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Feature

OR Noise: The Potential for Hearing Loss

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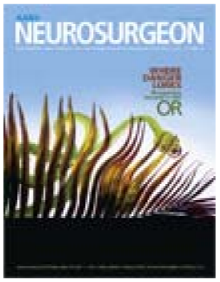

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With the use of the electric or air-powered drill in cranial or spinal procedures comes the potential for hearing loss among operating team members. Exposure to loud noise can result in sensorineural hearing loss, and this loss is a function of sound pressure levels and duration of exposure.

Much research has been done regarding the impact of noise-creating devices on patient and user safety in the field of neuro-otology (1, 6). Michaelides and Kartush measured peak and impulse sound pressure levels one centimeter away from their application in the temporal bone in a variety of otologic instruments, including lasers (potassium-titanyl-phosphate, erbium, and carbon dioxide) and drills (microdrill and pneumatic) (4). Only the erbium laser and air-powered cutting drills had impulse and peak sound pressure levels of greater than 100 A-weighted decibels, dBA. Kylen and colleagues found that the noise levels were influenced primarily by the size of the burr; diamond burrs generated less noise than cutting ones and variations in rotation speed had only a slight influence on the noise levels produced (2). Prasad and Reddy recently tested a variety of bone drills and microdebriders used in otolaryngological surgery and found them all to be safe, posing no occupational hazard to the user (7).

The results of several studies have shown elevated noise above safe levels during orthopedic procedures. In one early study, the authors found that the noise generated by various air-powered and electric tools exceeded the recommended levels, and hearing loss was present in half of senior orthopedic staff at that particular facility (9). The results of more recent studies have continued to demonstrate intermittent high levels of instrument-generated noise (above the recommended limits of 110 dBA) in the orthopedic surgical suite, but it is this intermittent nature that probably protects against hearing loss, speech discrimination difficulties, and tinnitus (3, 5, 8).

To date, no studies have been undertaken to evaluate noise levels generated during spine or cranial -neurosurgical operations; however, one can assume that this risk is small but probably real. Neurosurgeons tend to use instruments that make less noise than those used in orthopedic procedures such as total joint replacement. Although neurosurgeons do use the drill for significant periods of time, drill manufacturers are now cognizant of the risk to hearing, and contemporary drills are quieter in operation.

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