Occupational HEALTH

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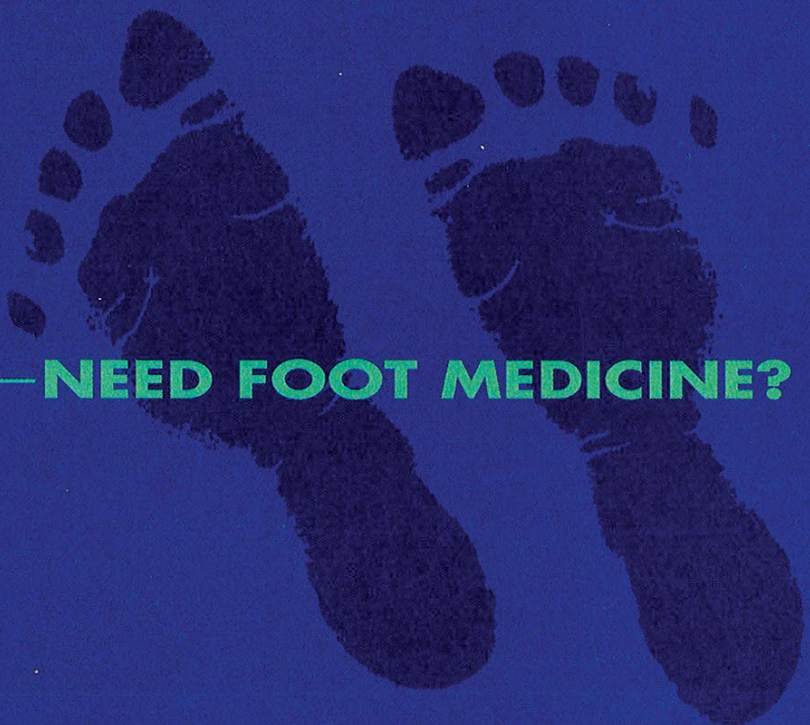
*Official Journal of the SA Society of Occupational Health Nurses (SASOHN)
the SA Society of Occupational Medicine (SASOM) and
the Occupational Hygiene Association of Southern Africa (OHASA)*



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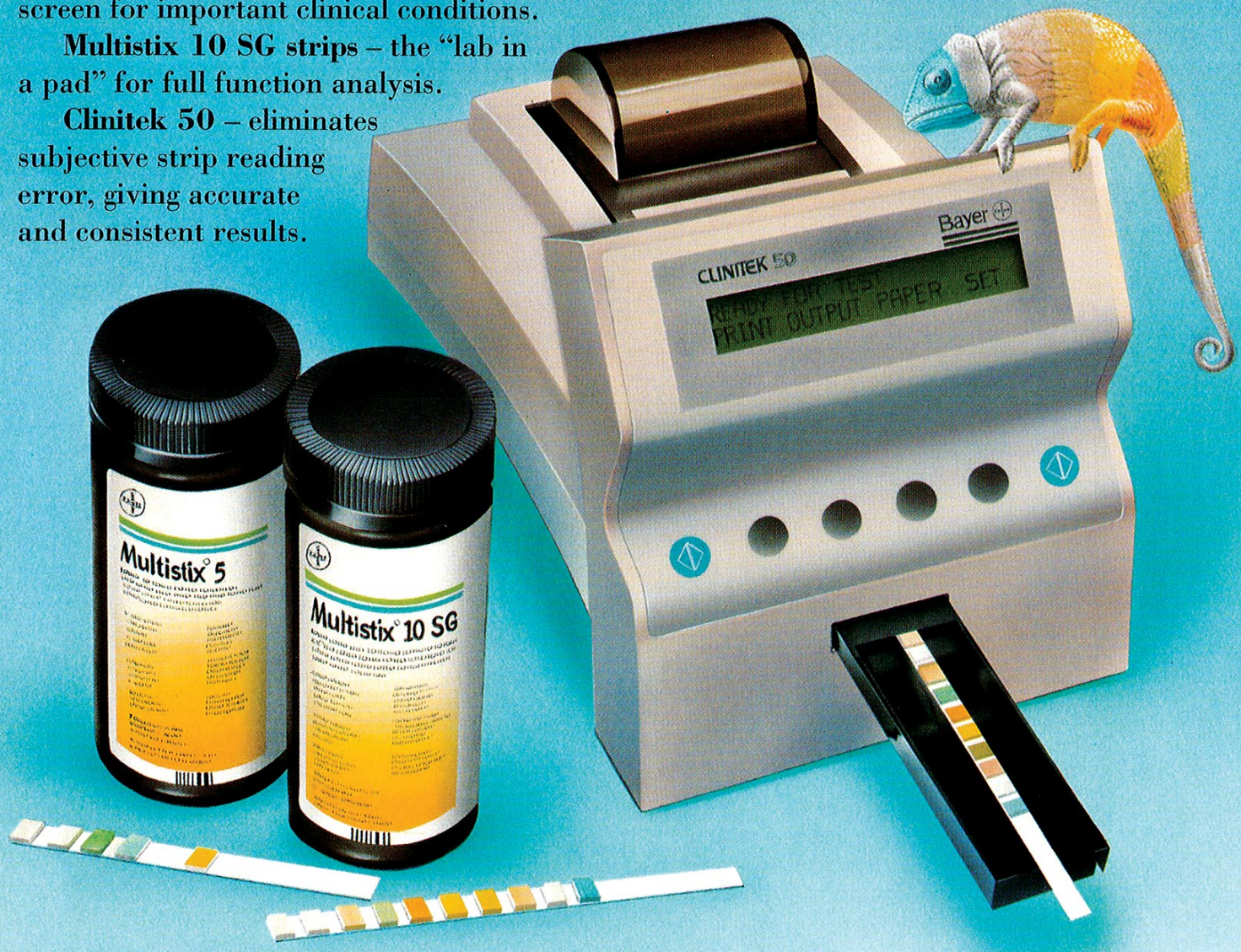

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This journal focuses on Occupational Health, Medicine, Hygiene and Safety, Primary Health Care at the workplace, Environmental Health and other employee health benefits

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The importance of education

In our vibrant and changing country, education and information seem to be a common thread running through society and its endeavours. Nowhere is this more apparent than the health of employees, whether in the realm of occupational health or primary health care. In industry, information is available from so many sources, whether from the Internet, government departments, NGOs, professional bodies, the multiplicity of conferences and meetings or other sources and yet, sadly, education and training of employees is often neglected.

Sir Thomas Legge, appointed in 1898 as the first medical inspector of factories in the United Kingdom, is often quoted, "all workmen should be told something of the danger of the material with which they come into contact, and not be left to find out for themselves - sometimes at the cost of their lives". The workplace is an ideal place to perform health education as workers are close by and willing to participate in these programmes.

However, downsizing and the practice of out-sourcing are commonly given as reasons for insufficient health education. Reduced medical departments and significantly depleted training departments result in less training and education. Also, the list of educational needs seem to grow with topics ranging from HIV/AIDS and STDs to tuberculosis, alcoholism, drug dependence as well as occupational exposures such as noise, lead, hazardous chemicals, use of personal protective equipment and so on.

How are occupational health personnel to respond to these challenges? They need to prioritize the important areas and balance these against the resources and time at their disposal. The process of prioritization is not that simple and several issues need to be investigated. These include a good working knowledge of legislation relevant to the particular industry, an evaluation of the health and safety statistics from the workplace, liaison with the workers and their representatives to establish their perceptions and needs and finally some knowledge of important health issues in the community. Once an educational priority list has been formulated, it must then be actively pursued. It must also be remembered that priorities change and need to be regularly revisited

A podiatric perspective on safety boots by the Alexanders is a useful review of the problems that can emanate from them. An enormous number of employees wear this equipment and a reduction of their problems is simple to achieve. Critical aspects of education include the correct fit, wearing of socks, the correct type of socks, proper foot hygiene etc.

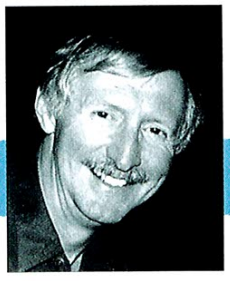
The under-reporting of occupational disease remains a serious issue with SADC countries under-reporting these by a factor nearly 20 times that of developed countries. Loewenson also points out the paucity of statistics in general and the fact that they are often out of date. With the recent co-operation of South Africa with other SADC countries, especially in the area of health, perhaps more uniform ways of reporting these statistics can be achieved in the future.

Naik and Eloff provide a very useful overview of the cardiovascular system and employment. So much of the literature is focussed on other systems such as the lung, nervous system, skin and the blood -forming system.

The whole area of disability is high profile at the present time due to the introduction of new labour legislation and the fact that run away costs due to disability have been the order of the day. Buys and van Biljon emphasize the importance of a multi-disciplinary team to assess and re-integrate people at work while Simon describes a holistic approach to back problems, an area in which Eskom has been so successful.

The concept of occupational exposure limits (OELs) is discussed by Gaze. He outlines simple mistakes made in using these limits. Recent legislation introduces both OELs and Risk Assessment to South Africa.

Maharaz and Lombaard from the Department of Health give an updated report on malaria in South Africa. They dispel the myth that people should not take prophylactic medicine as it may suppress symptoms.



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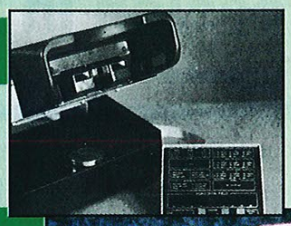

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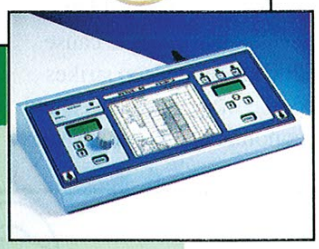

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Identifying depression in the work place

Depression is not merely a case of the "blues". The Awareness, Recognition and Treatment (DART) Programme of the National Institute of Mental Health identifies depression as a serious illness that may become chronic. Untreated, this illness can ruin careers, families and marriages. 15-20% of people experiencing severe depression may attempt suicide.

Depression is seldom traceable to a single cause. Clinical depression strikes people of all ages, races and economic status. Employees with clinical depression can be found throughout the work place, from unskilled hourly workers to highly paid executives.

Since depression is so widespread, employers need to develop more effective programmes and policies to address this treatable mental illness. Although employees may fear that new programmes could drive insurance cost higher, helping co-workers regain their health and return to full productivity is extremely cost-effective.

Supervisors should watch for these symptoms of depression in the work place:

- Decreased productivity
- Morale problems
- Lack of co-operation
- Safety problems, accidents, absenteeism
- Complaints of being tired all the time
- Complaints of unexplained aches and pains
- Alcohol and drug abuse

A decline in performance does not automatically mean clinical depression is the cause. Under no circumstances should a supervisor try to diagnose an employee's condition. Rather, the employee should be urged to consult an employee assistance programme (EAP) professional or a physician. Confidentiality is critical for an employee suffering from depression and any conversation with an EAP representative or treating professional will remain confidential.

One area that has proven successful in helping people recognise the symptoms of depression and seek treatment is giving the employees the telephone number of their local Depression and Anxiety Support Group. In South Africa these lines are staffed between 8am and 8pm, Monday to Saturday. The programme offers helplines on (011) 783-1474 or (011) 884-797, courtesy of nineteen of South Africa's foremost pharmaceutical companies.

Employers and employees both benefit when they take pro-active measures to detect and treat depression. Many people who suffer from depression are scared, confused and usually unaware of the reason for their behaviour. If employees are informed about their company's willingness to assist with these problems, they will be motivated to seek treatment, recover and enhance their work performance.

Membership of the Faculty of Public Health Medicine

Dr Mary Ross has received Membership of the Faculty of Public Health Medicine of the Royal Colleges of Physicians of the United Kingdom through distinction. This category of membership is based on a proposed recipient's professional standing, publications and contribution to the development and practice of Public Health Medicine.

SASOM Scientific Committee Update

A number of Scientific Committees under the auspices of SASOM are now functional. These committees have a SASOM member as a chairperson and participation is open to anyone (hygienist, safety officer, nurse, environmentalist etc) who has either interest or expertise in the subject field. The objectives of the scientific committees are to develop and enhance knowledge in these subject areas, to produce guidelines, to comment on legislation and to offer an advisory service to other scientific bodies, government and academic institutions. The scientific committees already in operation and those still being developed are listed below.

The SASOM Scientific Committees being developed include:

- Audit systems
- Ethics and legal
- Lung function testing
- Mining industry
- Occupational medicine training
- Primary health care (including infectious diseases)
- Transport and transport related industries (including aviation)

SASOM Scientific Committees in Operation	Responsible Person
Biological monitoring	Dr Tony Cantrell
Dermatology	Dr Jenny Stark
Information technology	Dr Hans van der Merwe
Medichem SA (Chemical industry including pesticides)	Dr Hans van der Merwe
Noise-induced hearing loss	Dr Dave Barnes

If you would like to be involved with any of these committees, please contact Dehlia Müller at SASOM's National Office on (012) 667-5160 and she will put you in touch with the correct person.

Status of professional driving permits

SASOM's relationship with fitness to drive certification dates back to their involvement with a comprehensive document detailing health restrictions. The document was published more than a decade ago. When the new road traffic act was promulgated, new initiatives in relation to the fitness to drive component were apparent. SASOM was therefore invited to provide medical input to the Department of Transport's multi-disciplinary work group. Established in November 1995, this work group has already made recommendations concerning the following issues:

- Medical requirements for a professional driving permit
- Documentation and records
- Input of data into the National Transport Information Data Base
- Registration and training of medical personnel to conduct the medicals

The professional driving permit will be required for four categories of drivers: goods, passenger, dangerous goods and breakdown vehicles. A PrDP will be required for all individuals who drive for financial gain and it is estimated that this will affect ± 400,000 people. As a permit will last only two years, the sheer scope of the process should not be under-estimated.

The Transport Minister is committed to road safety and the Arrive Alive Campaign is a good example of a creative approach to this commitment. However, it is unlikely that the Hon. Minister would look favourably on regulations to the Road Traffic Act that directly enrich either the medical or legal professions. Consequently, the medical profession needs to align itself with the Department of Transport's objectives and to put forward a proposal as to how the regulations may be put into practice. This is a first step and it should emphasise the value the medical profession is adding to the Department of Transport's safety objectives. The Department of Transport should be made to understand that this is a self-funded exercise.

The next step would be to get professional buy-in from other practitioner groups. In this context, it should be emphasised that the medical examination of drivers by doctors could become part of a career path.

Following on from this, it is recommended that SASOM adapt a section of the 5th Edition (1995) of the British Medical Association's (BMA) publications on *Fitness to Drive* to the South African context. This material could then form part of the curriculum for a licensing programme for doctors to become accredited in certification of fitness to drive. Here the Foundation for Professional Development of the South African Medical Association (SAMA) could play a pivotal role. Apart from providing corporate support, SAMA could accredit doctors who show compliance in the medical examination of drivers and this accreditation could lead to CME points.

The SA Association of Accident and Traffic Medicine holds copyright of previous editions of the BMA *Fitness to Drive* publication. Meetings are currently being held with their representatives.

SASOM has a long and proud history in supporting medical certification of drivers. Now that the Driver population for whom PrDPs will be required has been expanded at least tenfold, emphasis should be placed on the accreditation of doctors (many of whom will come from SASOM). Suitable training material can be produced by SASOM members who take on the responsibilty of course design, training and mentorship. All stakeholders acknowledge that training a critical mass of doctors will take several years. Nevertheless, if the Department of Transport sees the objectives of accreditation as being consistent with its own safety objectives, many barriers will be eradicated.

It should be noted that the introduction of the PrDP for passenger vehicle drivers has been delayed until 1999.

Dr B Dees, Department of Transport Medical Working Group

Acknowledgement

An article titled 'The effectiveness of ventilation controls in reducing symptoms of formaldehyde exposure among medical students in a human anatomy laboratory' was published in *Occupational Health SA Aug/Sep 1998*. The article was written by Jacques de Villiers at the Department of Environmental Health at the Natal Technikon. The research for the article was conducted through the Department of Community Health, University of Natal, towards a M Med Sci degree. The author would like to acknowledge the contribution of Dr Anne Raynal and Dr Barry Kistnasamy in their supervision of the research.

Appointment

David Rees has been appointed to the Chair of Occupational Health in the Community Health Department, Witwatersrand University and as Director of the National Centre for Occupational Health (NCOH), Department of Health. The major duties attached to these posts are to guide the development of effective support services at the NCOH and to promote occupational health teaching and research.

SASOHN Seminar and AGM

Date: 12 – 13 November 1998
Venue: Gateway Woods Hotel, White River

The 1998 Seminar and AGM of the South African Society of Occupational Health Nurses (SASOHN) will be held in the beautiful province of Mpumalanga at the Gateway Woods Hotel just outside White River. As there is space for only 200 people it is essential to book early to avoid disappointment.

For further information contact Linda Tozer on telephone (013) 750-1673 or fax: (013) 751-2650 or Cell: 083 290-1235 or e-mail: tozer@cis.co.za

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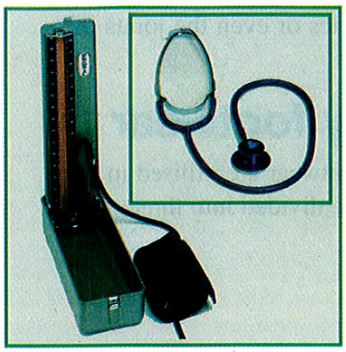

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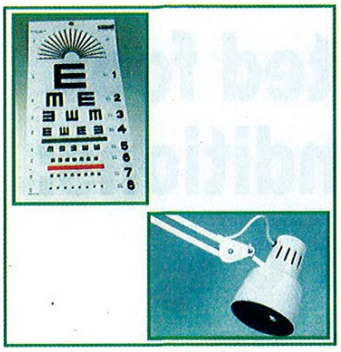

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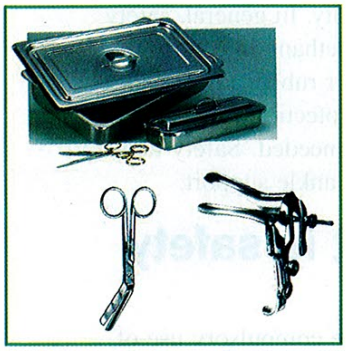

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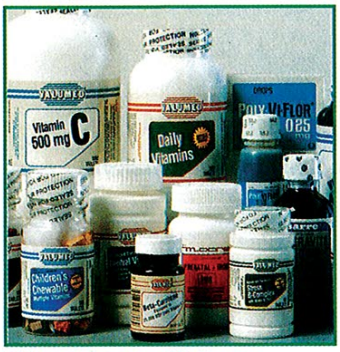

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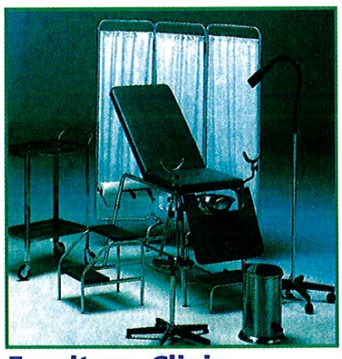

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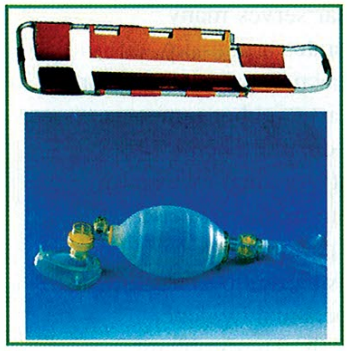

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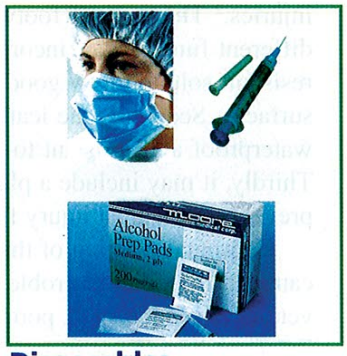

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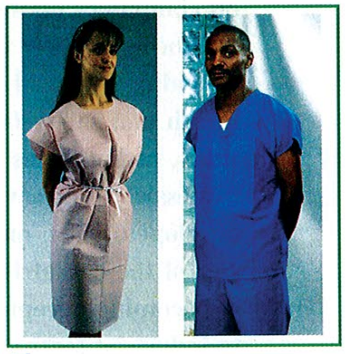

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Safety boots and related foot wear conditions: a podiatric perspective

Howard Alexander, Stuart Alexander
Final Podiatry Students, Technikon Witwatersrand, Johannesburg

Occupational Health SA 1998; Vol 4, No 5: 10-13

Abstract

New labour legislation is placing an emphasis on companies taking responsibility for the well-being of their workforce with a view to providing a more holistic approach to the health and safety of employees. Over the years, podiatry has grown steadily as a profession and new areas of interest have developed. Now, more than ever before, the role of the podiatrist in an industrial setting is becoming accepted. Foot problems related to industrial footwear and working conditions are a common occurrence in the work place. The podiatrist can thus play a vital role in keeping the "workforce on their feet".

Introduction

In today's industrialised world personal protective equipment or PPE has become a normal part of working attire. A particular component of this equipment is the wearing of safety boots or shoes for protection against heavy falling objects and corrosive chemicals. The regular use of these types of boots or shoes gives rise to specific types of foot disorders. In 1992, an Australian survey of people who wear safety footwear discovered that 94.7 % of all the persons surveyed reported that they had one or more foot pathologies.[1] These disorders usually affected the nails, skin, muscles or even the joints of the foot and ankle.[1]

Types of safety footwear

Various types of safety footwear are utilised in the industrial setting. They can be divided into three main categories:

- Shoes
- Boots
- Gumboots

Each of these groupings has specific characteristics and alterations which have been made to each type of shoe to allow versatility. In general, safety footwear consists of a polyurethane injection moulded sole with a leather or rubber upper and steel, plastic or no toe-cap protection - depending on the requirements of the shoe needed. Safety boots usually include some type of ankle support.

How important is safety footwear?

The implementation of the compulsory use of safety footwear and safety programmes has significantly reduced the incidence of foot and ankle injuries.[2] This type of footwear serves many different functions. It incorporates a non-slip, oil resistant sole to allow good traction on factory floor surfaces. Secondly, the leather or rubber upper is waterproof and resistant to industrial chemicals. Thirdly, it may include a plastic or steel toe cap to prevent mechanical injury from falling objects.[2]

Continual wearing of this particular type of shoe can lead to podiatric problems caused by insufficient ventilation in the shoe, poor personal hygiene, incorrect hosiery or incorrect fit. The problems related to the wearing of these shoes can be dealt with effectively by an industrial podiatrist.

Aims of industrial podiatry

Podiatry in the industrial setting has two main aims.

- To improve the general foothealth of the workers on the floor. Secondary gains would include a decrease in the amount of accidents, the amount of absenteeism and the amount of labour turnover. It may also support an increase in the productivity of factory workers.
- To aid in the early detection of systemic disease presenting in the lower limb.[1]

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Problems caused by safety footwear

As safety footwear is often ill-fitting and usually quite occlusive, the amount of clinical disorders presenting from the use of this equipment is specific to the environment that it creates. The types of problems that occur due to footwear problems can be divided into four distinct categories. These include the following most common disorders:

Dermatological

Dermatoses occupy a prominent position among the disorders treated by the occupational podiatrist.[2] The skin on the human foot supports a relatively large microflora due to the effect of occlusive footwear and associated moisture retention.[3] One of the most common pathologies is the infestation of the skin by fungal or bacterial elements, mainly due to the moist and sometimes unhygienic conditions found in this footwear. Bacterial infections are not usually severe and can be treated efficiently with antibiotic therapy. This limits the spread of the infection to other locations.[3]

Micro-innoculation of the skin with these bacteria due to small skin abrasions and other mechanically induced lesions represent a common route of entry for the bacteria.[3] Infections like these can occur anywhere on the foot and, depending on the causative organism, can lead to discolouration, maceration and inflammation of the skin. (The cause can only be verified through microbiological studies.)

Fungal infections (*Tinea pedis*) usually result from the same conditions that cause bacterial infections, the only difference being that inoculation of the pathogen onto the skin is via communal bathing and changing facilities.[3] The usual site of infection is the toe webs - especially the fourth - where moist, white 'blotting-paper' skin will be seen. *Pruritus* is common. The instep, and in persistent cases, the nails may also be involved.[4] *Anhidrosis* (dry skin) and *bromhidrosis* (malodorous) are usually secondarily related conditions.[3] Treatment of this disorder may involve topical or oral antifungals (such as Terbinafine and Tolnaftate) or others, depending on the presenting infection and causative organism.

Safety footwear occludes the foot. This means that compressive, torsional, tensional and shearing stresses are placed on the foot with every movement. These stresses can lead to hyperkeratotic lesions on all pressure areas of the skin on the foot.[3] These lesions can range from a normal *callus* to a *heloma* (corn). The type of lesion will depend on the area and the prevailing stresses. The most common presenting lesions are the *helomata durum* (hard corn), which will usually occur on the dorsum of interphalangeal joints or on the plantar aspect of the metatarsal heads and the *helomata molle* (soft corn), which normally occurs between the fourth and fifth interdigital cleft.[3] Treatment of these conditions involves removal of the overlying callus with a scalpel followed by excision of the nucleus by minute dissection.[3] This can be done without breaching the dermo-epidermal junction. Protective padding, designed to deflect pressure from the site, is applied post procedure.[3] Other conditions which can occur in the work place include *verucae* (wart) - caused by the human *papilloma* virus, ulcerations, eczemas, dermatitis and various tumours. Various factors[2] - mechanical, chemical, physical, biologic and botanical - cause these conditions.

It is interesting to note that direct skin contact with industrial chemicals is not the only cause of dermatosis.[1] Vapours from chemicals can also be absorbed into clothing and may result in irritation of the surrounding skin.

Prevention of industrial dermatosis[2]

- Ensure correct shoe fit when issuing new safety footwear.
- Identify and treat personnel who are carriers of fungal, bacterial and viral lower limb infections in order to prevent these conditions spreading to healthy workers who also use the public showers and common changing areas.
- Enforce footwear regulations - this enforcement should be done by the employer.
- Encourage the use of woollen or cotton socks.
- Advocate regular washing of socks, clothing and safety footwear.
- Implementation of a safety and hygiene induction and orientation programme to ensure compliance by new employees.
- Inform employees that they are free to seek medical attention for any condition, preferably at company sponsored medical facilities.

Onychology (nails)

A variety of nail disorders, not necessarily related to industrial usage unless chemicals are involved, exist. Some of the most common conditions include *onychauxis* (hypertrophied nail), *onychogryphosis* (deformed nail), *onychocryprosis* (ingrown nail) and

onychomycosis (fungal infected nail).

Onychauxis is an abnormal but uniform thickening of the nail, increasing the base to the free edge.[3] This may be accompanied by slight brown colour changes in the nail plate and enlargement of the sulci due to the thickened lateral edges of the nail. The aetiology of this condition in the nail may range from a single major trauma to fungal infection, poor peripheral circulation or systemic disturbance which has caused a trauma to the nail matrix and may lead to excessive production of onychocytes.[3] *Onychogryphosis* is a similar condition except that there is a gross deformity (rams horn) associated with the hypertrophy. Usually, a patient's complaint about a painful nail or nail bed will be due to shoe pressure on the enlarged nail. Treatment of these conditions involves regular reduction of the nail plate by means of a nail drill and a shoe assessment.

Onychocryptosis is a condition in which a nail spike, shoulder or serrated edge of the nail has pierced the epidermis of the sulcus and penetrated the dermal tissues.[3] Initially, this is experienced as mild toe pain. As the offending nail spike penetrates further into the dermis, inflammation and infection can result, causing severe pain. The nail therefore causes a traumatic injury to the skin. The chances of this condition occurring are greatly increased with the introduction of medial and lateral pressure from shoes. This may happen when safety shoes with toe-caps limit the area in which the nail sits. This can become a predisposing factor.

Treatment involves the removal of the nail spike with a scalpel or fine nippers and thereafter, filing the free nail edge to prevent the nail from ingrowing again. If sepses is present, a sterile dressing should be applied and the area rested until resolution. If the condition becomes chronic, nail surgery should be considered.[3]

Onychomycosis is a fungal infection of the nail bed and nail plate. The causative organism is usually a dermatophyte or candida. The fungus proliferates on the nail since it utilizes the keratin as a source of nutrition. An infected nail plate becomes thickened, brittle and yellowish-brown in appearance. It is said to be 'worm-eaten'.[3] Treatment of *onychomycosis* requires careful treatment over many months and success is greatly dependent on patient compliance. Medications are varied and can be topical and oral in use. Regular reduction of the nail is also needed.[3]

Muscle injuries

These injuries normally occur to the structures surrounding or attaching to the muscle. Tendons are a common site for injury. They are usually injured through overuse of a particular tendon or by friction or pressure over an area of a tendon.[5] The tendons most commonly affected are the extensor and Achilles tendons.

Extensor tendinitis is normally caused by wearing a heavy boot or shoe that is tightly laced. Both these practices increase the pressure on and the use of the extensor tendons. Tendinitis is treated with rest, icing and anti-inflammatories.

Foot strain is another common ailment among persons who stand for prolonged periods of time.[3] This type of foot pain normally includes morning stiffness and pain on first walking. The pain usually lessens as the day progresses. Wearing shoes that pad and support the foot may help prevent the condition from occurring.

Joint disorders

It is very difficult to relate specific joint pathology to shoe wear since many joint conditions have other underlying predispositions. However, ill-fitting foot wear may increase any existing malalignments. Conditions include bunions, arthritis (osteo and rheumatoid) and other systemic bone diseases.

All of the conditions referred to can be observed in workers who use industrial safety footwear.[1] The disorders can be related directly both to the use of this type of footwear and to the environment in which it is worn.

Conclusion

The use of safety footwear is essential and compulsory in many industrial settings. The wearing of such equipment needs to be carefully managed. Severe foot conditions, a possible side-effect of use, can be avoided through educating employees properly.

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Nutrition and employment

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Abstract

In terms of nutrition and employment, the main issue is the relationship between nutrition and socio-economic state where level of education is perhaps the main determining factor. This relationship is examined with particular reference to the occurrence of health/ill-health amongst the well-circumstanced and those who are poor and constitute the bulk of the world's population.

Introduction

In all populations, whether developed or developing, the employment rate is far higher amongst the well-circumstanced than the poor. Accordingly, the relationship between nutrition and employment largely becomes a relationship between nutrition and socio-economic state. While a fair amount of information on this topic is available in developed populations, little has been published on the situation in developing populations. Let's start by examining the situation amongst western populations and then take a look at some African populations.

Health/ill-health amongst the rich and the poor

In all populations we find the better circumstanced and the poor. Through the ages, indeed, until relatively recently, the poor constituted the majority of populations - as they still do in developing countries. In the latter, the invariably low level of education, adverse conditions of employment, inferior health amenities and other disadvantages were, and still are, manifested in their shorter lives. In the United Kingdom (UK), as late as 1842 in the last century, the average age at death for 'gentlemen and persons engaged in the professions and their families' was 45 years; for 'tradesmen and their families' it was 26 years and for the indigent majority, 'mechanics, servants and labourers and their families' it was only 16 years. Currently, in the poor and unemployed classes, one of the adverse ramifications is a higher infant mortality rate (IMR). In Switzerland, while the IMR amongst the wealthy is very low (7 per 100,000 live births), by comparison, amongst the poorer classes it is 11-15 and the rate is 21[1]. amongst unmarried mothers who are out of work or in other low socio-economic states. This figure is similar to that for African mothers in South Africa's large cities (20-25 per 100,000 live births).

A recent publication, ***Our Healthier Nation***,[2] revealed the situation in relation to adults in the UK. Losing a job has been found to double the chances of a middle-aged man dying within five years. The state of affairs is worse in Scotland where a jobless middle-aged man is four times more likely to die sooner than in England.

In the UK the dichotomy in socio-economic state is increasing. While the share of income for the poorest fifth has fallen from 10% in 1979 to 6% in 1990/91, the top fifth of the population has increased its share from 35% to 43%. Moreover, unemployment is increasing. In Australia, for example, in a study on "Unemployment and young people's health", it was noted that in 1953-1974 when a family could be supported on a single income, unemployment rates varied between 1% and 5%. However, during the 1980s and 1990s unemployment amongst youth (aged between 15-24 years) approached 30%-35% and in some parts of Australia, such as the Illawarra-Wollongong Statistical District in 1992, the official unemployed male youth rate exceeded 40%.

These adverse factors have a bearing on nutrition. For instance, in the UK, while the proportion of income devoted to the purchase of food is 17% in Social Class I, it is 47% in Social Class V.[3]

Nutrition, socio-economic state and health status

Historically, there have been enormous contrasts between the diets of the poor and of the rich. For example, virtually to the end of the 19th century in the Highlands in rural Scotland, it was usual for oatmeal porridge to be eaten twice or even three times a day, every day. The evening meal nearly

always included a thick broth or soup which contained barley, peas, lentils and a variety of vegetables. The consumption of meat and dairy produce was low. By contrast, in England at that time, the historian Arthur Bryant reports that 'Statesmen, judges, merchants, all engaged in the national vice of stuffing. It was not surprising that bulging veins, mottled noses and what was politely termed a full habit were common among the English upper and middle classes'.

In the UK, one of the nutritional milestones early in the present century was a study on 'Food, Health and Income'. Published in 1936, it stated that expenditure on food varied from 4 shillings per person per week amongst the poorest to 14 shillings per week amongst the middle and upper classes. The poor ate much more bread, margarine, lard, suet, dripping and condensed milk than the better circumstanced who consumed more cheese, fish, and vegetables (excluding potatoes).

In 1995,[3] the National Food Survey in the UK reported that for households with at least one earner, the estimated average amount spent per person per week on household food increased with the income of the head of the household - from £12.00 in the lowest income group to £15.71 in the highest income group. Expenditure on most food groups rose with increasing income, this pattern being particularly marked for the consumption of cheese, fish, fruit and alcoholic drinks. While expenditure on eggs, sugar and preserves declined slightly with increased income, expenditure on fats and oils showed little difference between households where the heads earned a range of salaries. Overall, spending on butter increased with income while that on margarine declined.

Recently, also in the UK, an investigation was made into dietary patterns and their association with demographic lifestyle and health variables, using a random sample of 9003 British adults. The aim of the enquiry was to identify dietary patterns from the frequency of consumption of food items and some semi-quantitative data and to examine the association of the main patterns with demographic factors, lifestyle habits, measures of self reported health and mortality.

The investigation revealed, *inter alia*, that frequent consumption of fruit, salad and vegetables alongside the frequent consumption of high-fat foods was associated with middle-aged, non-manual socioeconomic groups, non- and ex-smokers, 'sensible' drinkers, small households, the south of the country and self-assessed 'excellent' or 'good' health. One interesting finding on mortality was that when all other demographic, social, lifestyle and health measures are taken into account, consumption of a good diet was found to be more important for longevity in women than in men. Yet, by contrast, a recent study on data given in the Health and Lifestyle Survey showed that, after adjustment for social class and other factors, a low household income was a predictor of mortality for men although not for women.

In a recent study on "Healthier eating: income, difficulty and food intake",[4] the association between income and healthier eating was examined. Four hundred adults from five different income groups completed a structured questionnaire. It was found that the higher income groups spent more of their income on food but much less proportionately than those in the lower income groups. The latter consumed significantly less brown bread, fruit juice, fresh vegetables and semi-skimmed milk than the higher income groups but they ate more white bread, chips, tinned vegetables and whole milk. The lower income groups had difficulty in purchasing a healthier diet. It was considered that if people are to adopt healthier eating practices, it is necessary to understand the beliefs and concerns that they have and the barriers which they see to making changes. In this study, the difficulty people anticipate in making changes was considered to be the major determinant of the likelihood of eating a healthier diet and this perceived difficulty was greater for those on a lower income.

The cost of a 'prudent' diet and socio-economic state

A generation ago, recommendations were made to adopt Dietary Goals and to consume a 'prudent' diet so as to try to avoid the development of degenerative diseases. In the UK, an enquiry was made into what people could eat to meet the dietary goals as well as the cost of doing this.[5] Investigations were made into the habits of 4 000 households. The majority consumed more fat, more sugar and less carbohydrate and fibre than the amounts recommended. It was found that very few subjects met a combination of goals. For example, only 7% met all three fat goals and, moreover, only 1.5% of subjects met a combination of the goals for total fat/saturated fat/PS ratio/carbohydrate or sugar/fibre. In other words, the study showed that few people were meeting every one of the dietary goals at the same

time. Changes in the consumption of specific food items such as wholemeal bread, fruit, vegetables and low-fat products and a reduction of sugary foods are required to help to meet the goals. The cost of these changes, although small on a daily basis, was considered to be such that certain groups of the population could not afford to eat a diet that meets the goals.

Nutrition, employment, socio-economic state in Africa

Lack of employment, with ramifications in nutritional diseases, especially among the young, is widespread in Africa. In South Africa, it is estimated that 30%-40% of the economically active population is unemployed.[6] Survey findings showed that only 33% of the women aged 16-64 years, compared with 54% of men, were employed.

In a recent study made at Besters, a typical urban shack settlement adjacent to Durban, an enquiry was made into the anthropometric status of a group of 190 pre-school children aged 3-6 years.[7] In terms of their living conditions, the majority of their dwellings are composed of wattle and daub. There is neither running water nor refuse disposal. Mean monthly household income was found to be R513 and a large proportion lived under the poverty datum line for minimum income, namely R1 200. Less than a half were regularly employed. Of the children examined (children selected on the basis of a stratified random sampling technique), it was found that 13% were underweight and 27% stunted (i.e. below the 5th centile of the US National Centre for Health Reference Standards for weight and height for age). Interestingly, however, the concentrations of serum albumin, calcium, magnesium, phosphorus and vitamin E were found to be close to normal values, although 21% of the children had a haemoglobin level less than 11g/dl and 44% had low levels of serum retinol. In most respects, the information gathered seems considerably less adverse than had been expected. In this particular study, no clinical observations were made regarding the presence of nutritional deficiency diseases.

Elsewhere in Africa, in Zimbabwe, an investigation was made into whether people can afford to live.[8] The enquiry was undertaken by the Department of Community Medicine.

With the assistance of 4th year medical students, the Department monitored the basic cost of living of people. The cheapest diet able to provide sufficient energy, protein and vitamin A for a standard family of 5 people was calculated as well as the average cost of rent, rates, essential travel and schooling for a month period. Sixty to eighty people were interviewed on each of four occasions. It was revealed that the cost of basic foods increased by over 50% from $157.50 in March 1992 to $349.20 in June 1993. Moreover, the cost of rents, rates, transport and schooling rose from $230.63 to $268.43 in the same period. This gave an average total monthly cost of $388.18 in March 1992 and $617.63 in June 1993. This increase was then compared with the earnings of a security guard whose basic wage in March 1992 was $220.00 rising to $320.00 by March 1993 and $390.00 in August 1993 ($100 = R324). The huge dichotomy between the wage earned and the calculated cost of living emphasizes the magnitude of the problems involved in in bringing up families in very poor circumstances. In the area concerned, only half of the workers were regularly employed. The economic situation in Zimbabwe has since deteriorated considerably.

The outlook

In developed populations, the rich are getting richer and the poor poorer. In South Africa, the adverse situation is such that currently the poorest 40% of households earn less than 6% of the total income whereas the richest 10% earns more than half.[6] Accordingly, in South Africa, there must be far more research into the life styles and health disadvantages of the very poor. At present, in any given African community, there appears to be a scarcity of information on the nutritional state of the employed compared with that of the unemployed.

The bearing of nutrition on employment performance has been little studied. For example, in a number of developing countries, it has been shown that a low intake of iron lessens the extent of physical performance. Thus, early studies undertaken in Guatemala indicated a linear relationship between haemoglobin level and Harvard Step Test performance. Iron supplementation studies carried out on rubber tappers in Indonesia and on tea pickers in Sri Lanka[9] noted gains in productivity after the treatment of those who had significant anaemia. In the case of the tea pickers, it was considered that since the average reduction in productivity due to anaemia was 20%, the disadvantage could prejudice economic output very significantly.

Quantitatively, in an investigation made on the performance of cotton mill workers in Beijing in

China, iron supplementation in a group who had iron deficiency anaemia, led to a rise of 1g in haemoglobin level and this was associated with an improvement in production efficiency of 14%. Clearly, as indicated, the gains described could have a significant bearing on the agriculture and other economies of the countries.

In brief, socio-economic status - linked closely with educational level - carries major implications for the overall state of nutrition and level and nature of employment and, in so far as physical work is concerned, on level of performance.

It is tempting to think that the higher the food consumption, the better will be the performance in employment. This is not so. Obesity is rising in all developed populations and also amongst urban dwellers in developing populations. Not only does obesity have adverse effects on the outcome of most of the chronic diseases of lifestyle but the condition prejudices employment, income level and physical activity.

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Occupational disease in Southern Africa: causes and consequences of under-reporting

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Abstract

The current pattern of reported occupational disease in Southern Africa is outlined. Causes and consequences of under-reporting are noted. Some options are suggested for improving the recognition of the burden of occupational illness in the region.

Introduction

Recent estimates of the burden of disease indicate that Sub-Saharan Africa experiences not only the highest burden of communicable disease in the world but also amongst the highest rates of non-communicable diseases, such as cerebrovascular disease and diabetes. For adults under the age of 70, the probability of dying from a non-communicable disease is greater in Sub-Saharan Africa than in the OECD (established market) countries.[14] Some of this non-occupational disease burden must be occupational in nature but, currently, we do not have any reliable estimate of the extent and burden of occupational disease in Southern Africa.

Occupational disease in African countries

The only consistent data base on occupational morbidity is drawn primarily from reported data on injury and fatalities from compensation / Ministry of Labour statistics. (This data is drawn mainly from injuries reported to the compensation system. As shown in Table 1 for SADC countries, many of these systems are not state social insurance schemes, many operating through private insurers. They do not have common criteria for reporting, some requiring reporting for all injuries with more than 24 hours of lost work time (for example, Zimbabwe), some after longer periods. They do not cover all categories of workers and have varying and often low compliance rates.)

Table 1 shows the aggregate of this data for Southern Africa. This data indicates a median reported annual injury rate for wage workers in the SADC region of 6.26 injuries / 1000 workers. The reported median occupational fatality rate in the SADC region was 14.02 fatalities / 100 000 workers.

The highest risk sectors - forestry, electricity production, mining, basic metal production, non-metallic mineral manufacturing, wood product manufacturing and transport - all had reported injury rates greater than 30 injuries / 1 000 workers. Notably, these are sectors in which the likelihood of traumatic injury due to mechanical causes are higher, while those sectors where illness or chronic morbidity due to chemical, ergonomic and psychosocial factors are greater have a significantly lower reported risk.

In 1995, the Zimbabwean compensation system recorded only 172 reported 'illnesses' and 35 poisonings, out of about 20 000 reported cases, making up only 1% of the total. This is not unique to Zimbabwe: Tanzania recorded 11 cases of occupational disease in 1987 and 9 in 1988, making up 0.5% and 0.3% of total reported injuries in those years.[9,13] This ratio of 1:199 compares with an illness:injury ratio of 1:11 in industrialised countries where occupational health surveillance is more widespread. While the longer life expectancy in these countries may contribute to their higher reported disease rates, even a ratio of 1:50 in illness:injury would lead to quadruple the number of diseases currently reported.

The under-estimation of occupational disease is probably one of the most serious sources of bias in the currently reported data. In a recent WHO report,[27] the organisation estimated a burden of

Table 1: Estimate of occupational injury and illness: SADC countries

Country and year (*)	Employment	Administration of compensation	Injury rate/ 1000 workers (**)	Fatality rate/ 100 000 workers (**)
Angola	na	na	na	na
Botswana 1990		private insurance	0.35	0.85
1995	234 539			
Lesotho 1995	653 266	private insurance	na	na
Malawi 1986		private insurance	2.59	12.37
1995	558 000			
Mauritius 1990	440 000	social insurance	26.86	2.95
1995	506 000		12.61	1.38
Mozambique 1995	117 572	social insurance	na	21.26
Namibia 1990		social insurance		
1995	260 000		15.01	15.76
South Africa 1990		social insurance, mining/	49.42 (89)	
1995	5 200 000	construction-private		14.02 (93)
Swaziland 1994	157 283 (95)	private insurance	6.26	21.61
Tanzania 1990	711 800 (89)	private insurance	4.78	17.98
Zambia 1995	468 947	social insurance	1.22 (93-96)	4.47 (93-96)
Zimbabwe 1995	1 186 649	social insurance	16.74	21.23

(*) Year given is the latest year for which full data is available

(**) Crude estimates based on combining available data. Rates shown in year they are drawn from.

Sources: 1997 SADC Employment and Labour Sector Annual Report, 1996 ILO Yearbook of statistics,1990 ILO World Employment Programme African Employment Report, 1994 South African Government Labour Statistics, 1990 Swaziland Govt Department of Labour Report, 1995 Zimbabwe NSSA Annual analysis of occupational injury and accident statistics

1 060 000 occupational diseases in Sub-Saharan Africa. Using the disease rates found in Zimbabwe, the rate of 14.49 diseases / 100 000 workers would translate to 22 460 diseases in Sub-Saharan Africa annually or 2% of the WHO estimate. This means that the rates currently reported under-estimate the real rates 50-fold.

Reported data is also significantly below that found in *ad hoc* surveys of occupational illness carried out in various African countries. The textile, chemical and agro-industrial sectors are amongst those with a high prevalence of disease, despite being described as low risk in reported injury data systems.[20,9,8,16]

Causes and consequences of under-detection of occupational disease

Potential sources of data on occupational illness include death records, hospital records, compensation claim reports, cancer registry records, mesothelioma registers, work place medical facility records, surveys, respiratory disease surveillance systems and other sentinel survey system reports. Many of these data sets are either incomplete or do not exist at all in southern African countries. The prevalent data they provide, particularly for routine data systems, have a number of sources of bias - including inconsistent case definition and poor case ascertainment - especially given the multiple causes of disease and problems of misclassification of occupation. The most important cause of poor ascertainment of occupational disease in routine data systems is the absence or paucity of occupational health services[11] and the lack of occupational health skills in the public health services. Hence much occupational disease is only ascertained through surveys.

Most African countries have too few trained occupational medical personnel and many facilities lack the diagnostic equipment needed for ascertainment of occupational disease. Many African professionals are employed in better paying jobs in the private sector or in higher income countries.[16] Occupational health professionals are not well recognised either in the professional registers nor in their job placement in company structures. In the public sector, despite many years of training activities, poor salaries have led to the loss of many

trained people. This has left inspectorate and occupational health services understaffed.

There is often a rigid division in systems, laws and services between work place health (or occupational health) and public health, despite the fact that the worker moves between these two environments and is affected by both. This means that occupational health issues are partitioned between various government ministries that are inadequately co-ordinated (legally or administratively) and each of which face shortages of resources and personnel.

Large companies with their own medical services may not notify state authorities of their medical findings while workers themselves may under-report, ignoring symptoms which are mild or short lived, or fearing job loss if they are found to be ill.

Linking disease profiles with occupational causes requires exposure data that is often missing as companies do not carry out environmental monitoring[22] and doctors do not collect comprehensive occupational histories.[28] Many occupational health services do not carry out the systematic tests (in other words the baseline and periodic tests related to work exposures) needed to ascertain the development of occupational disease. Interacting occupational exposures also make it difficult to identify the individual risk factor.[15,12]

Perhaps the most systematic surveillance of occupational disease in African countries is the routine pneumoconiosis surveillance in the mining sector. This has provided some assessment of risk of pneumoconioses but, even here, there is reported to be under-ascertainment.[5,24] One important source of this gap has since been identified and studied, and this is the loss of cases when miners leave the mining industry and retire to rural areas. Studies in South Africa and Botswana have indicated that there are thousands of undetected or unreported cases of occupational lung diseases in former mineworkers in the rural areas of southern Africa. In a study of former mine workers resident in Botswana from South African mines, it was found[24] that only eleven miners had been compensated for occupational lung disease under South African law, although the overall prevalence of pneumoconiosis (>1/0 profusion) found was 26.6%. The study concluded that the established measures for identifying and preventing pneumoconiosis were totally inadequate and that the social costs were not being borne by the compensation system. In a later study of occupational lung disease in ex-mineworkers in Libode district, preliminary data analysed indicated that 13% were suffering from pulmonary TB (PTB), 23% had PTB plus pneumoconiosis, 17% had pneumoconiosis in the first degree and 15% pneumoconiosis in the second degree (or a total of 55% with pneumoconiosis with or without TB).[25] These studies present a limited but nevertheless powerful picture of rates of occupational lung disease in excess of 25% in migrant and former mineworkers to South African gold mines 15-25 years after exposure.

Former workers are not the only groups to be excluded from formal surveillance systems. Such systems almost universally exclude informal sector workers, where the majority of working people are found in Sub-Saharan Africa. Formal/ wage employment covers about 10% of economically active people in Africa[6] and only about two thirds of formal workers are covered by compensation reporting systems. This makes the currently reported data only about 6.4% of the total pattern of injury and fatality.

Misclassification of occupational illness also contributes to poor reporting. Tuberculosis provides a case in point. The association between silicosis and tuberculosis has been firmly established by epidemiological studies[2] and this is now well recognised in compensation systems, with TB being regarded as an additional complication in the presence of X-ray confirmed silicosis. Less well-recognised is the possibility of such TB being related to occupational risk before radiologically detected silicosis.[21] In black gold miners, the presence of a slight degree of silicosis not detected radiologically in life was associated with a significantly increased prevalence of pulmonary tuberculosis compared to gold miners without silicosis.[23,14] Minimal or slight silicotic lesions discovered for the first time at autopsy were still associated with an increased prevalence of active tuberculous lesions.[23] Similar findings were obtained in California. The increased risk of developing TB for winch drivers, drillers and other groups of workers exposed to high dust levels has further been noted.[7] Other occupational illnesses may also be masked by high levels of communicable and nutritional disease in African countries and may also interact with these diseases. Noise induced hearing loss has, for example, been found to be exacerbated by middle ear infection.[17,1] Such problems in mis-classification may arise in relation to other prevalent diseases, such as liver disease, respiratory illness and reproductive health-related illness.

These under-estimates of the disease impact of occupational risk compound the lack of recognition

given to the potential for harm to non-employed populations who are also exposed to the risks. There are many examples of the spill-over of occupational risks to people living in the vicinity of farm, mine and industrial production. This may be due to air and water pollution, to practices such as women washing work overalls or to migrancy in occupationally related communicable diseases.[19,11,3] The loss to social recognition of a significant proportion of occupational morbidity has its own effects on the system. One of the most serious of these is that the 'all is well' impression depresses investment in occupational health services within the private and public sectors. The poor attention paid to occupational health services is sustained by the lack of public information on the real burden of occupational disease.

Poor recognition of disease also undermines the early detection that is the cornerstone of effective management of such disease. This means that management takes place at a much later stage, when disability is greater and medical interventions are more complex. If occupational disease is not given an adequate public profile, medical practitioners in non-occupational services are less likely to suspect occupational causes in making their diagnoses, leading to possible mis-classification and poor management until late stages of disease. This is bad for the affected worker, for the system as a whole and for other workers exposed to the same risks.

Improving the ascertainment and management of occupational diseases

Under conditions of limited professional skills, limited resources and the often insecure employment patterns prevailing in Africa, the strategies to enhance the detection and management of occupational disease here need to be creative and resource effective.

The first step is the enhancement of professional occupational health skills, a step that includes maximising those already in existence. Despite some level of training, the current skills base is still too narrow and the critical mass of professionals too small for the level of development of occupational health practice required. It is time to move beyond *ad hoc* short courses towards a more systematic approach to occupational health training, both as a specialisation and as an essential upgrading of public health and general medicine training. This requires greater regional co-operation in designing systematic programmes of occupational health training. These training programmes would facilitate the effective use of the skills that do exist (even where these are concentrated in a few countries) to produce practitioners in all countries. Such training programmes need to be complemented by health profession systems that provide formal recognition for occupational health specialisations and by tripartite and state administrations that promote and provide legal pressure for professional standards in occupational health practice.

The second step is to find greater synergies between public health and occupational health systems. It is a luxury for these two systems to operate separately in Africa where many working people have difficulty in accessing any kind of health service at all and where the interaction between public and occupational health services can be problematic. Specialist areas of practice should perhaps not be confused with specialist facilities. It is as important for the primary health and medical care systems at local authority level to incorporate mechanisms for enhanced differential diagnosis, management and referral of occupational diseases as it is for industrial clinics and hospitals to apply competent up-to-date approaches towards the management of public health problems and to refer these appropriately.

Another step is to fill the gaps in the ascertainment of occupational disease with effectively targeted research, research that highlights areas of under-detection, provides more informed estimates of the real levels of disease and thus occupational risk and motivates intervention around such risk.

In the meantime, because we have an extremely poor picture of the disease impacts of work exposures and how they are distributed, we are unable to prevent this morbidity. Also, we cannot drive prevention through showing the high level of social cost arising from this morbidity. While the worker seems the obvious loser, a deeper analysis reveals that this under-recognition leads to professionals being undervalued, society suffering loss through reduced productivity and production and the already stressed health system bearing the additional costs of poorly managed occupational disease. In fact we are all the losers.

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Cardiovascular disease and occupational exposure

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Abstract

This paper reviews the possible associations between cardiovascular disease (CVD) and occupational and environmental exposures. Non-chemical factors (such as shift work, physical activity, stress, temperature, vibration) and chemical factors (such as carbon monoxide (CO), carbon-di-sulphide, lead, cadmium and arsenic) are discussed. A causal relationship is perceived to exist between CVD and shift work, stress and physical activity. Studies have also shown a relationship between exposure to noise, temperature, vibration and CVD although more controlled research is needed in these areas. A causal relationship is well documented between exposure to chemicals, carbon-di-sulphide and nitroglycerine/ nitroglycol and CVD. The acute effect of CO is well recognized although there is little evidence on chronic exposure. Low levels of lead exposure increase blood pressure and further studies are required concerning cadmium and arsenic exposures. Epidemiologic research into all these areas is warranted in South Africa, especially amongst black workers who are at a high risk of developing hypertension and subsequent CVD.

Introduction

Cardiovascular disease (CVD) is of one of the most important public health areas in modern industrialized societies. There is a growing awareness of the relationship between occupational exposure and its effect on the cardiovascular system. Over the past ten years many reviews of the literature on CVD and the work environment have been published,[1-7] documenting various occupational exposures as risk factors for CVD.

Coronary heart disease (CHD), a predominant category of CVD, is an important cause of morbidity and mortality in the younger working population aged 35 - 45 years,[8] with greater mortality reported for manual than for non-manual occupations.[9]

There are many well-documented risk factors for CHD of non-occupational origin such as hypertension, smoking, diet, hypercholesterolaemia and obesity. These risk factors can work synergistically with occupational exposure, increasing the risk of developing the disease. Kristensen,[4-5] in his reviews on CVD and the work environment, concluded that a causal relationship exists between chemical and non-chemical factors and CVD. Chemical factors include lead, cadmium, arsenic, carbon disulphide, nitroglycerine and organophosphates while non-chemical factors include shift work, stress, noise, cold, heat and vibration.

The objective of this article is to summarize briefly some of the epidemiologic literature on CVD and the work environment. As many factors are beyond the scope of this article, the review of the literature focuses only on a few, and by no means all, of the occupational exposures related to CVD. Potential occupational hazards are separated into two categories, namely, non-chemical and chemical exposures as risk factors for CVD.

Non-chemical risk factors

Shift work

Shift work is a common occupational stressor and affects neurophysiological rhythms such as blood pressure, metabolic rate, blood sugar levels, mental efficiency and work motivation, which may ultimately result in stress related disease.[10] Shift work, mainly night shift, has been shown to be associated with increased risk of disturbed sleep, increased fatigue, disruption of social activities and eating patterns, and ultimately gastrointestinal malfunction.[11] Poor physical working conditions,

especially ergonomics, can enhance stress at work[10]. Knutsson and co-workers[12] investigated the incidence of ischaemic heart disease (IHD) in a 15 year study. They followed a cohort of 504 papermill workers subjected to rotating shifts and compared them to non-rotating workers at the same plants, controlling for possible confounders such as age, smoking and marital status. They concluded that the Realtive Risk (RR) of IHD increased with increasing duration of exposure to shift work. Workers exposed for 11-15 years showed a RR of 2.2 (p=<0.04) and those exposed for 16-20 years showed a RR of 2.8 (p=<0.03). The RR fell sharply with shift work exposure of more than 20 years. More recently, Kawachi[13] studied 79 000 Boston nurses and found that those who were on rotating shifts had a higher RR for CHD when compared to the non-shifting nurses.

Noise

Noise exposures at levels of 90dBA and above are relatively common in industries. At this level, noise may initiate cardiovascular responses that mimic an acute stress effect leading to increased blood pressure, hormone levels, plasma cholesterol levels,[14-15] and platelet aggregation.[16] Eighteen subjects, exposed to noise levels ranging between 105-115dBA for three hours, showed an increase in blood pressure and catecholamine excretion, as well as increased levels of cholesterol, triglycerides, free fatty acids and plasma 11-OH cortisol.[14] These biochemical changes have been known to initiate cardiovascular responses which can have detrimental effects on the coronary arteries.

A recent longitudinal study of 2 197 South African miners failed to find a relationship between noise levels and blood pressure readings.[17] In this study, the inclusion of black mine workers would have been of considerable value, as they are often exposed to very high noise levels. Another drawback of the study was that some noise levels were estimated and not measured. From the literature it becomes apparent that more controlled and careful research is needed in this area.

Physical activity at work

Both occupational and non-occupational physical activity has a protective effect on the cardiovascular system. However, heavy physical exertion has been implicated as a cause of myocardial infarction (MI), particularly in people who are habitually sedentary.[18] In a study on 1 228 patients, all of whom were interviewed four days after a MI, the induction time from heavy exertion to the onset of the MI was found to be less than one hour. Their symptoms usually began during the period of heavy exertion.[18] Studies on transport workers such as truck, bus and locomotive drivers, with sedentary jobs, showed evidence for a higher incidence of IHD.[19] However, more research is needed in this area as there have been no controlled studies on the risk of MI during and after heavy exertion, the period of time between heavy exertion and its possible adverse affect on the heart and whether the risk could be reduced by regular physical activity.

Stress

Broadly defined, occupational stress is the sum of all factors in a work place which elicit a stress response in an individual. Stress has been shown to directly affect the cardiovascular system through its influence on blood pressure, cholesterol levels and myocardial supply,[20] and has been implicated as a risk factor for heart disease in many epidemiologic studies.[21-22] Chronic inhibition of anger is associated with elevated blood pressure and suppressed anger is associated with increased renin levels, resulting in borderline hypertension.[23] Future job uncertainty and stress in the work environment are also associated with elevated blood pressure.[23]

Job strain has been defined by Karasek[24] as 'work in jobs with high psychological demands and low control'. Most studies conducted on workplace stress in the last decade, using Karasek's job strain model, confirmed the relationship between this model and CVD.[5] Belkic[25] developed another method to measure occupational stress known as the occupational stress index (OSI). Numerous ongoing studies are attempting to establish a conclusive relationship between OSI and CVD.

Temperature

High mortality is associated with exposure to extreme heat or cold and large numbers of workers are exposed to these conditions in various industries.[1,2,6] In a study on potash miners exposed to high levels of heat, a significantly elevated IHD incidence was found in underground workers compared to surface miners.[26] There are no reports on workers chronically exposed to hot or cold environments and studies on workers from abattoirs, fisheries and cold storage plants are recommended.

Vibration

Workers subjected to occupational whole body vibration include truck, bus, locomotive, heavy equipment and farm vehicle drivers, as well as

helicopter pilots. The effect of vibration on the peripheral vascular system, such as in Raynaud's Phenomena is well documented,[27-28] but the literature regarding the effect on the cardiovascular system is limited.

Chemical risk factors

Carbon monoxide (CO)

Studies have shown a relationship, though controversial, between exposure to CO in occupations such as that of fire fighters, foundry workers and motor mechanics and an increased incidence of CVD.[29] Although there is little evidence on chronic occupational exposure to CO and its effect on the human cardiovascular system, the effect of acute exposure is well supported from studies on individuals.[4] Mechanisms by which CO may damage the heart include acute effects via the formation of carboxyhaemoglobin and long term effects via possible atherogenic effects. CO exposure at or above the standard occupational levels has been associated with a significant 35% increase in IHD in a NIOSH study of bridge and tunnel workers in New York City.[30] In a more recent study of the long term effect of CO exposure on foundry workers, the age standardized incidence density rate (ID/1000 person-years) was 2.7 for non-smokers with no or slight CO exposure and 9.2 for exposed smokers (95% confidence interval 1.13 - 12.11). This difference was mainly due to IHD.[29]

Nitrates

Nitroglycerine and ethylene glycol nitrate are used in the manufacture of commercial explosives and are pharmacologically active on the cardiovascular system. It has been confirmed that both substances have vasodilatory effects leading to a marked fall in the blood pressure and increased pulse rates.[31] Acute episodes of angina, MI and sudden deaths have been reported in workers exposed to these substances.[32]. A phenomenon known as 'Monday morning angina' or 'Monday morning death' occurs one to three days after exposure to nitroglycerine/ethylene glycol dinitrate ceases.[33] In a Swedish study on men who died between the age of 55 and 70 years and who were exposed to nitroglycerine for more then 20 years, the cause of death was IHD and the RR was 2.5.[31]

Carbon-di-sulphide

Carbon-di-sulphide (Cds) is used extensively in the rayon manufacturing industry. Excess mortality from CHD has been reported among workers exposed to Cds.[34-35] In a cohort of viscose rayon workers, exposed for at least five years to Cds, compared with control, non-exposed workers from a nearby paper mill, the results of the first five years indicated five times more deaths due to CHD in the exposed workers. Following these studies, efforts were made to decrease Cds exposure levels to 10ppm and, since then, the risk for CHD has been dramatically reduced.[35] In a more recent cohort on 15 000 workers exposed to levels of between 3.5 and 5.5 ppm of Cds for an average of 25 years, morbidity from hypertension, IHD and nervous system disorders was significantly increased in the cohort, compared to the controls.[36]

Lead

Chronic and acute lead poisoning, following lead exposure, can cause cardiac and vascular damage leading to potentially lethal consequences. These include direct effects on the excitability and contractility of the heart, vascular smooth muscle and blood pressure regulation within the central nervous system.[37] Similarly, elevated lipid levels, vascular lipid infiltration and increased plaque deposition on the arterial walls have been reported following chronic lead exposure.[38] Several reviews, including experimental and observational investigations, of lead exposure and blood pressure levels, are published in a special issue of *Environmental Health Perspective (1988, volume 78)*, which contains papers from the International Symposium on 'Lead-Blood Pressure Relationship' held in Chapel Hill, North Carolina in 1987. The conclusion reached was that low level lead exposure increases blood pressure and the risk of cardiovascular disease.

Cadmium

Cadmium induces high blood pressure in experimental animals. Hypertension was observed in rats when a cadmium concentration of 5mg/litre was added to their drinking water, whereas hypotension was noted when the dose was increased to 50 mg/litre.[40] A controversy remains regarding environmental exposure to cadmium and hypertension in humans. The epidemiologic research done thus far cannot support the hypothesis of a causal relationship between cadmium exposure and hypertension or CVD, and there is a need for epidemiologically sound research on this topic.[41]

Arsenic

Workers at high risk of occupational exposure to arsenic include alloy makers, smelter workers and

those employed in insecticide industries. In a case control study of a copper smelter in Sweden, a crude rate ratio of 2.2 for CVD and a dose-response relationship to arsenic exposure was observed, in workers.[42] Thus far, no epidemiological studies have been conducted to appraise the relationship between levels and duration of exposure to arsenic on humans and its effect on the cardiovascular system.

The summary of chemical factors associated with occupationally related CVD is shown in *Table 1* while the classification of possible risk factors for CVD in the work environment are shown in *Table 2.*

Table 2: Classification of possible risk factors for cardiovascular disease in the work environment. *(Adapted from Kristensen T.S.*[4] *)*

Causal relation to CVD	Risk factors	
	Non-chemical	Chemical
Very definite	Physical inactivity at work	Carbon-di-sulphide, nitroglycerine/ nitroglycol
Quite definite	Work strain (high demands and low influence), shift work, noise [a].	Lead [a]
Possible	Vibration	Arsenic.
Somewhat possible	Heat [b],	Carbon monoxide [b].
Probably no relationship	Cold[b]	Cadmium

[a] Increases the risk for CVD through increased blood pressure.
[b] High level exposures may be fatal, especially when combined with other risk factors.

Table 1: Chemical factors associated with occupationally related cardiovascular disease *(Adapted from Rosenman KD*[2])

Substance	High Risk Workers	Cardiovascular Abnormalities or Disease
Arsenic	Alloy, insecticide and smelters workers	**Chronic effect:** Increased mortality from CHD?
Cadmium	Alloy and jewellery makers	**Chronic effect:** Increased mortality from CHD? hypertension?
Carbon-di-sulphide	Ammonium salt , putty, rayon, resin, rocket fuel, rubber cement, textile, vacuum tube and varnish workers Degreasers, dry cleaners, electroplaters, iodine, oil, wax, sulphur and fat processors.	**Chronic effect**: Increased mortality from CHD Increased atherosclerosis
Carbon monoxide	Diesel engine operators, garage mechanics, miners Acetylene, blast furnace, boiler room, brewery, coke oven, steel, petroleum refinery, pulp and paper, water gas workers. Organic chemical synthesizers	**Acute effect:** Acute myocardial infarction (MI), angina, arrhythmias, sudden death. **Chronic effect:** Increased atherosclerosis?
Lead	Smelter, battery makers, brass foundry workers	**Chronic effect:** Hypertension?
Nitrates	Explosives, drug producers	**Acute effect:** Angina, acute MI, sudden death **Chronic effect**: Increased atherosclerosis?

Discussion

This paper has examined the known and less well documented associations between CVD and occupational exposures. Although the information in the literature is limited, it becomes apparent that occupational risk factors may increase the incidence of CVD.

The findings of an association between a single exposure and CVD do not necessarily implicate exposure as an independent predictor of CVD, rather the combination of risk factors which may exacerbate the effects of the exposure should be taken into account. Future research in this area, therefore, should consider the interplay between various environmental factors. In addition, the majority of the subjects studied in the literature reviewed were white males, whereas in South Africa the majority of workers are black and it is well documented that hypertension and CVD is developing at increasing rates amongst the black population.

Widespread urbanization has been taking place in South Africa for some time, as migrant workers leave the rural areas to work in an urban environment. In addition, factors such as

improvement of socio-economic status, changes in dietary habits, increased smoking and alcohol consumption, decreased physical activity, increased stress in the work environment and marked occupational exposures could further lead to the development of hypertension and CVD. It is therefore important to consider the black workforce in research in South Africa when investigating the association between CVD and occupational exposure.

Nevertheless, the evidence reviewed in the literature does provide support for the association between CVD and exposure to occupational and environmental factors. Since CVD is a significant cause of morbidity and mortality in the working population, it is paramount to minimize the exposure of workers to these factors.

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Malaria situation in South Africa

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Occupational therapy in occupational health and safety : dealing with disability in the work place

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Abstract

Despite comprehensive occupational health and safety measures, injury and/or disability occur at the work place. Whether these are work related or not, it is essential to manage their effects in order to ensure early and productive return to work. As part of the occupational health and safety team, the occupational therapist has an undisputed role to play in the assessment, rehabilitation, placement and follow-up of workers with injury and/or disability.

Introduction

Work as a therapeutic medium has been part of occupational therapy since the inception of the profession in the early 1900s.[1] South African occupational therapists have been involved in the treatment and assessment of clients with work related problems since the establishment of the Medical Fitness for Work Unit at Pretoria Academic Hospital (the then HF Verwoerd Hospital) approximately 30 years ago.[2] Currently there are a number of these units in major South African cities. As can be seen, both from our name and from a historical perspective, work/occupation has been a unique concern of our profession - one of the reasons probably being that illness, injury and disability invariably affect productivity and therefore the ability to work.

Traditionally, until recently, South African occupational therapists have been employed within hospitals and rehabilitation centres treating both acute and long term aspects of physical and psychological disabilities. Occupational therapists working in private practice were mostly involved in the treatment of children with perceptual and developmental problems. This has changed both through the marketing of the profession and through recent legislation.

Occupational therapy is a health and rehabilitation profession designed to help/enable people to regain and build skills that are important for health, well-being, security and independence across all ages. One of its unique contributions is when employability is negatively affected by injury and/or disability.

Service delivery of occupational therapists working in the field of Occupational Health and Safety tend to fall into two main areas: primary prevention and secondary and tertiary prevention or rehabilitation.[3] Historically, South African occupational therapists, as far as the work place is concerned, were mainly involved in the area of rehabilitation - specifically vocational rehabilitation.

Disability management and vocational rehabilitation

Vocational rehabilitation is a comprehensive rehabilitation process. Its aim is the successful employment or re-deployment of workers/employees with disability or injury.

For employed individuals with either job related or non-job related injuries and/or disabilities, the term "Disability Management" is commonly used, especially by the business sector. Shrey[4] defines Disability Management as 'an active process of minimizing the impact of impairment (resulting from injury, illness or disease) on the individual's capacity to participate competitively in the work environment'. The principles of such programmes facilitate joint decision

making by both the traditionally medically orientated professionals, the worker and also labour/management structures. This approach has improved the quality of care in the work place.

The process of both Disability Management and Vocational Rehabilitation would include screening, work assessment, vocational planning, preparation for return to work, placement and follow up.

Table 1: Disability and vocational rehabilitation processes

Screening	➢ analysis of referral ➢ review of all collateral information including medical background ➢ background interview ➢ goal setting and planning
Work assessment	➢ job analysis - critically assessing the requirements of the work situation and therefore playing a role in the worker's return to work ➢ clinical assessment of the worker - assessing fundamental psychological and physical abilities. It is important to establish worker skills in relation to job requirements and so the potential for improvement/recovery of abilities is also examined. ➢ pre-vocational assessment determines obstacles which could limit return to work such as personal grooming skills, use of transportation and other related skills. ➢ work abilities and skills assessment - matching work requirements with worker abilities. Aspects include work motivation, work habits, work endurance and speed of work.
Vocational planning	➢ in consultation, establishment of return to work strategies ➢ formulation of short and long term goals
Preparation for return to work	➢ treatment programmes and methods used to improve the worker's employability or occupational performance. These might include rehabilitation services, work hardening, learning additional skills, applying assistive devices or learning alternative methods of executing a task ➢ utilizing training resources to enhance employability such as in-house training, special training programmes for people with disability and further training in institutions for non-disabled people
Placement	➢ training of job seeking skills when alternative employment is considered ➢ job accommodation and adaptation of work environment where necessary
Follow-up	➢ removal of all obstacles limiting successful work performance ➢ ensuring career development/enhancement

There are many professionals operating within the field of Vocational Rehabilitation. The occupational therapist does not duplicate a service but he/she is unique, trained and skilled in the functional effects of injury and disability in the work place. Thorough training in activity analysis enables the occupational therapist to determine the demands of a job. This knowledge is then applied to the work situation of each individual patient/client.

Occupational therapy within the occupational health and safety team

The occupational therapist 'views disability within the context of a patient's occupational life, history and future, not as a separate entity to be treated by the therapist for the purpose of remediating a pathological condition'.[5] This kind of approach facilitates the 'work direction' of a patient's life thereby promoting health and well-being. The occupational therapist works holistically with the patient and takes into account how the person functions within their personal, social, work and leisure environments. The occupational therapist works with other professionals in the field of Occupational Health and Safety, enhancing already existing services by becoming involved specifically when disability/injury affects employability. This is usually for a very small percentage of the work force in a company, taking into consideration that most countries have a disabled population of 10% with substantially less being employed in the open labour market.[6]

Occupational therapy services in the work place

A few key areas where occupational therapists are involved in the workplace include:

Evaluation of the ill or injured worker

Evaluation comprises three types of assessment: a clinical assessment of the worker, an assessment of the worker's job and a work capacity evaluation.

The clinical assessment of the worker is usually done first to establish a profile of the worker. Assessment of joint range, muscle strength, balance, endurance, hand function, memory and concentration are some of the assessments which the occupa-

tional therapist would carry out. The aim is to establish what problems workers may have as well as their residual ability or potential.

The assessment of the worker's job is done to establish what is required of a worker in his/her specific work situation. This is done through interviews with the employees or human resource personnel, job analysis and/or work visits.

The last stage of evaluation is a very specific evaluation to match the worker profile and the job requirements. Keeping the last two in mind, the occupational therapist plans a specific assessment using standardized tests, work samples, job/task simulation activities and various other techniques to assess the worker's ability to do a specific job according to open labour market standards.

Due to the fact that the occupational therapy evaluation of a worker is activity based (the worker participates in various tasks related to their work situation), the assessment of 'symptom magnification' or 'malingering' (also known as inappropriate illness behaviour) is possible. Some of the standardized tests used have built in 'reliability checks' that are used specifically to identify symptom magnification.

Occupational therapy treatment

The value of treatment is often underplayed because of financial constraints. However, seen in the long term, occupational therapy intervention with the injured and/or disabled worker is more viable than retraining a new worker. In addition, the Code of Good Practice as contained in the Labour Relations Act,[7] underpins the necessity for intervention/treatment before considering termination of worker's employment.

Various treatment/intervention strategies can be designed to improve work performance depending on the nature of the illness and/or disability as well as available resources. Here are a few examples:

Work hardening programmes

These programmes provide a transition between acute care and return to work while addressing factors such as productivity, safety, physical tolerances and worker behaviour.[5] Activities are used to progressively grade biomechanical, neuromuscular, cardiovascular and psychosocial functions of a person either in a simulated or real work environment.

Assistive devices and other rehabilitation methods

The productivity of a worker with an injury/disability could be enhanced by the application of assistive devices, adaption or ergonomical environmental changes to his/her work situation. An example of an assistive device would be the use of a special glove to enhance grip strength and function in the case of a worker who had lost some function and strength after an injury to the hand or a step on which workers could alternatively place their feet to ensure prolonged standing endurance in the case of a spinal injury. An example of ergonomic environmental adaptation would be the lengthening of a machine lever for a worker who had suffered from burns, resulting in decreased joint range.

Placement programmes/ facilitation

Once a worker has been evaluated and (where necessary) rehabilitated to meet open labour market demands of their work situation, placement is facilitated by the application of assistive devices, adaptations and ergonomic environmental adaptations. Such changes are monitored to ensure that continuing open labour market standards of work are met.

Workers considered to be below open labour market standards should be encouraged to seek alternative employment such as sheltered or protected work, self help employment schemes and community based employment situations.

Follow-up services

Services are provided to employers and workers to ensure successful placement, job satisfaction and productivity of a person with a disability who has been (re)employed. The 'abilities' of the worker are appropriately managed to ensure maximum skill utilization and productivity in the work place.

Prevention

The occupational therapist can be used as a consultant for the practical implementation of ergonomic factors such as the presentation of back programmes. Various services, for example, stress management programmes are also available. The occupational therapist can function as a member of a team addressing post-traumatic stress syndromes and for trauma debriefing.

Application of legislative provisions

There are concerns regarding the increased ill health benefit applications and the correct management of these applicants. Recent legislation also aims at reducing discrimination on the basis of disability in

the work place as contained in the Constitution.

Legislative provisions include:

- The Labour Relations Act (particularly Section 10 and 11 of the Code of Good Practice: Dismissal) which give very definite guidelines regarding the evaluation of both temporary and permanent 'incapacity'. The occupational therapist can contribute greatly toward the application of these guidelines.
- Proposed employment equity legislation currently being developed to promote the eradication of unfair discrimination in the labour market. Disabled persons are included as a historically disadvantaged group.[7] According to Buys and Strasheim,[7] 'It is likely that as regards to persons with disability, the final Employment and Occupational Equity Act will follow many of the principles of the Americans with a Disability Act. The American Act has a specific definition of "disability" and requires employers to make and implement "reasonable accommodations" to promote employment equity and non-discrimination towards person with disabilities.'

An occupational therapist would be able to assist in the application of these requirements ensuring that workers with disability are placed in the most suitable position.

Referral to occupational therapists

Employers and occupational health and safety team members are often unsure of the type of injury or disability to refer to an occupational therapists. The essential element for referral is when 'employability / productivity' becomes affected by illness / injury / disability.

Conclusion

The occupational therapist is fast becoming an essential member of the comprehensive and pro-active Occupational Health and Safety team. Utilization of their services in issues regarding workers with injuries and disabilities would greatly streamline effective incapacity management programmes.

For more information on how to contact occupational therapists with the relevant knowledge and skills, contact the office of the Occupational Therapy Association of South Africa (OTASA) on tel (012) 342-5400.

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Low back pain in the work place: myths, facts and consequences

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Occupational Health SA 1998; Vol 4, No 5: 34-36

Abstract

Low back pain has affected people throughout recorded history. However, the phenomenon of low back pain causing occupational disability is a relatively modern one. It seems that disability has as much to do with how the malady is understood by society as with anything else.

Introduction

Before the nineteenth century, low back pain was ascribed, rather vaguely, to 'rheumatics' or 'fleeting pains'. It wasn't really regarded as disabling and, by and large, people got on with their lives.[1]

Then, two events occurred in the nineteenth century to cause an attitudinal shift : the first was the advent of new scientific concepts that low back pain came from the spine and could also be caused by injury. The second was the opening up of extensive railway systems in Europe and America. The work was hard and dangerous and a spate of injuries led to public outcry and the beginnings of a modern compensation system. Episodes of low back pain were almost automatically ascribed to injury and the notorious 'railway spine' was born.

The stage was set for the low back pain / disability epidemic in the latter half of the 20th century. All that was needed was the development of a sophisticated insurance system.

Today, the concept of chronic low back pain as being synonymous with disability is widespread and firmly entrenched. Significantly, in undeveloped economies, this attitude does not occur. In other words, to put it simply, no insurance: no disability.

In the developed world, the problem is compounding. Compensation costs in the United States for low back pain in 1990 were thirteen times what they had been in 1970.[2] Similarly, in the United Kingdom, disability days lost in 1990 were eight times the 1953 level.[3] Over the past two decades in South Africa, the experience of Insurance Companies and Pension Funds is of exponentially rising spinal claims. *(Personal Communication : J van Niftrik.)*

Clearly, something is wrong. The growth of the back pain / disability epidemic is unsustainable. Nachemson has recently estimated that the low back pain industry consumes 10% of Sweden's GNP annually.

International task force

Recently, an international Task Force was established to study the problem of low back pain in the work place. Results and recommendations were published in 1995. The findings were salutary and the root causes of the rising epidemic were identified.[1]

Briefly, these were as follows:

- *The establishment of a sophisticated insurance industry*

It seems that there was a correlation between the insurance pay-out and the disability claim: the higher the insurance pay-out, the higher the disability claim. Evidence led before the US Senate hearing highlights the phenomenon. At a compensation level of 57% of earnings, back claims were double those at a level of 49%. An increase to 80% of earnings resulted in a back claim increase of 5 - 6 fold.[4]

- *The misconception that 'hurt' and 'harm' synonomous*

If the back hurts, there is a widespread belief that damage must be occurring. In fact, studies involving serial scanning over years demonstrate that recurrent episodes of low back pain do not accelerate degenerative spinal changes.[5]

- *The current mind-set that low back pain is disabling*

This belief did not always exist. The Task Force specifically looked at whether the incidence or severity of low back pain has been increasing in past decades. It has not. Rather, it is simply the attitude that has changed.[1]

Myths

A number of myths have grown up over the years with regard to back pain. These are gradually crumbling in the light of new findings and scientific scrutiny. However, like all myths, they tend to exert a disproportionate influence on general opinion. Here are three of the myths:

Myth 1

If you have low back pain and degenerative changes are found on one of the hypnotically compelling imaging techniques, then the two must be causally interlinked.

Fact

Extensive epidemiological study has demonstrated only a very weak link or no correlation between chronic back pain and spondylosis, facet joint osteo arthritis, disc degeneration or protrusion, height, weight, spinal deformity (unless gross), spinal movements or muscle strength.[6] Much more important correlators of back pain disability are cardiorespiratory disease, smoking, psychological morbidity, poor work conditions, social class, education and income.[6] There is now considerable evidence that low back pain is strongly linked to vascular pathology. This may be arterial and ischaemic as a result of arteriosclerosis or vertebral artery stenosis. Or it may be on the venous side due to anatomical derangements (such as disc prolapse), causing venous dilatation, nerve root oedema and consequently eventual intra and perineural fibrosis.[6]

Other intriguing work currently being done demonstrates the increased excitability of the nervous system both peripherally and centrally in chronic back pain sufferers. This lowered threshold for pain goes a long way towards explaining the persistence of pain long after the initial tissue damage has resolved.[6]

Myth 2

Once low back pain or discogenic or degenerative sciatica begin, they are permanent and progressive. Often the myth goes a step further : these conditions are permanent and progressive unless surgery is performed.

Fact

The natural history of low back pain and sciatica is inexorably towards improvement. In a landmark study, Hedrik Weber followed up a cohort of such patients for ten years. He found that, irrespective of whether surgery had been done or not, the long term outcome was the same : people get better.[7]

Interestingly, he also found that all those who had been placed on back related disability pensions eventually returned to performing the same physical tasks they had done previously. This prompted Weber to call for a reassessment of the disability rules in his country.

Weber's findings have been confirmed in numerous other studies reported by Holms and Rothman, Scott, Martin Singer, Charles Burton, John Frymoyer and Alf Nachemson.[8]

Sciatica takes longer to recover than uncomplicated low back pain. Even so, 50% are better within 4 weeks and 90% by 12 weeks.

Myth 3

Low back pain should be treated by rest: the more prolonged the pain, the more prolonged should be the rest. In an absurd continuation of this therapeutic strategy, if the pain threatens to be lifelong, then the appropriate medical exhortation is for lifelong rest - usually via the means of a disability pension.

Fact

In discoscopically directed biopsy studies of disc material, Nachemson has demonstrated that disc metabolism and nutrition is critically dependent on movement. As discs have no intrinsic blood supply their metabolism is dependent on diffusion via the end plates. Diffusion is enhanced by movement and inhibited by immobility. The consequence of disc-immobility is degeneration.[4]

The role of endorphins in the suppression of low back pain has also been highlighted by Nachemson. Again, movement stimulates endorphin production.[4]

Current recommendations

The United States Department of Health and Britain's Royal College have recently, and more or less simultaneously, issued guidelines for the management of an episode of low back pain and sciatica.

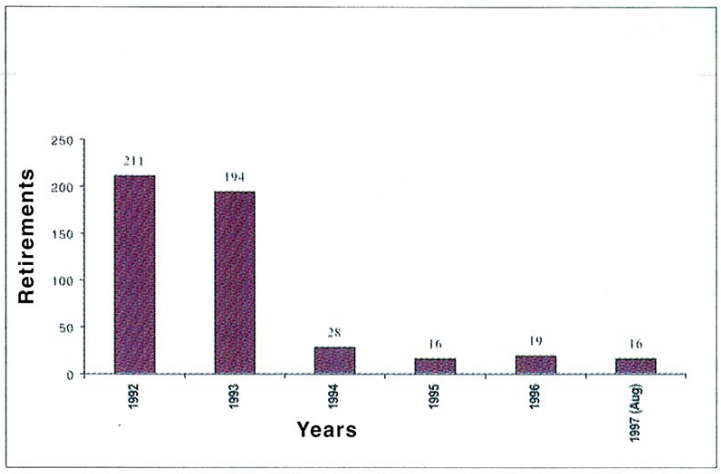
Core recommendations are :

- Restricted rest (2-4 days maximum) followed by a graded return to normal activity *plus* an emphasis on exercise (mainly aerobic) to a level of fitness greater than the pre-episode level. Prolonging rest to more than four days invites chronicity.
- Analgesics should be prescribed at regular intervals and not on an as required basis. It is easier to prevent a pain/spasm cycle than to break it. Recommended analgesics are paracetamol and/or non steroidal anti-inflammatories. The combination is particularly effective. Narcotic analgesics should be avoided if possible.

A key insight is to combine analgesia with increased activity. Again mere pain relief without increasing movement invites chronicity.

• Some medical practitioners may be surprised to learn that spinal manipulation is recommended in the first six weeks after the onset of an episode of acute low back pain. In a review of proof of effectiveness for a variety of treatment modalities, Nachemson rated the effect of manipulation as 'high' for the period 7 - 42 days after onset. This is the *only* therapeutic modality to receive such a rating.[9]

It is sobering to note that proof of effectiveness of surgery of any type scored 'none' for all time periods.



Ill health retirement due to low back pathology

Eskom's experience

Faced with rising numbers of employees incapacitated to varying degrees with low back pain and with exponential increases in back related ill health claims, a multifaceted approach to the challenge was launched.

A Back Safe Programme was devised and implemented by colleagues Mias Pretorius and Ann Tomlin. The programme is presented in an ongoing series of workshops to a wide target audience of people who are at occupational risk. The essentials of back care are taught : how to sit, stand, lift, push, pull and how to keep strong, fit and supple.

Back impaired employees are encouraged to create their own back conservation programme in the work place. This is simply to avoid doing things that they know will hurt their backs. A round table discussion between affected employees, management or supervisor and OHN or medical practitioner is always useful in obtaining consensus on work place accommodation.

However, no situation is ever set in stone and duties can increase as the employee gains more confidence. All back impaired employees are encouraged to embark on a lifelong programme of biokinetically supervised exercise. Eskom Health Services now have professional biokinetician support in each region.

Ill Health Retirement applications are assessed strictly in terms of the American Medical Association's *Guides to the Evaluation of Permanent Impairment*. This ensures a high degree of consistency and neutrality in the assessment of spinal conditions.

The results of this holistic approach to low back management were gratifying. Low back pain related ill health retirements may be used as a yardstick. The attached table is self-explanatory

Conclusion

It must be stressed that Eskom's approach is not particularly new or innovative. To a large degree, it reflects the recommendations of a Task Force which was set up to study Back Pain in the Workplace in 1995. The Task Force comprised an international panel of 25 experts on spinal problems and related disciplines.

A booklet was subsequently published. This slim volume of 67 pages is probably the most useful and informative book available on the management of back pain and interested readers would be well advised to obtain a copy.

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Occupational exposure limits

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Abstract

For many years, employers have been using Occupational Health exposure limits like *Threshold Limit Value* to determine the adequacy of control measures. While the use of threshold limit values has been a dominant force in occupational hygiene, it is one of the most misused and abused concepts. Nevertheless, in many countries, these limits have found their way into regulations.

In 1995 Occupational Exposure Limits (OELs) appeared in South African legislation in the Regulations for Hazardous Chemical Substances. Although they have been in use for a short time only, applications have already been misinterpreted. The following examples illustrate the kind of misunderstandings that have occurred:

* *The OEL of a gas is 30 ppm. A measurement is taken recording 40ppm. Has the OEL been exceeded?*

No, in most cases, a single measurement above the OEL is insufficient to determine that the OEL has been exceeded. The term OEL refers to the airborne concentration of a substance over a period of time, usually an 8 hour work day or a 40 hour work week (OELTWA). For some substances, another category also exists, the Occupational Exposure Limit - Short Term Exposure Limit (OEL-STEL). This is an airborne concentration over a 15 minute period.

Therefore, unless otherwise stated, the measurement must be Time Weighed Average (TWA). One measurement is usually insufficient unless conducted over a work shift. With chemicals, particularly gases and solvents, one short instantaneous measurement could miss critical information. The critical information would relate to the fluctuations, the degree of fluctuations, the time and length of their occurrence. Information like this needs to be obtained and discussed during an acceptable occupational hygiene assessment.

The OEL also allows for excursion above the OEL, provided that these levels do not exceed a maximum limit or for a specific duration. In both cases, the OEL-TWA must also not be exceeded. The excursion allowed is a maximum of three times the exposure limit (OEL-TWA) for a maximum duration of 30 minutes per 8 hour work shift. In many cases, the one high exposure is a significant problem and the primary risk. In the example above, while the result did not exceed these, tasks such as loading chemicals often exceed this limit and when Time Weighed indicate no exposure above the limit. Nevertheless, this one exposure can present a significant hazard and health risk to the employee loading the chemicals.

Clearly, it is important to measure short task exposures. For example, a worker opening a sampling hatch in which mercury vapour will be realised will experience a short duration of exposure. However, the exposure limit of those few minutes could be high enough to exceed the operator's respiratory capabilities and sufficient to present a long term health effect. A risk like this would not be identified on routine biological monitoring for mercury. In addition, if the occupational hygiene measurement did not include the task, the level would not be recorded or it could be lost in the Time Weighed Average result.

Recent legislation introduces both OELs and Risk Assessment to South Africa

All of this indicates the importance of Risk Assessments as well as the need to assess all conditions. What is also indicated is that one measurement (Time Weighed) over a longer period of 2-6 hours may not provide a correct and true picture. Therefore, management should insist that the person performing the assessment should provide details of the duration of the measurement, the findings and the recommendations based on these findings.

* *If the OEL of a gas is 30 ppm but the OEL-TWA and OEL-STEL are about 30ppm would the OEL be exceeded.?*

Yes. In this case it could exceed the limit as both measurements have the same limit. This means that no exposure above that limit over the work day (8 hours)

would be tolerated. The TWA and STEL are equal. These substances are considered to present extremely dangerous conditions and should be well controlled.

** Solvents used in laquer thinners, cleaning fluids, spray painting and shoe manufacturing release vapours containing a large variety of chemicals. How is the OEL measured?*

The assessment of the solvent vapour levels in the air should include all or most of the chemicals and the assessment of the problem as a mixture should take precedence over the results of an individual measurement or chemical result. Frequently, only one chemical within the mixture is evaluated. This usually under-estimates the problem and means that inadequate control is prescribed. In some instances, a qualified and competent occupational hygienist may be able to evaluate one or two chemicals and use this as a guide. In these cases, the OEL and Action Level must be modified to account for this inaccuracy.

The evaluation of a mixture as an additive effect only applies when the components in the mixture have similar toxicological effects. They should not be used for mixtures with widely differing reactivities.

Malaria situation in South Africa

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Occupational Health SA 1998; Vol 4, No 5: 39-43

Abstract

Malaria, still the most serious tropical disease in Africa, results in more than 270 - 480 million cases and between 1.5 - 2.7 million deaths annually.[1] The economic consequences of childhood deaths and disease and frequent bouts of illness in a significant proportion of adults is estimated at more than US$2 000 million in Africa alone.[1] In South Africa about 10% (4 million) of the total population (about 40 million) live in a malaria risk area. The notification of malaria is unsatisfactory. There are plans for collaboration in control between countries in southern Africa.

Introduction

In South Africa, the 1996 malaria epidemic with - 27 035 cases and 163 deaths - was the worst recorded since the epidemics of the 1930s. *Figure 1 illustrates* the trend of malaria transmission in South Africa over the past 18 years. The increases in 1984 and 1985 were a consequence of the influx of refugees from neighbouring countries, following on political instability there. Intensified control programmes and continuous drought over the next seven years brought the incidence down to below 3 000 cases in 1992. The increases in cases since 1993, not only in South Africa but throughout the southern African subregion, were attributed to the heavy rains and high temperatures experienced. A contributing factor in South Africa was the increase in movement of people across borders to neighbouring countries after the political change in 1994.

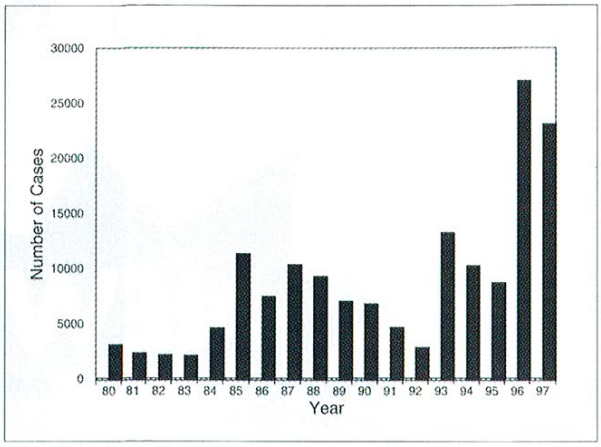

Figure 1: The annual notified malaria cases for the period 1980-1997

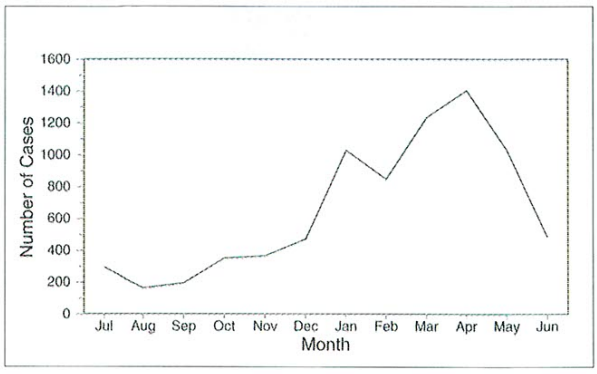

Figure 2: The average monthly notified malaria cases for the period 1980-1997

Figure 2 shows the seasonality of malaria that is characteristic of malaria transmission in this country. There is a sharp increase in the number of malaria cases from December with the peak being between March and May. The age distribution of malaria cases closely follows that of the age distribution of the total population in South Africa. This situation differs from the rest of Africa where malaria is highest in children under five years of age. In South Africa mortality in children under five years of age is very low, constituting less than 1% of total mortality due to malaria. More generally, since the implementation of vector control measures in the early 1940s, the mortality rate due to malaria has been markedly reduced: for instance, while the incidence of malaria has fluctuated over the past 10 years, the case fatality rate has remained under 0.5%, transmission has not spread and the risk areas are still the same.

Malaria in South Africa is limited to the low altitude areas of the Northern Province, Mpumalanga

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-Sunday Times, 18 August 1997

We've all heard the old saying, "Prevention is better than cure," but despite the availabiltiy of preventative medication to combat malaria and other simple ways to protect against mosquito bites, some ignorance still exists as to how malaria can be prevented.

Some people wrongly believe that by using preventative medicines, symptoms of the disease will be masked, making it difficult to detect. Others think that it is not necessary to take prevention when staying in malaria areas for a short period.

Many more do not take malaria seriously at all, even when travelling in game parks in South Africa or in any of the other risk areas indicated on the map on the right side of this page.

So unfortunately, even though malaria is preventable, it continues to be one of the biggest killers of people throughout the world.

For protection, the World Health Organisation (W.H.O) and the Department of Health recommend that people protect themselves against malaria and mosquito bites when in an endemic area.

Among others, in chloroquine-resistant areas, the W.H.O and Department of Health recommend preventative **combination** drugs **containing both chloroquine (DARAMAL®) and proguanil (PALUDRINE®)** especially during the high risk malaria season from approximately October to May.

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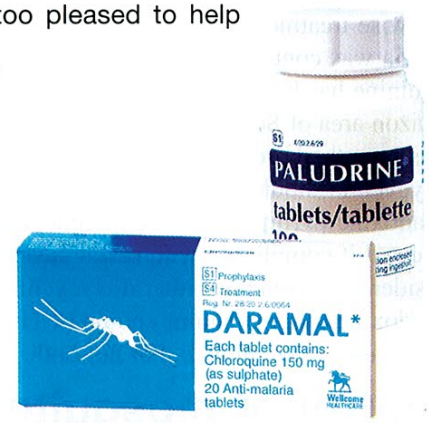

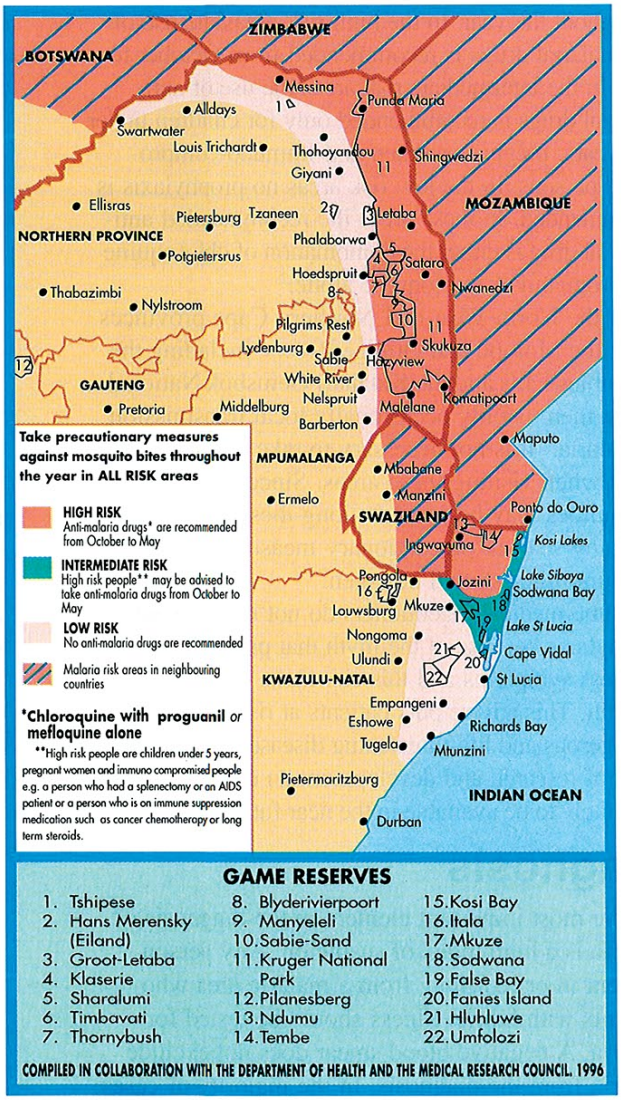

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and the north-eastern part of KwaZulu-Natal. Infections are seldom contracted outside the malarious areas and are then possibly a consequence of the importation of infected mosquitoes by motor or other transport. A map of malaria risk areas published in 1996 has not been changed.

Precautionary measures

Plasmodium falciparum is responsible for about 95% of locally acquired infections and all the malaria risk areas are regarded as chloroquine-resistant. The risk areas are divided into high, intermediate and low risk. (*Refer to Map*). In all risk areas, precautionary measures to prevent mosquito bites should be taken throughout the year. In the high risk areas the use of anti-malarial drugs is recommended from October to May. In the intermediate risk areas the use of anti-malarial drugs is recommended only for children under five years, pregnant women and immuno-compromised persons. In the low risk areas no prophylaxis is recommended. In these areas the recommended anti-malarial drug is either the combination of chloroquine and proguanil or mefloquine alone.[2]

In the North-West and Northern Cape provinces along the Molopo and Orange Rivers, including the Augrabies Falls and the Kalahari Gemsbok National Parks, there is only occasionally local transmission of malaria.[3] It is not necessary to take anti-malarial drugs when visiting these areas. Since nuisance mosquitoes may be present along these rivers during the rainy season, precautionary measures to prevent mosquito bites should be taken.

Some medical practitioners do not recommend prophylaxis because of the myth that prophylaxis suppress symptoms and this can make diagnosis difficult. This advice puts patients at risk of contracting a dangerous and life-threatening disease. Despite many years of research and development an effective vaccine is unlikely to be available in the near future.

Diagnosis

The most important element in the diagnosis of malaria is a high index of suspicion. Any person resident in or returning from a malaria area who presents with febrile illness should be tested for malaria. A negative blood smear does not exclude malaria from the diagnosis. In the majority of cases, examination of blood smears will reveal malaria parasites. The initial confirmation of parasitaemia may be simplified by the use of rapid diagnostic tests such as the immunochromatographic test (ICT). These rapid diagnostic tests have become popular as the diagnosis can be made and treatment given almost immediately. A new ICT test is now available which will detect all species of *Plasmodium* antigen. *Plasmodium falciparum* infection will be diagnosed on its own while there is no differentiation between the other three *Plasmodium* species. If the test for these three species is positive, blood smears should be taken and examined to differentiate between the species to ensure proper treatment of the infection and prevention of relapses. If a mixed infection of *P. falciparum* and one or more of the other species occur, the test can only indicate a *P. falciparum* result. With drugs used to treat *P. falciparum* will eliminate the other species, but relapses may occur in *P. vivax* and *P. ovale*. In all cases, a follow-up blood smear should be taken 2 - 3 weeks after completion of treatment to confirm elimination of parasites.

Treatment

Due to increasing chloroquine resistance, sulfadoxine-pyrimethamine is now the first line of treatment recommended for uncomplicated malaria.[5]

Quinine is the drug of choice for the treatment of severe and complicated malaria. Oral therapy is recommended if the patient is capable of swallowing, otherwise treatment can be given intravenously. If malaria was contracted in an area where resistance to quinine has been reported (for example, the Amazon area of South America or in Thailand in the areas near the border with Cambodia and Myanmar) doxycycline should be added. The addition of sulfadoxine-pyrimethamine to quinine may be indicated if compliance with seven days of quinine is considered a problem. Either doxycycline or sulfadoxine-pyrimethamine should be given in combination with quinine, but not both.

Control of mosquito vectors

Indoor house spraying with residual insecticides has been the mainstay of malaria vector control in South Africa. The use of DDT indoor spraying successfully eliminated *Anopheles funestus*, formerly the main vector of malaria in this country. During the past fifty years, indoor residual spraying with DDT has successfully eliminated malaria vectors from areas stretching as far south as Port Shepstone in KwaZulu-Natal and to the Gauteng province. Malaria risk areas have been reduced to about a fifth of the size of fifty years ago and the now safe parts of the country opened to agricultural and tourist development. Due to mounting pressure from environmentalists and politicians, the use of DDT in South Africa is being phased out. DDT has largely been

replaced by a synthetic pyrethroid, deltamethrin, which breaks down into neutral components and is considered to be more environmentally friendly. For many years synthetic pyrethroids have been used for agriculture and may have promoted the development of pyrethroid resistance in mosquitoes.

Through the use of Geographical Information Systems (GIS), the incidence of malaria in KwaZulu-Natal has been plotted and risk areas have been stratified as high, intermediate and low risk areas. GIS is a useful tool in targeting spraying activities in an area. Apart from the resources saved, the potential for environmental contamination is reduced.

Another important strategy for reducing malaria transmission is the use of insecticide impregnated bednets. Currently, trials are being carried out in KwaZulu-Natal to assess the feasibility of introducing bednets as a supplementary strategy to insecticide spraying. Preliminary results indicate that the use of bednets has a significant impact on malaria transmission. However, the cost of R60 - R80 for a bednet is a deterrent to widespread use.

Malaria and AIDS/HIV

In many areas of Africa where there is a high prevalence of HIV infection, malaria is common in adults and one of the most important causes of morbidity and mortality in children.[5] Studies in Africa have shown that malaria is not more frequent or more severe in children or adults with HIV-related disease. Malaria does not accelerate the progress of HIV disease. However, in pregnant women, HIV-infection would appear to lower resistance to *Plasmodium falciparum*.[6]

Political awareness and regional co-operation

More than twenty percent of cases in South Africa are diagnosed in migrants from neighbouring countries. Since malaria has no borders, the disease is regarded as a regional problem by southern African countries and common control strategies are promoted. There is great potential for joint ventures to improve control measures that will promote health and economic growth in southern Africa. This was a major theme at the first southern African Malaria Conference held in Maputo during May 1997.

The Health Desk of the Southern African Development Communities (SADC) is being developed in South Africa and plans for collaboration in malaria control between countries are included. Specific collaboration with neighbouring countries, especially Swaziland and Mozambique, was initiated when malaria control was identified as one of the major projects of the Spatial Development Initiative (SDI). A malaria control programme in the Lubombo and Maputo corridors (which connect the three countries) is to be developed. This should have a significant downstream impact on the disease burden in South Africa and Swaziland.

Due to the resurgence of malaria in Africa, attributed to environmental phenomena such as the El Niño, there is renewed interest from abroad to control malaria on the continent. A new initiative is being developed to handle problems of malaria in Africa. The African Initiative for Malaria Control (AIM) is being developed 'to control malaria in order to enhance a more equitable development globally and to control malaria in Africa as a contribution to its overall health and socio-economic consequences'.[1] The target of AIM is to initially reduce mortality due to malaria by 50% by the year 2010. It is envisaged that this would be accomplished by increasing access to and use of effective malaria treatment, selective vector control measures and personal protection in all endemic areas. Since the health infrastructure in the high risk rural areas is inadequate, the most appropriate strategy to begin with would be malaria control through environmental management. This will involve environmental manipulation, such as draining swamps, to reduce vector breeding sites and the possibility of malaria transmission.

Notification of malaria

Malaria is a notifiable medical condition in terms of section 45 of the Health Act (Act No. 63 of 1977). The procedure for notification is described in regulation 19 of the Regulations relating to communicable diseases and the notification of notifiable medical conditions (Government Notice No. R. 2438 of 30 October 1987). This regulation requires all medical practitioners or any other person legally competent to diagnose and treat a person with regard to a notifiable condition to report notifiable medical conditions.

As for all other notifiable diseases, the notification of malaria is unsatisfactory. In the malaria areas, notifications are received mainly from clinics, hospitals and laboratories. There is, however, no control over the reporting of the disease by medical practitioners to the local health authority. Doctors and other health workers are encouraged to notify the disease to the local health authority to help improve knowledge of the malaria transmission pattern in the country.

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Daan Kocks

Professor Daan Kocks is the new chairperson of the South African Society of Occupational Medicine (SASOM).From 1993-1997, he served as vice-chairperson of the Society.

Daniel Jacobus Kocks' interest in occupational medicine dates back to 1979. At this time, while studying for a diploma in Occupational Health at the University of Pretoria, he joined SASOM. Over the years, his interest grew. He followed an academic career and now heads the Department of Occupational and Environmental Health at the Medical University of Southern Africa (MEDUNSA). At present, this Department is the only one of its kind at a medical faculty at a university in South Africa. Professor Kocks' aim in initiating the first post-basic university qualification in Environmental Health at Medunsa was to enable students to register as professional occupational hygienists.

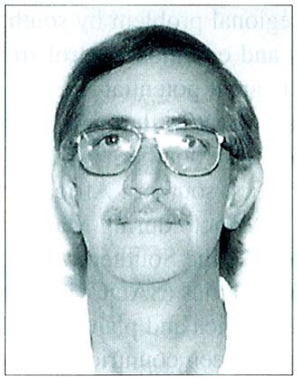
Professor Kocks qualified as a medical practitioner at the University of Pretoria in 1975. He obtained his diplomas in Public Health and Occupational Health at the same university in 1978 and 1980 respectively. In 1985 he was appointed Associate Professor in the Department of Community Health at Medunsa where he obtained his M.Med (Community Health) in 1984 and Doctor of Medicine (MD) degree in 1994. The FFCH(CM)SA academic qualification of the College of Medicine of South Africa had previously been granted to him in 1983.

Professor Kock is registered as one of the few occupational health specialists in South Africa. This registration is based on a 6 year post-basic academic training programme. He has acted as an occupational health specialist to various public and private organisations and he also has numerous publications to his credit..

Professor Kocks identified the need for the development of occupational medicine as a medical speciality in 1984. Over the following 16 years, he has continuously and, ultimately successfully, motivated for the development of this medical specialisation in South Africa: in 1997 the College of Community Health of the College of Medicine of South Africa created a Division of Occupational Medicine to develop Occupational Medicine as a 4 year medical speciality in South Africa. The establishment of this Division will assist with the finalisation of a syllabus and training requirements occupational medicine practitioners. Submissions in this regard have already been put to the College of Community Health by a group of occupational medicine practitioners and SASOM members.

Professor Kocks' professional involvement in the discipline of occupational health means that he has also been involved with organisations like ASOSH (Association of Societies for Occupational Safety and Health). Invited to become a council member in 1984, he was president of the Association from 1990 to 1994. He was included in the Marquis Who's Who in the World in 1997 and is a member of the British Society of Occupational Medicine, the Permanent Commission and International Association of Occupational Health, the American College of Occupational and Environmental Medicine and the New York Academy of Sciences. He is a diplomat of the American College of Forensic Examiners.

Professor Kock is married to Marthie, a nursing manager at a geriatric service. They have three daughters and a son.



To the editor

COID training manual for medical practitioners

After a nine month gestation period, SASOM has published the final version of the COID training manual. Through *Occupational Health Southern Africa*, we would like to thank all those who supported and assisted us in developing the manual. From the time SASOM submitted the proposal to the Compensation Commissioner up to the dispatch of the finished product, many people contributed to our 'offspring'.

Since the conception of the manual, Dr Rautenbach, Dr van der Merwe, Mrs Pieterse and Mrs Visagie from the Compensation Commissioner's office have been an invaluable resource. Trainers and other SASOM colleagues from around the country have contributed both ideas and content. Thanks for solicited and unsolicited content contributions are particularly due to Dave Barnes, Arthur Begley, Andre Botha, Rodney Ehrlich, Gail Todd, Leah Roodt, Mike Simon and Greville Wood. Fiona Robinson's well-organised overheads have been most helpful to a number of trainers. Feedback from trainers after their pilot training sessions was vital in helping us shape the revision of the manual through its six drafts. Finally, the birth of the manual would have been impossible without the continuous help of the long-suffering secretaries at SASOM and the Department of Community Health - Dehlia Müller and Anne de Jager, Project Manager Brendan Girdler-Brown as well as Engela Venter who helped with the editing.

As the authors and editors of the publication, we extend our sincere thanks to everyone involved in developing and launching the COID training manual. It has been a both pleasure to work with so many of our colleagues and a privilege to play a role in this very successful 50th Anniversary SASOM project with the Compensation Commissioner.

Mary Ross and Marianne Felix
Department of Community Health, University of the Witwatersrand

The facts on FACET

The recent Formoterol and Corticosteroids Establishing Therapy (FACET) Study, published in the *New England Journal of Medicine*, demonstrated the efficacy and safety of long term therapy with inhaled formoterol and budesonide for the daily management of asthma in patients with uncontrolled disease.[1] The primary role of the FACET Study was to investigate the addition of regular treatment with the long-acting beta-2-agonist, formoterol, to a low or high dose of the inhaled glucocorticoid, budesonide and to monitor the improvement in symptom control and lung function without any long-term deterioration in the control of asthma over a 12-month period.

The double-blind parallel group design of the FACET Study involved over 850 patients from nine countries.

Results from the FACET Study have shown that by adding formoterol to low dose budesonide, the number of severe asthma attacks was reduced by 26%. By giving the higher dose of budesonide and adding formoterol, a 63% reduction in severe asthma attacks was noted. A 49% reduction in severe asthma attacks was documented with a four-fold higher dose of budesonide.

With respect to mild asthma attacks, adding formoterol to low dose budesonide reduced the number of mild asthma attacks by 40%.

By adding formoterol to the higher dose budesonide, a 62% reduction was achieved and, by giving a four-fold higher dose of budesonide, the number of mild asthma attacks was reduced by 37%.

Formoterol is available in South Africa from Astra Pharmaceuticals (Pty) Ltd. as OXIS™ Turbuhaler®.

For further information, contact Dean Phizacklea on telephone (011) 797-6000 or telefax (011) 797-6001.

Reference

1. **Pauwels RA** *et al.* Effect of inhaled formoterol and budesonide on exacerbations of asthma. NEJM 1997; 337 (20): 1405 - 1411.

Support programme for multiple sclerosis patients

Figures recently released from a Swiss study of multiple sclerosis patients on treatment with Interferon beta-1b highlight the importance of patient education and support. Amongst patients who received counselling by dedicated nurses, only 5% discontinued treatment, while amongst those who did not receive this counselling, the dropout rate rose to almost treble this figure.[1]

In South Africa, the Betaferon Support and Convenience Programme has proved to be an invaluable source of support to patients suffering from multiple sclerosis, their families and doctors concerned. Established by Schering (Pty) Ltd, the Programme provides a wide range of information on multiple sclerosis, as well as practical support and counselling for patients on treatment with Interferon beta-1b.

The Betaferon Support and Convenience Programme in this country has recently been expanded with Audrey Heim, a new Betaferon MS Specialist Nurse joining the team.

For more information about the Betaferon Support and Convenience Programme or the MS Nurse should telephone (011) 313-9783.

Reference

1. **Prof Kappos L.** Clinical experience with Betaferon® in Switzerland. Presentation at Betaferon® Therapy in Multiple Sclerosis Symposium.16 June 1997, Rhodes, Greece.

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Contributions

Contributions are always welcome. Opinions, short reports, letters and articles should be sent to: The Production Editor, Occupational Health Southern Africa, PO Box 2433, Randburg, 2125.

Authors are requested to inform the Editor about submissions to other journals and are required to transfer copyright of their articles to the Journal when accepted for publication.

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Original and Review Articles: Should follow the format of : introduction, methodology, results, discussion and references. Less than 2 500 words.

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Opinions or short reports: These are short reports, less than 1000 words.

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Letters to the Editor: Less than 400 words.

Authors are solely responsible for the factual accuracy of their work and for ensuring their work does not infringe copyright.

Preparation of Manuscripts

Manuscripts should be typed double spaced, using only one side of the paper. Number pages consecutively and leave wide margins. A separate title page should contain the title, the author's full names, and details relevant to correspondence. References should also be listed on a separate page. If possible, a word count should be included and diskettes are welcomed and will be returned.

Authors should submit one original article and two copies of each manuscript. Scientific measurements should be expressed in S.I. units. Abbreviations and acronyms should only be used if absolutely necessary and must be defined on first use.

Illustrations, tables and graphs should be submitted on separate sheets as black and white prints. They should be clearly identified, tables should carry Roman numerals, I, II, III etc. and illustrations Arabic numerals 1, 2, 3 etc. X-ray films should not be forwarded, but glossy prints submitted.

References should be set out in the Vancouver style and only approved abbreviations of journal titles should be used.

Journal references, e.g.

1. Zwarenstein M, Barron P, Tollman S, *et al.* Primary Health Care Depends on the District Health System. S Afr Med J 1993; 83:558.

Book references, e.g.

1. Thompson L.A history of South Africa. Newhaven and London: Yale University Press, 1990.

They should be inserted in the text as superscript numbers and listed at the end of the article in numerical order (not alphabetically). The accuracy of references is the author's responsibility. 'Personal communication' and 'unpublished observations' may be cited in the text, but not in the reference list.

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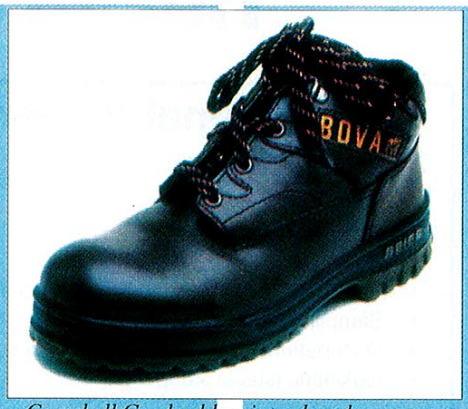
New range of fashionable safety shoes for ladies

Fashion continues to make an impact on the health and safety industry - this time in the ladies' range of safety boots.

Campbell Gardwel, leading safety manufacturer in the Klipton group, is introducing the Ladies Bova Blazer, the first ladies' boot manufactured locally. These safety boots are designed for safety and they look good as well. The boots feature a modern chunky look and could easily be mistaken for designer labelled footwear. During the past few years, all over the world, wherever they are available, these boots have achieved enormous popularity.

Manufactured by Beier, the Hiker is locally designed and manufactured to SABS specifications. The shoe is extremely comfortable due to its broad fit and cushioning effect when the wearer walks.



Campbell Gardwel has introduced a new fashionable ladies safety shoe.

The soles are direct-injected with double-density polyurethane for ample protection against static, petrol, solvents and acid across all industries. Each shoe also has isothermal lining to keep foot temperature consistent in all seasons.

Other features include an extra wide steel toe cap, a padded bellows tongue to keep dirt out and, for extra comfort, a padded collar.

For further information, telephone Ron Anderson at Campbell Gardwel on telephone (011) 613-2151.

Glaxo Wellcome helps young asthmatic to fulfil her dream

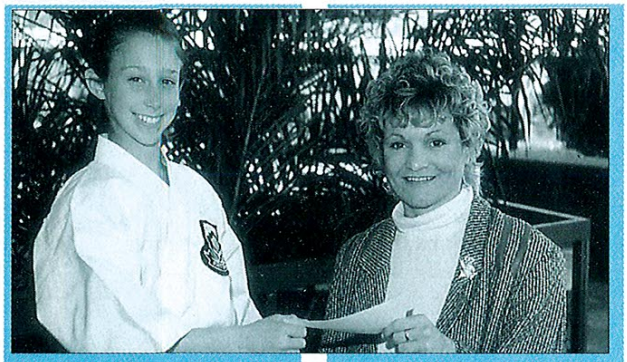
Eleven-year-old Stacy Bregman from Gallo Manor in Sandton, although tiny in stature and an asthmatic, was chosen to represent the South African Junior Karate Association (JKA) in the Junior World Shoto Cup Karate Championships held in Paris, France, from 29 July to 2 August. Helping her to get there was Glaxo Wellcome South Africa who donated funds towards her travelling expenses..

"We are delighted to report that Stacy came in third in Kumite, earning a Bronze Medal, and fourth (after three Japanese youngsters) in Kata," remarks Cynthia Nel, Product Manager at Glaxo Wellcome South Africa. "This is a great accomplishment for her first international tournament."

The donation was made as part of the company's Active Asthmatics educational campaign which honours asthmatic sports people who have distinguished themselves. The two spokespersons for the campaign are Bafana Bafana striker, Shaun Bartlett (who scored both goals in the Soccer World Cup match against Saudi Arabia) and Adrian Garvey (prop forward for the Springbok Rugby Team and the Coastal Sharks).

Stacy, who is in Standard 3 at King David Primary School in Sandton, first started karate five years ago. At about the same time she discovered she had asthma. This did not deter her. She continued to train and soon became a top junior karate champion, winning her South African colours for All Styles in 1995. Her mother, Lynn, believes Stacy may be the youngest person in South Africa to win her colours for karate. Stacy trains at the Friendsan Karate Academy in Rivonia.

Prior to leaving for overseas, Stacy won two Gold Medals in the JKA Juniors' competition held here in South Africa. She also won a Gold for Kata and a Bronze for Kumite in the SA Junior All Styles Championships.



Cynthia Nel of Glaxo Wellcome South Africa presents a cheque to Stacy Bregman, who has asthma, to assist her in taking part in the Junior World Shoto Cup Karate Championships in Paris, France.

Local allergy websites

If you have patients with allergies and you would like to know more about managing their conditions, then these sites may well be the only place you need to look to get all the information you require.

- Allergy Society of SA (ALLSA)
  http://www.AllergySA.org
- National Asthma Education Programme (NAEP)
  http://www.asthma.co.za
- SA Pulmonological Society (SAPS)
  http://os2.iafrica.com:8000/pulmon/index.htm

Calendar of Congresses and Conferences

September			
28 - 2 Oct	Minesafe International '98	Sun City, South Africa	Tel: (011) 498-7100 or visit the website www.mining.co.za/minesafe.htm
October			
6 - 8	The 2nd Emergency Services Exhibition	Kyalami, Johannesburg	Debbie Turncliff, Tel: (011) 466-2299 Fax: (011) 466-1318
13 - 15	Safety, Health and Environment "98 Exhibition	Gallagher Estate, Midrand	Joan De Beurges, PO Box 652495, Benmore, 2010. Tel: (011) 444-3937 or 444-7954 or Fax: (011) 444-7987 e-mail:raisa@iafrica.com
November			
4 - 7	Cleantex Africa '98	Nasrec, Johannesburg	Maria Hook, Tigue Promotions. Tel: (011) 454-1885 or Fax: (011) 453-5634
12 - 13	SASOHN Seminar and AGM	Gateway Woods Hotel, White River, Mpumalanga	Linda Tozer, MSOHN, P O Box 1977, Nelspruit, 1200. Tel: (013) 750-1673 or Fax: (031) 751-2650 or Cel: 083 290-1235 or e-mail: tozer@cis.co.za.
22 - 27	Noise Effects '98 7th International Congress on Noise as a Public Health Problem	Sydney, New South Wales, Australia	Congress Secretariat, Noise Effects '98, GPO Box 128 Sydney, NSW 2001, Australia Tel: 612 9262 2277 Fax: 61 2 9262 2323 e-mail: tourhosts@tourhosts.com.au
23 - 25	2nd South African Construction Health and Safety Conference	Monte Carlo Conference Centre, Cape Town	Ms Marshay Mackay, Tel: (021) 915-2580 Fax: (021) 915-2867 or e-mail: marshay@eskom.co.za
1999			
April			
7 - 9	The Ergonomics Society (50th Anniversary) Annual Conference	Leicester, England	Maragret Hanson, Annual Conference Programme Secretary, c/o IOM, 8 Roxburgh Place, Edinburgh EH8 9SU
Sept			
29 - 2 Oct	5th PACOH '99 - Pan African Conference on Occupational Health	Tunis	Secretariat, PACOH '99, 138 Boulevard du 9 Avril - 1006 Tunis - Tunisie Tel: (216-1) 596244 Fax: (216-1) 564280 or e-mail:rafik.gharbi@ing.tn
2000			
August			
27 - 1 Sept	ICOH 2000 - 26th International Congress on Occupational Health	Singapore	ICOH 2000 Congress Secretariat, Dept Community, Occupational and Family Medicine Faculty of Medicine MD3, National University of Singapore, Lower Kent Road, Singapore 119260 Tel: (65) 874-4989or Fax: (65) 779-1489 or e-mail: icoh2000@post1.ocm

Itraconazole pulse therapy: the optimal treatment for toenail onychomycosis

Conflicting or unequivocal results in clinical trials make it difficult to make the best treatment choice for onychomycosis and other common dermatomycoses. Factors to be considered include cost-effectiveness, beneficial pharmacokinetic and pharmacodynamic properties and the spectrum of antifungal efficacy and clinical utility of the available antifungal agents.

Cost/efficacy analysis in onychomycosis

A recent comprehensive pharmaco-economic study in the USA found the newer antifungal preparations (itraconazole pulse therapy in particular) to be subsequently more cost-effective than griseofulvin for the treatment of dermatophyte onychomycosis on the toenail, yet griseofulvin is still widely used.[1]

Evaluation of efficacy was performed at 12 months after starting treatment with the newer antifungal agents and after 18 months of treatment with griseofulvin. A time horizon of 3 years was chosen to allow a sufficient period for assessment and treatment of relapses.

Results

Intraconazole (pulse) therapy produced the higher mycological cure rate (76%) followed by terbinafine (74%). Itraconazole continuous therapy (64.4%) and fluconzole (59%) griseofulvin showed the lowest mycological cure rate of all (24.5%).

World-wide data indicate that the relapse rate for itraconazole (pulse) therapy one year after the start of therapy is 0.3%.

The cost regimen analysis showed itraconazole pulse therapy to be the least expensive form of treatment.

References

1. **Gupta AK.** Pharmaco-ecnomic analysis of oral antifungal therapies used to treat dermatophyte onychomycosis of the toenails. Pharma-coecnomics; 1998; 13(2) 243-256.

For further information please contact Dianne Rix telephone (011) 269–4600.

Congratulations! World award for former Telkom technician's innovation

Former Telkom technician Gervan Lubbe, who invented the APS therapy device for pain relief has been award the Outstanding Young Person of the World award in the medical innovation division.

Junior Chamber International (JCI) recognised the accomplishments of young people in 10 categories, with Lubbe chosen from thousands of nominations across the world. Lubbe will receive the award at the world congress in Manilla, Philippines, in November.

JCI said in a press statement Lubbe has shown that South Africa was still producing people of the highest quality, "Thousands of people have left South Africa and numerous articles have been written regarding the brain drain of South Africa's talent. This award has indicated to us all that there are still persons regarded as the best in the world in their field of expertise in South Africa. The entrepreneurial spirit of an individual such as Gervan is an inspiration to all others that dedication and hard work really pays off."

Supported by clinical and scientific evidence, Lubbe's company marketed the therapy device internationally. Through the device, many pain-related pathological conditions can be treated without any side-effects. This was achieved by various neurohormones and neurotransmitters in the body.

Since his invention in 1992, Lubbe has received numerous awards including an Academic Gold Medal from the SA Institute of Art and Science, a gold medal in the medical category during the International Inventions Show in Geneva, and South African Afrikaans Junior Businessman of the Year award. *(The Star 21 August 1998)*

Something old, something new

Needler Westdene Hearing (Pty) Ltd are involved in the marketing and sale of occupational health care products as well as the distribution of medical products and devices to both government and private health care sectors. They recently launched their new impedance meters and middle ear analysers which introduce additional features and advantages to their powerful and versatile maico audiometer range. Their new maico MA1000 is a fully automatic system with a multi-testing capability of one to sixteen tests with a single audiometer. This system is used with their software programme.

The A&D blood pressure monitors are another of their popular products. Renowned for their accuracy, these monitors are currently being used by pharmaceutical companies in Europe in blood pressure and cardiovascular medication trials. The units range from home-use digital blood pressure units to 24 hour blood pressure monitors which can be used with hypertensive blood pressure cases. Automatic NIBP units are also available for high care or ICU use.

For further information, please contact Coleen, Tony or Lucky on telephone (011) 453-7533/4 or telefax (011) 453-7518.

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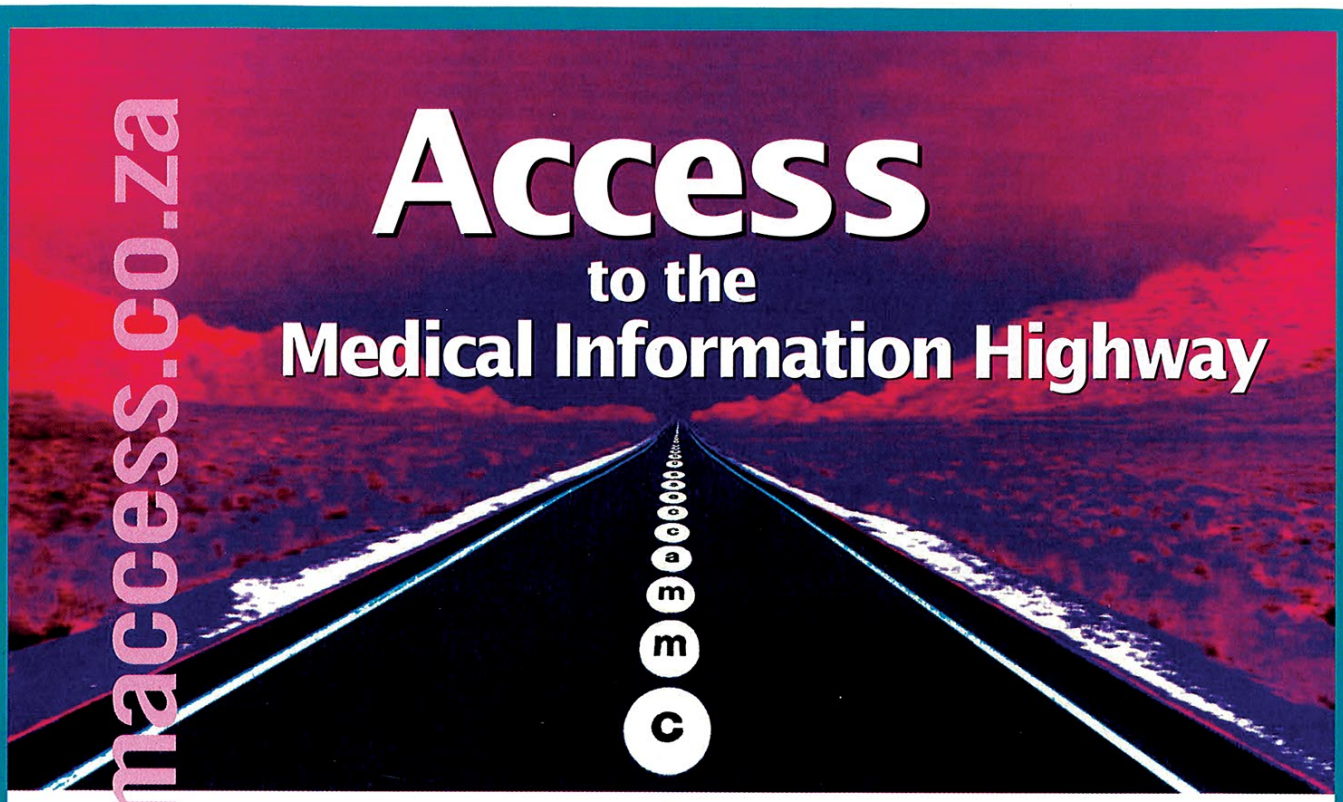

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South Africa's most Informative Medical Web Site

Structured along the lines of the Medical Industry Directory, the **CMMACCESS** web site gives you access to the widest range of information about medical products.

With the marketing muscle of Cannon Medical Media, it is to become SA's most well known medical web site too.

Supplier Index

Do you need to find a company? Supplier Index is an A-Z list of suppliers to the medical industry plus all their contact details.

Product Index

Do you need to find out who supplies a particular product? Click this button and find out!

Buyers Guide

Do you want to see what is available? Let your mouse do the walking!

Other Journals

If you want to stay focussed on medical progress, a subscription to a CMM journal is the way to do it.

Congresses

A must in the medical field. For continually updated information this is the place to go.

Financial Services

Vital information at your fingertips

CMM access

www.cmmaccess.co.za

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