

### **Low Salt Diets and Asymptomatic Hyponatremia**

“I believe, as a Canadian cardiologist who for 65 years has examined and treated elderly patients, that falls and subsequent fractures would dramatically decrease if seniors were given regular diets in place of the current low-salt regime.”

*Isaac Shesler, MD, FRCP(C), FACP Feb., 18, 2007*

Dr. Issac Shesler, a well-known Canadian Cardiologist sent an article into a popular general-interest family magazine describing his personal experience of living in an senior citizens' care facility. It was an upscale facilities with first-class amenities, but low salt diets were the rule for all elderly residents. Dr. Shesler stressed how the low-salt diets, so commonly prescribed in most assisted-living residences inevitably resulted in sub-acute hyponatremia, which, in turn, lead to a host of other serious medical conditions, including confusion, reduced cognition, impaired gait, falls, fractures and loss of appetite, inevitably resulting in malnutrition. One would have thought that the editors of the the magazine would take the word of a renowned physician seriously enough to have his article reviewed, considering the importance of its subject matter to such a large part of its readership. But, the article was rejected out of hand.

Why did Dr. Shesler take the trouble to write this article? And why was it so quickly rejected? It was certainly not because of supporting evidence, because a brief review of the available medical literature makes it clear that Dr. Shesler's experience was fully consistent with the stream of evidence published for years. They rejected the article because it conflicted with the common, but false, illusion that reducing salt or sodium in the diet improves health.

Unfortunately, the thinking behind this false illusion is firmly established and many of the senior citizens living in assisted living residences are forced to live with the consequences of outdated thinking and obsolete practices, of ideology undermining evidence. Because of the dire consequences of low sodium diets, particularly on the elderly, and because of the overwhelming, publicly available recommendations arguing against this practice, its utilization represents medical malpractice and a significant legal liability.

### **Low Salt Diets and Hyponatremia**

Normal plasma sodium levels are 135–145 mmol/L. (3 – 3.3 g/l). Hyponatremia occurs when that sodium level drop below 135 mmol/l, (<3 g/l). The condition is considered severe when the sodium level drops below 120 mmol/l (2.8g/l). Severe hyponatremia is an acute, life-threatening condition that can lead to brain cell swelling and must be treated as a critical emergency. Most mild hyponatremia, on the other hand is not diagnosed carefully because it is seemingly asymptomatic, however, for senior citizens it is a very significant source of sickness and death and a persistent, chronic destroyer of an individual's quality of life.

Food and dining are an integral part of senior citizen care and self-directed living for many reasons, including: (1) maintenance of interest in social activities, (2) upkeep of nutritional status, (3) prevention of weight loss, (4) prevention of functional and cognitive decline and avoidance of falls and fractures. Dining is a significant element of daily living and a key factor in

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quality of life for seniors, particularly those in assisted living facilities, who are away from home and family.

Hyponatremia can be caused by several factors including kidney disorders, Addison's disease, renin-aldosterone and anti-diuretic hormone (vasopressin) imbalances, improper diuretic drug treatment and cortical hormone disorders. However, an underlying cause is found in most assisted living facilities where the widespread practice of continual low-sodium or low-salt diets are the customary practice. The maintenance of residents on such diets for months inevitably leads to chronic hyponatremia that appears to asymptomatic, but only because there are no obvious acute symptoms. However, the term asymptomatic serves little more than a smokescreen for much deeper risks

The term 'asymptomatic hyponatremia' is frequently used in clinical settings because the symptoms of mild or moderate hyponatremia (<125–135 mmol sodium/l or 2.9- 3.0 g/l), and include lethargy, restlessness, disorientation, headache, nausea, and vomiting, muscle cramps, and depressed neural reflexes, all rather nondescript conditions common to seniors. However, whereas severe hyponatremia presents the dangerous symptoms of brain cell swelling that has to be treated urgently, asymptomatic hyponatremia appears to represent a mild and sedate version of it.

Throughout the body, sodium readily crosses capillary membranes through clefts between endothelial cells. In contrast, brain capillaries have tight endothelial junctions and are lined by cells that create an effective blood–brain barrier that sodium cannot cross if everything is in balance. However, an abnormally low plasma sodium concentration causes water to enter brain tissue in an attempt to equilibrate with the low-sodium plasma. Because of the confines of the skull, only a small degree of this type of brain swelling is compatible with normal life. So, while mild or "asymptomatic" hyponatremia is not quite as dramatic as acute hyponatremia, its cascades of lesser impacts are widespread, often with devastating sequelae and generally related to the very same blood-brain barrier disturbances.

### **The Symptoms of 'Asymptomatic' Hyponatremia**

Of interest to the concept of 'asymptomatic hyponatremia' is a study of patients with hip fractures who were treated at an emergency medical center in Belgium. These patients had a 67-fold higher risk of being hyponatremic.<sup>1</sup> The authors of this well-known study also showed that 'asymptomatic hyponatremia' was associated with gait disturbances and decreased response time, which mimicked the effects of alcoholic excess. In another study, mild hyponatremia, was associated with an increased risk of bone fractures in ambulatory elderly patients.<sup>2 3</sup> The most recent results demonstrate osteoporosis in elderly women who suffer from borderline hyponatremia.<sup>4</sup> Moreover, the combined results of two identical randomized, double-blind, placebo-controlled studies of 448 patients with mild hyponatremia<sup>5</sup> demonstrated that a significant rise in plasma sodium concentration was associated with a significant improvement in the mental component of the medical outcomes.<sup>6</sup>

With the growing elderly population and increased recognition of subclinical, as well as clinical, dementia in elderly individuals, it is worth noting that hyponatremia has been reported in 30% of

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geriatric patients in nursing homes. Moreover, the thiazide diuretics are still the recommended antihypertensive therapy for elderly patients, despite their known hyponatremic adverse effects, particularly in elderly women. It is a case where the practice has neglected to keep pace with the evidence, to the detriment of patients. Hyponatremia is also present in approximately 30% of depressed patients, and hyponatremia is a major risk factor for mortality in patients with advanced heart failure<sup>7</sup> and cirrhosis - clinical entities that are known to predispose patients to encephalopathy.

### **Assisted Living or Nursing Home Statistics**

Injuries from falls account for roughly 36 percent of potentially preventable visits to the hospital emergency room by assisted-living patients. According to the CDC, assisted living falls frequently go unreported. But despite the lack of accurate nursing home fall data, the CDC still receives hundreds of reports of assisted living home falls each year from average-sized facilities. In Europe, the available data indicates that falls and resulting fractures are almost three times more frequent in these facilities than at the family home.

Nursing home falls frequently cause a disability, functional decline, reduced independence, and reduced quality of life for an elderly person. Patients with a fear of assisted living home falls may also experience feelings of helplessness, loss of function, depression, anxiety, and social isolation. For these reasons, it is particularly important to take precautions, both in and out of such a facility, to prevent elderly falls, fractures, and injury.

The problem with nursing home falls is severe, as cited by the CDC:

- *The CDC estimated almost 2 million adults over the age of 65 living in assisted living/nursing home facilities.*
- *Regular use of restraints has not proven to lower a patient's fall risks.*
- *Between 50 percent and 75 percent of elder patients in these facilities suffer from a fall each year. This rate is more than double the rate of falls which occur for elders living in the general community.*
- *The CDC estimates that roughly 5 percent of elders, age 65 and older, are assisted living/nursing home residents. However, these patients make up about 20 percent of the deaths resulting from an elderly fall.*
- *Facility patients typically fall multiple times each year. The CDC averages this statistic at 2.6 falls per assisted living/nursing home patient, per year.*
- *Roughly 35 percent of elderly fall injuries happen to nursing home patients who cannot walk.*
- *Between 10 percent and 20 percent of nursing home falls result in serious injury for the elderly patient.*
- *Between 2 - 6 % of nursing home falls cause elderly fractures.*
- *Approximately 2,000 elderly patients die each year as a result of nursing home falls.*

And much of this result from the practice of implementing a low-salt diet policy.

### **What is the Standard of Practice for Resident Diets in Assisted Living Facilities?**

Up until this point, we have assumed that Nursing Homes, Assisted Living Facilities, and Senior Citizen Residences follow dietary practices endorsed by the national organizations and association tasked to make such recommendations. But is that really the case?

The answer is a categorical, NO!

Food and dining are core components of quality of life and quality of care in assisted living facilities. Research also shows that 50%-70% of residents leave 25% or more of their food uneaten at most meals. Even though 60%-80% of residents have physician- or dietitian-prescribed dietary supplements, more than a quarter of residents' experience weight loss over time.

The American Dietetic Association (ADA) reports that under-nutrition adversely affects the quality and length of life, and that has aroused the concern of geriatric health professionals. The prevalence of protein-energy under-nutrition for residents ranges from 23% to 85%, making malnutrition one of the most serious problems facing health professionals in long term care. Malnutrition is associated with poor outcomes and is an indicator of risk for increased mortality. It has been found that most residents showing evidence of malnutrition were on restricted diets that might discourage nutrient intake. For the elderly in this country, the dietary standards currently practiced in assisted living facilities has proven to be disastrous.

In response to this dilemma, the Hulda B. & Maurice L. Rothschild Foundation supported a Stakeholder Workshop on May 14, 2010, attended by 83 national leaders, which reviewed the feedback from all stakeholders, expert speakers and individual participants. Two of the many recommendations at the Creating Home II Symposium, for future consideration were:

- 1) To hold a National stakeholder workgroup to develop guidelines for clinical best practices for individualization in long term care living, to provide regulatory overview and interpretive protocol and investigative guidance and prepare related education materials to facilitate implementation.
- 2) Each profession serving elders in long-term care should develop and disseminate standards of practice for their professional accountability that addresses proper training, competency assessment, and their role as an active advocate for resident rights and resident quality of life, from a wellness perspective in addition to quality of care from a medical perspective.

These recommendations were acted upon, at least in part, thanks to the generous funding of the Hulda B. & Maurice L. Rothschild Foundation to the Pioneer Network in 2011 by forming the Food and Dining Clinical Standards Task Force. The Food and Dining Clinical Standards Task Force is comprised of symposium experts, representatives from Centers for Medicare and Medicaid Services Division of Nursing Homes, the US Food and Drug Administration and the Centers for Disease Control and Prevention as well as national standard setting groups.

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This task made a significant effort to obtain evidence and thus the **New Dining Practice Standards** document reflects evidence-based research available to-date. The document also reflects current thinking and consensus, which are in advance of research. Therefore, the Current Thinking portions of each section of the New Dining Practice Standards document represent a list of recommended future research.

The National Organizations Agreeing to the New Dining Practice Standards include:

- **American Association for Long Term Care Nursing (AALTCN)**
- **American Association of Nurse Assessment Coordination (AANAC)**
- **American Dietetic Association (ADA)**
- **American Medical Directors Association (AMDA)**
- **American Occupational Therapy Association (AOTA)**
- **American Society of Consultant Pharmacists (ASCP)**
- **American Speech-Language-Hearing Association (ASHA)**
- **Dietary Managers Association (DMA)**
- **Gerontological Advanced Practice Nurses Association (GAPNA)**
- **Hartford Institute for Geriatric Nursing (HIGN)**
- **National Association of Directors of Nursing Administration in Long Term Care (NADONA/LTC)**
- **National Gerontological Nursing Association (NGNA)**

### **What is their thinking when it comes to Low-Sodium Diets?**

#### *What is the basic thinking?*

AMDA:

Low sodium diets may benefit some individuals, but more lenient blood pressure and blood sugar goals in the frail elderly may be desirable, while a less palatable restricted diet may lead to weight loss and its associated complications.

ADA:

The relationship between congestive heart failure, blood pressure, and sodium intake in the elderly population has not been well studied. The American Heart Association recommends that older adults attempt to control blood pressure through diet and lifestyle changes and recommends a sodium intake of 2 to 3 g/day for patients with congestive heart failure. However, a randomized trial of adults aged 55 to 83 years found that a normal-sodium diet improved congestive heart failure outcomes. A liberal approach to sodium in diets may be needed to maintain adequate nutritional status, especially in frail older adults.

#### *What are the Relevant Research Trends?*

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The typical 2,000mg sodium diet that is often recommended for individuals with hypertension, has been shown to reduce systolic blood pressures, on average, by only 5 mmHg, and diastolic blood pressures by only 2.5 mmHg, making this diet's effect on blood pressure modest at best and has not actually been shown to improve cardiovascular outcomes in the nursing home resident.

Guidelines for blood pressure targets for older adults differ from those for younger people. For older adults, current literature supports intervention, with medication and/or diet, only for systolic blood pressures over 160 mmHg and targets a systolic blood pressure of less than 150mmHg.

Lowering systolic blood pressures below 120 - 130mmHg and diastolic pressures below 65mmHg may increase mortality in the elderly. Limiting salt intake in individuals with congestive heart failure is felt to be of benefit by limiting fluid retention, but the clinical experience of two medical directors of numerous nursing homes shows that this is necessary in only a minority of nursing home patients, usually those who are salt sensitive and often have advanced disease. Older people have the same taste preferences as they have had all of their life, and thus low sodium, low fat meals are not always as appetizing as the normal version of a food with naturally high fat and sodium content.

*What is the Recommended Course of Practice?*

**Low sodium diets are not shown to be effective in the long-term care population of elders for reducing blood pressure or exacerbations of congestive heart failure and therefore should only be used when benefit to the individual resident has been properly documented.**

**Unless a medical condition warrants a restricted diet, consider beginning with a regular diet and monitoring how the person does eating it.**

**Conclusion**

A low salt or low sodium diet is no longer considered to be the recommended practice for assisted living and nursing home facilities. This recommendation, supported by the recognized major national associations devoted to nutrition has been in place since 2011. Any residents of such facilities that are placed on low salt diets without the express consent of a physician, specifically prescribing it for an established condition, are the victims of medical malpractice. Negative consequences, such as loss of cognition, confusion, impaired gait, falls, cardiovascular events, fractures and loss of appetite with accompanying malnutrition can serve as the basis for a tort liability action.

"Spending your golden years in a retirement home with a low-salt diet will convert your last years to a long, chronic illness."

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<sup>1</sup> Renneboog B, Musch W, Vandemergel X, Manto MU, Decaux G. Mild Chronic Hyponatremia is Associated with Falls, Unsteadiness, and Attention Deficits. *Am J Med.* 2006;119(1):71.e1-8.

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