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Studies support population-based efforts to lower excessive dietary sodium intakes

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Recent studies that examine links between sodium consumption and health outcomes support recommendations to lower sodium intake from the very high levels some Americans consume now, but evidence from these studies does not support reduction in sodium intake to below 2,300 mg per day, says a new report from the Institute of Medicine.

Despite efforts over the past several decades to reduce dietary intake of sodium, a main component of table salt, the average American adult still consumes 3,400 mg or more of sodium a day – equivalent to about 1 ½ teaspoons of salt. The current Dietary Guidelines for Americans urge most people ages 14 to 50 to limit their sodium intake to 2,300 mg daily. People ages 51 or older, African Americans, and people with hypertension, diabetes, or chronic kidney disease – groups that together make up more than 50 percent of the U.S. population – are advised to follow an even stricter limit of 1,500 mg per day. These recommendations are based largely on a body of research that links higher sodium intakes to certain "surrogate markers" such as high blood pressure, an established risk factor for heart disease.

The expert committee that wrote the new report reviewed recent studies that in contrast examined how sodium consumption affects direct health outcomes like heart disease and death. "These new studies support previous findings that reducing sodium from very high intake levels to moderate levels improves health," said committee chair Brian Strom, George S. Pepper Professor of Public Health and Preventive Medicine at the University of Pennsylvania Perelman School of Medicine. "But they

also suggest that lowering sodium intake too much may actually increase a person's risk of some health problems."

While cautioning that the quantity of evidence was less-than-optimal and that the studies were qualitatively limited by the methods used to measure sodium intake, the small number of patients with health outcomes of interest in some of the studies, and other methodological constraints, the committee concluded that:

- evidence supports a positive relationship between higher levels of sodium intake and risk of heart disease, which is consistent with previous research based on sodium's effects on blood pressure;
- studies on health outcomes are inconsistent in quality and insufficient in quantity to conclude that lowering sodium intake levels below 2,300 mg/day either increases or decreases the risk of heart disease, stroke, or all-cause mortality in the general U.S. population;
- evidence indicates that low sodium intake may lead to risk of adverse health effects among those with mid- to late-stage heart failure who are receiving aggressive treatment for their disease;
- there is limited evidence addressing the association between low sodium intake and health outcomes in population subgroups (i.e., those with diabetes, kidney disease, heart disease, hypertension or borderline hypertension; those 51 years of age and older; and African Americans). While studies on health outcomes provide some evidence for adverse health effects of low sodium intake (in ranges approximating 1,500 to 2,300 mg daily) among those with diabetes, kidney disease, or heart disease, the evidence on both the benefit and harm is not strong enough to indicate that these subgroups should be treated differently from the general U.S. population. Thus, the evidence on direct health outcomes does not support recommendations to lower sodium intake within

these subgroups to or even below 1,500 mg daily; and
- further research is needed to shed more light on associations between lower levels of sodium (in the 1,500 to 2,300 mg/day range) and health outcomes, both in the general population and the subgroups.

The report does not establish a "healthy" intake range, both because the committee was not tasked with doing so and because variability in the methodologies used among the studies would have precluded it.

The recent studies suggest that dietary sodium intake may affect heart disease risk through pathways in addition to blood pressure. "These studies make clear that looking at sodium's effects on blood pressure is not enough to determine dietary sodium's ultimate impact on health," said Strom. "Changes in diet are more complex than simply changing a single mineral. More research is needed to understand these pathways."

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