Summary for Australian Dental Journal, 2008, 53: 302-305

# The role of alcohol in oral carcinogenesis with particular reference to alcohol-containing mouthwashes

1. MJ McCullough[1] and
2. CS Farah[2]

## Overview

Worldwide, oral cancer represents approximately 5 per cent of all malignant lesions, with over 800 new intra-oral squamous cell carcinomas registered in Australia each year. Despite recent advances in therapy, the five-year survival rate remains around 50 per cent and the sequelae of treatment can be seriously debilitating. It has been long established that smoking and alcohol consumption are risk factors linked to the development of oral cancer. This review assesses the epidemiological evidence, supportive *in vitro* studies and mechanism by which alcohol is involved in the development of oral cancer. Further, we review the literature that associates alcohol-containing mouthwashes and oral cancer. On the basis of this review, we believe that there is now sufficient evidence to accept the proposition that alcohol-containing mouthwashes contribute to the increased risk of development of oral cancer and further feel that it is inadvisable for oral healthcare professionals to recommend the long-term use of alcohol-containing mouthwashes.

## The association between alcohol-containing mouthwash and oral cancer

Alcohol is used in mouthwashes principally as a solvent for other ingredients. However, at 10–12 per cent it also acts as a preservative, antiseptic and caustic agent.[20] In addition to the above mentioned effects on mucosal permeability and metabolic production of acetaldehyde, studies have shown that high concentrations of alcohol in mouthrinses may have detrimental oral effects such as epithelial detachment, keratosis, mucosal ulceration, gingivitis, petechiae and oral pain.[21] Bernstein *et al.* reported the presence of diffuse white oral mucosal lesions with long-term use of an alcohol-containing mouthwash.[22] Some commercially available mouthwashes and their alcohol content are outlined in Table 1.

**Table 1. Alcohol content of some commercially available mouthwashes**

| Mouthwash | Ethanol concentration (%) |
|---|---|
| Listerine Antiseptic | 26 v/v |

**Table 1. Alcohol content of some commercially available mouthwashes**

| Mouthwash | Ethanol concentration (%) |
|---|---|
| Listerine Teeth Defence | 22 v/v |
| Listerine Cool Mint | 22 v/v |
| Listerine Tartar Control | 22 v/v |
| Listerine Citrus Fresh | 22 v/v |
| Listerine Smooth Mint | 21.6 v/v |
| Cepacol Mint | 15 v/v |
| Cepacol | 14 v/v |
| Savacol Original | 11.5 w/v |
| Savacol Freshmint | 9.5 w/v |
| Listerine Whitening | 8 v/v |
| Difflam Solution | 7.5 w/v |
| Difflam-C Solution | 7 w/v |
| Neutrafluor 220 | 7 w/v |
| Plax | 6 w/v |
| Peroxyl | 5.5 w/v |
| Neutrafluor 900 | 5 w/v |

## Conclusions

There is now sufficient evidence to accept the proposition that developing oral cancer is increased or contributed to by the use of alcohol-containing mouthwashes. …. It is the opinion of the authors that, in light of the evidence currently available of the association of alcohol-containing mouthwashes with the development of oral cancer, it would be inadvisable for oral healthcare professionals to recommend the long-term use of alcohol-containing mouthwashes.