

Salt controversy

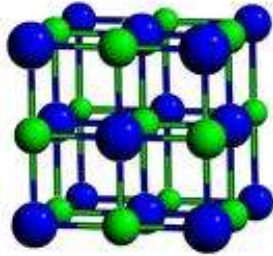
By

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What is salt?
Where is it found?
How is it made?

Salt

- Salt exists in nature as a cubic crystal .



Salt in Nature

- Salt is found naturally in seawater (precipitation)
- In mineral deposits
- In natural bodies of water (lakes, streams)

2000 years ago salt was used as money. Gold and salt had the same value. The word “salary” comes from salt.



- CSF
- amniotic fluid
- Salt aids blood sugar control by improving insulin sensitivity.
- Salt is a natural antihistamine
- plasma osmolality
- Salt supports thyroid function

How much salt should we consume

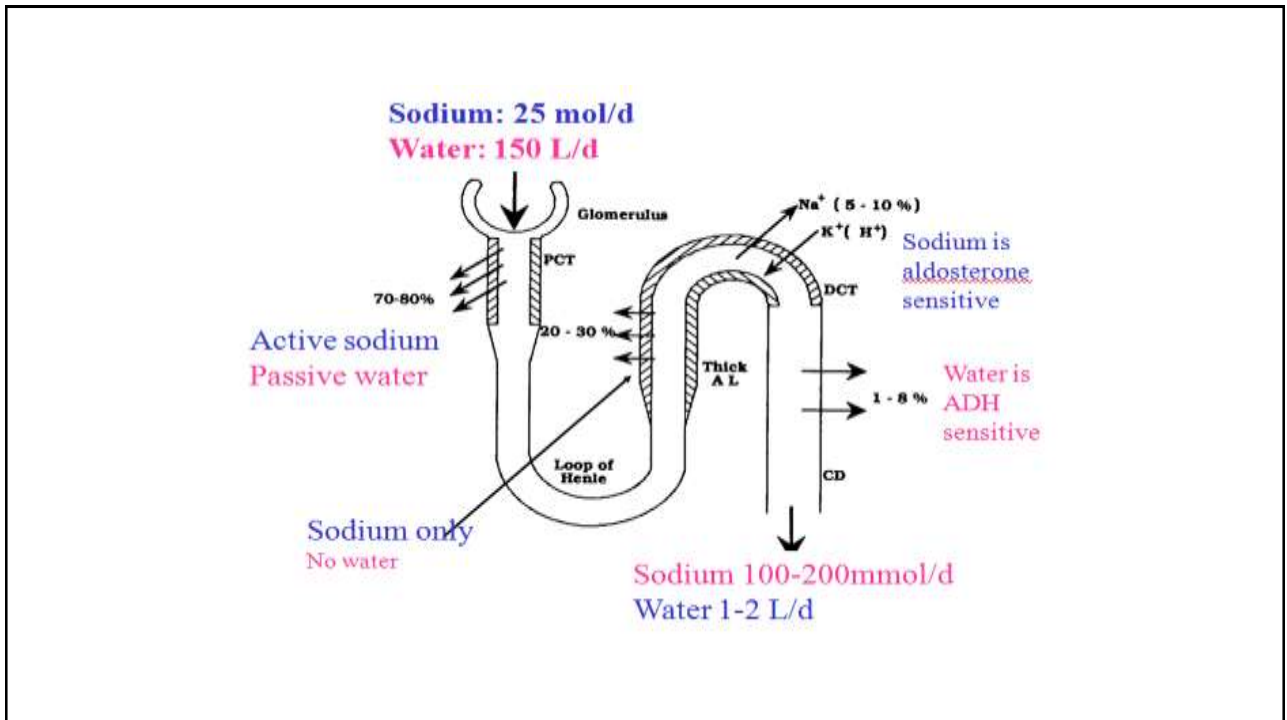
The major health organizations recommend that we cut back on sodium:

- United States Department of Agriculture (USDA): 2300 mg.
- American Heart Association (AHA): 1500 mg
- Academy of Nutrition and Dietetics (AND): 1500 to 2300 mg.
- American Diabetes Association (ADA): 1500 to 2300 mg

Control of salt in our body:

- **RENAL HANDING OF SALT**

- **↑Salt intake → ECF expansion → ↑Na excretion by the kidney and vice versa**



Neurohormonal regulation of Na

- In response to ECF expansion: \downarrow renin
aldosterone, \uparrow ANP \rightarrow \uparrow Na excretion
- In response to ECF depletion: \uparrow renin-
angiotensin-aldosterone system and \downarrow ANP \rightarrow
 \downarrow Na reabsorption

non physiological :

- Na + and water retention continues despite \uparrow ECF volume, as in edematous patient there is arterial under filling which stimulate sympathetic nervous system and **more salt and water retention occur.**

Na vs water

Na

~

H₂O

Hyponatremia

Hypernatremia

Volume overload

Volume Depletion

Salt and Blood Pressure

- Guyton et al., **40 YEARS AGO**, salt sensitive individuals suffered from impairment of Na excretions and alteration of RAS system
- ; BP ↑ with salt intake in most people. ***“Blood pressure is strongly associated with heart disease and stroke”***.
- The body tends to Conserve salt.
- ↑ salt in the diet → water retention and ↑ fluid → ↑ BP

Historical review

- 1904 French doctors: 6 of their subjects who had high BP were salt fiends.
- 1970s **Dahl : salt causes hypertension**: he induced high BP in rats by feeding them the human equivalent of 500 gm of Na a day.

Shocking news:

Bernstein and Willett, 2011 :

Despite our sodium intake has been stable at ~ 3,500 mg Na / day (9.1 g salt) for the last 50 years the prevalence of hypertension had been increased which appears to disbelieve any link between salt intake and hypertension

- “we CONSUME a far lower level than ever before, in recorded history Military records during WW11 (both soldiers and prisoners consumed ~18 - 20 g of salt per day).



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It's Time to End the War on Salt

The zealous drive by politicians to limit our salt intake has little basis in science

By Miranda Warner Mayer on July 8, 2012



Unexpectedly!

- ***meta-analysis of seven studies*** involving a total of **6,250** subjects in the *American Journal of Hypertension* **found no strong evidence that cutting salt intake reduces the risk for heart attacks, strokes or death in people with normal or high blood pressure.**
- European researchers publishing in the *Journal of the American Medical Association* :**the less sodium that study subjects excreted in their urine**—an excellent measure of prior consumption—**the *greater* their risk was of dying from heart disease?????**

Salt DOESN'T cause high blood pressure, new study claims



- Study of more than 8,000 French adults found no link between salt consumption and high blood pressure
- 30 per cent of people in England and the U.S. suffer hypertension - high blood pressure, the most prevalent chronic disease in the world
- Researchers found body mass index (BMI) had the greatest impact on systolic blood pressure levels

By [LIZZIE PARRY FOR MAILONLINE](#)

PUBLISHED: 15:03 GMT, 11 September 2014 | **UPDATED:** 15:03 GMT, 11 September 2014

Debate was since ever about salt and hypertension:

- large study published in 1988, compared Na intake with blood pressure in subjects from 52 international research centers and found **no relationship between sodium intake and the prevalence of hypertension.**

- **In 2004** the Cochrane Collaboration, published a review of **11 salt-reduction** trials. Over **the long-term**, low-salt diets in healthy people reduce SBP by **1.1** (mmHg) and DBP by **0.6** mmHg
- The review concluded that "**intensive reduction of salt intake, provide only minimal reductions in blood pressure during long-term trials.**"
-

On the other hand:

RECOMMENDATIONS OF SALT INTAKE CONTINUED:

- **In 2005**, the [U.S. Department of Health and Human Services](#) recommended that adults in the U.S. consume no more than **2300** mg of sodium per day (5.8 grams of salt). Additionally, people in specific groups (those 51 years of age or older, people with high blood pressure, diabetes, kidney disease and adults of African American ethnicity should) consume only **1500** mg
- [AHA](#), the [WHO](#) and the government of England and Wales have made similar recommendations to reduce dietary sodium.

- **2006** *American Journal of Medicine editorial*: daily sodium intakes of 78 million Americans to their risk of dying from heart disease over the course of 14 years. **It found that the more sodium people ate, the less likely they were to die from heart disease.**
- **2007** study published in the *European Journal of Epidemiology* followed 1,500 older people for five years and **found no association between urinary sodium levels and the risk of coronary vascular disease or death**

Possible explanation:

- **the 2010 [Dietary Guidelines for Americans](#)**: the number of people who experience \uparrow in BP after eating high-salt diets \sim the number who experience BP spikes
- Explained by Michael Alderman president of the International Society of Hypertension

Human kidney is made, by design, to vary the excretion of salt based on the amount you take



Myth 6: Salt is bad for you



Old but gold :

- **DR Channing** and his group, back in **1982** made a study comprised **10,079** in 32 countries **lasted 6 years**

Remarkable discovery was made...

- It was found that a tiny, isolated tribe living in northern Brazil had **ZERO** cases of hypertension.

- **Dr Channing** spent the next 3 years studying their diet, **discovered that higher protein diets with high fiber intakes led to a massive reduction in high blood pressure risk**
- **Dr Channing** also discovered that their diet rich in **Coenzyme Q10**, which is found in cold-water fish like salmon, tuna and herring, as well as dark leafy greens, nuts, shellfish, pork, chicken and beef

Salt sensitive vs. salt resistant individuals:

- Salt sensitive individual (NON MODULATORS) tend to have ↓ in BP during salt depletion and ↑ in BP during salt repletion
- Salt sensitive individuals usually have renal troubles/DM/ old age/obese

High-Salt Diet and Hypertension: Focus on the Renin-Angiotensin System

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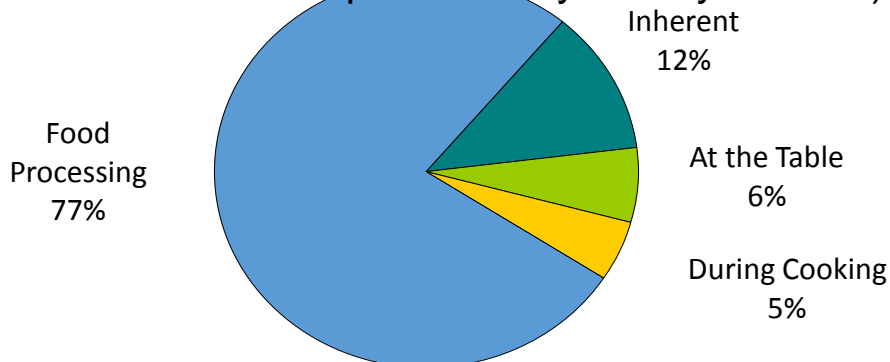
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Clinical pearls

- **Some patients of HTN experience immediate or late diminished response to ACE inhibitors drugs, that's because what's called (ACE escape)**
- **Sometimes when you advise your patient to reduce salts, he experience sudden unexpected drop in BP, he is one of salt sensitive individuals**

Sources of Dietary Sodium

(62 adults who completed 7 day dietary records)



Mattes and Donnelly, JACN, 1991; 10: 383 – From a presentation given by Dr. Lawrence Appel to FDA on November 29, 2007.

TAKE HOME MESSAGE:

- **Don't forget to** advise your patient at high risk of hypertension to **eat more meat more fiber diet more salmon, tuna and herring, as well as dark leafy greens, nuts, shellfish, pork, chicken and beef,**
- Controlling **BMI** is also a clue to solve the problem
- Advise your patients **not to** eat much processed food
- **DASH** diet is of value in patient at risk hypertension

Don't forget to read:

Nutrition Facts	
Serving Size 1 cup (236ml)	
Servings Per Container 1	
Amount Per Serving	
Calories 80	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol Less than 5mg	0%
Sodium 120mg	5%
Total Carbohydrate 11g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 9g	17%
Vitamin A 10%	Vitamin C 4%
Calcium 30%	Iron 0%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	

