

## Effects of Noise Contribute to Physicians' Challenges

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Goines and Hagler<sup>1</sup> correctly point out that noise is exceptionally common and not just an annoyance. It imposes on rights guaranteed to US citizens. In this regard it is no different from air and water pollution which are unarguably necessary to regulate to safeguard human health.

However, noise is not the usual pollutant because it operates in two ways. Sound energy damages nerve cells in the cochlea producing hearing loss especially at high frequencies (the auditory or aural effects of noise exposure), making it like other pollutants that cause damage directly to cells. However, noise pollution is distinctive in that it is energy that the brain can perceive as information, particularly as a threat. This stimulates systemic responses that when overactivated become injurious (the nonauditory effects). The information content of noise is an assessment made by an individual with personal likes and dislikes. What one person deems unnecessary and unwanted may not be for others (eg, the loud car stereo).

This dual mode of action makes it both interesting and troublesome for researchers. Sound must be interpreted to be perceived as noise and thus the systemic effects are affected by personal preferences. This makes the scientific study of its effects much more difficult. Insofar as regulation is based on scientific information, this difficult-to-study aspect can be a hindrance to the development of sound regulations. It is not this difficulty alone that has slowed the regulation of noise to reduce its harmful effects on health and the social fabric.

Why have we backed off regulation to control this hazard? Certainly the politics of the early 1980s played a large part, but other factors pertain. Noise is commonplace and has been for centuries as Goines and Hagler summarize, and as a familiar feature it does not fit the cultural myth of a new, unnatural technology that threatens human nature and has to be controlled (ie, radiation, cloning, pesticides, polycyclic aromatic hydrocarbons, or phthalates). People may think one can become accustomed to noise because it is so common. (If that were true, occupational noise exposure would not be a danger.) This may be a case of familiarity breeding contempt and complacency. In addition, the contributors to noisy en-



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vironments are not only large industries whose outputs can be controlled at the source like air pollution from power plants, but include individuals as well. Many of us contribute to the noise level at one time or another, making regulation more intrusive and possibly involving personal sacrifice from time to time.

Our evolutionary history has not prepared us well for chronic, loud noise. Human adaptation to anthropogenic (aka man-made) environments is questionable. The evolutionary history leading to humans was devoid of many of the exposures commonplace today. Urban life which involves most elements of the anthropogenic environment arose less than 10,000 years ago—a blink of evolutionary time. It is unlikely that we are especially well equipped through evolutionary preparation to adapt to these exposures.

To maintain a healthful environment, whether urban, suburban or rural, noise production must be brought under some measure of control. Until it is, physicians can help prevent exposures by providing information to all age groups about the dangers of noise exposure, as described by Goines and Hagler.

The impact of noise on the practice of many physicians is not trivial. As we live longer now, a larger portion of our lives are lived in the older years when damage from earlier noise exposure was influential. The cumulative effects of noise exposure will contribute to poor cardiovascular health and hearing loss. Impeded communication thins the social network that is so important to the health of the elderly. The resulting social isolation will produce downstream effects on health that will settle in physicians' waiting rooms.

### Reference

1. Goines L, Hagler L. Noise pollution: a modern plague *South Med J* 2007;100:287-294.

Please see "Noise Pollution: A Modern Plague" on page 287 of this issue.

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