

A novel measure of sleep depth and sleep fragmentation by noise: The Odds Ratio Product

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Nocturnal noise exposure has established effects on subjective sleep disturbance, and chronic exposure is associated with cardiovascular disease and metabolic disorders that are also linked with restricted and fragmented sleep. However, the effects of nocturnal noise on sleep macrostructure are often found to be minimal. Classical sleep scoring, the rules for which have origins in the 1960's when EEG traces were plotted on paper, may not capture short duration yet potentially biologically relevant changes in sleep activity induced by noise. Here we present laboratory data ($n=72$; 10 nights each) on the effects of traffic noise on sleep, assessed using a recently-developed measure of electrophysiological sleep depth, the Odds Ratio Product (ORP). Results demonstrate the usefulness of ORP as a measure of the effects of external stimuli on sleep, and afford deeper insights into noise-induced sleep disruption than are possible using traditional methods of sleep analysis.