Indoor+Built Environment

William R. Jarvis (ed.)

Nosocomial Pneumonia

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Nosocomial pneumonia – pneumonia acquired in hospital – is a major cause of morbidity and mortality (the primary or contributory cause of at least 30,000 deaths each year in the US). The costs associated with these infections are substantial – well in excess of $1 billion each year in the US alone.

This monograph, to which 18 authors (14 from North America) have contributed, places considerable emphasis on the prevention of nosocomial pneumonia. It is, therefore, particularly disappointing to report that several of the chapters that deal with this topic fell short of this reviewer's expectations.

For example, there is an overly long chapter on selective decontamination of the digestive tract (SDD). This is a controversial concept which is underpinned by the premise that colonisation of the stomach and oropharynx by pathogenic bacteria precedes the development of ventilator-associated pneumonia (VAP). The advocates of SDD claim that eradicating bacteria from these sites can prevent VAP. Much evidence from, often flawed, studies is reviewed, before coming to the conclusion that there is no basis for the use of SDD in routine clinical practice. This is hardly novel: official guidelines from the US Centers for Disease Control made this same recommendation in 1994. Moreover, SDD is also reviewed in an earlier chapter on prevention of nosocomial pneumonia which, again, arrives at the same conclusion. Another chapter deals with immunoprophylaxis and immunomodulation. However, this focuses almost exclusively on pneumococcal pneumonia and influenza – infections that are far more likely to be acquired in the community than in hospital.

The section on nosocomial pneumonia in neonatal and paediatric intensive care units is overly long and repetitive – we are told on no less than four occasions that legionellosis is rare in children. It also contains some contentious statements, e.g. that *Chlamydia psittaci* is a cause of nosocomial pneumonia (acquired from the ward parrot, perhaps?). Some of the treatment recommendations given in this section are also difficult to understand. For example, a combination of an aminoglycoside and rifampicin is recommended for infections caused by *Stenotrophomonas maltophilia,* agents to which this bacterium is nearly always resistant. Another chapter, devoted to the antimicrobial therapy of nosocomial pneumonia, is similarly disappointing, with the names of agents consistently misspelled and recommendations made for the use of drugs which have already been withdrawn from clinical use because of unacceptable toxicity.

Is there much in the book of interest to the hospital engineer? The most promising chapter in this respect would appear to be one on the operating theatre. Unfortunately, much of this section is concerned with the incidence of, and risk factors for, postoperative pneumonia – topics already covered in an earlier chapter – before devoting a few pages to anaesthesia-related topics.

Nevertheless, some sections of this book are of much more value to the reader. The chapter on the diagnosis of VAP is a balanced, yet authoritative, review of this controversial topic by authors with much experience in this field. There are also interesting and well-written sections on the surveillance of nosocomial infection, cost-effective strategies for its prevention, including the role of continuous quality improvement programmes. These chapters notwithstanding, it is difficult to recommend this book as an introduction to nosocomial pneumonia and the interested reader is advised to look elsewhere.

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Airborne Particles: Exposure in the Home and Health Effects

MRC Institute for Environment and Health, Leicester 2000
105 pp.; £15.00
ISBN 1–899110–33–X

It was with mixed feelings that I received this book for review. On the one hand I was pleased to see it published, because I had played a small part in its inception, but on the other sad, because it revived memories of a friend and colleague, Dr. Graham Patrick, who was another of the scientists whose discussions shaped the book. Graham died suddenly a few months before its publication. He was one of the UK's most eminent non-clinical scientists working on clearance of particles from the lung, and I was pleased to see that the book has been dedicated to his memory.

This is very much a British book in its outlook and so a welcome addition to a literature dominated by American and pan-continental studies most of which, incidentally, are concerned with the outdoor air. There is a serious lack of information on indoor air quality in the UK although the IEH with others are seeking to redress this. The book is the final outcome of a workshop held at the IEH to discuss airborne particulates indoors. It is well produced and full of information. As a participant at the workshop, I know it properly reflects the discussions that were held. Nothing is perfect but I had to search for the niggles. I think the WHO definition of particulate matter as a concentration could have been better stressed and the difference between primary and secondary pollutants spelt out. If speciation turns out to be important, then this difference is too. I do not understand why emasculating the abbreviations for anions (p. 29) by removing their charge was done particularly as little use was made of the results and sulphate and nitrate are written en clair later in the book. Small things: only a pedant, or an editor, would whine at these details.

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Up to now most studies of indoor air have been concentrated in developing countries. This is because in recent years it has become clear that indoor air pollution in these countries from the use of open fires for cooking and heating poses a serious health problem. The WHO estimates that about 2,800,000 people die annually from exposure to high concentrations of suspended particulate matter in the indoor environment. However, in the developed world there is a scarcity of monitoring results from the indoor environment and it is not surprising there have been few studies of indoor air in the UK. This is not because there is no problem: the UK is as polluted a country as most others. The OECD (1995) puts our annual airborne particulate load at 444,000 tonnes – a very big pile of dirt indeed.

Although the indoor environment is driven by the outdoor environment, it may also contain pollutants that are largely specific to enclosed spaces. The combustion products from heating and cooking have already been noted but there is also environmental tobacco smoke (ETS) – the subject of a promised future volume – and a complex mix of biologically derived materials. Whether this deconstruction of the pollution mix is scientifically justified we do not know at present. There may be an argument for the biological material but the particulates from combustion must be considered together else those excluded will be confounders. This is not the same as considering the effect of specific point sources, usually ETS. Since, in this book, the concern with pollution is its effect on people, it was good to find one particular aspect of this as fully covered as the sparse literature allows. Personal exposure may be very different to the exposure received by a fixed monitor and only now is this starting to receive adequate study. Unfortunately, nearly all the studies of personal exposure in people's homes are American, none are British. Not that this really matters since the important point to determine is what governs the interrelationships between indoor, outdoor and personal exposures.

Most of the book is concerned with health effects, the major reason for undertaking research into airborne particulates. Epidemiological studies have consistently shown an association between particulate air pollution and not only exacerbation of illness in people with respiratory disease but also rises in the numbers of deaths from cardiovascular and respiratory disease among older people. Two cohort studies conducted in the USA suggest that life expectancy may be 2–3 years shorter in communities with high particulate pollution than in communities where it is lower. Epidemiology on its own does not allow the conclusion that cause and effect are associated and that death may be a consequence of exposure to increases in particulate levels to be drawn. Evidence, though, is accumulating and meta-analyses of the epidemiological studies show that the associations are unlikely to be explained by confounders. One problem is that there is considerable overlap in the signs and symptoms produced by other associated pollutants such as sulphur dioxide and carbon monoxide. The Bradford Hill criteria are mostly followed with the possible exception of plausibility. These are early days but a picture is emerging of what particulates do to people. A biological gradient does exist and we have some idea of how much particulate is needed to have an effect. There appears to be no lower limit and studies suggest that even at low levels of particulate matter (less than 100 $\mu g/m^3$), short-term exposure is associated with health effects. The outstanding question, the question of plausibility, is how do they do it? What might be called a joined-up biological mechanism is still needed. There are theories and these are given a fair airing in the book but they come down to saying that very small particles cause irritation and inflammation deep in the lungs which may do any number of things and then you die.

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