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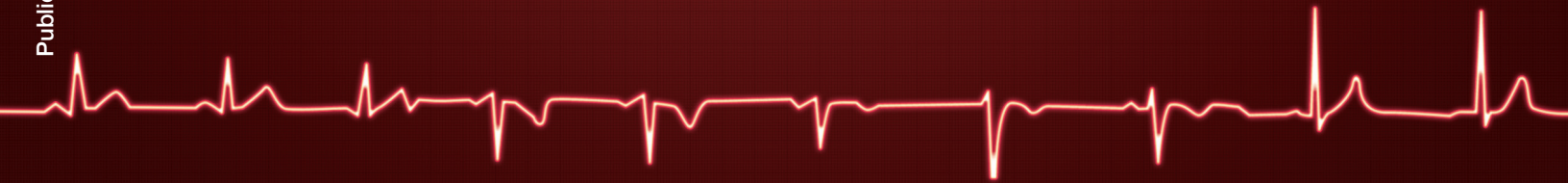

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Updating Your Cardiovascular Toolkit Annual Spring Conference Ottawa, ON – May 2015

The Canadian Council of Cardiovascular Nurses (CCCN) held its fifth National Spring Conference "Updating your Cardiovascular Toolkit" in Ottawa, Ontario, on May 29, 2015. The one-day event took place at the Brookstreet Hotel with 90 delegates in attendance.

The conference consisted of 10 sessions ranging in length from 30 minutes to an hour. We were fortunate to have a personal story included as part of one of the sessions. The patient's experience provided great insight into how patients cope with an implantable cardioverter-defibrillator (ICD).

The conference evaluations were very positive. Respondents highlighted how they liked the clinical approach to the conference and the varied health care professionals who spoke during the day. A significant number of attendees agreed that the information they learned during the day would change the way they care for patients and that it was a great way to interact with their peers. PDFs of the slide presentations are available on the spring conference website.

CCCN would like to thank the following sponsors of the event:

- Astra Zeneca (National Sponsor)
- Actelion
- Bayer
- Novo Nordisk

CCCN's Annual General Meeting (AGM) immediately followed the conclusion of the conference. For the very first time, the meeting was broadcast over the internet. If you were unable to join and are interested in what transpired, you can view a recording of the AGM at: **http://cccn.adobeconnect.com/p7mrrd10nxk/**

If you are interested in more information on how the changes put in place by the Canadian Cardiovascular Society (CCS), as it relates to CCCN and its participation in the Canadian Cardiovascular Congress, we would encourage you to view the recording.

CCCN is committed to providing ongoing education to its members. The 2016 ***Updating your Cardiovascular Toolkit Spring Conference*** will take place in Halifax, Nova Scotia, in May. Please visit our website at **www.cccn.ca** for more information. ♥

New Brunswick members at AGM

Opening Plenary Speaker, Dr. Thierry Mesana, CEO, The University of Ottawa Heart Institute

CCCN Clinical Improvement Grant

The purpose of this grant is to provide funds to CCCN members for research pertaining to cardiovascular or cerebrovascular nursing in Canada. A maximum of $2,500.00 is available for this competition.

This grant is directed to nurses in clinical settings who use results from research to improve practice, and to research nurses wishing to establish linkages with clinical nurses to facilitate the uptake of research evidence and advance clinical practice.

Types of clinical projects to be funded

1. Knowledge Dissemination Project
2. Knowledge Utilization Project

Range of funding

1. $1,000 to maximum of $2,500
2. A candidate may only receive one CCCN clinical grant for the same project

Eligibility

1. Canadian citizens or permanent residents
2. Current members of the CCCN
3. Currently licensed as a nurse in a provincial/territorial professional association
4. Project must include both clinical and research nurses

Selection criteria

The CCCN National Research Committee reviews grant applications with attention to relevance of the project in relation to pertinence. In the event that projects receive equal rating, then preference is given to an applicant who 1) has not received funding from CCCN in the past five years, or 2) has contributed the most to CCCN endeavours.

Closing date for applications

August 15, 2015. Please visit our website at **www.cccn.ca** for complete details and to apply.

Canadian Council of Cardiovascular Nurses

Conseil canadien des infirmières(iers) en nursing cardiovasculaire

CCCN Research Grant

The purpose of this grant is to provide funds to CCCN members for research pertaining to cardiovascular or cerebrovascular nursing in Canada. A maximum of $2,500 is available for this competition.

Types of research to be funded

1. Development of a research proposal that will lead to funding from another granting agency.
2. Pilot study, a small project, or instrument development and testing.
3. Evaluation of a nursing intervention.

Range of funding

1. Up to a maximum of $2,500.
2. A candidate may only receive one CCCN research grant for the same project.

Eligibility

1. Canadian citizens or permanent residents.
2. Current members of the CCCN.
3. Currently licensed as a nurse in a provincial/territorial professional association.

Selection criteria

The CCCN National Research Committee reviews grant applications with attention to both relevance and scientific merit. In the event that projects receive equal scientific rating, then preference will be given to the applicant who 1) has not received funding from CCCN in the past five years, or 2) has contributed the most to CCCN endeavours.

Closing date for applications

August 15, 2015. Please visit our website at **www.cccn.ca** for complete details and to apply.

POSITION STATEMENT

Advance Care Planning and the Role of the Cardiovascular Nurse

Preamble

This position statement was created in response to a need identified by cardiovascular nurses from across Canada for greater clarity about the role of cardiovascular nurses in advance care planning (ACP). It was developed in collaboration with cardiovascular nursing and ACP experts from across Canada. It is intended to inform and guide cardiovascular nursing practice and to ensure all cardiovascular nurses understand the importance of ACP in the delivery of client[1]-centred care.

The core principles were adapted from the Canadian Council of Cardiovascular Nursing (CCCN) practice framework (CCCN, 2009) and the values statement was adopted from the Canadian Nurses Association (CNA) code of ethics (CNA, 2008a).

Background

The Canadian Hospice Palliative Care Association [CHPCA] (2012) defines ACP as the development and expression of wishes for the goals of medical treatment and the continuation or discontinuation of such treatment and care. It involves discussions with family and friends with whom the person has a relationship, and may involve healthcare providers, and/or lawyers who may prepare wills and powers of attorney. Advance care planning also involves naming a substitute decision maker. (p. 2)

Yet, ACP is more than the consent for and/or refusal of treatments. It is a process of reflection and communication of values and beliefs, and development and expression of wishes for care. Cardiovascular nurses have an important role to play in ACP. Nurses are considered trusted professionals, as evidenced by 88% of Canadians reporting that they are comfortable talking about end-of-life care wishes with nurses (CHPCA, 2014). As such, they are well-positioned to discuss values-based ACP and provide information and ongoing support.

The CCCN standards of cardiovascular nursing practice (2009) highlight the core concepts of partnership and quality of life within the paradigm of caring. The standards state that relationships with clients are based on respect, authentic communication, cooperation, and confidentiality.

Our position is that all cardiovascular nurses should encourage clients to engage in ACP. ACP should be a normal process for all, and integrated into everyday practice. Therefore, all cardiovascular nurses should be aware of the value of ACP and understand their role, as outlined in this position statement.

Core Principles

As many cardiovascular conditions are chronic in nature, CCCN believes ACP dialogue needs to begin at time of diagnosis. CCCN also recognizes that ACP is a dynamic process that is subject to revisions over time, for example, when clients are faced with a decline in health or offered new treatment and/or interventions. An early introduction to ACP provides clients ample time to think about their goals and preferences of care, and to make decisions in collaboration with their support system, cardiovascular nurse, and interprofessional team. Our goal is to ensure that our clients are informed, satisfied with current decisions, and aware that decisions can be revisited.

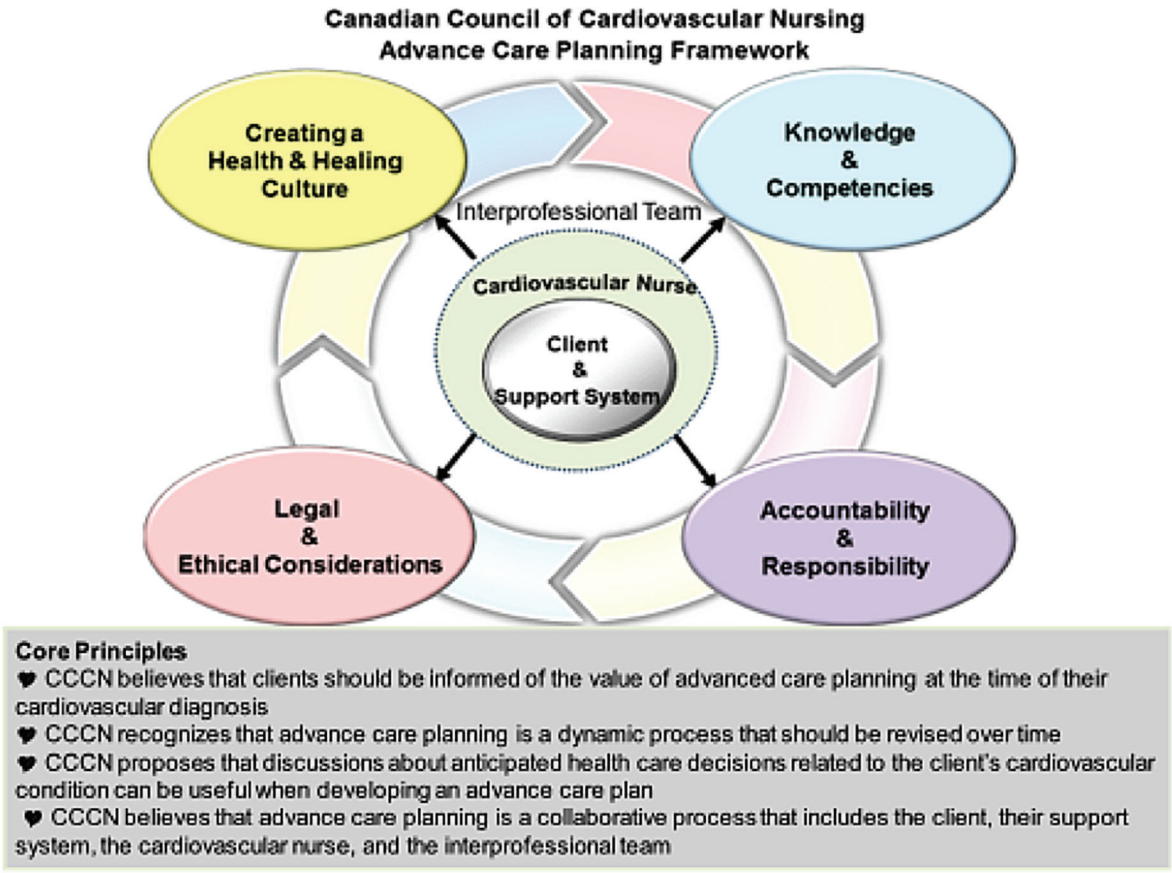
Core Values

CCCN values the provision of safe, compassionate, competent, ethical care that respects and advocates for the client's desired goals (CNA, 2008a).

Framework

The conceptual framework below represents the key elements that guided the development of this position statement. The four domains: a) creating a health and healing culture, b) knowledge and competencies, c) legal and ethical considerations, and d) accountability and responsibility were identified as foundational to the profession of nursing. These domains were selected to align with provincial nursing regulatory professional standards, the CNA code of ethics (2008a), the CCCN standards framework (2009), and the guiding principles from the Canadian Hospice Palliative Care Association ACP national framework (2012). CCCN believes these domains capture the foundational principles and essence of cardiovascular nursing practice in Canada. Each domain within the framework identifies goals and key messages to guide cardiovascular nursing practice.

[1] Client is used throughout this document and refers to the patient and his/her self-identified support system. Client encompasses all individuals across the lifespan, from pediatrics to geriatrics, and is inclusive of all backgrounds, religions, cultures, socio-economic status, and sexual orientation.



The client and his/her self-identified support system is at the core of the framework. The support system can include anyone with whom he/she wishes to share the ACP decision-making process (e.g., family, close friends, and members of the interprofessional team). The cardiovascular nurse enacts the four domains in the process of care. The client then becomes empowered to engage in ACP.

Domains of Practice

Creating a Health and Healing Culture

CCCN believes the client has the right to be cared for in a culturally safe environment[2]. To facilitate ACP discussions, the health and healing environment must incorporate the client's preferred cultural values, beliefs and rituals (British Columbia's Heart Failure Network [BCHFN], 2013). Creating a health and healing culturally safe environment for clients must be more than just a checklist of ethnic preferences (BCHFN, 2013). For the cardiovascular nurse it includes an awareness of self, active listening, knowledge of the potential for power imbalances, and empathy (BCHFN, 2013). It is also important to ensure the nurse is aware of the cultural differences within a specific group and how the differences can affect the ACP discussion. Awareness and integration into practice of these beliefs ensures the cardiovascular nurse facilitates the ACP discussion within the health and healing culture domain.

Goals

- Create a culturally safe environment and engage in culturally safe communication and nursing care.
- Respect and support clients' meanings of health.
- Encourage clients to ask questions, explain their circumstances, and express their personal preferences.
- Ensure all interactions/discussions and decisions are in the best interest of the client.
- Engage in shared decision-making to ensure that clients are informed and involved in decisions about their treatment options.
- Respect the culturally and individually diverse needs (social, spiritual, lifestyle, gender, mental and physical abilities, socioeconomic, etc.) of the client when establishing an ACP.
- Be culturally sensitive to clients' values and beliefs surrounding living, illness, death, and dying and be responsive to their needs.

[2] Environment can mean all types of environments (e.g., community, primary care, emergency, acute care, palliative care)

Key Messages

- Cardiovascular nurses understand and respect their clients' cultural preferences.
- Cardiovascular nurses understand how imbalances in power can affect the ACP discussion.
- Cardiovascular nurses need to set aside their personal values or beliefs.
- Cardiovascular nurses facilitate supportive conditions for ACP discussion within the context of the interprofessional team and organizational environment.

Knowledge and Competencies

Advocacy and education are core nursing roles in ACP that support clients' self-determination, and ensure that their health care preferences are elicited and respected (Black, 2006; CNA, 2008b). It is essential that nurses acquire the necessary competencies through academic studies, professional continuing education, organizational position statements and reports to effectively inform and advocate for clients through the ACP process. Examples of supporting documents include, but are not limited to, CCCN's nursing standards (CCCN, 2009) and the ACP in Canada national framework (CHPCA, 2012).

Commonly reported barriers to nurses' engagement in ACP are a lack of knowledge, skills, and comfort with discussions that pertain to end of life (Pere, 2012). To promote proficiency, the acquisition of specialized knowledge about the natural progression of cardiovascular disease processes; communication skills; cultural, legal and ethical considerations; and familiarity with provincial and territorial legislation on consent and ACP can best prepare a cardiovascular nurse to facilitate meaningful ACP dialogues.

Developing an ACP with clients is a collaborative process (CHPCA, 2012). ACP not only includes the provision of information, it is also a relational process in which nurses create partnerships with clients to elicit and understand their values, beliefs, and preferred goals of care Knowledge of a client's needs, developmental stage, and level of readiness are required to develop a relevant and meaningful ACP. When caring for anyone with cognitive limitations, cardiovascular nurses must determine their degree of understanding of living well, death, and dying. This applies when working with children. Knowing how to assess and document decisional capacity and when to involve the interprofessional team to agree about the client's capacity are also essential. Persons who are deemed unable to make their own decisions should participate in decision-making to the level they are able (Dempsey, 2013).

Cardiovascular nurses hold specialized knowledge about cardiovascular disease that should be shared with the client. This does not extend to conferring a diagnosis or prognosis.

Goals

- Acquire and integrate specialized knowledge of cardiovascular conditions in ACP discussions, as it relates to disease trajectory, treatment options, and care management.
- Advocate for clients' self-determination and ensure that their ACP preferences and goals are elicited and respected.
- Educate clients about ACP, as it relates to their cardiovascular condition.
- Create partnerships with clients to elicit and understand their values, beliefs, and preferred goals of care.
- Identify our own personal knowledge gaps about ACP and end-of-life planning and seek education and guidance where appropriate.

Key Messages

- All cardiovascular nurses should be aware of the value of ACP and encourage their clients to develop ACP.
- Cardiovascular nurses must acquire knowledge and competencies, as they relate to cardiovascular care and ACP that will best support their clients in the process.
- Knowledge and competencies are not limited to specialized cardiovascular knowledge, but also include client-specific knowledge. This includes an understanding of whether the client accepts and understands his/her prognosis, the client's decisional capacity, his/her values and preferences, and his/her wishes and expectations for care.
- ACP should be available to all clients along the trajectory of their cardiovascular condition.

Legal and Ethical Considerations

In Canadian law, persons with capacity have the right to make verbal or written advance care plans that provide instructions about their wishes. Capacity is commonly defined as the ability to understand information that is relevant to making personal care/health care treatment decisions and the ability to appreciate the consequences of a decision, including the decision to decline treatment (Canadian Nurses Protective Society [CNPS], 2009; CHPCA, 2012; College of Registered Nurses of Nova Scotia [CRNNS], 2013). Capacity and quality of life are dynamic. Therefore, goals of care require frequent review. Given nurses' ongoing and continuous presence with clients in a variety of practice settings, they are uniquely positioned to collaboratively review and revise their clients' informed wishes. Long-term interactions with clients in a variety of practice settings provide opportunities to review and revise clients' wishes based on the most current health care information available to them (CNA, 2008b).

Cardiovascular nurses must advocate for a client's right to autonomy. Clients' wishes and health care choices must be honoured (CNA, 2008a, 2008b). As knowledge translators, nurses must provide unbiased health care information to clients. Education is individualized to ensure that clients fully understand what the treatment entails including risk/benefit scenarios and prognosis (CNA, 2008a).

Substitute decision makers (SDM) are designated by the client or court to make health care and/or personal care decisions when the client is incapable of doing so (CHPCA, 2012; CNPS, 2009; CRNNS, 2013; Vogel, 2011). When the client is no longer capable of making those decisions, cardiovascular nurses must respect the client's previously expressed wishes or instructions and advocate for these when the SDM is making the decisions. If the client's wishes are unknown, the cardiovascular nurse must be aware of provincial or territorial laws for consent and ACP legislation in order to identify who can make medical decisions on behalf of the client (i.e., proxy).

Goals

- Recognize the client's capacity to make decisions related to his/her care.
- Elicit and respect the client's ACP goals and preferences.
- Provide clients with individualized information they need to make fully informed personal and health care treatment decisions.
- Ensure that clients have given informed consent for any care or service provided.
- Advocate for the client when the SDM is involved by respecting any previously known wishes or instructions.
- Refer to provincial legislation regarding SDM.
- Cardiovascular nurses function within their own level of competence within the legally recognized scope of practice.

Key Messages

- Clients have the right to have consistent information about cardiovascular disease, prognosis, and the benefits and risks of interventions.
- Cardiovascular nurses must advocate for and support a capable person's decisions regarding his/her health and well-being.
- ACP may involve the expression of wishes in writing, verbally, or by other forms of communication. In some jurisdictions, it involves the creation of a written directive, which may take effect when the person lacks the capacity to make decisions. This may include the appointment of an SDM.
- Cardiovascular nurses should be cognizant of the laws that govern ACP in the province or territory in which they are employed, and with current policies at their institutional/governance bodies with regard to age of consent, SDM and the type of documents that are recognized. A lawyer may not be required to create an ACP or advance directive, but may be helpful in explaining issues of consent, capacity and choosing a SDM.
- Cardiovascular nurses are guided by the CNA code of ethics and/or their professional regulatory college and association.
- Cardiovascular nurses function within their own level of competence within the legally recognized scope of practice.

Accountability and Responsibility

In accordance with the CNA (2008a) *Code of Ethics,* the CCCN believes that cardiovascular nurses "… are accountable for their actions and answerable for their practice" (p. 18). Discussing ACP with clients can be a sensitive and personal experience both for the client, as well as the cardiovascular nurse (Hospice and Palliative Nurses Association, 2011). Cardiovascular nurses recognize that clients have the right to make decisions about their health care. Advanced directives are legal documents that carry significant weight and cardiovascular nurses must honour clients' wishes in keeping with their respective jurisdictional professional standards, laws and regulations, as well as their own personal beliefs and values (CHPCA, 2012; Regina Qu'Appelle Health Region, 2011).

Goals

- Communicate any change in a client's treatment goals/wishes to the interprofessional team.
- Respect a client's right to assess his/her quality of life and make health care and end-of-life decisions, as he/she deems acceptable.
- Enter into a respectful and supportive therapeutic relationship to support the client in his/her decision-making process.
- Interact with clients honestly and with integrity when discussing clients' wishes.
- Preserve dignity, confidentiality, and privacy of the client.
- Provide individualized client information regarding pharmacological, medical, and nursing care procedures. This may be in addition to and different from standard client education materials.
- Recognize that ACP is deeply personal to the client and is based on his/her own personal values and beliefs.
- Engage in personal reflection regarding one's beliefs and values in order to engage in a meaningful and respectful discussion with clients.
- Identify personal limitations, disclose any potential conflict of interest, and seek help from a supervisor or employer to arrange for alternate care arrangements for their clients, in cases where they feel unable to support a client's wishes.
- Communicate any changes in client treatment goals/wishes to the interprofessional team.
- Document interactions and client wishes on client's chart.

Key Messages

- In order to create a meaningful and supportive environment, cardiovascular nurses must reflect on their own beliefs and values.
- Include the client and SDM (if appropriate) in all decisions regarding nursing care.
- Cardiovascular nurses support clients in their right to make health care and end-of-life decisions.
- In the event of conflict of interest between the cardiovascular nurse's beliefs and values and the client's wishes, the cardiovascular nurse must make alternate arrangements to support the client in his/her decision-making. ♥

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Quantity and Quality of Daily Physical Activity in Older Cardiac Patients

David M. Buijs, Ailar Ramadi, Karen MacDonald, Rhonda Lightfoot, Mano Senaratne, and Robert G. Haennel

Abstract

Background: *Sedentary behaviour and the level of daily physical activity are of particular concern in cardiac patients, as diminished activity may be a strong predictor of mortality in this population.*

Purpose: *In this study we assessed sedentary behaviour and the quantity and quality of daily physical activity among older cardiac patients who were at different stages of recovery following a cardiac event.*

Design: *We used a cross-sectional design and a convenience sampling technique.*

Method: *Participants were recruited into three groups: an Acute group (n=32), a Rehab group (n=32), and a Maintain group (n=29). Continuous minute by minute physical activity was assessed using the SenseWear™ Mini Armband, which was worn throughout each day for four consecutive days and provided data on steps/day, as well as time spent sedentary (waking time ≤ 1.5 METs), or in light (1.6-2.9 METs) or moderate-vigorous (≥3.0 METs) physical activity.*

Findings: *While the Rehab group accumulated more daily activity than the other two groups, they remained sedentary for approximately 70% of waking time. The quantity and quality of the activity in the Maintain group was comparable to that observed in the Acute group.*

Conclusions: *Our observation of consistently elevated sedentary time regardless of whether the participant was entering, completing or were long removed from a formal cardiac rehabilitation program reinforces the need for cardiac rehabilitation nurse educators to both monitor routine daily activity and encourage coronary artery disease patients to adapt a lifestyle that is focused on reducing sedentary behaviour by incorporating planned exercise training and unstructured physical activity throughout the day.*

Key words: daily physical activity, older adults, cardiac patients, cardiac rehabilitation, activity monitoring

Background

Approximately 5% of the Canadian population reportedly lives with coronary artery disease (CAD). The proportion increases to 15% among those aged 65 to 74 years, and 23% among seniors 75 years and older (Dia et al., 2009). For many of these older adults, CAD negatively impacts their ability to perform activities of daily living and their independence (Yazdanyar & Newman, 2009). While participation in an exercise-based cardiac rehabilitation (CR) program has been shown to improve functional capacity and help participants maintain independence (Marchionni et al., 2003), some evidence suggests that many participants struggle to remain physical active after completing a CR program (Chase, 2011; Conraads et al., 2012; Hansen et al., 2010). This is a particular concern, as diminished levels of daily physical activity (PA) may be a strong predictor of mortality (Caspersen, Powell, & Christenson, 1985) and a PA energy expenditure (PAEE) of <1,000 kcal/week has been associated with a higher likelihood of atherosclerotic disease progression (Hambrecht et al., 1993).

While we know that regular PA helps reduce symptoms in patients with documented CAD (Shiroma & Lee, 2010; Thompson et al., 2003) a growing body of evidence suggests that, even when the minimum PA recommendations are being met, cardiovascular health can be compromised if the remainder of the day is spent sedentary (Dunstan et al., 2010; Healy, Mathers, Dunstan, Winkler, & Owen, 2011; Pate, O'Neill, & Lobelo, 2008). For this reason, nurses who counsel CAD patients should seek to gain a thorough understanding of the habitual daily PA of their patients, including sedentary behaviour. The utilization of devices such as accelerometers may aid the nurse in establishing behavioural interventions designed to improve the patients' adherence to a more active lifestyle (Chase 2011).

Researchers assessing PA in CAD patients have used a variety of methods ranging from self-reported questionnaires and diaries to activity monitors (Chase, 2011). Performance-based PA measures, acquired from accelerometers, can accurately estimate energy expenditure (EE) and can be used to ensure that a patient's daily PA is sufficient to achieve the desired health benefits (Asakuma, Ohyanagi, & Iwasaki, 2000). For CR nurses, the use of accelerometer data will provide insight into the routine PA of their patients including the intensity, duration and diversity of daily activity. This information could then be used by the CR nurse educator to both reinforce ongoing daily PA and reduce sedentary behaviour in CAD patients.

Purpose

To our knowledge, no studies have used performance-based objective measures of sedentary time and daily PA in cardiac patients older than age of 65 years who are at different stages of recovery following a cardiac event. Therefore, the purpose of this study was to assess sedentary time and the quantity and quality of daily PA among these participants including those who were entering a CR program and those who had either recently completed CR or were more than one year removed from a formal CR program.

Method

Design

This study used a cross-sectional design and a convenience sampling technique. The dependent variable, daily PA, was defined as steps/day, and time spent sedentary (waking time ≤ 1.5 METs) or in light (1.6-2.9 METs) or moderate-vigorous PA (MVPA ≥3.0 METs).

Sample

Men and women between 60 and 85 years of age were included. Participants had a primary diagnosis of CAD, were medically stable, receiving optimal medical therapy and were able to participate in exercise. Participants were grouped into three categories: an acute group (Acute), those who recently had a cardiac event or surgical intervention (e.g., coronary artery bypass, percutaneous angioplasty) and were about to start a CR program, a rehabilitation group (Rehab) consisting of participants who had recently completed a CR program, and a maintenance group (Maintain) consisting of participants who had completed a CR program ≥ one year ago but self-reported that they were still physically active. To determine the sample size we assumed that as the number of scores in a sample reaches 30, the distribution of means approximates a normal distribution (Gravetter & Wallnau, 2009).

In this study we anticipated 5% loss due to non-adherence to the assessment and a sample goal of 32 participants in each group (total n=96) was set. All participants provided written informed consent and the study was approved by the university's human research ethics board.

Outcome Measures

Exercise capacity. To assess exercise capacity, a six-minute walk test (6MWT) was completed following the American Thoracic Society guidelines (American Thoracic Society, 2002). The 6MWT has moderate to good construct validity with the gold standard for exercise capacity (VO2peak), when walking a distance up to 490 metres (Pollentier et al., 2010). For the Acute and Rehab group the 6MWT was completed in the CR facility at the hospital. The Maintain group testing was done at the community-based facility where they exercised.

Daily physical activity. Daily physical activity was assessed objectively using the SenseWear™ Mini Armband (SWA; BodyMedia, Pittsburgh, PA). The SWA has been validated against the doubly labelled water technique and shows strong correlation with it when estimating daily energy expenditure (r=0.89) (Mackey et al., 2011). The SWA has been shown to be valid and reliable in many populations including cardiac patients (Cole, LeMura, Klinger, Strohecker, & McConnell, 2004). Continuous minute-by-minute data were used to provide information on the number of steps/day, energy expenditure (EE), and time spent at different intensities of activity (i.e., sedentary, light or, moderate-vigorous PA).

Participants wore a SWA for four consecutive days, with a minimum of one weekend day, in the hope that three full days (i.e., ~ 24 hours/day) of data would be collected. To ensure an accurate representation of their daily PA, the average of three days was used and only days where the SWA was worn for >95% of the day were included for analysis (Scheers, Philippaerts, & Lefevre, 2012). For this study, only waking time was included (i.e., sleep data were excluded). Using the SWA data, steps/day was calculated by averaging the total number of steps taken each minute for all three days. In order to protect from disease progression it has been suggested that cardiac patients accumulate > 6,500 steps/day (Ayabe et al., 2008). Thus, the number of participants in each group meeting this target was also recorded.

Using the SWA EE data, PA intensity was categorized into different levels: sedentary, light, and MVPA. Sedentary time was defined as waking time with an energy expenditure < 1.5 METs (Dogra & Stathokostas, 2012; Pate, O'Neill, & Lobelo, 2008). Time spent in light activity consisted of minutes where activities yielded an EE of 1.6-2.9 METs (Pate et al., 2008). Time spent in MVPA included each minute where the activity resulted in an EE ≥ 3.0 METs (Pate et al., 2008).

Secondary prevention guidelines recommend cardiac patients accumulate ~150 minutes of moderate to vigorous PA (i.e., MVPA > 3.0 METs) each week in bouts of >10 minutes (American College of Sports Medicine, 2010; Garber et al., 2011; Smith et al., 2001). However, some suggest that shorter bouts may favourably influence cardiometabolic risk (Glazer et al., 2013). Therefore, we inspected the data to determine both the time spent in planned continuous (i.e., ≥10 minutes bouts) and spontaneous MVPA (i.e., < 10 minutes duration). To count as a planned continuous MVPA bout, the activity had to exceed the moderate intensity cut-point for >10 consecutive minutes with allowance for a maximum of two observations falling below the cut-point during that period (i.e., 8 out of 10 minutes) (Colley et al., 2011; Glazer et al., 2013). For all MVPA bouts (i.e., both planned continuous and spontaneous) we recorded PA time.

Data Analysis

Data are expressed as mean ± standard deviation. For all measures of daily PA (steps/day and time spent at the various PA intensities) differences between the three groups were determined using a one-way analysis of variance (ANOVA). Post-hoc comparisons were done using a Bonferroni test. A level of significance was set at $\alpha = 0.05$ with a power of 0.80.

Findings

Sample Characteristics

Ninety-three participants (Acute, n = 32; Rehab, n = 32; Maintain, n = 29) completed the study (Table 1). Participants in the Acute group waited 40 ± 24 days post-hospital discharge before starting CR. The Rehab group attended 92 ± 6% of their exercise classes and were tested within the first two weeks after completing CR. The Maintain group was 46 ± 57 months post-cardiac event and self-reported 2 or more exercise sessions/week. No differences in age or gender were observed between the groups ($p \geq 0.05$; Table 1); nor were any differences observed in SWA on body time (averaged 23.7 ± 0.2 hours/day across the entire sample; $p \geq 0.05$).

Outcome Measures

Exercise capacity. The 6MWT distances were comparable across the three groups; ranging from 445 ± 90 m to 489 ± 68 m and 494 ± 98 m for the Acute, Maintain and Rehab groups respectively.

Physical activity. As a group, participants averaged 5,467 ± 3,508 steps/day and had a daily energy expenditure of 2,464 ± 496 Kcal/day. They spent 12.4 ± 1.9 hours/day sedentary (74 ± 8% of waking time) while 3.2 ± 1.1 hours/day were spent performing activities of daily living (19 ± 6% of waking time). Overall, participants spent 0.65 ± 0.57 hours/day in planned MVPA (~3% of waking time). When the groups were compared, the Rehab group completed more steps/day, and was less sedentary than the other two

Table 1: Participant Characteristics

Variable	Acute Group (n=32)	Rehab Group (n=32)	Maintain Group (n=29)
Gender (M:F)	25:7	26:6	27:2
Age (years)	69.0 ± 7.2	69.1 ± 7.0	71.8 ± 5.2
Height (cm)	169 ± 11	170 ± 9	174 ± 7
Weight (kg)	81 ± 15	81 ± 15	88 ± 14
Body Mass Index (kg.m-2)	28.3 ± 3.7	27.9 ± 3.5	29.2 ± 4.2
Primary Diagnosis N (%)			
MI	16 (50)	20 (63)	13 (45)
PCI	17 (53)	20 (63)	16 (55)
CABG	7 (23)	6 (19)	4 (14)
Valve	4 (13)	2 (6)	6 (21)
Aortic Aneurysm	0 (0)	1 (3)	1 (3)
Heart Failure	2 (6)	3 (9)	2 (7)
Medications, N (%)			
ASA	30 (94)	31(97)	28 (97)
Beta-Blocker	30 (94)	28 (88)	24(83)
ACE Inhibitor	28 (88)	25 (78)	21(72)
CA 2+ Blocker	6 (19)	5 (16)	4 (14)
Statin	28 (88)	31 (97)	27 (93)
Diuretic	9 (28)	8 (25)	10 (34)
Digoxin	0 (0)	1 (3)	2 (7)
Nitrate	0 (0)	1 (3)	0 (0)
Insulin	4 (13)	0 (0)	3 (10)
Bronchodilator	1 (3)	4 (13)	3 (10)

Note: Data are expressed as mean ± SD or as N (%). MI = Myocardial Infraction; PCI = Percutaneous Coronary Intervention; CABG = Coronary Artery Bypass Graft; Valve = Valvular Repair; ASA = Acetylsalicylic Acid.

groups. The Rehab group also completed more planned continuous MVPA (Table 2). Interestingly, both the Rehab and the Maintain group completed more spontaneous MVPA than what was observed in the Acute group (Table 2).

Discussion

The purpose of this study was to compare sedentary time and the quantity and quality of daily PA among participants between 60 and 85 years of age who were at different stages of recovery following a cardiac event.

A commonly used measure of daily PA is step counts. Several investigators have suggested that, in order to achieve the health benefits associated with PA, individuals older than age 60 years and those with CAD should strive to accumulate > 6,500 steps/day (Ayabe et al., 2008; Tudor-Locke et al., 2011). Participants in our study, who had recently completed CR (i.e., Rehab group) recorded more steps/day than either the Acute or Maintain groups. Only the Rehab group achieved the recommended daily step count of >6,500 steps/day. This observation supports the suggestion that there is an association between recent participation in CR and higher step counts (Ayabe et al., 2004; Stevenson et al., 2009). Given that the Acute group had yet to commence a formal CR program the failure of the majority of these patients to achieve this step count goal was anticipated. Indeed, their step count was consistent with previous reports that have noted 3,500–4,300 steps/day in CAD patients (Houghton, Harrison, Cowley, & Hampton, 2002; Walsh, Charlesworth, Andrews, Hawkins, & Cowley, 1997). The lower step count, observed in the Maintain group (versus the Rehab group) reinforces the suggestion that patients long removed from a formal CR program may find it challenging to maintain regular PA (Chase, 2011; Conraads et al., 2012; Hansen et al., 2010). It is noteworthy that <30% of all our participants achieved the goal of > 6,500 steps/day (Rehab, n=13; Maintain, n=6; Acute, n=5). The inability of most of our participants to achieve the current recommendation of >6,500 steps/day (~ 215 kcal/day) is consistent with the observation of Ayabe et al. (2008) who reported that 48% of their participants who were actively involved in a CR program failed to achieve this goal. It must be emphasized, however, that a simple daily step count only provides an indication of stepping volume and lacks any index of exercise intensity, a key element in the exercise prescription for CAD patients, and the dose response relationship between PA and disease progression (Ayabe et al., 2008).

One of the unique aspects of this study was the examination of sedentary behaviour. Historically, sedentary behaviour has been defined as the absence of a formal exercise intervention or MVPA (Pate et al., 2008). Recently it has been suggested that sedentary behaviour is distinctly different than the absence of PA (Tremblay, Colley, Saunders, Healy, & Owen, 2010). The National Health and Nutrition Examination Survey indicated that, for adults older than 60 years, sedentary behaviour accounts for ~60-65% of waking time (Matthews et al., 2008). In this study, participants spent ~74% of their

Table 2: Physical Activity of Older Cardiac Patients Who Are at Different Stages of Recovery

Variable	Acute Group (n=32)	Rehab Group (n=32)	Maintain Group (n=29)
SWA on body time			
hours/day	23.7 ± 0.2	23.7 ± 0.2	23.8 ± 0.2
Measures of physical activity			
steps/day	4,051 ± 1,993	6,898 ± 4,724a	5,452 ± 2,569
Sedentary time (waking time ≤ 1.5 METs)			
hours/day	13.3 ± 2.0	11.6 ± 1.9a	12.4 ± 1.4
% of waking time	78 ± 7	69 ± 11a	73 ± 6
Light Activity (1.6-2.9 METs)			
hours/day	2.8 ± 0.9	3.5 ± 1.3a	3.2 ± 0.9
% of waking time	17 ± 5	21 ± 7a	19 ± 5
MVPA (> 3.0 METs)			
Spontaneous, min/day	24 ± 13	39 ± 25a	38 ± 19a
Planned Continuous, min/day	24 ± 26	54 ± 39a	39 ± 30

Data are expressed as mean + SD. SWA = Sensewear Armband; METs = metabolic equivalents; MVPA = moderate-vigorous physical activity; Spontaneous = bouts <10 minutes; Planned Continuous = bouts ≥ 10 minutes. a p<0.05 using the Acute Group as the reference group in a given row.

waking time sedentary (Table 2). This finding is consistent with other patient studies. For instance, Karjalainen et al. (2012) noted that their CAD patients spent almost ~76% of waking time sedentary. Manns, Dunstan, Owen, & Healy (2012) reported that patients with various chronic diseases spent between 75% to 88% of their time sedentary.

The elevated sedentary time observed in our participants may partially be attributed to a reduced exercise capacity typically seen in CAD patients. In the present study we noted that participants achieved less than 500 metres on the 6MWT. Their 6MWT performance was consistent with what has been observed in previous reports on cardiac patients (Hanson, McBurney, & Taylor, 2012). Of note, a 6MWT distance of < 450 metres implies an aerobic capacity of roughly < 14 mlO2/kg/min, a marker that has been suggested as the threshold for independence (i.e., the ability to perform activities of daily living) (Morales et al., 1999). The higher sedentary time observed in our Acute group may be attributed, in part, to apprehension concerning PA following their cardiac event (Yohannes, Doherty, Bundy, & Yalfani, 2010). In the present study, the Rehab group was the least sedentary, recording significantly more time in both light PA and planned continuous MVPA compared to either the Acute or Maintain group. These findings suggest that recent involvement in a CR program is associated with higher levels of overall daily PA. By contrast, sedentary time and the quantity of light and planned continuous MVPA observed in the Maintain group was not significantly different from what was observed in the Acute group. The similarity in the PA profiles of the Acute and the Maintain groups implies that patients long removed from a formal CR program may benefit from follow-up visits with the CR nurse. A reassessment of habitual PA (including sedentary behaviour) combined with cognitive (such as self-efficacy enhancement measures, barrier management and problem solving) and behavioural interventions (e.g., self-monitoring, goal setting and feedback) may aid these CAD patient in maintaining an activity profile which is associated with improved risk factor profile and decreased mortality (Chase 2011).

For cardiac patients 1,500 kcal/week of PAEE (approx. 150 min/week) is recommended as the minimal PA goal for secondary prevention (Amercian College of Sports Medicine, 2010; Smith et al., 2001). To achieve this objective most patients are encouraged to perform 20–30 min of planned continuous MVPA (preferably 30–60 minutes) most days of the week (Balady et al., 2007). As can be seen in Table 2, the Rehab group recorded more time in both light PA and planned continuous MVPA and their overall PA approximates the targets as set out by the American Heart Association (Balady et al., 2007). These findings suggest that having recently completed a CR program was associated with a higher level of overall daily PA. A lower level of planned continuous MVPA in patients long removed from a formal CR program is not uncommon. However, the comparable level of spontaneous MVPA across the Rehab and Maintain groups may imply a consistency in short intermittent bouts of MVPA. In healthy populations, several studies have noted an association between shorter bouts of MVPA and reduced cardiometabolic risk, independent of planned continuous MVPA (Glazer et al., 2013; Strath, Holleman, Ronis, Swartz, & Richardson, 2008).

Clinical Implications

As the results of this study illustrate, performance-based activity monitoring can provide CR nurses both with a simple measure of the quantity of a patient's daily activity and insight into the quality of that PA. While a goal of CR is to encourage CAD patients to adapt and maintain an active lifestyle, as noted in this study, CAD patients regardless of whether they were entering, completing or long removed from a formal CR program tend to remain sedentary compared to age match healthy individuals (Matthews et al., 2008). This finding serves as a reminder that participation in a CR exercise program does not guarantee a patient's long-term adherence to an active lifestyle. Given the elevated risk of CAD associated with sedentary behaviour and the significant challenges associated with modifying this behaviour, CR nurses may wish to first objectively assess habitual daily activity before developing a PA action plan. For habitually sedentary patients encouraging them to start with short spontaneous bouts of light physical activity embedded in their daily routine may be the best first step towards the long-range goal of a physically active lifestyle that includes both planned exercise training (i.e., 30–40 minutes of continuous MVPA most days of the week) and an overall reduction in sedentary behaviour.

Limitations

A potential limitation of this study was the number of days the Acute group waited to enter CR (i.e., 40 ± 24 days). As a result, some may have started exercising on their own and, therefore, were not representative of those typically entering CR. However, our results suggest that the Acute group was, indeed, quite sedentary. Another potential limitation was the number of monitoring days used to assess PA. However, Rowe Kemble, Robinson, and Mahar (2007) determined that only two monitoring days are required in an older population (i.e., > 60 years) due to the lower intra-individual variability between monitoring days.

Summary and Conclusion

Findings highlight the value of performance-based measurements of daily activity in assessing both sedentary behaviour and the quantity and quality of PA in older CAD patients. Present findings suggest that sedentary behaviour remains an issue for CAD patients regardless of how far removed they are from the clinical event. We encourage nurses to first counsel patients on reducing their sedentary behaviour prior to implementing a structured, prescriptive exercise program. ♥

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Cardiovascular Nursing Leadership Excellence Award

2015 Recipient: Bonnie Catlin, RN, BN, MN

The following is an excerpt from the nomination team of Bonnie Catlin:

Throughout Bonnie's nursing career she has exemplified leadership qualities in a diverse number of ways that are a tribute to the profession of nursing. Bonnie makes extraordinary contributions daily in her current role, as the Provincial Heart Failure Clinical Nurse Specialist for the province of British Columbia. In this multidimensional role she contributes her gifts, talents and knowledge in the field of cardiology, in particular heart failure, to nurses, physicians, nursing students, nurse practitioners, clients, dietitians, psychologists, exercise specialists, management leaders in multiple health authorities and government representatives responsible for supporting health care initiatives and change.

The duties within these roles mentioned helped to set the stage in Bonnie's career to take on and be immensely successful in the role of the Provincial Heart Failure Clinical Nurse Specialist for Cardiac Services B.C./Provincial Health Services from 2010 to present. Her overall responsibilities in this role are to co-lead B.C.'s Heart Failure Strategy in multiple ways to improve the care of the heart failure patient in B.C. It is during this time that I came to know and work regularly with Bonnie on several different committees with my work, as a Heart Failure Clinic lead nurse. Bonnie has led and co-led multiple different working groups within the provincial strategy. She has been an immense inspiration to me, as I watched her lead our working groups over the last four years. Her professional manner, tireless attention to detail, never-ending patience, respect for all members' points of view and overarching sense of humour led to the successful development of more than 60 different heart failure-related patient education resources. We worked weekly within a teleconference modality in order to access nurse and other allied health expertise across the province in the development of these resources. She ensured that all material was evidence-based within the development of the material, accessing experts in all related fields for their opinions and review, including listening carefully to the patient voice representative and incorporating his input whenever necessary. She ensured there was extensive literature research prior to the start of each resource and ensured all stakeholders were in agreement of what information the resource should provide.

Amongst these resources was her work in co-leading the establishment of a provincial Heart Failure End of Life Strategy. She, along with other experts, established standardized resources and practice tools for heart failure professionals managing clients with heart failure symptoms at the end of life. The original creation of a provincial Heart Failure End of Life Implantable Cardioverter Defibrillator (ICD) deactivation process with accompanying materials such as deactivation order set, referral form, and consents was born. One of her colleagues, Carol Galte, Director of Cardiac services in the Fraser Health Authority, commented, "Bonnie has been a very large contributor to the CCCN position statement on advance care planning. She led the development of end-of-life resources for heart failure patients presented at Canadian Cardiovascular Congress last year. She worked with three patient voice representatives, me and a palliative care physician to create a framework for end-of-life care for heart failure patients".

Bonnie was also a lead for the creation of a heart function clinic registered nurses Competency, Assessment, Planning & Evaluation (CAPE) tool, which outlines the core competencies for heart function clinic nurses. The tool is groundbreaking work for heart function clinics across Canada. This fact was also noted by Carol Galte, "Bonnie is a tireless role model and advocate for a very high standard of nursing practice, as evidenced by the comprehensive competency framework for RNs in Heart Function Clinics."

Bonnie also shares her leadership skills in her volunteer life. She has been an active member of the B.C. and Yukon CCCN since 2011, initially serving as the executive committee secretary. The duties and responsibilities in her professional life mirror the vision and mission of CCCN, so I would have to say Bonnie is the embodiment of what we want to achieve within this organization. More than a year ago Bonnie took on the role of provincial director. It was felt that Bonnie was ideally positioned to lead this division for many reasons, but particularly due to the provincial relationships she already had developed in her professional life. Within this role she is leading the executive group in the development of the first ever B.C. and Yukon Division Provincial Strategic Plan Framework, which is to be presented at the 2015 AGM.

I believe Bonnie demonstrates all the qualities of an outstanding, dedicated leader and possesses personal integrity in all of the endeavours she takes on. She leads others with transformational leadership skills and does this collaboratively with all those with whom she comes in contact. She effects change by using all experts within the health care team and does so in an engaging and gracious manner. I cannot think of anybody more deserving of the Cardiovascular Nursing Leadership Excellence Award than this worthy candidate, Bonnie Catlin. ♥

The CCCN Awards committee is proud and pleased to announce that Bonnie Catlin is the 2015 CCCN recipient of the Cardiovascular Nursing Leadership Excellence Award.

Cardiovascular Nursing Clinical Excellence Award

2015 Recipient: Marcie Jayne Smigorowsky, RN, MN, NP, CCN(C)

From the nomination team:

Marcie has committed her career to improving cardiac nursing. She started her career on the step-down cardiology ward, moving to the coronary intensive care unit (CVICU) where she worked as a senior staff nurse for more than 10 years. She took on the challenge of nurse educator in CVICU where she was able to inspire many new nurses to cardiovascular nursing. She extended her knowledge by working in cardiac rehabilitation and the device clinic. It was while she was working in the device clinic that she was seconded to the cardiac EASE clinic. It was perfect timing as Marcie had just finished all of the components for a Master's of Nursing degree, to become a nurse practitioner (NP).

The cardiac EASE clinic was a brand new clinic being designed to decrease wait time to obtain a cardiology consultation and also improve clinic efficiencies. The "clinic" became Marcie's Master's of Nursing thesis and where she developed a passion to continue to improve clinical efficiencies with the ultimate aim to improve the patient's journey. The EASE clinic is a multidisciplinary clinic of physicians, NPs, registered nurses (RNs), doctor of pharmacy, administrative assistants and management. Marcie played an integral role when the clinic participated in Alberta Improvement means and LEAN strategies to help the clinic become a leader for measuring and meeting wait times set by the Canadian Cardiovascular Society. The clinic also worked on many areas within the program to help make the patient's journey more efficient.

As the clinic was working towards improving efficiencies, all roles were reviewed and it became apparent some were not working to their full scope of practice nor necessarily doing the right job. Marcie developed, along with the medical director, symptom-specific algorithms for the RNs to work to full scope of practice. These algorithms enable RNs to order diagnostic testing prior to the clinic visit, so the patient's journey can be shortened limiting follow-up and speeding up access to more advanced testing, if required. She also worked with the RNs to increase their skills with history and physical completion for use during the patient's initial cardiac consult. This resulted in Marcie being able to see patients within the clinic to her full scope of practice.

The patient's journey is extremely important to Marcie. She shares that passion with everyone she works with and hopes to have everyone sharing that dream. She believes all patients should be treated and cared for as you would want your own family cared for. She takes the time at every interaction to ensure the patient and their families understand the diagnosis, treatment and follow-up plans. She is a role model in many areas—from taking the time to help lost patients within the hospital to finding new ways to help deliver patient care. She assisted with the development of the digital stethoscope program using Telehealth technology with initial consults so patients could stay in their own community while benefiting from speciality consultation from a tertiary hospital.

It is from this passion for patient care that Marcie has recently taken on two new roles. She is a core member of the Cardiovascular Health and Stroke Strategic Clinical Network and a member of the Arrhythmia Expert Working Group. Alberta Health Services has challenged these groups to find new and innovative ways of delivering care that will provide better quality, better outcomes and better value for every Albertan. She is also an integral clinical member of the Mazankowski Atrial Fibrillation Program, which is a new clinic to assist with the burden of this chronic disease.

Sharing knowledge and helping others interested in learning more about cardiovascular nursing has also been important to Marcie. She is a guest speaker for the Faculty of Nursing, University of Alberta, in both the undergraduate and graduate programs for cardiac and advanced nursing classes. She also developed and teaches Advanced Management of Cardiac Disorders, which is the final course towards the Post Basic Cardiac Certificate through Grant MacEwan University.

Marcie has been a lifelong learner, continually participating in educational events and more formally with academia. Currently Marcie is working on a PhD in Medicine focusing on quality of life in patients with atrial fibrillation. She is also the Chair of the NP Forum—a conference for nursing and allied health that promotes improving cardiac patient care. Not only is this forum for learning new cardiac knowledge for patient care, it's also about networking with other cardiac professionals interested in heart health and sharing valuable resources. ♥

The CCCN Awards committee is proud and pleased to announce that Marcie Smigorowsky is the 2015 CCCN recipient of the Cardiovascular Nursing Clinical Excellence Award.

Cardiovascular Nursing Research Excellence Award

2015 Recipient: Donna McLean, RN, BSc(AD), MN, NP, PhD (Nursing)

Her nomination committee had this to say:

Dr. Donna McLean is a clinical cardiovascular nurse scientist with a unique background that is dynamic and extensive. She has more than 25 experienced years in cardiovascular clinical nursing, working currently as an advanced nurse practitioner in cardiology, internal and family medicine and urgent care. She combines her clinical expertise with multicentre research investigation and coordination (more than 80 studies), having implemented a new cardiac risk reduction clinic, and undergraduate and graduate lecturing in research methods in the Faculty of Nursing and in the Advanced Nurse Practitioner program at the University of Alberta and MacEwan University.

Since 2008, Dr. McLean has represented nurses and nurse practitioners with Hypertension Canada on the CHEP Task Force Recommendation Committee for the Home BP committee and participates on the Evidence-Based Recommendations Task Force (RTF) with Hypertension Canada. She is involved with the Hypertension Educational Tools Committee/Knowledge Translation and Train-the-Trainer Sessions for the Canadian Hypertension Education Program (CHEP) that has her involved in various knowledge transfer activities around hypertension prevention, detection and management for Canada. She has an extensive presentation and publishing list, including book chapters, video/slide and DVD development around treatment and control of hypertension. She is a reviewer for various journals.

Dr. McLean has received numerous grants and research funding, awards, most notably a national-level nursing research fellowship for three years from the Heart and Stroke Foundation of Canada, and was a co-applicant in several peer-reviewed, national grants from the Canadian Diabetes Association, the Heart and Stroke Foundation of Canada, and the Canadian Institutes of Health Research. She graduated from the CIHR strategic training fellowship program, Tomorrow's Research Cardiovascular Health Professionals (TORCH) and was involved with the FUTURE program for Cardiovascular Nurse Scientists. She has conducted research spanning cardiovascular risk management (primarily hypertension and diabetes) including systematic reviews, randomized controlled trials and yearly development of national clinical guidelines (Canadian Hypertension Education Program [CHEP]), translating evidence into practice.

At MacEwan University in Edmonton in the Faculty of Health and Community Studies, Dr. McLean teaches and directs the research methods course mentoring undergraduate students to appreciate and be involved in nursing research. She also coordinates the MacEwan Research and Scholarly Activities Resources Committee mentoring undergraduate students and trainees who showcase their research and scholarly activities. Most recently, through the MacEwan University Global Health Advisory and Steering Committee, she has advanced global health initiatives specifically hypertension management through education, research and leadership and service in Ternopil, Ukraine. Dr. McLean has enhanced student and faculty experiences through development of an international nursing hypertension project that has engaged culture and promoted intellectual and professional growth for nursing students and faculty. This is a testament to her abilities as a teacher and mentor.

She is a highly motivated health care researcher who relishes the challenge of the academic environment and has been educated in critical appraisal and epidemiologic methods relating to cardiovascular prevention. She has very strong problem-solving and communication skills. She has quickly risen to the challenges of protocol development, funding and grant/award application for nursing and medicine and has a proven track record.

Her research focus for her PhD thesis was a multicentre randomized trial of nurse and pharmacist-led identification, assessment and physician referral aimed at improving blood pressure control in patients with diabetes and hypertension. Additionally, she completed and published a historical review of the nursing literature regarding blood pressure measurement undertaken between 1945 and 2000. This review sheds light on the roles played by nurses in blood pressure measurement and management and provides insights that are useful in shaping future directions with respect to nursing practice, nursing research and nursing education.

Her newest adventures and program of research have her involved in global health, participating in hypertension advocacy programs and translations of hypertension educational materials from CHEP for patients and health care professionals in Ukraine. Recently lecturing in Ukraine to nursing and medical students, she will be travelling in the fall to Yaroslavl, Russia, to address nursing roles in hypertension management. ♥

The CCCN Awards committee is proud and pleased to announce Dr. Donna McLean is the recipient of the 2015 CCCN Cardiovascular Nursing Research Excellence Award

Cardiovascular Nursing Leadership Excellence Award

2015 Recipient: Sheila O'Keefe McCarthy, RN, CNCC(C), PhD

The following is an excerpt from Sheila's nomination team:

Sheila's doctoral work entitled, *Pain and anxiety in rural acute coronary syndrome patients awaiting diagnostic cardiac catheterization,* was shaped by her experience as a clinician working with cardiovascular patients in a rural setting and continues to shape her passion for advancing nursing care of the cardiovascular patient. She demonstrates this passion by sharing her knowledge with the scientific community through numerous publications; 12 papers in peer-reviewed journals, 8 as primary author and another 7 papers in press and/or submitted; collaborated as a contributing author of four peer-reviewed book chapters, with an additional chapter in press; and 34 published abstracts. Sheila has also contributed to the online learning community, through collaboration with other nursing scientists by facilitating a webinar and in the development of 9 online resources in the care of cardiac patient. Her leadership is also evident in her continued commitment to knowledge translation through presentation of her work at more than 40 National and International Conferences. In addition, Sheila's exemplary leadership in the care of the cardiac patient and collaboration with the Cardiovascular community and the Canadian Pain Society has contributed to her being recognized as a leader and invited to speak (12 times) about Cardiac Pain and other aspects of the care of the cardiovascular patient.

Early in Sheila's career as a cardiovascular nurse scientist, she was the successful recipient of the Cardiovascular Nurse Scientist FUTURE Program, CIHR/CHSF grant for $17, 500 and to date has been the recipient of over 45 grants/funding opportunities, 32 of which she is named as principal investigator. During her mentorship in the FUTURE program, Sheila had the opportunity to work with nursing leaders in the cardiovascular community, forging relationships with current and future nurse leaders. It was during this time that Sheila was able to appreciate the importance of mentorship and benefit first hand from these relationships. It was through this recognition that further shaped Sheila's leadership skills and her generosity with other colleagues potentiating all of our (the nomination group) careers' through collaborating on presentations, publications and developing our research capacity through participation in various aspects of the research process.

Sheila further demonstrated her ability to mentor as an educator. Sheila has been a guest lecturer at the University of Toronto, and has also performed as a teacher's assistant, clinical faculty, placement coordinator, and has worked with an interdisciplinary team that consisted of six health science faculties at the University of Toronto, developing curriculum for pain education. Sheila has also been employed as a clinical instructor at both Trent University and the University of Toronto. Her extensive clinical experience at the bedside since 1984 has contributed to her ability to provide leadership in the care of the cardiovascular patient through inclusivity of her colleagues and patients within the community that has shaped her practice. Sheila continues to work tirelessly on incorporating evidence based care on an academic level as well as bedside clinician. Sheila has been recognized for her efforts in mentorship by the Registered Nurses Association of Ontario (RNAO) in 2015, as the recipient of the President's Award for Leadership in Clinical Practice and in 2014 she was the recipient of RNAO's Leadership Award in Student Mentorship. Sheila has also been recognized by the University of Toronto for her leadership capacity being awarded the Gordon Cressy Student Leadership award (2013). As a student and member of the scientific community, Sheila herself has received numerous awards and grants for her own work and contributions to improving the care of the cardiovascular patients from various prestigious organization; Canadian Council of Cardiovascular Nurses (CCCN), Canadian Pain Society (CPS), Canadian Association of Critical Care Nursing (CACCN), Sigma Theta Tau International (STTI), Registered Nurses Foundation of Ontario (RNFOO) and the American Heart Association (AHA).

Sheila exemplifies excellence in leadership as a clinician, scientist and researcher but also through her commitment to professional organizations that support the development of clinicians and researchers who are caring for patients with cardiovascular disease. As a CCCN and CPS committee member, Sheila has worked on planning committees for annual conferences (2008, 2009, 2012, 2013) and 2009-2011 respectively.

Sheila also supports various Professional Organizations through membership and participation: Canadian Council of Cardiovascular Nurses (Ontario research chair 2011-2015, Ontario CCCN Executive Member 2011-2015), AHA, Council on Cardiovascular and Stroke Nursing, European Society of Cardiology (CCNAP), Canadian Pain Society (Chair 2014–2016, Co-Chair NSIG Executive member 2013–2014, CPS Trainee Rep 2009–2011, Membership Liason 2011–2013), CCS member in training 2007–2013 as well as others which are listed in her CV.

As an active member of the CCCN, Sheila has contributed to advancing cardiovascular care in Canada through her leadership in research and knowledge translation. In addition to acting as the Ontario research chair, Sheila also reviews abstracts for scientific sessions and has been a moderator at the annual scientific meetings.

As is evident in her curriculum vitae, Sheila is an accomplished nurse scientist and leader in the care of the cardiovascular patient. However, her greatest strengths as a nurse leader are how she conducts herself with colleagues and her ability to collaborate with other scientists and clinicians to not only potentiate other people's careers but to further the care of cardiovascular patient. ♥

The CCCN Awards committee is proud and pleased to announce that Sheila O'Keefe McCarthy is the 2015 CCCN recipient of the Cardiovascular Nursing Leadership Excellence Award.

Barriers to Influenza Vaccination in Patients with Implantable Cardiac Defibrillators

Suzette Turner, Russell J. de Souza, Ramanan Kumareswaran, and Sheldon M. Singh

Abstract

***Background**: Multiple studies have demonstrated a reduction of cardiovascular events in patients who receive the annual influenza vaccine. Despite recommendations from cardiovascular societies, influenza vaccination remains suboptimal in the implantable cardioverter defibrillator (ICD) population. Barriers to receiving the influenza vaccination have not been explored.*

***Purpose**: To evaluate the barriers to receiving the influenza vaccine in patients with ICDs.*

***Design:** Exploratory descriptive design using a survey developed by the staff of the ICD clinic.*

***Procedure:** A pilot study was conducted as part of a quality initiative of ICD patients at a regional cardiac centre. These patients were approached to participate in a one-page survey assessing barriers to receipt of the influenza vaccination. Predictors of vaccination were determined using multivariate logistic regression.*

***Findings:** Of the 229 patients who completed the survey between September 1 and November 31, 2011, 78% of the patients received the influenza vaccine. The only factor independently associated with influenza vaccination was a positive patient attitude toward the safety of influenza vaccination. Easier access to the influenza vaccination was not associated with its receipt.*

***Conclusion:** A positive patient attitude toward the influenza vaccine is associated with its use. ICD clinic practitioners may have an opportunity to explore any misconceptions toward the influenza vaccine at each clinic visit in hope of increasing its receipt. Given the importance of this vaccination, future studies are recommended.*

Key words: vaccine; influenza; implantable cardioverter defibrillators; barriers

Background

Influenza is a contagious viral disease of the upper respiratory tract with a seasonal pattern of occurrence that can cause epidemics and global pandemics (Madjid, Aboshady, Awan, Litovsky, Casscells, 2004; WHO, 2009). It is ranked among the top 10 infectious diseases affecting the Canadian population (Kwong et al., 2012). While most healthy adults experience an acute infection that does not require medical intervention, individuals with underlying chronic medical conditions, especially those older than 65, account for more than 90% of the mortality associated with influenza infection (Goodman 1999; Macintyre, et al., 2013). The influenza vaccination is a safe and cost effective prophylaxis against the influenza virus (Centers for Disease Control and Prevention, 2014; Nichol, 2003; Schanzer, Langley & Tam, 2008). Randomized controlled trials have demonstrated that the influenza vaccine can provide protection even when not targeted for the circulating strain of influenza (Pattikawa, 2007). It is also known that the influenza vaccine could result in cost savings due to fewer respiratory or cardiovascular hospitalizations (Nichol & Treanor, 2006). Despite the evidence, influenza vaccination rates remain suboptimal.

Acute influenza infection may result in cardiac arrhythmias and sudden death (Siriwardena, Gwini & Coupland, 2010). Patients with compromised cardiac function are at risk for arrhythmias with acute influenza infection, which is associated with increased morbidity and mortality (Myerburg, 2008). Many patients with compromised cardiac function have an ICD to prevent life-threatening arrhythmias (Russo et al., 2013). Of these patients, some have already experienced a prior life-threatening arrhythmia. This means they received an ICD for secondary prevention of recurrent malignant arrhythmic events (Myerburg, 2008; Russo et al, 2013). Primary prevention, on the other hand, means many are at risk, but have not yet experienced a malignant arrhythmic event (Russo et al., 2013).

One proposed mechanism for the prevention of further cardiovascular events is the avoidance of atherosclerotic plaque rupture triggered by the influenza virus (Public Health Agency of Canada, 2011). In vivo and in vitro models have shown that multiple inflammatory pathways are triggered by the influenza virus resulting in the activation of the coagulation cascade, which is associated with tachycardia, hemodynamic stress, possible ischemia, endothelial dysfunction and, ultimately, destabilization and rupture of plaques (Collins, 1932; de Diego et al., 2009; Madjid et al., 2007).

A meta-analysis of five cardiovascular clinical trials representing a total of 6,735 patients reported that 2.9% of individuals receiving the influenza vaccine had a major adverse cardiovascular event that included myocardial infarction, stroke, heart failure, hospitalization for unstable angina or cardiac ischemia, and urgent coronary revascularization within one year follow-up compared with 4.7% receiving placebo

(Udell et al., 2013). This absolute reduction of 1.8% translates to one less major adverse cardiovascular event (cardiovascular death, myocardial infarction, coronary revascularization) for every 58 cardiac patients receiving the flu vaccine. The number of patients needing to be treated with the influenza vaccine to prevent an adverse cardiac event is less than commonly accepted therapies in cardiovascular medicine such as the treatment of hyperlipidemia with statins (Ciszewski et al., 2008; Madjid, Naghavi, Litovsky, & Cassels, 2003).

Given the adverse association between influenza-like illness and cardiac events, the Canadian Cardiovascular Society and American Heart Association/American College of Cardiology have provided a Class I recommendation for the annual influenza vaccination in individuals with cardiovascular disease (CVD) (Arnold et al., 2006; Smith et al., 2011). In order to increase receipt of the vaccine in vulnerable populations (such as patients older than 65 years and patients with significant cardiac disease), new approaches targeted to perceptions and beliefs are required (Cheney & John, 2013). It is imperative that clinicians understand barriers to receipt of the influenza vaccine, as it may influence the dialogue with patients about the safety and effectiveness of the vaccine in preventing potential complications associated with the virus (Blue & Valley, 2002).

Barriers to Influenza Vaccination

Researchers have evaluated barriers to influenza vaccination in the general population. For example, Johnson, Nichol and Lipczynski (2008) surveyed 2,000 individuals to determine impediments to adult influenza immunization. Common barriers associated with reduced vaccination included skepticism about the vaccine's effectiveness, concern about the side effects, fear of needles, and lack of insurance coverage. Additional barriers included being too busy, administration of the vaccine at an inconvenient location, never having had influenza infection, being ill at time of scheduled vaccination, and thinking the vaccine is not protective (Mayo & Cobler, 2004; Qureshi, Hughes, Murphy, & Primrose, 2004). To date, there has been no specific study examining the attitudes of patients with CVD and ICDs toward the influenza vaccination. Clearly knowledge of the barriers to using the flu vaccination is important in this patient population given the significant positive impact of reducing cardiovascular events in this compromised population and the Class I recommendation for use by both Canadian and American cardiovascular societies (Arnold et al., 2006; Smith et al., 2011).

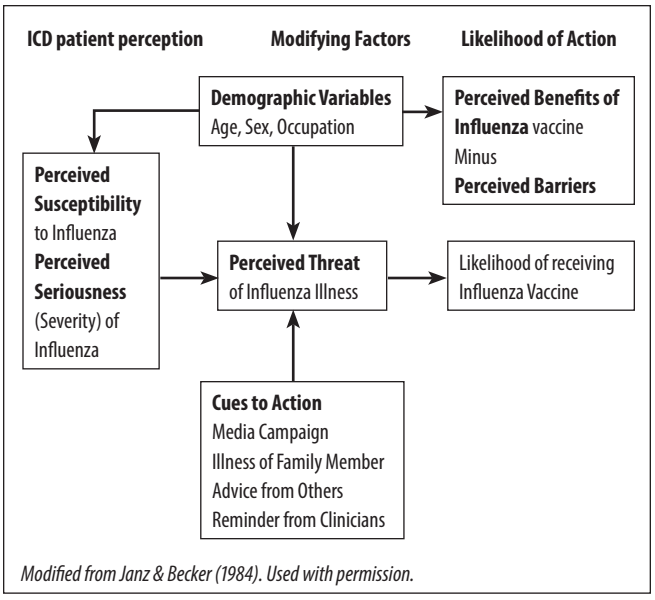
Understanding Barriers to the Use of Influenza Vaccination

Health literacy is defined as "the ability to access, understand, evaluate and communicate information to promote, maintain and improve health in a variety of settings across the life-course" (Rootman & Gordon-El-Bihbety, 2008, p. 11). An appreciation of the concept of health literacy by health care providers may promote an enhanced understanding of the impediments to receipt of the influenza vaccine by CVD patients (Neilson-Bohlman, Panzer, Hamlin, & Kindig, 2004). Previous studies have used The Health Belief Model (Janz & Becker, 1984) to evaluate factors that can affect patient behaviours (Hochbaum 1958; Rosenstock, Strecher, & Becker, 1988). This model (Figure 1) suggests that for individuals to take action to avoid disease individuals need to believe that (a) they are susceptible to the health issue, (b) the condition has serious consequences, (c) the recommended behaviour will reduce susceptibility or severity associated with the health condition, (d) the benefits of engaging in a behaviour outweigh the costs or barriers to the intervention, and (e) the likelihood of undertaking a health intervention can be motivated by internal factors (e.g., symptoms) or external factors (e.g., clinicians, family, experiences, media reports/campaigns) or cues (e.g., environmental prompts that activate the individual's readiness to seek vaccination—Figure 1) (Cheney & John, 2013; Janz & Becker, 1984; Strecher, Champion, & Rosenstock, 1997). People who believe they are susceptible to a serious condition feel threatened and are more likely to consider taking action to improve their health (Janz & Becker, 1984).

To improve influenza immunization rates, health care clinicians must have a thorough understanding of the barriers to vaccine receipt (Johnson et al., 2008). While a single model may not provide complete insight into barriers influencing health care use, it is important for clinicians to appreciate various aspects of proposed models of care to better understand barriers to health care use.

Study Purpose

This study was a pilot quality initiative designed to explore barriers to and the receipt of the influenza vaccination in our ICD patient population. The goal was to determine the rate of influenza vaccination in this population and assess factors



Modified from Janz & Becker (1984). Used with permission.

Figure 1: Health Belief Model

associated with its receipt. Patients' attitudes were explored and the relationship between age, co-morbidities, availability of a family physician, household income, and the type of ICD intervention — primary or secondary — on receipt of the influenza vaccine were examined.

Method

Design

We used an exploratory descriptive design using a survey developed by the staff of the ICD clinic.

Sample

Purposive sampling was used. Patients were approached by a study coordinator at the ICD clinic between September 1 and November 30, 2011, to participate in the one-paged 18-question survey assessing attitudes to and receipt of the influenza vaccine in the previous influenza season. A verbal consent was obtained from each patient prior to completing the questionnaire. The exclusion criteria included patients who did not speak English or had cognitive deficits based on clinical documentation. Of all the patients approached, 229 completed the survey.

Table 1: Sample characteristics

	Influenza vaccination status		p-value
	Vaccinated (N=180)	Not vaccinated (N=49)	
Age years (SD)	71 (10)	65 (11)	<0.005
Male /female (%)	87/13	79/21	0.3
Median neighbourhood income (CDN$, inter-quartile range)	27,086 (22,982 to 32,004)	26,305 (22,012 to 32,606)	0.9
Family physician >5 years (%)	85	71	0.03
Coronary artery disease (%)	67	67	1.0
Renal disease (%)	7	12	0.2
Diabetes (%)	33	31	0.7
Stroke (%)	16	6	0.1
Ejection fraction (% (SD))	29 (10)	29 (10)	0.8
Primary prevention defibrillator (%)	76	86	0.04
Anti-arrhythmic drugs (%)	73	72	0.6

Legend: SD=standard deviation.

Procedure

A single-page questionnaire was administered to all patients presenting to our ICD clinic. This survey had four questions examining patients' attitudes to the influenza vaccine and their ability to obtain this vaccine. The statements were as follows: "The flu shot is not effective", "The flu shot will make me sick", "I can easily get the flu shot" and "I am more likely to get the flu shot in the ICD clinic. A Likert-type scale (1 – strongly agree, to 5 – strongly disagree) was used to assess the self-reported views on the effectiveness, safety and ease of access of the influenza vaccine in this patient population. Furthermore, they were asked to indicate (yes or no) regarding their comorbidities, medications used, household income, as well as length of time with their primary care physician. The survey was designed by the clinicians in our ICD clinic based on perceived needs of our ICD patient population. The survey was reviewed and approved by the institutional research ethics board. Each questionnaire took less than 10 minutes to complete. This tool was not tested for reliability or validity, as our intention was to obtain pilot data to facilitate future studies in this field.

Data Analysis

Patients were divided into two groups: those who received the influenza vaccine and those who did not. Vaccination status was determined by self-report. Baseline characteristics for each group were reported as proportions, mean ± standard deviation or median with range where appropriate. Student's t-test, Fisher's exact, and Wilcoxon Rank-Sum tests were used to assess for differences between the two groups. Uni- and multivariate logistic regression analysis were performed to determine the predictors of receipt of the influenza vaccine. For all analyses, a P-value <0.05 was considered statistically significant. Statistical analyses were carried out using SAS version 9.3 (SAS/STAT, 2009). Ethics approval was obtained from the Sunnybrook Health Sciences Center Research Ethics Board.

Findings

Sample

Two hundred and twenty-nine patients completed the survey, representing 44% of all ICD patients presenting to the ICD clinic during the study period. Seventy-eight per cent of these patients reported receiving the influenza vaccine. Table 1 summarizes the characteristics of participants who did and did not receive the influenza vaccine. Individuals not receiving the influenza vaccine were younger (65 versus 71 years; p<0.005), less likely to have had a family physician for at least five years (71% vs. 85%; p=0.03), and were more likely to have received a primary prevention ICD (86% versus 76%; p=0.04). There were no differences in comorbidities, left ventricular systolic ejection fraction, use of anti-arrhythmic drugs or median household income, a marker of socio-economic status, noted between the two groups.

Table 2: Rank of agreement with various statements pertaining to the effectiveness, safety and access to the influenza vaccine (% of individuals choosing the response)

		Strongly Agree → Strongly Disagree					P value
		1	2	3	4	5	
"The flu shot is not effective"	Flu Shot	10.3	15.8	14.6	15.2	44.2	<0.0001
	No Flu Shot	2.5	15.0	52.5	15.0	15.0	
"The flu shot will make me sick"	Flu Shot	8.5	2.6	7.8	11.1	69.9	<0.0001
	No Flu Shot	7.7	15.4	33.3	20.5	23.1	
"I can easily get the flu shot"	Flu Shot	68.7	12.1	4.8	1.2	13.2	0.54
	No Flu Shot	69.4	16.4	8.3	0.0	5.6	
"I am more likely to get the flu shot in the ICD clinic"	Flu Shot	11.6	5.8	25.8	5.2	51.6	0.99
	No Flu Shot	11.4	5.7	22.9	2.9	57.1	

Table 3: Univariate predictors of receipt of the influenza vaccine

Variable	Odds ratio (OR) (95% Confidence Interval - CI)	P-value
Age >70	3.2 (1.6, 6.3)	0.001
Female sex	1.9 (0.6, 5.8)	0.24
Income (per $10,000 increase)	1.3 (0.8, 2.1)	0.34
Any co-morbidity	1.2 (0.6, 2.6)	0.58
Same family doctor for > 5 years	2.5 (1.2, 5.4)	0.02
Prior receipt of the pneumonia vaccine	2.7 (1.1, 6.3)	0.03
English language at home	0.8 (0.3, 2.0)	0.63
Flu shot not effective	1.5 (0.6, 4.2)	0.42
Too sick for shot	0.4 (0.1, 2.9)	0.33
Flu shot will make me sick	4.0 (1.5, 10.6)	0.004
Can easily get the flu shot	2.7 (0.6, 12.3)	0.19
More likely to get flu shot in ICD clinic	1.0 (0.4, 2.6)	0.91
Ejection fraction <30%	0.9 (0.5, 1.9)	0.84
Primary versus secondary prevention	2.2 (1.1, 4.4)	0.03
Anti-arrhythmic drug use	0.6 (0.3, 1.1)	0.11

Table 4: Multivariate-adjusted predictors of receiving flu shot

Variable	OR (95% CI)	P-value
Any comorbidity (yes vs no)	3.09 (0.83, 11.48)	0.09
Flu shot will make me sick (agree vs disagree)	5.56 (1.48, 20.86)	0.01
Primary vs. secondary prevention	2.93 (0.79, 10.88)	0.11

The attitudes of ICD patients to the influenza vaccination are summarized in Table 2. Participants who did not receive the influenza vaccine were statistically more likely to agree with the statements "The flu shot is not effective" and "The flu shot will make me sick" (p = 0.0001). There was no significant disagreement between the two groups with regards to statements related to access to the influenza vaccine.

Multiple factors were associated with the receipt of the influenza vaccine in the univariate analysis (Table 3). They included age more than 70 years, same family doctor > 5 years, prior receipt of pneumonia vaccine, receipt of a primary prevention intervention ICD, and disagreement with "flu shot would make me sick".

We performed multivariate analysis whereby we adjusted for variables significant in the univariate analysis shown in Table 4. Only disagreement with the statement "the flu shot will make me sick" was significantly associated with receipt of the influenza vaccine after adjusting for other variables. Those who disagreed with this statement were six times more likely to receive the influenza vaccine than those who agreed with it (odds ratio = 5.6, 95% CI, 1.4-20.9; p=0.01).

Discussion

In this single-centre cross-sectional exploratory study, we examined the attitudes of ICD patients toward the influenza vaccination. Our findings show that 22% of ICD patients surveyed did not receive the influenza vaccine even though evidence is strongly associated with health benefits. Although more research is required to gain an in-depth understanding of the ICD patient population with regard to the influenza vaccine, this research establishes that patients' attitudes towards the influenza vaccine were the most important determinants of its receipt. This provides an opportunity for ICD clinicians to explore benefits/barriers and clarify misconceptions (influence clues to action) in order to increase receipt of the vaccine. The ICD patient population is a vulnerable population and understanding barriers to influenza vaccine will provide the opportunity for clarification and possibly increased receipt of the vaccine.

Influenza Vaccination

Despite current Class I recommendations for the use of the influenza vaccine in patients with cardiovascular disease, this study demonstrates that almost one in five patients surveyed with an ICD, a sub-group of compromised cardiac patients, did not receive the influenza vaccine. While the rate of influenza vaccine receipt in our population was nearly double that of the general population (Quach et al., 2012), near universal vaccination should be the aim in this patient population (Arnold et al., 2006).

Barriers to Influenza Vaccination

Potential barriers to vaccination exist and include misperceptions regarding the effectiveness of the influenza vaccine or the potential for making ICD patients sick. As this work was conducted in the setting of universal health care, cost of the vaccine was not a barrier to influenza vaccination. It is noteworthy that other non-medical factors including the ease of obtaining the influenza shot, socioeconomic status and speaking English at home did not predict barriers to vaccination. Previous studies have explored socioeconomic status and language spoken at home among children of immigrants and have found socioeconomic status to influence barriers while English language spoken at home did not (Baker, Dang, Ying Ly, & Diaz, 2010). While patient health care practices, including receiving other preventive vaccinations and having a stable family physician for greater than five years, were associated with receiving the influenza vaccine, none of these factors remained statistically significant after multivariate analysis (Table 4). The only factor independently associated with the receipt of the influenza vaccine was patients' beliefs surrounding the safety and efficacy of the influenza vaccine, which was statistically significant.

Negative perceptions of the influenza vaccine are not unique to ICD patients. The vaccine debate continues in the media for all vaccines. This has been reported in patients with mental illness (Lorenz, Norris, Norton, & Westrick 2013), pregnant women (Eppes et al., 2013), and the elderly (Nowalk, Zimmerman, Shen, Jewell, & Raymund, 2004), as well as children (Allison et al., 2010). Knowledge of this perception is critical, as patients with already compromised health may avoid vaccination based on misconceptions that the influenza vaccine is not effective, but may also exacerbate their underlying illness. Device clinic clinicians must be cognizant of this misperception and ensure adequate education/clarifications are provided to ICD patients on the benefits of influenza vaccination prior to them making their decision. These benefits include decreasing morbidity and mortality associated with those patients at risk.

Practice Implications

The presence of robust objective data supporting the benefits of influenza vaccination in patients with cardiovascular disease, including those at risk for arrhythmias, should empower clinicians to continuously advocate for this intervention (Centers for Disease Control and Prevention, 2014). This, coupled with the known safety profile of the influenza vaccine, must be communicated to patients to dispel any misperceptions ICD patients may have, thereby preventing their influenza vaccination (Centers for Disease Control and Prevention, 2014). Device clinic clinicians are uniquely positioned to improve vaccine receipt in patients with ICDs. Specifically, these patients have multiple visits to the device clinic each year, including recurrent visits during influenza season. The device clinic clinicians providing care to the ICD patient are able to assess for influenza vaccine use and advocate for vaccination. Device clinic clinicians should also be knowledgeable of the benefits associated with influenza vaccination and communicate these to patients at each visit to help patients overcome any fears they may have toward this intervention. Repetitive discussions around the merits and safety of the influenza vaccine may surmount patient perceptions resulting in their willingness to receive the vaccine.

In addition to direct interactions between patients and device clinic clinicians, provision of written teaching materials at a level appropriate to patients, allowing for timely interactions, and ensuring the environment where discussions take place is private and not rushed or noisy, may all allow for a positive interaction and positive outcome (Gilboy & Howard, 2009). Furthermore, advertising campaigns on Twitter, Facebook, device clinic waiting rooms, or post-clinic visit reminders may also serve as powerful tools to result in patient action.

Limitations

Our study has several limitations. Foremost is that patients were surveyed based on their recall and this may potentially alter the results and reflect a bias due to a potential for underreporting negatively perceived behaviours and overestimating behaviours perceived as good. This may be reflected in our wide confidence interval.

As with any survey, there is the potential for Hawthorne effect, which would make our sample biased due to patients being aware that they are being observed. Our work is also limited in sample size, and potentially may only reflect the beliefs of patients in our ICD clinic. We do not believe that this is a major limitation, as our sample size was still large despite only representing 40% of our ICD population and our patient population is similar to other regional ICD clinics in Ontario.

Additionally, our survey tool was not validated. This was by design, as our study was a pilot study to inform future work in this field. Furthermore, multiple individuals in various health care capacities (physicians, nurses, clinic managers) were polled during the creation in an attempt to create a clinically relevant survey tool. Another limitation to acknowledge is that our survey did not rigidly conform to previously published models including the Health Belief Model. It is important for clinicians to be aware of the framework of existing models, as they provide an opportunity to explore patients' general beliefs around the influenza vaccine in their approach to and evaluation of vaccination. Given the important health benefits reported with influenza vaccination in ICD patients, additional work is encouraged to enhance understanding of this patient group's perception.

Conclusion

Findings from our survey of ICD clinic patients reinforce that underutilization of the influenza vaccine is associated with patients' negative perceptions of the vaccine in terms of their vulnerability to the virus, as well as the effectiveness of the vaccine. Despite clinical practice guidelines for the use of the influenza vaccination in high-risk CVD patients, universal receipt of this vaccine is not occurring. It is recommended that device clinic clinicians use a patient-focused model to understand barriers that may be preventing ICD patients from receiving the influenza vaccine. These findings also suggest that if there is increased receipt of the influenza vaccine, cardiac events will be decreased and, therefore, less ICD shocks and, ultimately, fewer hospital admissions and reduced health care costs. ♥

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