Cervical dentinal hypersensitivity (CDH) is one of the most common complaints which arises in adult patients in general dental practice. It is a particular issue in patients who have undergone periodontal therapy and have subsequently been placed on a maintenance program, since sensitivity may be exacerbated following a maintenance visit because of the removal of cementum and dentine by hand or powered scalers.

Strategies to reduce cervical dentinal hypersensitivity generally focus on one of two targets: the dental pulp or the tooth surface, and in particular for the latter the patency of the dentine tubules on that surface. For cervical areas of the root surface to become sensitive, they must be exposed to the oral environment. A range of processes can lead to this exposure, including aggressive toothbrushing, gingival recession and periodontal surgery. Once the dentine tubules have become exposed, microscopic fluid movements can trigger reactions from the nerves which approximate the odontoblasts. The types of stimuli which can trigger cervical dentinal hypersensitivity include changes in temperature, mechanical stimuli (such as toothbrushing, using interproximal cleaners or wooden sticks) and acidic or intensely flavoured foods.

Occluding strategies
With regards to over-the-counter or professional products which may be used for patients to reduce cervical dentinal hypersensitivity, there is an abundant literature regarding the possibility of reducing the diameter of the exposed dentine tubules. Because the fluid flow through a dentine tubule is not proportional to the radius, but to the radius raised to the fourth power, it is not necessary to block a dentinal tubule completely in order to prevent fluid flow down the tubule itself. Partial blockage can be achieved through abrasive

Figure 1. Dentine hypersensitivity due to dental erosion from subclinical dehydration from exercising activity at work or during recreation.
particles contained within toothpaste, for example, zirconium silicate and other materials.

The deposition of mineral in the dentinal tubule can also achieve a full or partial block and therefore reduce fluid flow. Agents which can achieve this include those which can react to form mineral precipitates. For example, high concentration fluoride products (e.g. neutral sodium fluoride gel and fluoride varnishes) form precipitates of calcium fluoride and because of their low solubility, these can provide partial blocking of the dentinal tubules. Strontium compounds can have similar occluding actions. Aggregations of protein can be created by agents which have a protein fixative effect, such as glutaraldehyde, a component included in some desensitizing products.

Physical blockage of tubules can also be achieved by the application of low viscosity, hydrophilic adhesives to the tooth surface, e.g. many dentine bonding agents and some flowable composites have this property. Over a period of time, hydrolysis of the interaction zone between these resin materials and the dentine may occur, a phenomena designated as "nano-leakage". Once this begins to occur, the sensitivity problem may recur as fluid movement once again is able to commence.

Other approaches to the management of cervical dentinal hypersensitivity, which are focused on the surface approach, include those which utilize not one but several mechanisms to block the tubules. An example of this is the application of Tooth Mousse or Tooth Mousse Plus, where the Recaldent protein

Figure 2. Sensitive exposed dentine due to undiagnosed gastro-esophageal reflux.

"I recommend they use Sensodyne twice a day, every day."

Dr. Susan Gibbs, Strathpine, QLD.