

## Objectives

- 1.) Long Term Objective: What is the replicability and practicality of published counseling methods to reduce salt intake in order to lower blood pressure?
- 2.) Immediate Objective: i.) Create a protocol for a systematic review in order to achieve the overall objective. ii.) select papers to be reviewed for replicability and practicality

# Effectiveness of Salt-Reduction Strategies in Lowering Blood Pressure

Jay Toor<sup>1</sup>, Dr. Marcel Ruzicka<sup>2</sup>, Dr. George Fodor<sup>2</sup>, Dr. Sabine Steiner<sup>3</sup>

*University of Ottawa Faculty of Medicine,<sup>1</sup> University of Ottawa Heart Institute<sup>2</sup>, Medical University of Vienna<sup>3</sup>*



## Data Extraction and Assessment

## Background

Sodium restriction to 2300 mg/day (equals 5 gram of salt or one teaspoon) is recommended for the general population of Canada. For prevention and treatment of hypertension, depending on age restriction, an intake of 1200- 1500 mg is recommended (2-3 grams of salt/day) (1).

The present level of salt intake among Canadian males is 9 grams/day and among Canadian females is 6.5 grams/day (1). Restricting the present level of sodium intake by nearly half in normotensives and 2/3 in hypertensive males is a daunting task that requires intensive individual counseling and support (2).

Randomized clinical trials to study the **efficacy** of counseling to reduce salt intake in order to reduce blood pressure were reviewed by Hooper et al. 2002 (3) and Jurgens and Graudal at 2004 (4).

Our research questions are different from those studied by Hooper et. al and Jurgens et al.

We intend to ascertain the following primary outcomes:

- i. What proportion of studies reporting success in reducing salt intake following individual or group counseling describe the methods used in sufficient details so that other investigators would be able to repeat the published study i.e. what is the **replicability** of those studies?
- ii. Furthermore, in cases of successful reduction of dietary salt intake, we intend to assess the **practicality** of the intervention for the average Canadian family practice.

As a secondary outcome we will evaluate the degree of blood pressure reduction in reviewed studies in relation to salt reduction.

## Search Strategy

A literature search was conducted on the OVID platform in the following databases:

Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations - 1940 to present  
Embase Classic + Embase - 1948 to present,  
Cochrane Central Register of Controlled Trials (CENTRAL) -  
Database of Abstracts of Reviews of Effects (DARE)  
Health Technology Assessment (HTA) -

Methodological filters will be applied to limit retrieval to randomized controlled trials, controlled clinical trials and meta-analyses. Additional filters will be applied in Medline and Embase to restrict searches to non-animal studies and to exclude certain publication types (case reports/letters, news, editorials) from the search results. No language or date limits will be applied.

See Figure 1 for initial inclusion and exclusion criteria. Fifty-five papers were selected for further review.

## Selection Criteria

Studies will be included if the **PICO** criteria as outlined below are met.

### - Types of studies

Only randomized controlled trials (randomization of individuals or clusters) published in peer-review journals are included.

### - Types of participants

Studies enrolling adults (16 years and older) with hypertension.

### - Types of intervention

Counseling to reduce sodium intake.

Figure 1: Initial Inclusion and Exclusion Criteria

Included Studies	Excluded Studies
1.) Select only those papers which document a significant reduction of the urinary output of sodium following counseling. 2.) Only randomized controlled trials (randomization of individuals or clusters) published in peer-reviewed journals included.	1.) All studies that do not document a significant reduction of the urinary output of sodium: a.) Studies that did not measure urinary output of sodium before and after counseling b.) Studies that measured urinary output of sodium but did not document a significant reduction in the urinary output of sodium

Figure 2: Assessment of Replicability

- Program delivered by: doctor, nurse, nutritionist?
- Is the content of counseling reported?
- Additional practical training –cooking classes?
- The number of contacts with respondents.

### • Form of counseling:

- Individual, " face-to-face"
- Group sessions
- Phone counseling
- Educational material provided
- Web- based instructions

### • Information on control program

- Usual management from GP or nurse
- Usual care plus information (verbal or written advice)
- No intervention

Two reviewers will independently screen each trial report with regard to the inclusion criteria. A quality checklist will be completed for each study included into the systematic review. Each of the included studies will be reviewed independently by the two investigators assessing the following :

1. Is the population under study hypertensive?
2. Is BP measured before and after the study intervention?
3. Is a 24-hr urinary output of sodium measured (quantitative assessment of urinary sodium output achieved)?
4. Is the method used for counseling described in sufficient details that it can be replicated by other investigators ? (see figure 2)
5. If point # 1 is affirmative, is the method used applicable in a standard Canadian primary care setting ? (Maximally two dietary counseling session delivered by the GP, providing printed instructions and referring for dietary counseling to a nutritionist).

Disagreements will be solved in consensus. If necessary, attempt will be made to contact authors of included studies for further information on trial and intervention characteristics, quality and outcomes.

## Conclusions

Only 55 of the 1528 studies produced by the search followed a protocol that used urinary output of sodium as a measure, and reported a significant decrease in urinary output of sodium. This indicated that most studies do not quantifiably measure the effect of dietary sodium reduction, and thus calls into question the effectiveness of salt reduction strategies in the vast majority of the studies. The final 55 studies are still to be assessed for replicability and practicality of the dietary counseling salt reduction strategies.

## References

1. CMAJ 2011;183 (15): 1724-33
2. Fischer, PWF et al. Appl. Physiol. Nutr. Metab. 34 :884-892 (2009)
3. Hooper L, Bartlett C, Davey Smith G, Ebrahim S. Advice to reduce dietary salt for prevention of cardiovascular disease. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD003656. DOI: 10.1002/14651858.CD003656.pub2.
4. Jürgens G, Graudal NA. Effects of low sodium diet versus high sodium diet on blood pressure, renin, aldosterone, catecholamines, cholesterol, and triglyceride. *Cochrane Database Syst Rev*. 2004; (1):CD004022.