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FALL 2008

CLINICAL NOTES

INNOVATIVE HEALTHCARE SOLUTIONS

Reducing wheelchair restraints: Following a least restraint or no restraint policy in long term care

By Eliana Caranci, BSc OT Reg (Ont) and Jennifer Allen, BHSc OTA/PTA, St. Joseph's Health Care London, ON, Parkwood Hospital Site

Long-term care (LTC) settings are facing challenges around the use of restraints due to government-imposed policies. Restraints are defined as the use of some method to control a resident's free movement and behaviour by chemical, physical, environmental or other means to protect them from an avoidable injury or harm.

Dementia patients are often restrained due to: compromised memory and judgment, increased risk for falls associated with wandering/exit seeking, physical impairments, inability to communicate needs, more behavioural issues (e.g. agitation, restlessness, confusion) and staff feeling that restraints assist in delivering care in a safe manner.

Injuries or death can occur from applying restraints incorrectly and from poor monitoring by staff. Restraints can cause strangulation, falls, sensory deprivation, disorganized behaviour, post-traumatic stress disorder, and can exacerbate agitation. Restraints are also associated with longer hospital stays, increased incidence of skin breakdown, immobility and incontinence.

A case study

Parkwood Hospital's Veterans' Dementia Care program is a long-term care setting within a rehabilitation hospital. There are a total of 296 veterans living at Parkwood; 80 are living on two dementia units. One unit is ambulatory and one is non-ambulatory. Parkwood Hospital follows a *least restraint* policy.

The interdisciplinary team on the dementia program includes: an occupational therapist, occupational/physiotherapist assistant, phys-

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The serious side of gravity: Preventing falls a major priority for Fraser Health

By Michael Bernard

Fabio Feldman, Fraser Health's first Manager of Seniors Falls and Injury Prevention, has been studying how and why people fall and hurt themselves for more than six years. Yet the man that some people consider one of the leading researchers in the field in Canada has an admission to make – he's never actually witnessed a fall.

"It's true. I've watched lots of falls in laboratory situations or on video but I've never seen a senior fall first-hand," he says, adding that fewer than one in 10 falls are witnessed.

That fact hasn't stopped him from becoming a crusader for falls prevention at Fraser Health, a health authority which oversees care at 78 residential care facilities and 12 acute care hospitals in BC's Lower Mainland. In fact, understanding how and why people fall has been the catalyst for much of Feldman's graduate work at Simon Fraser University, and more recently at Fraser Health.

In little more than 14 months, Feldman, who is completing his doctorate in biomechanics at the School of Kinesiology (the science of human movement), has been in the forefront of several research projects and prevention programs aimed at better understanding falls and injuries.

The stakes are huge, particularly for seniors in residential care facilities across Canada. Studies indicate that about 50 per cent of all long-term care residents fall each year and of these, 40 per cent fall twice or more each year. About 10 per

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iotherapist, behavioural analyst, social worker, social work case aid assistant, dietician, nurse clinician, pharmacist, RN's/RPN's, therapeutic recreation specialist, speech language pathologist, physicians and a unit co-ordinator.

Problem

Minimum data set scores (MDS) indicated that there were more residents in the Veterans' Dementia Care Program using wheelchair restraints, compared to other LTC settings with a similar population.

MDS is an interdisciplinary assessment tool mandated for use for all patients in chronic care funded beds in Ontario. This tool has sections which represent aspects of the patient's functional status (restraints is only one section). MDS allows for the generation of quality indicators, funding systems and clinical care planning. MDS defines restraints as: *Any manual method or any physical or mechanical device, material or equipment, that is attached or adjacent, cannot remove easily and that does, or has the potential to, restrict the resident's freedom of movement or normal access to his or her body.* It is important to note, that MDS classifies any tilt wheelchair as a restraint.

Quarterly rates at Parkwood Hospital Veterans' program indicated that the restraint use on the program in 2007 was as high as 66 per cent. Some residents had one wheelchair restraint and others had multiple restraints.

Occupational therapy (OT) staff also decided to develop their own data collection system that would only track restraints and exclude tilt wheelchairs. Tilt wheelchairs were not prescribed as a restraint but as a therapeutic mobility device. The OT 2007 data demonstrated a much lower restraint score (58 per cent) compared to the MDS score (66 per cent).

Too many restraints!

Whether we looked at the MDS scores or our own data collection scores, it was evident that we were over utilizing wheelchair restraints on the Veterans Dementia Care Program. Interdisciplinary Team Members (IDT) had some ethical concerns:

- Were we practicing patient-focused care?
- Were we following legislation?
- Were wheelchair restraints really keeping patients safe?

Barriers

After close investigation it was found that wheelchair restraints on the Veterans' Dementia Care program might be over utilized for the following reasons:

- Restraints were easily accessible
- No one overseeing why restraints were being applied
- Shortage of staff to monitor patients
- Peer pressure
- Family/substitute decision maker (SDM) making ill-informed decisions
- Lack of knowledge regarding alternatives to restraints
- Poor collaboration with team members
- No protocol for application/removal of restraints
- Caregiver "guilt" and concern for injury
- Risk of liability

Objectives

The Veterans' Dementia Care program set out to lower the number of wheelchair restraints used on the units and to improve overall safety and quality of life for residents. To do this, it would be necessary to educate staff/family/SDM on restraint legislation/hospital policy, the indications for restraint use, the care of residents and restraints and resident/family rights. A method of assessing the need for a restraint and monitoring residents in a restraint also needed to be developed.

Is a tilt wheelchair a restraint? The answer is yes and no!

According to MDS, a tilt wheelchair is a restraint. The government uses MDS to review best practice standards in facilities. According to OT *best practice*, a tilt wheelchair should be prescribed for individuals with poor sitting tolerance, poor trunk control, the inability to shift weight independently and/or skin issues, i.e., NOT as a restraint, but as a therapeutic mobility device.

Are these types of wheelchair restraints?

- Pinlock belts (4pt. or 2pt.)
- Reverse belts
- Auto style belts
- Velcro alarm seatbelts
- 10/11/12 pound belts
- Laptrays
- Chest straps
- "Dump" of w/c seat
- Limb straps
- Head straps
- "Lap buddies"
- Broda/Geri Chairs
- Tilt wheelchair

Alternatives to restraints

- Modifying and improving pain/comfort control
- One-to-one staff supervision
- Increased visual observation
- Attempts at reorientation
- Review and modification of medications
- Utilizing special alarm devices
- Providing diversion activities
- Increasing access to personal items and assistive devices
- Providing de-escalation interventions
- Modifying environment

Gillies et al. (2005)

Method

A Restraint Task Group consisting of OT staff, a behavioural analyst, a nurse clinician and the unit coordinator developed a process to reduce the number of wheelchair restraints.

This mandatory process included flow sheets, which tracked risk for falls and difficult behaviours of residents, education provided to staff and family/SDM, and two algorithms detailing sequential steps to the application/removal of restraints.

Education for staff included: legislation/corporate policy, benefits of frequent and detailed chart entries, restraint alternatives, communication with IDT members/team meetings, when/how to use the flow sheets and how to use the algorithms.

Education for family/SDM included: types of restraints commonly used, Parkwood Hospital's restraint philosophy, indications for restraint use, restraint alternatives and possible complications of restraints. The OT was the IDT member chosen to educate the family/SDM regarding restraints. Education was and continues to be provided on an individual case basis as the need arises.

The two algorithms used provide concise direction to staff regarding decision-making with respect to the application/removal of wheelchair restraints and are easy for staff to locate, interpret and apply.

Measured outcomes

- More use/knowledge of alternatives to wheelchair restraints (chart/care plan audits)
- MDS scores indicated a lower number of wheelchair restraints in use
- Monthly resident restraint reviews indicated a lower number of wheelchair restraints in use (OT data collection)

Hypothesized outcomes

More quantitative/qualitative data is required and ongoing. The Restraint Task Group can hypothesize from informal staff/family/SDM feedback that the following outcomes have also occurred:

- Reduction of staff stress regarding application/removal of restraints
- Reduction of family/SDM stress
- Improved safety and quality of life for residents
- Improved role clarity among team members

Discussion

To provide a person with dementia a wheelchair that is comfortable, appropriate for needs and safety is a challenge on its own. Those with late stages of dementia may have poor judgment, lack of insight and may be impulsive at times. For these reasons and more, a wheelchair restraint is commonly over-utilized.

The Restraint Task Group developed a process to limit the use of wheelchair restraints on the dementia units. A comprehensive education program for all involved parties pertaining to restraints and the newly developed process remains ongoing.

The Restraint Task Group also faced many challenges during this process. Some of these challenges included: perception of staff that following the process would be more work, some staff/family were uneasy about removing restraints, new wheelchair equipment options were delayed in delivery, lack of communication with physicians regarding the new process, MDS definitions of restraints and staff inaccuracy when recording MDS data.

On the Veterans' Dementia Care Program, wheelchair restraints were used frequently without proper assessment and follow-up for need and safety. Being a least restraint facility, it is acknowledged that wheelchair restraints are at times warranted, however, one must keep in mind that there are always consequences to restraining an individual and the need must outweigh the consequences.

Summary

The Veterans' Dementia Care Program has implemented a process to reduce wheelchair restraints. Their work may guide others to develop a similar process in other LTC facilities. Flow sheets, education and algorithms should be tailored specifically to the facility, the patient population and the resources available.

References available from the authors Eliana.Caranci@sjhc.london.on.ca and Jennifer.Allen@sjhc.london.on.ca

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Is an automobile style seatbelt a restraint for a person with late staged dementia and poor fine motor skills? The answer: Possibly...

Cognitive impairment likely would inhibit the ability to unbuckle the seatbelt and fine motor impairment may inhibit the physical ability to unbuckle the seatbelt.

The take home message is that there are a lot of "grey" areas. When prescribing seating equipment one must consider the individual as a whole and all team members must be consulted for input. Ask yourself: *Am I prescribing this for a therapeutic reason?* If so, properly document clinical reasoning/rationale.

Preventing falls *continued from cover*

cent of those falls result in serious injury.

Falls extract enormous human——and financial——costs. Many of those who fall and injure themselves never recover the mobility they enjoyed before the fall, leading to a loss of independence and social interaction. For some, it leads to premature death. It's estimated that falls cost the Canadian healthcare system about $1 billion annually in hospital and other costs, money that could be diverted to other pressing needs.

Some of Feldman's leading-edge research at Simon Fraser University has focused on examining the reliability——or lack of reliability——of falls reporting. In one experiment, using students as guinea pigs, Feldman devised a lab environment in which the rug was literally pulled out from under their feet. The students were given no warning when the floor moved to expose a soft surface onto which the students fell harmlessly.

"We then asked them about three minutes later to describe the elements of their fall, including body parts that received the impact of the fall and whether that was an attempt to break the force of the fall," said Feldman. "Most of them weren't able to correctly remember even basic details. Given this, can we expect seniors——many of them suffering from dementia or other cognitive impairments——to accurately describe their falls, sometimes weeks after the incident?

That laboratory work has led to even more in-depth research into reporting reliability. In a research project supported by the BC Network for Aging Research, Feldman is capitalizing on existing security video cameras to capture falls that happen around common areas in Fraser Health residential care facilities. So far, he has captured more than 40 falls.

Preliminary results bear out his suspicions: there are often major discrepancies between what is reported by staff who interview seniors who fall and what the videotape shows.

"In one case, a senior was found on a hallway floor with a shoe nearby. It was concluded they fell because a shoe had come off," Feldman said. "In fact, the video showed the person had fallen in their room and had crawled out into the hallway to try to get help. Along the way, the senior removed a shoe to scratch an itchy foot."

In another case, it was concluded that the senior had fallen from their wheelchair which was near the scene because the brakes were not applied, even though the video showed the wheelchair played no part in the fall.

Feldman suggests that any falls reports where there are no witnesses should be taken with a grain of salt. He said it is only human for people to "fill-in the blanks" to try and explain what happened. And sometimes staff will report a fall in such a way as to ensure they are not held responsible in some way. The problem is that the "filling in" does nothing to prevent future falls.

Feldman thinks there is another factor in falls that is often under-reported or ignored: aggression between residents. In at least five videos he examined, a resident thought to have fallen was actually pushed by another resident, though there was no mention of aggressive behaviour in the falls report. He said any report should take note of whether other people were near the scene at the time of the fall.

While he is conducting research, Feldman has also been examining other in-house programs that show promise for reducing falls in residential care settings. One involves a pilot at the hospital in suburban Burnaby. For the last four years seniors admitted for surgery have been assessed and fitted with hip protectors, an undergarment akin to the pants worn by hockey players. While the number of falls has not declined appreciably, hip fractures have dropped dramatically, especially when compared with Fraser Health's other 11 hospitals. Between 2003 and 2007, reports of hip fractures dropped to three a year from 14 a year.

"Only two preventive strategies could account for this," said Feldman. "Almost all of in-hospital hip fractures are due to falls, so one factor is falls prevention, which involves educating staff, conducting safety checks and establishing standardized safety procedures. The other is the use of hip protectors."

Feldman said about $5,000 was spent on hip protectors during that period. With hip fracture surgery and convalescence averaging more than $20,000 a patient, Feldman figures hip protectors saved more than $300,000.

Feldman He has also launched what he believes to be the first series of public falls and injury prevention clinics to be organized in Canada.

The clinics——more than 20 were being planned for Fraser Health communities in 2007-2008——are designed to assess an individual senior's risk of falling. Seniors first sign up for a community presentation to learn what they can do to prevent falling and injuring themselves.

At the subsequent clinic, seniors get a chance to speak one-on-one with various health professionals such as pharmacists, physiotherapists and dieticians. Seniors are tested for their visual ability to detect contrast in surfaces, a factor in some falls, and their sense of balance, their muscle strength, asked about the mix of medications they are taking and a host of other questions in the 90-minute circuit. At the end of it, they receive a customized report that rates the various risk factors they face. A copy of the report is also sent to their family doctor to follow up.

Kathleen Friesen, Geriatric Services Project Director at Fraser Health, said the shifting demographic is reason enough to make falls and injury prevention a major priority at Fraser Health.

"It's absolutely critical that we start thinking more and more about prevention," she said. "Falls can have such a profound——and potentially tragic——effect on peoples' lives."

Michael Bernard is a senior media relations consultant for Fraser Health.

Some facts about seniors' falls in Canada

- Likelihood of long-term care residents to fall: 200 to 400 per cent more frequent than seniors in their own home
- Risk of facility residents injuring themselves compared to at-home seniors: 200 per cent
- Risk of women in residential facilities suffering a hip fracture compared to women in the community: 10.5 times greater
- Percentage of those injured in a residential facility fall that regain pre-injury mobility: 15
- Major predictors of falls injury include: dizziness, syncope, hypotension, balance, gait disturbances, confusion and frequent urination, use of assistive devices, dementia or cognitive impairment, increased gait and mobility impairment, staffing and environmental issues.

(Source: Canadian Public Health Agency : Residential Care Falls Hospitalization Analysis May 31, 2005)

Vestibular rehabilitation: Therapy for dizziness and balance disorders

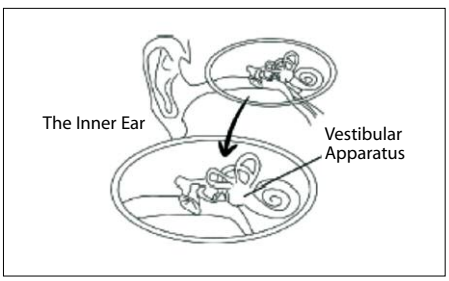
By Abeed Hirji, BScOT, BScKIN, Certified Vestibular Rehabilitation Therapist

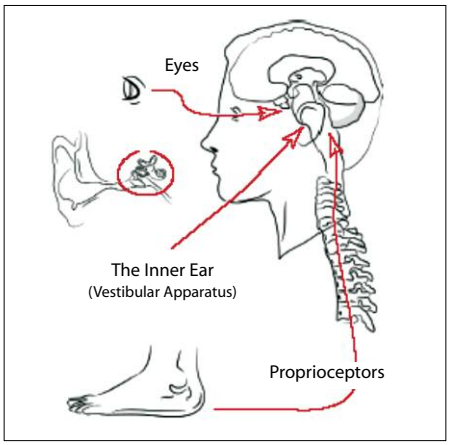
Vertigo, dizziness, and balance disorders are among the most frequent reasons for visits to the doctor's office. In fact, approximately 40 per cent of all adults and 20 per cent of working age adults will experience dizziness at some point in their lives. Furthermore, dizziness is the primary reason for physician visits by people over the age of 65. Symptoms can be mild and short lived, or can have a more serious and persistent impact on daily functioning, affecting one's ability to work, perform household chores, drive, and participate in valued social activities. Symptoms may include:

- Mild dizziness or imbalance, to severe attacks of vertigo and falls
- A sense of exaggerated motion with certain head movements or positions
- Trouble reading, focusing, or watching motion
- Feeling unsettled in busy environments like traffic or shopping malls, or on elevators or escalators
- Visual problems: fuzzy or blurry vision; jumping or bouncing vision; Hearing problems
- Unsteadiness, especially in the dark or on uneven surfaces
- Nausea, vomiting, poor concentration, headaches, fatigue
- Depression, anxiety, loss of self-confidence
- Social isolation and decreased activity levels

What causes dizziness?

Although dizziness can be due to variety of causes, most dizziness and balance problems stem from a disturbance of the vestibular apparatus, located in the inner ear, or its connections in the brain. This apparatus detects sensory information related to head position and head movement, which in turn is sent to the brain for processing. Ultimately, the brain then uses this information to control our balance and eye movements.





Possible sources

Vestibular or inner ear problems can affect people of all ages. Possible sources include:

- Ear infections (viral or bacterial)
- Biomechanical problems in the inner ear
- Head trauma and whiplash
- Illness or disease
- Ototoxicity (i.e. Gentamicin toxicity)
- Blood flow problems in the head
- Aging

Dizziness or balance problems can also arise from trouble with our feet, legs, neck and eyes. This is because our balance is a complex interaction between three primary systems:

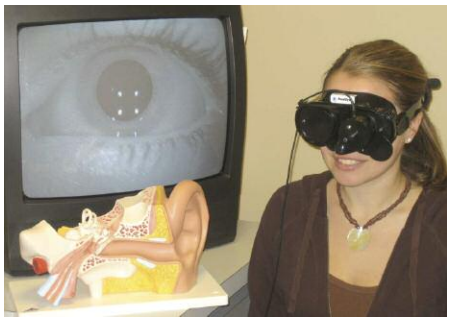
- Vestibular apparatus in the inner ear
- Vision
- Proprioception (i.e. the ability to sense stimuli arising within the body)

Dizziness vs. vertigo

True vertigo (an illusion of rotary movement) is often described by patients as a sense of the environment or room spinning, or a sensation of self-twirling or whirling when not actually moving. It is usually a prominent feature in those who experience vestibular problems and must be differentiated from dizziness, which can be more of a vague, ill-defined sensation. Dizziness can encompass many sensations, some of which include true vertigo, imbalance or disequilibrium, lightheadedness, spinning inside the head, and a sensation of impending faint or near syncope.

Vestibular rehabilitation assessment

Assessment of function in a patient with inner ear dysfunction is comprehensive and entirely one on one (i.e., patient-therapist interaction). A pre-assessment screen includes tests for vertebral artery patency and oculomotor functioning, cerebellar tests, and a cranial nerve scan. The primary components of the assessment consist of vestibulo-ocular reflex (VOR) tests, static and dynamic balance testing, tests for motion sensitivity and neck-related dizziness; and a nystagmus battery which involves positional tests for Benign Paroxysmal Positional Vertigo (BPPV), a common cause of vertigo. The most objective part of the assessment is performed using infrared vestibular goggles attached to a video recorder.



The goggles are specific to detecting different patterns of nystagmus, which are involuntary patterns of eye movement that may be suggestive of a vestibular imbalance. Nystagmus (not vertigo, nausea, or dizziness) is the primary diagnostic indicator used to indentify most central and peripheral vestibular lesions, and thus offers a diagnostic edge in providing information about the inner ear and its connections in the brain. Whilst utilizing this specialized equipment, the therapist is afforded the ability to gain a lot of information about vestibular function that one would not see if the same tests were performed in room light.

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TABLE 1

Distinguishing between Central and Peripheral Vestibular Pathology

Pathology	Nystagmus	Vertigo	Other Symptoms	Other Signs	Fixation—Suppression?
Central	Pure vertical (uniplanar); often down beating	Uncommon	5 D's, *lateropulsion, altered consciousness, infrequent hearing loss	Abnormal smooth pursuit or saccades, Persistent ocular tilt reaction	No
Peripheral	Mixed vertical and torsional (multiplanar)	More common	Hearing loss, fullness in ears, tinnitus	Smooth pursuit and saccades usually normal	Yes

Table adapted from Schubert, M.C. Course notes on Central Vestibular Disorders from Vestibular Rehabilitation — a competency based course, March 2007.
* 5 D's = dizziness, diplopia, dysphagia, dysarthria, drop attacks

Treatment

Vestibular rehabilitation is an effective and specialized form of treatment that helps to alleviate or remediate problems related to dizziness, vertigo, unsteadiness and motion intolerance. It incorporates a symptom driven, non-invasive, drug-free exercise based approach used to maximize, assist, and speed up central nervous system compensation for vestibular deficits. The principal goals of treatment are to increase functional balance during ambulation, increase one's ability to see clearly during head movements, increase general physical condition and activity levels, decrease social isolation, and decrease disequilibrium and oscillopsia. This form of therapy has undergone a tremendous amount of research and development in recent years and is supported by valid and reliable outcome measures.

If assessment indicates that vestibular balance and rehabilitation treatment is appropriate, therapy can include:

- Specific repositioning maneuvers to eliminate a common cause of vertigo from the inner ear called Benign Paroxysmal Positional Vertigo (BPPV). There are two main types of BPPV, with 12 different variants and thus different treatment maneuvers contingent on the specific variant and pattern of nystagmus.
- Specific exercises which stimulate the brain to adapt to the abnormal ear
- Specific exercises to improve gaze stability
- Specific exercises to improve visual sensitivity
- Balance retraining where there is unsteadiness and fall risk
- Specific cervical exercises for potential neck-related dizziness
- Training of alternate orientation strategies when both ears are abnormal or the problem is not ear-related

Conditions commonly encountered and treated by vestibular therapists include BPPV, Unilateral Vestibular Losses (usually due to a vestibular neuritis or labyrinthitis), Bilateral Vestibular Losses (often idiopathic or caused by Gentamicin toxicity), motion or visually provoked dizziness, visual-vestibular mismatch, neck related dizziness, and central dizziness. BPPV treatment maneuvers, in particular, have an outstanding efficiency rating with 74.8 per cent resolution after one treatment, 93.8 per cent after two treatments, and 98.4 per cent in the rare case that three treatments are required (Macias et al, 2000). Other conditions identified by vestibular therapists may comprise Vestibular Migraine, Meniere's Disease, Perilymphatic Fistula, Vascular Vertigo, Mal de Debarquement, and other potential central causes of dizziness.

Effectiveness and efficacy

In general:

- Vestibular rehabilitation improves symptoms, postural stability and dizziness related handicap in patients with chronic dizziness [Yardley et al, 2004]
- Vestibular rehabilitation is efficient, safe, and effective for a variety of balance disorders and is applicable for all ages with minimal gender differences [Shepard et al, 1993]
- Prognostic indicators are useful for goal setting [Shepard et al, 1993]
- Numerous randomized trials have demonstrated that vestibular exercises will decrease subjective complaints and improve balance and vision during head movements in patients with vestibular hypofunction [Enticott et al (2005), Herdman et al (2003), Horak et al (1992), Krebs et al (2003), Szturm et al (1994), Topuz et al (2004), and Yardley et al (1998)].

Research has also shown that vestibular balance and rehabilitation treatment is effective for most vestibular disorders when the malfunction is stable and not fluctuating, and that a patient specific program is more beneficial than generic programs. Moreover, those with mixed central and peripheral problems may require lengthier treatment stints, but still improve.

Conclusion

There is treatment for dizziness and hope for people living with this sometimes debilitating symptom complex. More can be done for patients and clients than just telling them they have to learn to live with it. Vestibular rehabilitation is a specialized, customized, and individualized form of treatment that will help to alleviate concerns related to dizziness, vertigo, imbalance, and motion intolerance. Guided by a unique philosophy of assessment and treatment techniques and a profoundly different knowledge base, vestibular therapists are able to assist those who may be suffering from vestibular related dysfunctions or pathologies. If left unmanaged, or symptomatic, the consequences may result in higher anxiety and depression, decreased activity levels, and a lower health-related quality of life.

References available from abeed.hirji@lifemark.ca

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For more information on Vestibular Rehabilitation contact (604) 687-5911 or visit www.lifemark.ca

Preventing burnout:
Recognizing anxiety and depression in the caregiver

By Judy Osborne

Those who care for others by profession tend to have very nurturing profiles and personalities. Often we see compassionate, warm individuals choose a profession of caring such as nursing, massage therapy, occupational therapy, physiotherapy or social work. These caregivers are frequently seen by clients, friends, and families as the strong, resilient type–someone who can endeavour to resolve complication problems or issues while maintaining a delicate balance themselves. Such caregivers are often perceived as individuals who have boundless energy and a remarkable ability to recover, both in their work as well as in their personal lives.

However, these perceptions are simply not realistic. When one spends the better part of everyday providing treatment and care for others and then returns home to another set of responsibilities, fatigue, stress, and anxiety can take their toll on one's spirit, immune system, and general well-being.

It's also important to remember that individuals in the helping professions can be negatively affected by the very crisis that brought the client in for treatment. The same issues for which clients require support can lead to burnout in the caregiver if appropriate boundaries or limits are not firmly established and self-care is not maintained.

As a mental health professional, I have seen and supported clients who have suffered burnout. Feelings of extreme fatigue, poor concentration, restlessness, sadness, lack of interest in previously enjoyed activities, over-eating, under-eating, abuse of substances, irritability or somatic complaints are all signs that something could be "out of balance." It is important for professionals to pay attention to these signs and to be aware that they could be indicative of pending burnout. Such individuals should seek support from friends, family, and colleagues as appropriate. They may also wish to involve a trained professional should these symptoms persist.

Here are some simple measures to help avoid burnout:

1. Self reflect at the end of the day. Acknowledge your accomplishments and identify areas you need to develop. Try to focus on your successes rather than dwelling on your failures. Keep your situation in perspective.

2. Eat a well-balanced diet, get some fresh air, exercise, and enough rest to keep your mind and body working at its best (yes, your grandmother was right).

3. Set limits for yourself and stay within your limits. Don't try to solve the world's problems before 6 p.m., not to mention your clients'.

4. Involve yourself in extracurricular activities you enjoy. Respect yourself enough to take breaks and socialize with others.

5. Share your thoughts and feelings with a loved one. Try writing in a journal to vent and explore concerns and emotions that may be weighing heavily on your mind.

6. Have a good laugh, especially at yourself. Don't be hard on yourself if you mess up. No one is perfect and attempting to be will only result in disappointment.

7. Seek professional help if any prolonged sadness, feelings of worthlessness, difficulty concentrating, extreme anxiety, fear or feelings of dread seem to persist. These signs may mean that professional treatment is needed.

It is rewarding to provide care and comfort to others. It is equally important to recognize that there need to be limits set in order to provide the best possible care to our clients. Learning to both support and empower others while also preserving oneself is indeed a delicate balance. By maintaining our own physical and emotional health and generally taking good care of ourselves, we are definitely in a better position to care for others.

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Judy Osborne has been a nurse for 22 years and is a sessional professor with Fleming College in Peterborough, Ontario, where she teaches nursing.

A dynamic wheelchair seating system: Design and technical development

Authors – Jim Wighton, Linda Smith, and Flora Stephenson

Wheelchair seating systems are typically static or rigid in design. These types of seating systems are not responsive to, or accommodating to the voluntary or involuntary movements of the individuals who use them. These movements often lead to forceful pushing against the seating system's back support, seat, and footrests. In a study of static posture in school children, researchers found that the children were more likely to experience neck and upper back pain when they maintained static posture during classes (Murphy, Buckle, & Stubbs, 2004).

Similarly, wheelchair users may experience discomfort when they maintain the same seated posture for prolonged periods of time. As an alternative to the static seating systems, dynamic seating systems (i.e., seating that responds to the user's movements) are now being developed. It is purported that individuals using dynamic seating systems can decrease their body/muscle stiffness, lessen their potential to develop pressure sores, and improve their range of motion and sensory tactile feedback (Lange, 2000). Research groups and manufacturers have developed dynamic wheelchair seating systems to accommodate people with strong uncontrolled muscle movement (such as extensor thrusts). It has been documented that these individuals may slide out of their wheelchairs and potentially be injured. Strong extension movements may also damage the wheelchair (Hong, Patrangenaru, Singhose, & Springle, 2006; Zeltwanger, Brown, & Bertocci, 2001). Ault, Girardi, and Henry (1997) proposed and developed a seating system that was responsive to movement by allowing the wheelchair seatback angle to change. This design may improve the individual's posture in the wheelchair, and decrease the mechanical failure rate of the seating components and the wheelchair structure. However, there were some limitations with this design, as well as with others. One of the new seating systems altered the wheelchair frame, thus restricting the chair's portability. Another design added a pivot mechanism to the wheelchair canes allowing the wheelchair back to move, which maintained the integrity of the wheelchair structure, but did not allow the pivot point to be adjusted for each individual. These concerns prompted staff from the Seating and Mobility Services Team at Thames Valley Children's Centre (TVCC) to design and build a Novel Dynamic Seating System (NDSS). The NDSS uses a standard seating system along with two new components. This system can be customized and fitted to both power and manual wheelchairs without structurally modifying the chair. This summary presents the highlights of the evolution and evaluation of the mechanical designs of TVCC's NDSS, and the creation of formulas to develop a mathematical evaluation spreadsheet for customizing the system.

Design of the system

A standard seating system fabricated at TVCC includes a seat cushion and a moulded plastic back attached to the seat cushion with an aluminum plate bent at 95 degrees. The development of TVCC's dynamic seating system began in 2003 with two major changes to our standard static seating system—the addition of a sliding footplate, and a two-piece hinged back with lower and upper sections connected to a spring-activated lever mechanism.

The sliding footplate moved forward in response to the force exerted through the individual's feet, and then returned to the start position when the force was removed. The pivot point of the back support was aligned with the point that the individual's spine was determined to be most flexible into extension. The deflection range of the upper back support typically allows for 15 degrees of movement.

Evaluation of the components

Throughout the development period of the NDSS, the design of the sliding footplate and the two-piece back support remained unchanged. At this time, an evaluation of the sliding footplate's effects and force measurements has not been completed. Nevertheless, individuals who use the footplate report that they believe it is beneficial to their positioning and comfort. What did change, however, was the design of the spring mechanisms attached to the new back support. The first design used a compression spring mechanism. It was determined upon trial and observation that this mechanism did not adjust to the changing angle of the load. This was potentially damaging to the back support because of the stress placed upon it. The second design using extension springs accommodated the changing angle of the back support, but was difficult to customize. The current mechanism incorporates a torsion spring lever. Of the three fabricated mechanisms, the torsion spring design provides the most desirable qualities. It is able to move with the changing angle of the back support as it is deflected, and can be customized and adjusted through the selection of the spring's size, and the position of the mechanism on the back support. Our efforts were then focused on evaluating the technical qualities of these mechanisms. The amount of force that the springs in the levers were able to absorb as the upper back support was deflected was unknown. We identified the spring mechanism and the upper back support as two separate levers. The manner in which these two levers worked together could then be determined using mathematical calculations. Formulas were created using mathematical equations that considered as many as 15 variables, such as lever lengths, the user's point of contact with the back, spring type, and degree of back deflection. These formulas were then entered into a Microsoft Excel® spreadsheet to create the "Mathematical Adjustment ToolEquation Spreadsheet" (MATES), which can calculate the force measurements when the value of any variable changes (Stephenson & Wighton, 2008). Adjustments could be made to the force absorbing quality of the lever based on the spreadsheet output. Although we could now predict the lever force with the MATES, the optimal position of the lever on the back support has yet to be investigated.

Key observations

We made three important observations about the design of dynamic seating systems.

1. We learned that the action of the lever mechanism that more closely resembled the action of the person's body movement was the most successful in its ability to move with the body.
2. Individuals who are positioned in wheelchairs with static seating systems are often limited and restricted from movement by straps, or rigid accessories placed across their bodies to control the pelvis, knees, or trunk. These components are always placed against the individual from the front where they oppose the direction of the body's force. The NDSS works in a different way. The sliding footplate is placed under the persons' feet and the dynamic back lever is placed behind the individual, both being in a position that moves in the direction of the force. This approach allows, supports, and promotes the movements of the individual rather than restricts these movements.
3. The torsion spring lever, although simple in appearance, required the input of individuals with a broad range of technical skills. These observations may seem obvious and the mechanism simple in design, however a closer look reveals the opposite. Coordination of the action and forces of mechanical mechanisms with the movements of the body was a complex challenge. The collaborative effort of many individuals' clinical and technical expertise, experiences, perspectives, values, and approaches were required to design, fabricate, install, and evaluate the NDSS.

Conclusion

We developed our NDSS to accommodate individuals exhibiting a wide range of abnormal muscle movement, while providing postural support and allowing the seating system to move. The NDSS was installed on manual and power wheelchairs. A sliding footplate support and a two-piece hinged back support incorporating a spring-activated lever mechanism allowed this seating system to be responsive to the movements of the user. The mechanism that included a torsion spring was the most suitable for the NDSS. The development of the MATES application allowed us to determine the force required to deflect the upper back support. Specific guidelines for the optimal positioning of the spring lever mechanism need to be determined as adjustments are presently made on an *ad hoc* basis. Anecdotal reports from the users of the NDSS, their caregivers, and seating clinicians were favourable. There was an overall perception that the system was beneficial to the physical and psychological health and wellness of the individuals using the system. At the present time, there are 35 clients using our Novel Dynamic Seating System.

Future work

Future work should consider methods to determine the most accommodating set up of the lever mechanism and sliding footplate for each individual. Some of the factors that may influence the set up include physical considerations (e.g., pulmonary function, range of motion, skin integrity), psychological considerations, and functional considerations (e.g., task accomplishments). The NDSS concept and component design will continue to evolve and be refined through the ongoing work of clinical and technical staff. The experience of individuals who use the NDSS will be valued in this collaboration.

References available in the original source document.

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Largest Canadian study on osteoporosis informs health policy

New recommendations to public health authorities on how to best cope with osteoporosis have been released by the Research Institute of the McGill University Health Centre (RI MUHC) in Montreal.

Their recommendations derive from the latest results of the Canadian Multicentre Osteoporosis Study (CaMos), which was published June 16, 2008 in the *Canadian Medical Association Journal (CMAJ)*.

Osteoporosis results from reduced bone mineral density (BMD), disrupted bone architecture and changes in the distribution and variety of certain proteins in bone, all of which serve to place sufferers at far greater risk of bone fractures, which can be life-threatening in older people.

The measure of BMD is the main predictive marker of the disease. "Osteoporosis has enormous impact on public health and on the quality of life of patients," said Dr David Goltzman, co-principal investigator of the CaMos project, researcher in the Musculoskeletal Disorders RI MUHC and Professor of Medicine and of Physiology at McGill University's Faculty of Medicine.

The latest CaMos results confirm that, for women, menopause is a critical period during which bone mineral density decreases in all the bones studied. More specifically: an average decrease of 6.8 per cent over five years was observed in the hip.

Significant BMD loss also occurs after age 70, mainly in the hip bone. In men, BMD decreases more gradually, although it starts earlier, around the age of 40. The fact that rapid BMD loss occurs after menopause was already known but had never been previously quantified, while the second period of BMD decline after age 70 is a completely new discovery. "These findings provide new insight into the public health impact of osteoporosis," Dr. Goltzman said.

"Population aging combined with the potential human and financial consequences of fractures — notably hip fractures — represent a major challenge. However, knowing the age at which bone loss is more likely to occur opens up new avenues for preventive measures." The CaMos study involves nine other centres across Canada that are coordinated from the MUHC in Montreal. It has recruited more than 10,000 participants since 1996. The long duration and the national scale of the project have enabled researchers to determine that participants' BMD varies very slowly in the absence of other risk factors.

"The scope of the CaMos study means that we can produce data that are representative of the entire Canadian population, in order to help improve official recommendations, and to enhance the prevention, diagnosis and treatment of osteoporosis," said Dr. Goltzman.

"In light of our results, we think that, in the absence of other risk factors, BMD should be measured every five years, instead of every two years, as is currently the case," he continued. Of course, this frequency should be modified if the person does have other risk factors.

Source: McGill University Health Centre (MUHC)

The potential of information: Communication technology in home care

By Nadine Henningsen

Information Communication Technology (ICT) is defined as *reflecting all forms of technology used to create, store, exchange and use information in its various forms*. Within health care, ICT is an essential enabler for improving client care, enhancing provider capacity and effectiveness and achieving appropriate utilization of the health system. However, ICT is not yet broadly implemented across the health care continuum; and there is even less application in home care.

In response to the absence of a strategy for ICT specific to home care, the Canadian Home Care Association (CHCA) has committed to building a national knowledge base on technology in the home and community sector and exploring the challenges and opportunities for current and future applications. A practical demonstration of the value of ICT in home and primary care was achieved through the CHCA's National Partnership Project. The Project showed the positive benefits to clients, staff and the system of structured partnerships aligning home care and family physicians and expanding the role of home care in chronic disease management. A key component of the partnership was the application of ICT to enable improved and timely exchange of information between practitioners.

Understanding the potential

Most recently, the CHCA has entered into a partnership with Canada Health Infoway to lead a national project on technology in home care. The project—*Integration through Information Communication Technology in Home Care in Canada*—was undertaken in order to achieve a better understanding for the potential of and readiness for ICT in the home care sector across Canada. The chance to define where the ICT opportunities lie captured the attention of home care leaders from all jurisdictions. Examples of technology applications being tested in Canada include: remote monitoring to support client self-management and leverage the home care work force; communication between providers and the client and health care team through portals, emails and data file transfers; standardization of care through care management systems and consistent data collection; and automation of business processes within home care organizations. For the client, ICT helps to improve the care at the point of delivery and the quality of life for those requiring home care. For the home care provider, ICT improves the ability to see more patients, decrease paperwork and access the right information at the right time. Effective application of ICT ensures that the system is appropriately and efficiently used and improves the ability to measure, assess and manage health care.

> **Home care is an array of services for people of all ages, provided in the home and community setting, that encompasses health promotion and teaching, curative intervention, end-of-life care, rehabilitation, support and maintenance, social adaptation and integration and support for the informal (family) caregiver.**

Notwithstanding the benefits and the solutions that could address the need, ICT implementation advances cautiously. Most home care programs do not have dedicated budgets for technology and are able to adopt systems through pilot program initiatives primarily. Ongoing concerns about privacy, finding the "right" solution that will interface within the broader network of solutions and the electronic health record; and the impact to existing staff workloads (compounded by the mobile workforce which makes re-assignment difficult) as new systems are tested all contribute to the sluggish rate of automation within home care.

As the "next essential service", an effective home care system is vital to the sustainability of our health system. The CHCA believes that it is time to address the disproportional investment in ICT in the hospital sector by investing in home and community care. The changing demographics in Canada is resulting in a shift in focus by the health care system from reactive episodic care to proactive integrated care of people with chronic health issues. These issues are typically managed at home by the health care consumers who have high expectations of technology. They expect that there is accurate information that moves with them across the health care continuum; communication between their various health care providers; protection of their privacy; input into decisions; elimination of undue risk; and timely access to results.

Technology must support the evolution of home care. The opportunity is to increase efficiency of information exchange across the system; reduce errors, duplication and administrative costs; achieve more accessible diagnostic results more quickly; improve the quality and coordination of care and improve the capacity to support individuals to remain independent at home wherever that may be. Within Canada ICT has the potential to improve access to care for the estimated 22 per cent of the population who live in rural, remote and northern communities.

Aging in Place/Aging at Home initiatives in a number of jurisdictions across the country serve to underscore the importance of shifting the ICT investment paradigm to the home and community. The CHCA has found that providers and clients are not only ready for the challenge but they embrace the opportunity to use technology more effectively. It's time!

About the Canadian Home Care Association

The Canadian Home Care Association (CHCA) is a not-for-profit membership association dedicated to ensuring the availability of accessible, responsive home care and community supports to enable people to stay in their homes with safety, dignity and quality of life. Members of the Association include organizations and individuals from publicly funded home care programs, not-for-profit and proprietary service agencies, consumers, researchers, educators and others with an

interest in home care. Through the support of the Association members who share a commitment to excellence, knowledge transfer and continuous improvement, CHCA serves as the national voice of home care and the access point for information and knowledge for home care across Canada.

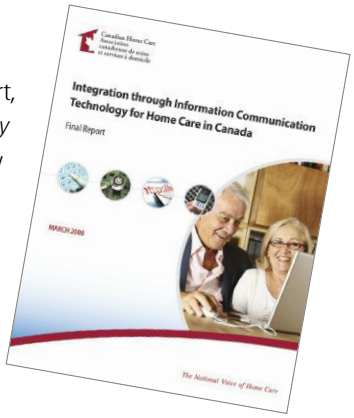
References are available from the author at nhenningsen @cdnhomecare.ca.

Information on the work of the Canadian Home Care Association, can be accessed at www.cdnhomecare.ca or by calling (613) 569-1585.

Technology and home care

A newly released Canadian Home Care Association report, *Integration Through Information Communication Technology for Home Care in Canada*, highlights the role technology plays in improving care at the point of delivery. It claims that ICT improves the home care provider's ability to see more patients, decrease paperwork and access the right information at the right time to enable collaboration with other providers. The full report is online.

Source: www.cdnhomecare.ca



Linda's corner

Linda Norton, Rehabilitation Education Co-ordinator at Shoppers Home Health Care, answers your seating and mobility-related questions.

Q I have a client with Multiple Sclerosis. She requires a mobility device, and is not able to efficiently propel a manual wheelchair. I know she would benefit from a power wheelchair so that she can use it in her home. She refuses to consider a power wheelchair, but wants to purchase a scooter. At this time she is able to walk within her home, by hanging on to the walls and furniture. Any thoughts?

A In my experience, when clients are choosing a mobility device, especially a powered device for the first time, they are often looking for the "least disabled" device, rather than understanding the benefits and limitations of each device. If this appears to be the case, engaging the client in a conversation about disability and what a device means to them may be helpful, in addition to helping the client establish their power mobility goals. Once the goals have been established, working with the client to empower them to make an informed choice becomes the focus. In practice I encourage the client to try both devices (assuming they are safe using the devices). In my experience, I have found that once the person has tried a well prescribed power chair, they recognize the benefits and choose it over a scooter. If the client chooses the scooter, you may want to consider encouraging a rental. This gives the client an extended period with the scooter, and if their needs change, a prescription for a more permanent device can occur.

Q My client who has a spinal cord injury, has a stage 3 pressure ulcer over his right ischial tuberosity, with a significant undermined area [tunnelling]. I have been asked to reassess this client's wheelchair, bed and other surfaces. I have maximized the pressure management strategies, but the wounds have not changed significantly. The team has addressed nutrition, dressing choices, moisture, client concerns, etc. Is there anything else I should be considering?

A Assymetrical undermining around a pressure ulcer is usually indicative of friction and/or shearing forces. Friction is the force that happens between the client's skin and supporting surface when the client slides. Shear is the force that happens between the client's bones and skin as their posture changes. We know that friction and shear magnify the impact of pressure on the client's skin. If pressure management has been optimized, consider the friction and shearing forces which may be occurring when the client transfers, during repositioning, if the client slides or when the client is propelling. There may be other activities which can also create these forces. As activities which cause these forces are identified, consider approaches to either alter or eliminate the activity or reduce the forces involved. In some cases, e.g. repositioning a client in bed, the implementation of glide sheets may help to reduce these forces. When assessing transfers consider whether the skin is dragging across a surface in addition to the force of the "landing."

A note from Linda: For anyone interested in wound care, you might want to go to www.woundpedia.com. This website provides up to date clinical evidence regarding a number of topics. A panel of experts ensures that this evidence is timely and clinically relevant. Another excellent resource for clinicians, families, caregivers and administrators is www.preventpressureulcers.ca. This web site is written in non-medical language, and provides general information on the treatment and prevention of pressure ulcers.

Contact Linda via phone **416-232-1706** or e-mail **lnorton@shoppersdrugmart.ca**

Covert strokes cause memory and thinking problems

Most people know that high blood pressure, diabetes, obesity, smoking and sedentary lifestyle can lead to an evident stroke or "brain attack", that strikes suddenly and without warning.

But few are aware that the same risk factors increase the likelihood of a more frequent and mostly undetected "covert" strokes that affect our brain's executive functioning or cognition—how we process information, think, remember, plan activities and organize the day.

Unlike the big, evident strokes that wind up in emergency rooms because of sudden-onset paralysis or loss of speech, covert strokes result in subtle changes that become more apparent over time.

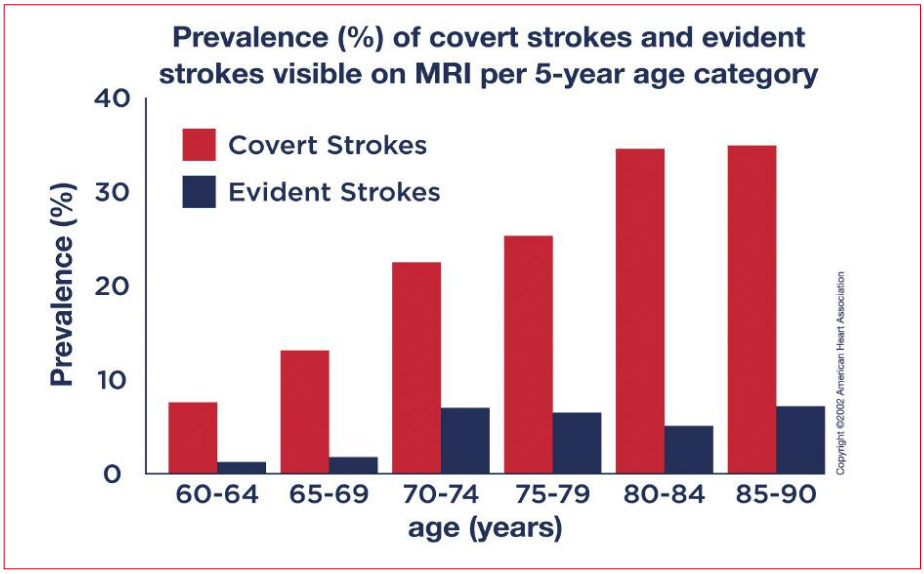
"This is a huge problem," says Canadian Stroke Network (CSN) CEO and Scientific Director Dr. Antoine Hakim. In the age group 70 to 75, for example, it is believed that 25 per cent of the population will have covert strokes as compared to seven per cent with evident strokes.

"As you get older, the ratio of 'covert-to-evident strokes' gets bigger," Dr. Hakim says, adding that covert strokes can substantially amplify the impact of Alzheimer's disease.

Dr. Mike Sharma, CSN's Deputy Director, says that "people who have covert strokes are at increased risk for evident strokes and dementia and some studies suggest the risk may be as high as 20 times."

New information on covert strokes has come to light in the last 10 years with the development of sophisticated imaging technology that picks up changes in the brain.

Based on U.S. and European data, it is believed that as many as 450,000 Canadians every year may have covert strokes caused by the blockage of the small vessels in the brain.



"We have to face the fact that small vessel disease will be a huge cause of cognitive decline and dementia in the greying population," says Dr. Hakim.

Dr. Sharma says that new understanding about covert stroke has raised awareness among medical professionals that "individuals need to have risk factors addressed in a much more aggressive way."

"Stroke and Alzheimer's interact and share the same risk factors. The overall message we would like to get out is to address risk factors early—before they have a chance to produce covert strokes and cause brain damage."

This includes controlling blood pressure, obesity, diabetes and encouraging people not to smoke, to consume less sodium, eat more fruits and vegetables and to get active. Risk factor control starts as early as childhood!

To aid health promotion and to decrease the risk of covert and evident strokes, the Canadian Stroke Network recently launched a new website called www.sodium101.ca, pulling together facts and the latest research evidence about the health effects of excessive sodium consumption.

The site contains consumer information, handy tips, interactive tools, nutritional guides, news releases, and more. Research shows that consumption of high levels of sodium increases blood pressure. High blood pressure is the major risk factor for stroke as well as heart disease, kidney disease, and dementia. High sodium consumption has also been linked to osteoporosis, asthma, stomach cancer and obesity. According to published reports, excessive sodium intake is responsible for the premature deaths of more than 30 Canadians a day.

A 2007 report by Statistics Canada reveals that the average Canadian consumes over 3,000 mg of sodium a day—more than twice the adequate daily level as recommended by Health Canada and the U.S. Institute of Medicine.

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Publisher's note: The views expressed in *Clinical Notes* are those of the authors and do not necessarily reflect the opinions of the publisher or Shoppers Home Health Care.