CORRESPONDENCE

PBN as a possible bladder carcinogen

In their paper updating a previous investigation of the mortality of workers employed at a factory producing chemicals in North Wales, Sorahan, Hamilton, and Jackson plead for priority to be given for studies on the cancer experience of other working populations exposed to N-phenyl-β-naphtylamine (PBN). 1

It is, therefore, disappointing that the authors made no reference at all to studies conducted by the British Rubber Manufacturers’ Association (BRMA), and others, on rubber workers employed after 1950. These workers would have been exposed to PBN, and to other antioxidants in still use in the production process (in 1949) of Nonox “S” and similar, non-phenolic antioxidants, as well as by β-naphthylamine (BNA). This contaminant, a potent human bladder carcinogen, was at a concentration (2500 ppm) sufficient to double the incidence of bladder cancer in those exposed.

A particular study2 which singled out a large cohort of male rubber workers (2577) at a tyre factory, who experienced mixed exposure, but also exposure to PBN as the predominant antioxidant was followed up from 1951 to 1990. No excess of bladder tumours was found (25 observed, 24.1 expected; standardised incidence ratio (SIR) 104, 95% confidence interval (95% CI) 67 to 175). This antecedent in such a mixed exposure situation, where exposure can be confirmed in occupational hygiene terms, strongly suggests that whatever agents are being used they are not (under those conditions of manufacture) exerting a carcinogenic influence. Also a subcohort of 1322 men at the same factory, but employed before the end of 1949, who could be excluded from concomitant exposure to Nonox “S”, but with predominant exposure to PBN, showed similar results (12 observed, 14.5 expected; SIR 83, 95% CI 43 to 145).

The rubber industry deserves to be reassured from such purposefully conducted studies as soon as possible.

There is no evidence that PBN is itself carcinogenic. As the authors indicate, it is not a proved animal carcinogen and it is not mutagenic to bacteria. If some dephenylation occurs in vivo, it probably does so to a very minor degree, and at a stage in the metabolic cycle that renders any metabolites relatively innocuous, or unavailable to the urothelium.3

It is one thing to cast suspicion of carcinogenicity at manufacturing industry, quite another to transcribe this into the situation of open usage; I cite the auramine and magenta example in the dye industry. From the data shown in their figure, Sorahan et al essentially rely on only six cases of bladder tumour in a subcohort of 94 men, all allegedly exposed to PBN, but 52 of whom had mixed exposure to o-toluidine and to 2-mercaptobenzothiazole (MBT) as well. Three tumours related to this mixed exposure in one group, three to the 42 men allegedly exposed only to PBN.

The authors have undoubtedly shown that an excess of bladder tumours has occurred in the factory workforce studied, but on all the evidence presented, in my opinion, it is unjustifiable to ascribe a suspicion of carcinogenicity to PBN, when overall the epidemiological and other evidence available is more reassuring than not.

C A VEYS
University of Keele, School of Postgraduate Medicine, Industrial and Community Health Research Centre, North Staffs Medical Institute, Harrhill Road, Stoke On Trent, Staffordshire ST4 7NY, UK

1 Sorahan T, Hamilton L, Jackson JR. A further cohort study of workers employed at a factory manufacturing chemicals for the rubber industry, with special reference to the chemicals 2-mercaptobenzothiazole (MBT), o-toluidine, phenyl-β-naphtylamine and o-toluidine. Occup Environ Med 1996;53:258–73.

CORRESPONDENCE

Childhood cancer and possible exposure to benzene from traffic and petrol stations

In a study of childhood cancer and possible exposure to benzene from traffic and petrol stations Harrison et al found a non-significant increase in childhood leukemia. In their conclusion they state that “... the data are overall rather reassuring in showing that any such effect, if real, is likely to be small in magnitude.” We think that this conclusions cannot be drawn from such limited material.

Firstly, they merge all types of leukemia, whereas studies in adults have indicated that non-lymphocytic leukemia is most strongly associated with benzene. An ecological Swedish study found an association between car density and NLL but not with other types of leukemia or lymphoma.4

Secondly, the misclassification of exposure may be substantial in the study by Harrison et al. In Sweden wood burning makes a major contribution to the exposure to benzene in some areas. Probably the burning of other fuels for heating will also contribute. Children are transported in cars, stay in kindergartens, schools, sports areas, shopping areas, etc for much of their days. Even a statistical sampling shows a difference in the concentration of pollutants close to roads, that may not mean that the exposure of the children differs in the same way. A Danish study found that although front door concentrations of benzene were significantly higher in a city than in rural areas (8.9 ± 1.9 μg/m³), there was almost no difference in the mean personal exposure of these children (5.4 ± 4.5 μg/m³).5 Such misclassification of exposure leads to an understimation of the relative risk.

The important findings of Harrison et al and other studies6 7 (see London Research Centre for further references) is that living in high populated areas with high car density, means a higher risk of childhood leukemia, which may be preventable. We think that as benzene is a known cause of non-lymphocytic leukemia in adults, much more thorough studies are needed before we can rule out that benzene is an important factor in childhood leukemia.

So even if we disagree with Harrison et al about the importance of the risk, we agree that further studies are necessary. They should use different types of leukemia and use much better precision in the estimates of benzene and other possible exposures.

BENGJARVHOLMBERTILFORSBERG
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Correspondence to: Dr Bengt Jarvholm


Authors’ reply—Jarvholm and Forsberg quite rightly point out that studies in adults have indicated that exposure to benzene is associated with an excess of non-lymphocytic leukemia (NLL) and implicitly criticize us for being merged all types of leukemia. The reason for merging the leukemias was because lymphocytic leukemias accounted for 176 of 225 leukemias in the West Midlands in the age group 0–14 years in the period 1993–7, and therefore non-lymphocytic types accounted for only a very few cases, with only 42 registrations of acute myeloid leukemia over this period. It seemed very unlikely that we would be able to obtain a significant result from so few cases.

Jarvholm and Forsberg comment also on the potential for misclassification of exposure in our study. We do not think this very likely in the United Kingdom. Wood burning is almost unknown in the West Midlands.
Correspondence to: Professor R M Harrison

that this merits further investigation.

gest a slight excess of cancers for children liv-

ers. The inventory of air pollutant emis-

symptoms in healthcare sta-

date review of this problem.

factors for latex allergy within a United King-

is useful in measuring the prevalence and risk

EDITOR—The recent report by Smedley

United Kingdom hospital.

Brain injury: an indication of the likely gradients between

symptoms for the conurbation

and the influence of outdoor air on indoor concentrations.

Järvholm and Forsberg cite a Danish study

showed significantly higher front door concentrations of benzene in a city than in

rural areas. In the United Kingdom West

Midlands the risk of childhood cancer is

higher in rural than in urban areas which

suggests that benzene exposure is unlikely to be a major factor and that other causal agents

such as population mixing may be far more

influential. 1 None the less our results do sug-

gest a slight excess of cancers for children liv-

close to major roads and petrol stations

and we wholly agree with Järvholm and Fors-

berg that this merits further investigation.

ROY M HARRISON

LILLIAN SOMERVAILLE

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Birmingham, Edgbaston, Birmingham B15 2TT, UK

Correspondence to: Professor R M Harrison

1 London Research Centre, West Midlands atmos-


2 Leung PL, Harrison RM. Evaluation of per-

sonal exposure to monomeric aromatic hydrocar-


cokriging for estimation and mapping of the

risk of childhood cancer. IMA J Math Appl


4 Dickson HO, Parker L. Quantifying the effect

of population mixing on childhood leukaemia risk: the

Seascale cluster. Br J Cancer 1999;81:

44–51.

Prevalence and risk factors for latex allergy: a cross sectional study in a United Kingdom hospital

EDITOR—The recent report by Smedley et al is useful in measuring the prevalence and risk factors for latex allergy within a United King-

dom environment, and providing an up to date review of this problem.

The paper highlights the high frequency of symptoms in healthcare staff but suggests a low frequency of confirmed type I latex

allergy. Those who only read the abstract might be misled into considering that the fre-

quency is much lower (two of 372 respond-

ers). The frequency among those tested with

symptoms was 3% (one of 33) and one

person without symptoms was positive on testing (4%; 1/26).

Within the Argyll and Clyde region health surveillance has been performed on staff working in areas with exposure to glutaralde-

hyde. Such staff also received advice to protect them from blood and body fluids. A recent audit of the results of health surveillance over

the past 3 years identified seven cases of type I latex allergy (confirmed by specific IgE radio allergosorbent test (RAST)) in a work-

force of 226 nurses (3% prevalence). The frequency of reported skin symptoms was higher (6% at the last health surveillance) but

other cases were also identified (such as rosacea, seborrheic eczema, irritant dermati-

tis, and type IV allergy to colophony, formal-

dehyde, and rubber accelerators).

The findings confirm a low frequency of type I latex allergy and support the view that highly intensive health surveillance is not jus-
tified. One of the seven healthcare workers identified noted an allergic reaction after eating a sandwich bought from the hospital can-

teen which had been handled by a member of the catering staff who was wearing latex gloves. Healthcare workers with type I latex

allergy can be exposed to latex proteins away from their own work area by such actions or from the contact use of powered gloves

in other areas. This emphasises the need for an organisational approach to this issue. Organisa-
tional action to reduce the incidence of this allergy should have priority including the use of non-powdered latex gloves where exposure to

blood and body fluids is a risk for those without allergy, the provision of non-latex gloves for those identified with type I allergy and

early assessment of those with symptoms related to glove use. Catering staff do not now use latex gloves in the hospital where the

reaction reported here occurred.

EUGENE R WACLAWSKI

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Correspondence to: Dr Eugene R Waclawski


Prevalence and risk factors for latex allergy

EDITOR—We read with interest the cross sec-
sional study of latex allergy of workers in a

United Kingdom hospital. 1 We have also tried

to study healthcare workers in a district gen-

eral hospital and have had problems with the

response rate for skin prick testing and also

blood taking. We have, however, used stan-

ardised and evaluated skin prick test materi-

als from Stalleragen (1:200) and the Pharma-

cia CAP for latex and have found a high percentage of symptomatic workers with positive skin tests and specific IgE. We also

found that workers in general wards were exposed to as much airborne latex as those in

operating theatres, accident and emergency,

and intensive care, areas which we previously

thought of as high exposure. Median concen-

trations of latex in air were 0.44 µg/m 3 in our

high exposure areas and 0.48 µg/m 3 in our

lower exposure areas, perhaps because lower

quality gloves were used in the general medi-
cal wards.

We obtained questionnaires from 73% of our

sample workers but only 60% response from

symptomatic workers who were invited for

skin prick testing and blood taking. There

were a few significant differences between

groups but there was a greater relation between

the number of gloves worn a day than the hours of glove wearing. Work related

symptoms relative to glove use are shown in the

table.

Seven of 48 symptomatic workers had at

least a 3 mm weal to the latex allergen and

nine had positive RAST (>0.7 ku/l). All skin

prick positive workers had itching skin, four

out of seven had eye irritation, two out of

seven wheeze, and three out of seven rhinitis.

Any study of this sort is likely to miss the

most severely affected workers who cannot

c tolerate latex at present in the air in ordinary

hospital environments.

IANA FOLEDS

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North American Congress of Clinical

Toxicology Conference. 13–18

September 2000. Tucson, Arizona

This annual conference allows an oppor-

tunity for physicians, pharmacists, nurses,

and scientists from around the world to

participate in the sharing of a wide variety of

toxicological issues. As well as platform and

poster sessions, the programme will offer

symposia, and other traditional and novel

special sessions.

Contact: Contemporary Forums Confer-

ence Management, 11900 Silvergate Drive,

Dublin, CA 94568, USA. 001 925 828 7100,

ext 0, www.clinintox.org

IEA European Regional Meeting. 24–26

August 2000. Lithuania.

Satellite Seminar, Future of Epidemiology II.

24 August 2000. Kaunas University of Medi-

cine, Central Building, Mikelievicaus str 9,

LT-3000 Kaunas, Lithuania.

From Molecules to Public Health, 25–26

August 2000. Kaunas Vytautas Magnus University, Daihakanto str 28, LT-3000 Kaunas, Lithuania.

Epidemiology is still the core discipline in

preventive medicine despite recent and im-

portant achievements in biology and clinical

medicine. This discipline plays a key part in

public health and clinial research. This will

Table 1

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<thead>
<tr>
<th>Pairs of gloves worn / day</th>
<th>Itching %</th>
<th>Skin redness %</th>
<th>Runny nose %</th>
<th>Eye irritation %</th>
<th>Wheeze %</th>
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<td>≤10</td>
<td>33</td>
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be true also in the next millennium. Epidemiologists have to consider how best to use the new tools provided by the biologists and how best to use methods and knowledge from demography, sociology, and philosophy.

The IIEA European Regional Meeting in the year 2000 is an appropriate scene for reflection. Lithuania is an appropriate place for discussing our role in a rapidly changing Europe, which is so crucial for our common future.

The Organising Committee hereby invite you to participate at the Satellite Seminar and the Big Meeting. Electronic registration form please find at http://www.info.kma.lt/EUROIEA2000, meeting secretariat email address: EUROIEA2000@KMA.LT


September–November 2000—NEBOSH Specialist Diploma in Environmental Management, Warwickshire. A 3 week course run with HASTAM. Past students achieved 100% pass rate. Revision and exam: 29–30 November. £2995+VAT per delegate.


All events are held in central London, except where indicated otherwise. Phone 0044 020 7420 3500; fax 0044 020 7420 3520. Industrial Relations Services, Lincoln House, 296–302 High Holborn, London WC1V 7HJ, UK.

BOOK REVIEWS


The first edition of this famous book was published in 1969 and rapidly established itself alongside works by Comroe and Cotes as required reading for respiratory physiologists and especially for anaesthetists. This new edition—the original author having handed the torch to Lumb, maintains the high standards of its predecessors. As the editions have appeared changes in the arrangement of sections of the book have been made. These are most marked in this edition: basic principles, applied physiology, and the physiology of pulmonary disease now being the sections that contain the smaller chapters. The last section is a new venture and contains much new material. To keep the book to about 700 pages Lumb has excised some material that was in the earlier editions. This is recognised by the original author in his foreword. Casual readers will notice few changes—“tho’ much is taken, much abides” and the quality is undiminished.

The book begins with a chapter, by the original author, on the atmosphere. This is outstanding and should be read by all physiologists. Did you know that half the expected life of this planet has passed? Did I and is it a sobering thought. The author makes the point that our atmosphere has dictated our physiology. Current concerns about antioxidants in the diet and their role in protecting the airways against free radical attack are presaged by the chapter on the details of oxygen radical formation see page 496: the chemistry is complex but elegantly explained. Section 1 continues with accounts of lung structure, elastic forces, resistance to gas flow, the control of ventilation and perfusion. This has always been a difficult chapter and some changes can be recognised. It is still difficult but recent advances in modelling of and the use of the MIGET technique have done much to simplify the theory. Discussion of the Riley, Fenn, Cournard model has been reduced—this may indicate some change although, to paraphrase Saunders, this area has provided many with much quiet intellectual amusement and (instruction) at the cost of a few pencils and some reams of paper only! Those proposing to follow a career in respiratory physiology should read the account given in earlier editions of this book. The “applied” sections of earlier editions appealed, I suspect, more to anaesthetists than to physicians. This should no longer be the case. Pregnancy, sleep, air pollution, and smoking for example are all now given chapters of their own: indeed, only one chapter is headed “anaesthesia”. The third section provides an account of most of that which a respiratory physician or anaesthetist should know about pathophysiology. The chapter on acute lung injury is particularly good with an excellent account of the role of cytokines.

The book concludes with five appendices dealing with the maths and physics. The appendix on nomograms and correction charts will appeal to many: the great Siggard-Anderson-Beau work. The Fio2–PaO2 nomogram remains as does the invaluable PaO2–Fio2, shunt nomogram (much photographed!).

Reading this book has been a pleasure. It is the best single volume account of pure and applied respiratory physiology now available. At £59.50 it is a bargain—buy it!

R L MAYNARD


The structure and function of the United States healthcare system is perceived by many as being analogous to an inescapable labyrinth. Moreover, the medicolegal terrain in which physicians practice in the United States is extraordinarily litigious. Liang’s remarkably well researched, and excellently written, book Health law and policy provides healthcare practitioners with a lucid, detailed road map to avoid legal catastrophes in the mine ridden, United States medicolegal landscape.

Although Liang’s book is a superb compendium specifically of United States medico-legal issues and principles, it is noteworthy that the legal systems of the United States and United Kingdom are rooted, similarly, in the soil of judge made, “common” law. As such, Liang’s expert examination of the simply developed body of United States medicolegal case precedents, spawned by the highly active legal system in America, may be of considerable instructive value to healthcare practitioners in the United Kingdom desiring to avoid entanglement in legal traps.

Liang has a triad of doctorate degrees (in medicine, public policy, and law); and earns living as a professor at an American law school. By virtue of his unusually wide ranging formal educational background, Liang is able to closely, and very competently, pierce and dissect multidiscutinous, timely issues residing at the interface of law and medicine. The book is configured into four parts, encompassing 16 chapters. An often and effectively used mantra of Liang is to identify a medicolegal concept; and then provide an illustrative case, based on a real life case, followed by a pithy legal discussion of the case illustration. Generally, the numerous cases and accompanying legal discussions brightly illuminate the adjoining textual material.

In part I of the book, Liang focuses readers’ attention on traditional areas of concern in the realm of law and medicine, including such topics as informed consent and confidentiality. In part II, Liang works assiduously to sketch the contours of the healthcare insurance structure in the United States. Modern delivery considerations—for example, physicians’ remuneration, fraud, and abuse of the health law—comprise the subject of a third part. In a concluding part, on end of life considerations, Liang studiously elucidates advance directives and definitions of death, and attendant legal and policy issues.

In the preface, Liang states that the book is aimed at people interested in learning about the United States health enterprise. In this task, he is, indeed, quite successful. A distinguishing feature of the book, which finely tailors it to fit readers educated in fields outside the law, is that the author uses language understandable to non-lawyers. At the same time, Liang supplies copious quantities of medicolegal references. The book, as tailored, thus legal scholars as well.

It is important for readers to understand that the book is not a substitute for competent legal counsel. The book can capably assist the non-lawyer in recognising potential legal problems; but it is not a source enabling the non-lawyer to fully flesh out legal issues in exacting manner, without the assistance of qualified counsel. Finally, although the book is presently up to date, a relevant salient reality is that the medicolegal world explained so succinctly and carefully by Liang is changing rapidly, thus mitigating the book’s future, practical value to readers.

LEO UZYCH
Evaluation in occupational health practice, 1st edition

Evaluation in occupational health practice, 1st edition

Evaluation of healthcare systems, with its significant use of qualitative data, has to date received less attention in relation to conventional research methods. However, study designs such as randomised control trials are of limited use when occupational health services seek to describe their own practice or are asked to justify programmes to employers, who expect such activities to impact on the functioning of their organisations. The evaluation approach, developed partly in the social sciences, helps provide models for such research questions. Calls for a greater emphasis on such studies have been heard in the BMJ and Occup Environ Med. Menckel and Westerholm's book coherently draws together the conventional study methods and these newer approaches. In doing so the potential researcher is encouraged to seek clarity of thought in the question to be addressed before the study design is selected, to consider the role and expectations of stakeholders, and to consider the wide range of potential outcomes from any occupational health programme.

The evaluation approach requires a knowledge of systems theory and this book provides a useful introduction that may help occupational health specialists see the workings of their own departments in a new light. The book has a consistent emphasis on occupational health experience and rarely strays into unnecessary theory. The principal weakness is a lack of worked examples on common themes in occupational health practice—for example, management of sickness absence. However, as the authors observe, comparatively few evaluation studies have been published in the occupational health literature and this book will no doubt help correct this situation.

This thought provoking book encourages reflection on the daily practice of occupational health and offers a wide range of approaches that may be adopted to evaluate conventional programmes. Such approaches may lead not only to formal research but also to well informed management decisions on the development and impact of occupational health services. In conclusion this book is a useful introduction that may help occupational health specialists see the workings of their own departments in a new light. The book has a consistent emphasis on occupational health experience and rarely strays into unnecessary theory.

The 4th edition of Waldron's book (Waldron et al 3rd edition) had the edge on the 3rd edition and it is very patchy on occupational health illness and occupational health practice. The first detailed chapter is on ambient effects of particles in animal experiments. The book is thus broad although not all embracing. The scope is thus broad although not all embracing. The first detailed chapter is on ambient effects of particles in animal experiments. The book is thus broad although not all embracing.

The first detailed chapter is on ambient effects of particles in animal experiments. The book is thus broad although not all embracing.

This is an exceptionally useful book with an odd title. The idea is that you can look up a problem—for example, poisoning by mercury—and read all you need to know about it in 5 minutes—really? Well, not quite perhaps, but almost. The authors have achieved their objective by designing a standard layout for each topic and sticking to it. Information is presented in columns: then to the page and divided up by clear subheadings.

The book is in four sections: the first “general approach” is only a few pages long; the second “patient presentations with toxicological causes”; the third “antidotes” and the fourth “chemical and biological agents”. The fourth section covers about 300 compounds or agents. In reviewing this book I looked up topics I thought I didn’t know enough about. In both cases I was pleased. Take gulf war syndrome or methaemoglobinemia, or multiple chemical sensitivity. On each a spread of two pages is provided—and you can, just, read the two pages in 5 minutes. The information provided is focused and clear—the reader is given clear information on basics, diagnosis, treatment, follow up, and pitfalls. Recommended reading is also provided. I looked up treatment for metal fume fever: beautifully clear, telling you what to do and also what not to do, listed in “not recommended therapies”. The section on individual chemicals and agents is equally good. Interesting topics—such as gila monster, marijuana, and cane snail are included as well as the better known chemical toxicants.

This is the best book I’ve seen for use in dealing with an enquiry over the telephone about a poisoning. Not as comprehensive, of course, as the books that simply list chemicals and provide a few details but wonderfully helpful in sorting out a patient management plan. At £69.95 and with 752 large pages this book is excellent value for money. It should be at the elbow of every occupational physician who is called upon to deal with poisoning and on the desk of every clinical toxicologist.

R L Maynard


The publishers of this 7 volume book have kindly provided me with volume 1. I have learned something of substances beginning A-B! For each compound information is provided on physical properties, occupational exposure standards, ecotoxicity, environmental fate, mammalian and avian toxicology, genotoxicity, and legislation. A section entitled “other comments” is appended, as is a useful list of references. Some entries are short—and not all these topics are covered for each. Take for example, picked at random, allyl chloroformate. This compound is not very toxic (LC_{50} (mouse)=2000 mg/m^3), is corrosive, is classified as a toxic substance for transport purposes, is a respiratory irritant but I have no idea whether anybody has looked to see whether it is a carcinogen. We are also not told the uses of this chemical. Perhaps it is rare: the 12th edition of the Merck index does not list it at all! I then looked for amyl nitrite: not listed. I wondered whether drugs were included—yes, amylobarbitone is included. Benzo(a)pyrene is much better treated: pages of useful data are provided.

So: this is the first volume of a reference text that is designed more for libraries than for individual purchase. At £1295.00 a set it is not cheap but free access to a web database version is provided with each paper copy. Useful! Yes, although as usual with encyclopaedias the thing you wanted to know may not be there!

R L Maynard