

Table 4. Time Trade-off Utilities of Different Medical Diseases

Health State	Utility
Atrial fibrillation, nonvalvular, receiving warfarin	0.98
Minor stroke	0.89
Breast cancer	0.89
Myocardial infarction	0.87
Complete impotence	0.85
Diabetes type I	0.84
Breast cancer, lumpectomy, good physical and mental health	0.75
Edentulous in 1 or both jaws	0.73
Asymptomatic HIV infection	0.69
Angina pectoris	0.69
Tuberculosis, hospitalized, 3 mo	0.6
End-stage renal disease	0.56
Breast cancer, mastectomy	0.48
Osteoarthritis, hip, moderate, hip replacement, 6 mo after surgery	0.44
Depression, 3 mo	0.44
Poorest imaginable oral health state	0.43
Major stroke	0.3

Tengs and Wallace (2000).

Bold rows indicate states featured in the present article.

(Courtesy of Sendi P, Oppliger N, Chakroun F, et al: Health state utilities in edentulous patients: A time trade-off approach. *JDF Clin Translational Res* 3:346-353, 2018.)

Stepwise regression analysis indicated that sex was the only variable that was associated with the utility score. Women tended to rate their oral health state utility an average of -0.18 lower than

men. Length of time the patient was edentulous did not affect TTO score.

DISCUSSION

The majority of these edentulous patients were willing to trade life years for optimal oral health and even more willing when they considered a worse oral health state. Women in the study group assigned a lower health state utility to their oral health condition than men did.

Clinical Significance

Medical disorders can significantly diminish the quality of life for patients. Quality of life also appears to be susceptible to the effects of poor oral health, such as being edentulous. This evaluation underscores the important contribution of oral health to patients' quality of life and shows how it can be compared to results related to medical health status.

Sendi P, Oppliger N, Chakroun F, et al: Health state utilities in edentulous patients: A time trade-off approach. *JDF Clin Translational Res* 3:346-353, 2018

Reprints available from P Sendi, Inst for Clinical Epidemiology and Biostatistics, Spitalstrasse 12, 4031 Basel, Switzerland; e-mail: Pedram.Sendi@unibas.ch

FLUORIDATION

Supporting community water fluoridation



BACKGROUND

Community water fluoridation was addressed in a policy statement by the American Association for Dental Research (AADR). It has been found to be safe and effective in preventing dental caries in both children and adults. The specific areas addressed in the statement on community water fluoridation included a detailing of the problem of dental caries, the effects of community water fluoridation on dental caries, the cost-effectiveness of this intervention, and any adverse effects associated with fluoridation of community water supplies.

DENTAL CARIES

Children and Adolescents

Dental caries is characterized by the destruction of the dental hard tissues and causes pain, infection, and loss of teeth. Caries results from the bacterial fermentation of sugar, which creates acidic by-products that attack the dental tissues. The primary teeth are affected in more than a third of children age 2 to 8 years, and the permanent dentition becomes carious in 20% of those age 6 to 11 years and more than half of adolescents age 12 to 19 years. Children with poor oral health are more likely to develop problems that cause them to miss school and have

poor academic performance. In addition, children with caries can experience embarrassment, withdrawal, difficulty eating and sleeping, and suffer from limited facial expressions and behaviors related to social interactions.

Adults

Adults can also develop caries in their teeth when they are not exposed to water fluoridation. Older adults can expect to have about 1 new decayed tooth surface each year. They can also experience the diminished quality of life seen in children and adolescents.

EFFECTS OF FLUORIDATION

The effectiveness of fluoridation has been documented in many studies. Cochrane conducted a systematic review of 20 studies that showed water fluoridation decreased tooth decay in both the primary and permanent dentition in children and increased the number of children free of caries in both sets of teeth. However, the authors of this review rated the evidence collected as low quality, with many studies done before 1975. Randomized trials, which would provide a higher quality of evidence, are not usually feasible for population-level interventions, so it may be difficult to increase the level of evidence found.

The Community Preventive Services Task Force (CPSTF) found that water fluoridation begun in children age 5 to 17 years decreased caries by 30% to 50%. When water fluoridation was discontinued, caries increased by 18% in these children. The benefits associated with fewer caries and less severe caries extend into adulthood and are related to halting the progression of oral disease. Adults who consume fluoridated water throughout their lifetime demonstrate reduced tooth decay as well.

Community water fluoridation can also reduce disparities related to access to oral health care. Children and adults who are socioeconomically disadvantaged are more likely to develop dental disease and less likely to receive treatment. When fluoridated water is delivered to a community, it does not distinguish between privileged and socioeconomically disadvantaged populations but delivers the same caries-preventive action to all who drink the water.

COST-EFFECTIVENESS AND SAFETY OF FLUORIDATION

The cost of fluoridation is far less than the cost associated with dental restorations. The larger the community, the greater are the cost savings realized for water fluoridation.

ADVERSE EFFECTS

Community water fluoridation is safe, with no significant or consistent associations between fluoridation and various adverse outcomes that have been claimed for it. These include neurologic conditions, cancer, and osteoporosis. The only adverse health effect of water fluoridation that has been clearly documented is dental fluorosis. The teeth at risk for this problem are in children less than age 8 years, during the period when enamel is formed. The US Public Health Service recommends that fluoride concentrations of 0.7 mg per liter of water be delivered to achieve caries preventive effects and minimize the risk for dental fluorosis. Studies indicate that most people who drink fluoridated water do not develop fluorosis, and those who do tend to have discoloration that is not visible to the naked eye and demonstrate no compromised function. Only rarely does a severe case of fluorosis develop, and it is unproved that fluoridated water is clearly the cause, with other sources of fluoride, such as toothpaste, supplements, and food and beverages prepared with fluoridated water, seen as possible contributors to the problem.

Clinical Significance

Support for community water fluoridation has been expressed by many groups, including the American Association of Public Health Dentistry, the American Public Health Association, the American Dental Association, and the American Academy of Pediatrics. The Centers for Disease Control and Prevention (CDC) identified water fluoridation as 1 of 10 great public health achievements made in the 20th century because of its effectiveness and its ability to distribute fluoride both equitably and cost-effectively. The AADR supports community water fluoridation and recommends the 0.7 mg level of fluoride per liter of water as both effective and safe.

Ajiboye AS, Dawson DR III, Fox CH, et al: American Association for Dental Research policy statement on community water fluoridation. *J Dent Res* 97:1293-1296, 2018

Reprints available from AS Ajiboye, American Association for Dental Research, 1619 Duke St, Alexandria, VA 22314-3406; e-mail: sajiboye@iadr.org