





Bisphenol A Released from Resin Based Dental Sealants

Abstract

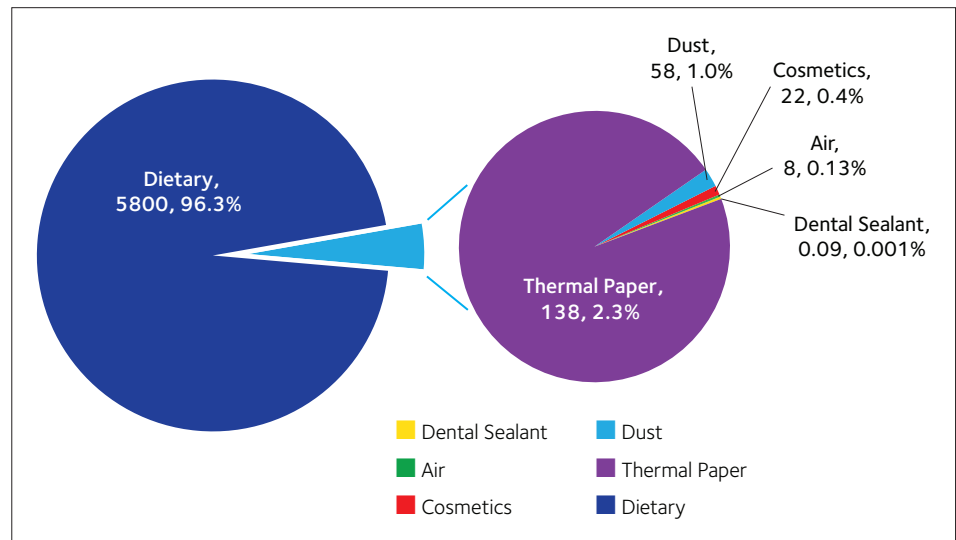
Dental sealants are used successfully to prevent occlusal caries. Modern dental sealants penetrate the pits and fissures present on the occlusal surface of molars, allowing dentists to avoid drilling into healthy enamel. Dental sealants also are able to arrest caries progression when placed onto incipient caries, preventing future invasive restorative procedures. Resin-based sealants composed of bisphenol A glycidyl methacrylate (bis-GMA) monomer use bisphenol A (BPA) during the manufacturing process. Bisphenol A has been detected at trace levels on composite resin materials including dental sealants. A variety of adverse effects associated with exposure to BPA have been reported. The US Environmental Protection Agency (EPA) established an exposure level of 50,000 ng/kg body weight/day, which is equivalent to 1,000,000 ng/day for a 6-year-old child, weighing 20 kg.

This report from the Science Institute at the American Dental Association (ADA) demonstrates extremely low BPA release of 0.09 ng associated with the application of four dental sealants. By comparing the overall

daily exposure to BPA estimated at 6020 ng/day by the European Food Safety Authority associated with different sources, we found that the contribution from dental sealants is limited to 0.001% when measured after 24h. Further analysis reveals that the BPA exposure from dental sealants (0.09 ng) is 100x lower compared to the exposure associated with BPA present in air (8ng/day). The current results support the data published in 2014 and 2015 issues of the ADA Professional Product Review indicating limited release of BPA from a variety of resin-based dental materials. Our conclusion is that BPA levels in 12 dental sealants evaluated in this report are far below the daily exposure level set by the US EPA. The ADA will continue to monitor dental materials periodically, addressing a variety of concerns relevant to the oral health community.

-  BPA has been detected at trace levels on dental sealants
-  The US Environmental Protection Agency (EPA) established an exposure level of 50,000 ng/kg body weight/day
-  BPA exposure from dental sealants is 0.09 ng and is 100x lower compared to the exposure associated with BPA present in air (8ng/day)
-  BPA levels in dental sealants evaluated in this report are well below the daily exposure level set by the US EPA

Daily BPA Exposure 6-year-old child (source, ng, %)



Daily BPA exposure estimated to a 6-year-old child from a variety of sources based on the European Food Safety Authority (2015). The application of four dental sealants would represent 0.001% of the estimated BPA exposure following the first 24h.