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# Salt Skip News

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Use the **academic address** when writing about **salt control**—see the panel on page 4.

## From the Editor's desk



Welcome to the first edition of SSN for 2009. In this issue we have contributions from Professor Chris Nordin from the Royal Adelaide Hospital and our own Trevor Beard. Professor Nordin has had a lifelong interest in osteoporosis and writes about the relationship between salt intake and bone health.

I was very pleased to hear just before Christmas that one of our studies looking at the effects of salt on blood vessel function was accepted for publication in the American Journal of Clinical Nutrition. In this study we examined the effect of a reduced salt diet of 50 mmol sodium per day compared with a more usual intake of 150 mmol sodium per day on blood vessel function measured by ultrasound. The technique called flow mediated dilatation measures the

ability of the endothelium, which is a thin layer of cells that line the inside of the blood vessels, to relax as needed to help regulate blood flow. The study included 29 overweight and obese men and women with normal blood pressure who followed both diets in random order for two weeks. Endothelial function improved on the reduced salt diet suggesting that dietary salt reduction can help keep the blood vessels work properly. The improvement appeared to be unrelated to the reduction of 5 mmHg in systolic blood pressure suggesting that the effect is independently beneficial to the blood vessels. This was a short study and the findings need to be confirmed in a longer one.

Dickinson KM, Keogh JB, Clifton PM. Effects of a low-salt diet on flow-mediated dilatation in humans. *Am J Clin Nutr.* 2009 Feb;89(2):485-90.

**SODIUM, CALCIUM AND BONE****B.E. Christopher Nordin**Consultant Physician  
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The relation between sodium intake and blood pressure is perhaps the best known of the adverse effects of salt on the body but there are others which, though less well-known, may be of clinical significance. In particular, published work on the relation between salt intake and bone status, particularly in postmenopausal women, indicates that salt intake is a risk factor for osteoporosis.

Osteoporosis is most simply and elegantly defined as a condition of "too little bone in the bone"; the composition of the bony tissue is normal but there is just too little of it. It is a common condition in the elderly and is the main cause of the age-related rise in fracture rates. It is also the index disease of calcium deficiency because 99% of the body's calcium is located in the skeleton and available for mobilisation by bone breakdown if needed. This need arises if absorbed dietary calcium does not match obligatory calcium losses through the kidneys, bowel and skin which amount to over 300 mg daily. When this happens, bone is resorbed to maintain the ionised calcium and protect the neuromuscular system. Although there are several risk factors for osteoporosis, the most important single factor is postmenopausal estrogen deficiency which lowers calcium absorption and increases obligatory urinary calcium and therefore increases calcium requirement. Unless this increased requirement is met, bone is resorbed to make up the deficit.

One of the many factors that determine urine calcium is sodium intake because sodium and calcium compete for reabsorption in the renal tubules. In the

fasting state, there is a very significant correlation between urinary sodium and urinary calcium with a molar gradient of 1% i.e. every 100 mmol of sodium takes out 1 mmol of calcium. This relationship is much less apparent in 24-hour urines where calcium excretion is largely determined by calcium intake and absorption but, in the fasting state and in calcium deficiency, urine sodium is a major determinant of urine calcium and therefore of bone breakdown. In fact, sodium feeding has been shown to cause osteoporosis in rats, and salt restriction has been shown to lower the markers of bone resorption in postmenopausal women.

Moreover, diuretics such as Lasix (frusemide), which are known to take calcium out in the urine, have been shown to increase the risk of hip fracture, and the thiazide diuretics (which retain calcium) have been shown to protect against age-related bone loss in men and women.

Negative calcium balance is probably the single largest risk factor so any factor for osteoporosis so anything that increases urinary obligatory calcium loss must accelerate the osteoporotic process.

Osteoporosis is a largely predictable and preventable condition. All women should have their bone density measured at menopause (and men at age 60); those with values below average should increase their calcium intake and lower their dietary salt and animal protein and take extra exercise. Only in this way, and by use of vitamin D if necessary, will the annual 20,000 hip fractures in Australia be reduced. It is largely a nutritional problem.

## Cardiac rehabilitation requires foods low in fat, saturated fat, sugar and salt—four green traffic lights

Dr Trevor C Beard, Menzies Research Institute, Hobart

Many people are surprised at how well they feel when they take regular exercise, eat a lot more fruit and vegetables and far less fat, saturated fat, sugar and salt. People reach cardiac rehabilitation gradually, through the following steps:

- they start with the normal blood pressure of a fit teenager—100/60;
- blood pressure rises with age on the diet and lifestyle of industrial societies;
- at or above 120/80 they have prehypertension [1];
- at or above 140/90 they have high blood pressure (hypertension);
- they have no symptoms until after the onset of a complication of hypertension (heart disease, stroke, kidney failure);
- heart disease eventually brings them to Cardiac Rehabilitation.

About 20 healthy tribes have been discovered in isolated places, where people keep the normal blood pressure of a fit teenager throughout life. They have no factories to make sugar, salt or processed foods, and they still eat the fresh foods that their ancestors were eating without added fat, sugar or salt. With no mechanical transport they have all the exercise they need to stay slim, and they live without cigarettes or heavy drinking of alcohol.

They not only stay slim and keep the blood pressure of a fit teenager, they grow old without any cases of heart disease, stroke, kidney failure, Type 2 diabetes, or any of the other “diseases of civilisation” linked with our own artificial diet and lifestyle [2]. They are at risk of all those problems however if they migrate and adopt the industrial diet and lifestyle (they are just as susceptible as we are, if not more so). The human body evolved for millennia on a superbly healthy diet of fresh fruit, vegetables and nuts, supplemented

sometimes with fresh lean meat, poultry or fish. Salt could not have exceeded a sodium excretion rate of 30 mmol/day [3]. These foods are still available in abundance, along with about 300 herbs and spices. They can give us delicious meals low in fat, saturated fat, sugar and salt if eaten fresh or cooked in ways that conserve flavour [4].

It is too late for most Australian adults to regain the blood pressure of a fit teenager, but most people can halt the rise of blood pressure with age—usually reversing some of it—by simply changing to fresh foods, and adding only a few processed foods after selecting them very carefully.

The definition of low salt foods (120mg sodium/100g) makes the salt guideline very precise, but guidelines such as “Limit saturated fat and moderate total fat intake” will take us nowhere near the fat levels on which humans evolved.

Cardiac Rehab programs need to set some clearer guidelines for the use of processed foods to help people keep their saturated fat intake at the recommended levels. For example guidelines set by the UK traffic lights system could be used, where the limit for the green light for fat (UK 2006 revision) is 3g/100g and for saturated fat 1.5 g/100g.

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# Cooks' Corner



## Gazpacho Soup – cool for summer

- ❖ 1 Spanish onion
- ❖ ½ kg ripe tomatoes
- ❖ ½ kg red peppers (capsicum)
- ❖ 1 cucumber, peeled
- ❖ 1 garlic clove
- ❖ 6 basil leaves
- ❖ 2 tablespoons red wine vinegar
- ❖ 1 tablespoon olive oil
- ❖ cracked black pepper to taste
- ❖ 1 red chilli, de-seeded – optional

### Method

- ❖ 1. Chop onions, tomatoes, red peppers and cucumbers into pieces.
- ❖ 2. Put onion, tomatoes, red peppers, cucumbers, garlic and basil (and chilli) into food processor and blend to required consistency (also depending on the size of your processor you might do this in stages).
- ❖ 3. Pour vinegar and oil and blend until well combined. Season with pepper.
- ❖ 4. Place in fridge and chill for a couple of hours before serving so flavours intensify.

**TIP:** Add a cup of no added salt stock or water if you want a thin soup.

Adapted from Flip's Faves -

[http://www.goforyourlife.vic.gov.au/hav/articles.nsf/docs/Flips\\_Gazpacho\\_Soup?Open](http://www.goforyourlife.vic.gov.au/hav/articles.nsf/docs/Flips_Gazpacho_Soup?Open)

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