

Personal View

In occupational medicine a basic science degree in physics or chemistry has often proved to be a valuable asset in determining the doctor's future career and research projects. The chemist is a valuable adviser in a factory manufacturing toxic chemicals. The physicist with a mathematical background gravitates to the "physical agents" of the factory environment such as noise and vibration. In 1960 I found myself "typed" into noise with special emphasis on "neighbourhood" noise where discotheques and places of night entertainment cause night nuisances requiring noise pollution surveys and subsequent litigation. I became dictatorial in my condemnation of annoyance, distraction, and sleep disturbance affecting innocent, helpless neighbours.

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In 1985 in the course of the first night in a comfortable modern hospital I encountered yet another noise pollution problem. Around 3 00 am there was a conversation in full swing centred on the ward's nursing station. Descriptions of the city's latest films and shopping centre bargains were broadcast loud and clear to surrounding wards interspersed with telephone bells from outside and inside the hospital. My acoustic mind registered impact components around 80-85 dB(A) from crockery being washed and subsequently stacked in metal grids on mobile trolleys. These were then run on hard plastic tiles with a continuous output around 85 dB(A) but for a raised expansion joint stretching across the corridor when the trolley bounced on take off and landing. No Florence Nightingale attempted to control the sudden rise in the acoustic signal—the largest in the night spectra. Regulations forbid ward and single room doors to be closed and so direct sound pathways were the order of the night. If we must have such hard acoustic propagating floors we could easily silence the trolley and at the same time provide an issue of silent footwear for the night staff. I am now awake listening for "hammer" from water mains noise, lift noise, and toilet flushing noise, but these have been efficiently controlled at the design stage with the exception of the sluice room located across the corridor with open door and centrifuges as near the patients as the designer could get.

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A three week hospital stay has convinced me that noise, while not contributing to permanent health effects, has no place in a healing

and comforting environment. In the past there have been technical difficulties associated with all neighbourhood noise measurements first in expressing noise ceilings in terms of a single figure (the "A" weighted decibel) and more recently the equivalent continuous sound level Leq. Now, in the 1980s, there are instruments especially designed to give single integrated number ratings over eight hour intervals for seven days thus ensuring a representative sample. These have not been used in hospitals since operation and interpretation will require technical assistance to extract the maximum data. Intermittent and impact noise spectra can now be handled with ease. For hospital wards noise levels of 45 dB(A) Leq eight hours (by day) and 35 dB(A) Leq eight hours (by night) are recommended. To avoid sleep arousal a value of 10 dB(A) higher than these background levels should not be exceeded. Without special efforts it is most difficult to achieve such low recommended values. Hospital managements should know their own day and night measurements for comparison.

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In our new hospital designs central nursing stations, while improving communications, create a central noise source emitting through 360°. If sub kitchens are also incorporated in the design the trolley meal service constitutes a major noise source. In the past noise from patients has been difficult to control and to quantify, but my recent superficial experience indicates a marked improvement in this area due to reduction in ward size, the provision of single rooms, and more efficient therapeutic control of patients. This being my first long stay in hospital I was impressed with the ward design features and mechanical aids. The effort and enthusiasm evident in the wards has not been extended by way of noise abatement programmes in which ward staff, hospital designers, architects, and engineers should have been actively concerned at the hospital design stage.

I did not complain—it seemed an ungracious act in view of the dedicated nursing care, the medical skills, and the material comforts bestowed on a retired medical teacher not knowing the meaning of ill health.

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