 20 pages including tables, figures, illustrations and references. (Compute the graphics as equivalent to one half or one full size page depending on anticipated size when published.)

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Follow the APA guidelines for grammar, punctuation, usage (capitalization, numerals, seriation), unbiased language, references and citations. Two exceptions from APA are these: spelling should be current Canadian usage where applicable; abstract may be expressed in a maximum of 150 words.

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Acknowledgements

Sources of funding for the research that resulted in this manuscript should appear in the acknowledgement section of the paper.

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Manuscripts for original articles are reviewed anonymously by peers for merit and clarity. If the peer reviewers recommend publishing with content revisions, the manuscript will be forwarded to the author with a deadline for the return of the revised paper by e-mail or on disk.

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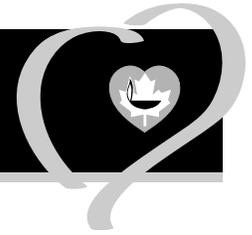
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Check the CJCN web page for a Powerpoint Presentation which will assist you with APA formatting: www.cccn.ca/info/cjcn.cfm

Information pour auteurs



La *Revue Canadienne de Nursing Cardiovasculaire* (RCNC) publie quatre issues annuellement – février, mai, août et octobre. Le RCNC publie des documents dans le Français et l'anglais. Le journal accepte des manuscrits originaux qui décrivent des résultats de recherches ou des issues concernant la santé et les maladies cardiovasculaires.

Le journal fournit un forum pour :

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Des lettres au rédacteur en réponse à nos articles ou colonnes sont encouragées.

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Le manuscrit devrait être soumis par courriel ou sur disque/disc par la poste :

Kirsten Woodend
Université de Ottawa, Faculté de Sciences Santé, École des Science Infirmières
451 Rue Smyth, Salle 3247B, Ottawa, Ontario, K1H 8M5
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