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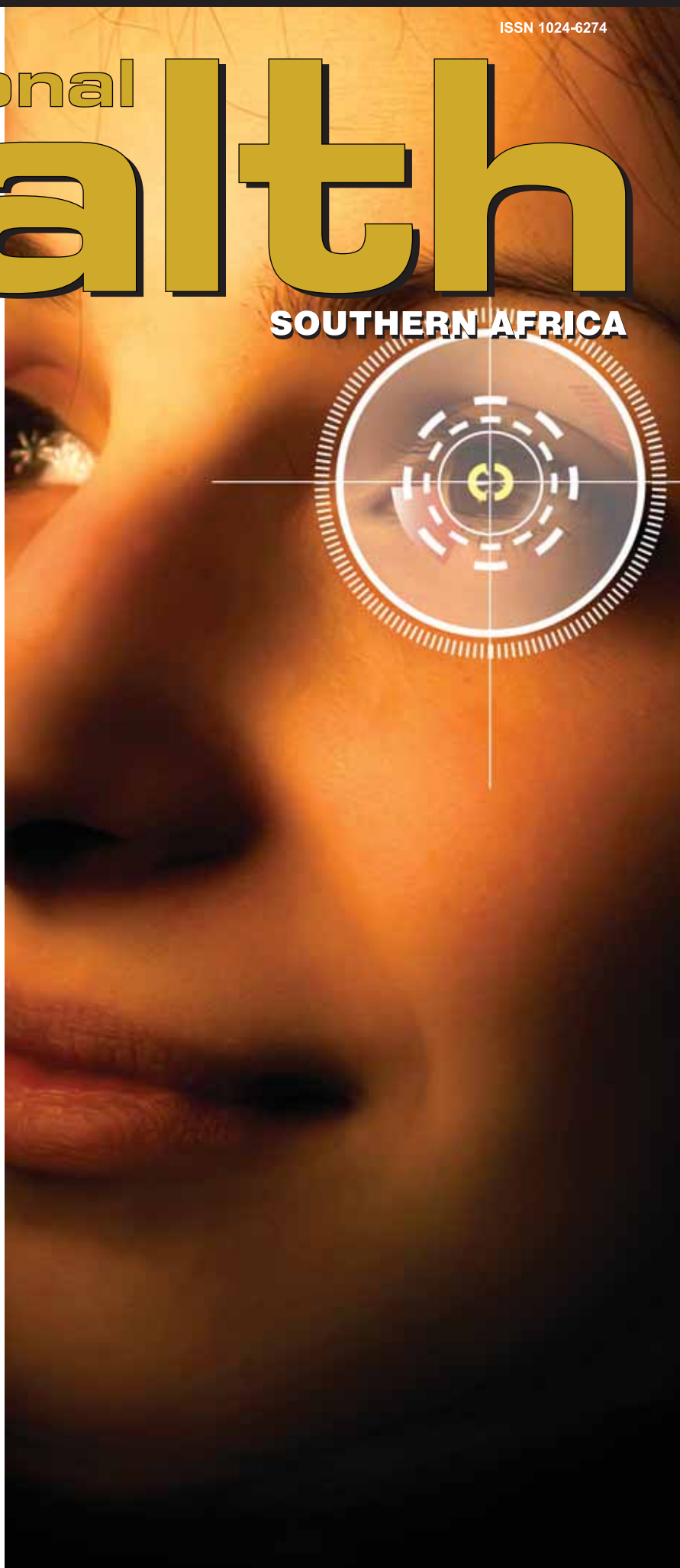

*Factors that influence return to work after stroke*

*Computer-related symptoms in the workplace: causes and preventive strategies*

*Workplace eye injuries: a literature review*

*"Gloves in a Bottle?"*

*Official Journal of The SA Society of Occupational Health Nursing Practitioners, The SA Society of Occupational Medicine, The Southern African Institute for Occupational Hygiene and The Mine Medical Professionals' Association.*


# International Mesothelioma Interest Group
## 2014 CONFERENCE
## Register Today!
## www.imig2014.org

Dear Colleagues
October 2014 will mark 50 years since the landmark international conference held in New York City brought together pioneers and giants like Wagner, Churg and Selikoff to share their rapidly growing understanding and knowledge about the links between asbestos and disease. Dr Selikoff stated in his opening address that

> *"this journey… has branched into intertwining roads, including those of epidemiology, oncology, physical chemistry, physiology, experimental pathology, and many others. Those of us who have been exploring these roads, meet now at a common junction, to exchange experiences and perhaps ask helpful directions."*

That conference ended on 21 October 1964, and we will be welcoming you to Cape Town and South Africa for our mesothelioma conference exactly 50 years later on 21 October 2014 where we will be looking to have another fertile confluence of minds, bringing together diverse fields and disciplines in our common quest for cure.

This meeting will include presentations on new and exciting areas of mesothelioma research, such as genomic sequencing of cancer cells and its potential to generate new treatments, and new immunotherapy approaches - labelled by Science magazine as 'the breakthrough of the year' in 2013 - plus updates on all current research and clinical topics in the field. In addition we will present some interesting reviews of 'where we have come' to celebrate the that fact that the meeting is being held in the country from whence came Wagner's original description of the association between asbestos and mesothelioma in 1960 plus the 50th anniversary of the Selikoff-Churg international conference that helped focus public concern on asbestos and mesothelioma.

We invite you to bring your sciences to sunny South Africa and iMig2014 - to once again place the spotlight of science and awareness on this disease, to further our understanding thereof, and to advocate for the victims of this most terrible of environmental diseases.

Dr Jim teWaterNaude, Prof Tony Linegar (co-chairs, South Africa)
& Prof Steve Mutsaers (iMig President)

## Conference Programme Highlights

All events are at Cape Town International Conference Centre unless indicated

21 October 2014
Reception - Welcome to Cape Town!

22 October 2014
Official opening and plenary keynote addresses on Genomics & Thoracic surgery

23 October 2014
Jurisprudence, Epidemiology, Nursing

Gala dinner for all with drumming at GOLD restaurant, plus Wagner medal winner announcement

24 October 2014
Closure and future scientific directions

Special seminars will include:
- What have the last 54 years taught us?
- IASLC /iMig staging database results
- Asbestos pollution and meso in South Africa
- Artist exhibits on "Images of mesothelioma"

## Abstracts for Poster & Oral Presentation

We are accepting Abstracts until late June 2014. We encourage submission on the following streams:
Molecular genetics · Immune checkpoint inhibition · Immunotherapy · Molecular classification · Molecular therapeutics & novel trials · Clinical trials · Mesothelin therapy · Cancer stem cells · Personalized medicine · Trials in Progress · BAP1 · Radiotherapy · Biomarkers · Gene regulation · Pathology · Peritoneal mesothelioma · Nanoparticles · Multimodality treatment · Oncology & Chemotherapy · Imaging · Animal models & preclinical studies · Social advocacy · Surgical & postoperative management · Palliative care

Please visit our website for additional topics and submission criteria.

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**This journal is on the Department of Higher Education and Training's list of Approved South African Journals, and authors qualify for a subsidy for their affiliated tertiary institutions. It is also listed in African Index Medicus.**

# From the Editor . . .

**Gill Nelson, Editor**

In 2011, cerebrovascular disease (into which category stroke falls) was the third leading underlying natural cause of death in South Africa (5.1% of all deaths), following tuberculosis (10.7%) and influenza and pneumonia (6.6%).[1] South Africa is in the midst of the epidemiological transition, and the burden of stroke is predicted to increase.[2] There is strong evidence that a multi-disciplinary approach is essential to maximise chances of recovery from stroke and to minimise dependency.[3] Research by Duff et al. on stroke patients, published in this issue, shows that many stroke survivors do not return to work, perhaps because they are not receiving the full package of services that could be made available to them.

The two other papers in this issue both address ocular concerns, and both are from the University of KwaZulu-Natal's Discipline of Optometry in the School of Health Sciences. The first, written by Khathutshelo Mashige, is a back to basics paper on the effects of computer use, primarily those involving the eyes. Eye strain is something that is bound to be experienced by most of us who spend long hours working in front of our desktops, laptops or tablets. One of the main recommendations to avoid eye strain is to look away from the screen at regular intervals. While this is sound advice, like me, you probably find that two or more hours have passed before you remember to look away. I have now installed an app called fadetop on my laptop, available at http://www.fadetop.com/. This app fades the screen every 15 minutes, or a time period set by the user, as a reminder to take a break. The second paper is a review of the literature on occupational eye injuries, by Velibanti Sukati, and also highlights the need for eye protection, but of a different kind. Most injuries can be prevented by using appropriate eye protection, yet workers appear to be resistant to its use due to many factors, including alcohol and drug abuse. Much of the research has been conducted in countries other than South Africa. Is it not time to do some research here?

The society pages sadly feature tributes to two prominent occupational health practitioners – Dr Charles Roos from SASOM and Professor Leana Uys from SASOHN, both of whom contributed significantly to their professions. On a happier note, SASOM is preparing for the combined African Regional Association of Occupational Health (ARAOH) /SASOM Congress in August; SAIOH is preparing for its annual conference in October; and the MMPA has reported on their very successful Kimberley symposium held at the Kalahari Lodge in the Northern Cape in April.

In our last two issues, Dr Jim teWaterNaude wrote about the Asbestos and Kgalagadi Relief Trusts' important contributions to providing financial relief to sufferers of asbestos-related diseases. In October this year, the 12th International Mesothelioma Interest Group (iMIG) Conference is being held in Cape Town. Dr TeWaterNaude of the South African Mesothelioma Interest Group is the local organising chairperson. The meeting promises to be a worthwhile event for all of you who have an interest in asbestos research. More details can be found in this issue.

On the subject of asbestos, the Helsinki Declaration on Management and Elimination of Asbestos-Related Diseases adopted by the International Conference on Monitoring and Surveillance of Asbestos-Related Diseases in February in Finland, has been signed by Prof. Harri Vainio, Chair of the Organising Committee of the International Conference on Monitoring and Surveillance of Asbestos-Related Diseases and Dr Kazutaka Kogi, International Commission on Occupational Health (ICOH) President. The Declaration can be found at: http://www.icohweb.org/site_new/multimedia/news/pdf/20%20March%202014%20Final%20Signed%20Declaration%20for%20website.pdf

Winter is upon us, although those of us in Gauteng are still experiencing glorious days. This is also the time of mid-year exams and we wish everyone who is writing, the best of luck. Congratulations go to those who will soon be graduating.

## REFERENCES


1. Statistics South Africa. Mortality and causes of death in South Africa, 2011: Findings from death notification. Statistical release P0309.3; 2014. Available at: http://www.statssa.gov.za/publications2/statsabout.asp?PPN=P0309.3&SCH=5490 (accessed 2 Jun 2014).
2. Connor M, Bryer A. Stroke in South Africa. In: Chronic diseases of lifestyle in South Africa: 1995-2005. Steyn K, Fourie J, Temple N (eds). Chronic Diseases of Lifestyle in South Africa: 1995-2005. Technical Report. Cape Town: South African Medical Research Council, 2006. pp 195-203.
3. Bryer A, Connor M, Haug P, Cheyip B, Staub H, Tipping B, et al. South African guideline for management of ischaemic stroke and transient ischaemic attack 2010: A guideline from the South African Stroke Society (SASS) and the SASS Writing Committee. S Afr Med J 2010; 100(11):747-778.

# Upcoming events

## LOCAL MEETINGS

| DATE | MEETING | TOPIC | PLACE | MORE INFORMATION |
|---|---|---|---|---|
| 1-3 August 2014 | International ARAOH/ SASOM Congress | Occupational health and safety in a rapidly changing work environment in Africa | Emperors Palace, Johannesburg | E-mail: info@sasom.org Website: http://www.araoh.org/index.php/congress-reports/congress-2014 |
| 12-13 August 2014 | Supply Chain Africa Summit | Supply chain aspects in Medical Sciences and the Mining Industry | Hyatt Regency Hotel, Rosebank, Johannesburg | E-mail: alphy.nangani@fleminggulf.com Website: http://scl.fleminggulf.com/supply-chain-africa-sumit |
| 3-6 September 2014 | 10th PHASA Conference | Dignity, rights and quality: towards a healthcare revolution | Protea Ranch Resort, Polokwane, Limpopo | E-mail: deon.salomo@mrc.ac.za Website: www.phasaconference.org.za/ |
| 5-6 September 2014 | MMPA Annual Congress | | Kloofzicht Lodge 5, Kromdraai Road, Muldersdrift, Jhb | E-mail: elaineg@mpas.org.za |
| 9-11 September 2014 | 4th Global Health and Safety Forum in Mining | Health and Safety in Mining | Hyatt Regency Hotel, Rosebank, Johannesburg | E-mail: Sanjay.Swamy@ fleminggulf.com Website: http://energy.fleminggulf.com/global-hs-forum-in-mining |
| 21–24 October 2014 | 12th International Mesothelioma Interest Group Conference | The ongoing quest for cure | Cape Town International Conference Centre | E-mail: jimtewn@mweb.co.za Website: http://imig2014.org/ |
| 29-31 October 2014 | SAIOH Annual Conference | Beyond dust and noise | North-West University, Potchefstroom Campus | Johan du Plessis E-mail: Johan.DuPlessis@nwu.ac.za Website: http://www.saioh.co.za/Conference2014.aspx |

## HEALTH AWARENESS DAYS, WEEKS AND MONTHS

### JUNE 2014

Men's Health Month

1 International Children's Day
1 14th World Milk Day
2 International Cancer Survivors Day
3-9 World Heart Rhythm Week
5 World Environment Day

### JULY 2014

28 World Hepatitis Day

### AUGUST 2014

1 - 7 CANSA Care Week

## INTERNATIONAL MEETINGS

| DATE | PLACE | MEETING | MORE INFORMATION |
|---|---|---|---|
| 2-3 September 2014 | Moscow, Russia | Central Asia Health and Safety Forum in Mining | E-mail: sonika.mendjoge@ fleminggulf.com http://energy.fleminggulf.com/central-asia-health-safety-forum-mining |
| 2-4 September 2014 | Fukuoka, Japan | The 21st Asian Conference on Occupational Health | E-mail: acoh2014@mbox.med.uoeh-u.ac.jp Website: http://acoh2014.com/index.html |
| 17-19 September 2014 | Adelaide, Australia | Work Organization and Psychosocial Factors | E-mail: maureen.dollard@unisa.edu.au Website: http://unisa.edu.au/ICOHcongress |
| 18-21 September 2014 | Marrakech, Morocco | 41st International MEDICHEM Congress | Website: www.medichem2014.com |
| 24-26 September 2014 | Porto, Portugal | International Congress on Environmental Health (ICEH2014) | E-mail: iceh2014porto@gmail.com Website: http://iceh2014.pt.to |
| 29 Sep – 1 Oct 2014 | Toronto, Canada | 3rd International WDPI 2014 Conference on Work Disability Prevention | E-mail: sandra.knol@utoronto.ca Website: http://wdpi2014.iwh.on.ca/ |
| 21-23 January 2015 | Dubai, UAE | 4th ScienceOne International Conference on Environmental Sciences (ICES 2015) | Email: ices@thescienceone.com Website: http://thescienceone.com/ices |

# Gloves In A Bottle lotion

The increase in global business and industrialisation has, unfortunately, many knock-on side effects. One is an increase in work-related dry skin conditions for employees.

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- GIAB is recommended and used internationally by more than 9 000 dermatologists and medical practitioners.
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- More than 10 million bottles have been sold.
- GIAB is currently sold internationally in more than 20 000 chain store groups, pharmacies and hardware stores.

GIAB lotion is not a conventional moisturiser but is categorised as a SHIELDING lotion. A shielding lotion assists in locking out moisture-depleting irritants whilst simultaneously locking in the skin's natural moisture and oils. GIAB achieves this while still allowing the skin to breathe and perspire naturally. Excessive and consistent loss of natural oils and moisture from the skin inevitably results in dry skin conditions.

When applied, GIAB lotion adheres to the external layer of the skin, creating a similar effect to that of an invisible glove, assisting in shielding the skin from moisture-depleting irritants and locking in the natural moisture and oils that we require to maintain a healthy skin.

Employees who experience work- or otherwise-related dry, cracked, red, itchy or flaky skin, generally, as a first line of defence, purchase an over-the-counter conventional moisturiser which provides synthetic moisturisation. How often have you heard someone say that once they stop using their conventional moisturiser, their skin is worse than it was before using the moisturiser? The reason for this is that applying synthetic moisturisers to the skin sends off the "wrong" signal, duping the body into believing that it is producing sufficient natural moisture and oils for the skin. The moment that the synthetic moisturiser is no longer used, the skin has a reduced amount of natural moisture and oils available due to the "wrong" signal it received and, thus, the skin feels and looks worse than before. A never-ending circle, or a catch 22 situation, is created, i.e. one needs to continue applying the conventional moisturiser to achieve symptomatic relief whilst, sadly, the body continues to receive the wrong signal that it is producing sufficient natural moisture and oils.

The technology associated with GIAB is opposite to that of a conventional moisturiser. The skin is the largest organ of the human body and consists of seven layers. In order to achieve an effective moisturising result, it is important that moisturisation penetrates to, at least, the second layer of skin. GIAB achieves this as the natural moisture and oils of the body are assisted to optimally perform their function by being "locked in". Thus, the skin is successfully and naturally moisturised from the inside out without further promulgating a "wrong" signal to the body. In addition to this, the protective layer created when applying GIAB assists in locking out moisture-depleting irritants. Thus, a win-win situation is created when using GIAB. The results achieved are remarkable and are noticeable within just a few days of consistent use.


Unlike conventional moisturisers, an added advantage of using GIAB is that it does not wash off through the conventional washing of the skin but comes off through the natural exfoliation of the skin. A single application lasts 4 – 12 hours. Employees continue to achieve protection and dry skin care even after washing.

GIAB lotion is in no way a replacement for safety apparel and should be used in conjunction with recommended safety wear for those who experience work-related dry skin conditions. The product is suitable for use on hands, face and body.

If you have a workforce that experiences dry skin conditions for whatever reason, simply try GIAB lotion. See the amazing results and make an educated and cost-effective decision as far as dry skin care and skin protection for your employees are concerned. A healthy employee is a happy employee. Less "down time" = greater efficiency.

For more information contact Rob Oosthuizen
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Fax: 0866 020 790

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# Factors that influence return to work after stroke

**Duff N, Ntsiea MV, Mudzi W**
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*Correspondence:* Ms Nicole Duff of Nicole Duff, Rita Henn and Partners, Netcare Auckland Park Hospital, Bunting Road, Auckland Park, South Africa, 2006. e-mail: jigglynduff@gmail.com

## ABSTRACT

**Stroke continues to be a major health problem for both developing and developed countries. An increasing number of survivors are within the working age range and thus still have much of their working life remaining. This study aimed to establish the rate of return to work (RTW) and the factors that influence RTW after stroke. This was a quantitative cross sectional study comprising 97 participants from various rehabilitation units in Gauteng province. The mean age of study participants was 51 ± 10.5 years. The RTW rate was 34%. The most common reasons for RTW were financial (77%) and enjoyment of work (77%). The most common reasons for not returning to work were upper limb dysfunction (61%) and walking difficulties (53%). Being depressed and not paying life insurance or monthly car repayments decreased the likelihood of RTW.**

***Keywords:*** **stroke, work, rehabilitation, cerebrovascular accident**

## INTRODUCTION

Stroke continues to be a major public health problem for both developed and developing countries, despite various advances in health care. Connor et al.[1] showed that the prevalence of stroke survivors in rural South Africa (SA) is around 300/100 000 people, which is almost double that of the estimated 164/100 000 in the United Kingdom (UK).[2] This has increased significantly since a study conducted in urban SA in 1986, which showed that around 1/1000 patients suffered from stroke.[3]

**CT scan slice of the brain showing a right-hemispheric ischemic stroke. (Source: http://en.wikipedia.org/wiki/Stroke)**

Recent studies have shown a "shift in the natural history of stroke towards a less fatal and disabling disease".[4,5] However, whereas stroke used to be a disease of the elderly, an increasing proportion of stroke survivors are now of working age and many have much of their working lives remaining.[6,7] As more patients survive stroke, the costs of medical care and indirect costs of lost productivity increase.[8] With strokes occurring in younger people, examining how stroke survivors can return to a productive lifestyle needs to be explored.

The rates of return to work (RTW) after stroke range from 1% to 91%[6] between countries, such as the United States of America (USA), the UK, Japan and Singapore. In Sweden, rates ranged from 84% in 1977 to 10% in 1983,[9] while Trygged et al. found a 69% RTW rate from 1996 to 2000.[10] In a 2009 German study, a 26.7% RTW rate was estimated.[11] In 1990, a maximum RTW percentage of 49% was reported in the USA and, in the UK, a rate of 38% was reported in 1979.[9] Morris' 2011 review showed that there was a dearth of literature on RTW from developing countries.[12]

Variations in RTW rates across studies are attributed to different definitions of work used in the various studies such as full time work only, inclusion of home executives and students, specific age groups of patients, differences in the nature and intensity of the stroke rehabilitation programmes undertaken, stroke duration, cultural factors such as availability of help from family members, and disability compensation programmes.[9,13] Social security benefits also appear to influence RTW post stroke.[9,14] Countries with economic incentives for RTW, but without disability grants, have higher RTW rates,[15] while those

that provide disability grants seem to enable disability rather than promote recovery.[8] Disability benefits likewise influence RTW.[16,17] Mennemeyer et al.[4] found that economic incentives to work and the level of disability-related compensation are important mitigating factors in RTW.

Much research has been conducted on factors affecting RTW[5,6,8] but there is a dearth of literature specific to SA. Factors that have been shown to increase RTW in other countries are: younger age,[15,18] higher education and qualifications,[18] white collar employment,[8] independence in ambulation and activities of daily living (ADLs),[6,9] urinary and bowel continence,[13] work flexibility and good work colleagues' attitudes,[8,18,19] familial support,[19] availability of transport,[13] and patients' knowledge of their rights.[13]

Factors influencing RTW for stroke survivors in developed countries may not be the same as those in developing countries due to differences in labour laws, infrastructure, culture and socioeconomic conditions, as well as the unique economic, social and political elements in each country. Barriers to RTW include architectural factors, high unemployment rates, and stereotypes in an organisation.[20,21] Stroke survivors have indicated that not being able to RTW frustrates them.[22] Thus, there is a need to understand what stroke survivors feel is limiting them from returning to work.[22] Knowledge of factors that influence RTW will enable therapists to better target factors that influence RTW during rehabilitation.

The objectives of the study were to establish the rate of RTW of stroke survivors within the Johannesburg area and to determine the factors that influence their RTW.

## METHODS

This was a quantitative cross sectional study.

### Study participants

Study participants were stroke survivors recruited from eight stroke rehabilitation facilities in Johannesburg during 2012. They were included in the study if they had a diagnosis of stroke confirmed by a doctor either clinically or using magnetic resonance imaging, were between six months and two years post-stroke (research shows that maximum improvement post-stroke is seen within the first six months and, maximally, up to two years[17]), were employed prior to the stroke, lived within the Johannesburg area, and were aged from 18 to 64 years. A sample of at least 97 stroke survivors was required to determine RTW to within an accuracy of 10% with 95% confidence. The expected proportion of stroke survivors returning to work was assumed to be 50% for the sample size calculation.[9] Work was defined as "continuing occupation in the production of supplies and services for payment".[23]

### Procedure

Ethical clearance was obtained from the Human Research Ethics Committee of the University of the Witwatersrand (clearance certificate number M080953). Stroke survivors were contacted telephonically to explain the study and, if they agreed to participate, an appointment was made to meet them at their places of residence. The questionnaire was administered by the researcher or a trained research assistant who was a health care professional. A caregiver was included in the interview, if required.

### Measuring instruments

A questionnaire was developed to establish the reasons for RTW, using information from the literature. The following information was elicited: socio-demographic information, date and side of body of stroke, orientation to person, place and time, level of participation in family activities, pain, walking abilities, ADLs, communication and cognitive abilities, co-morbidities, depression, rehabilitation programmes undertaken, and information pertaining to RTW. The content of the questionnaire was validated by eight therapists who were experienced in the fields of adult neurological and vocational rehabilitation.

Prior to data collection, a pilot study was performed to establish inter- and intra-rater reliability. The inter-rater reliability scores were excellent, which made the use of

**Table 1. Socio-demographic and other characteristics of stroke survivors in the study (N = 97)**

| Demographic Detail | | n | % |
|---|---|---|---|
| Race | Black | 54 | 55.7 |
| | White | 29 | 29.9 |
| | Indian | 8 | 8.2 |
| | Coloured | 6 | 6.2 |
| Marital status | Married | 57 | 58.8 |
| | Single | 18 | 18.5 |
| | Divorced | 8 | 8.2 |
| | Widow/Widower | 12 | 12.4 |
| | Live-in partner | 2 | 2.1 |
| Education level | University degree | 14 | 14.4 |
| | University diploma | 16 | 16.5 |
| | Grade 12 | 25 | 25.8 |
| | Up to Grade 11 | 22 | 22.7 |
| | Up to grade 7 | 19 | 19.6 |
| | None | 1 | 1.0 |
| Smoker | Yes | 32 | 32.9 |
| | No | 67 | 67.1 |
| Hand dominance | Right | 92 | 94.8 |
| | Left | 5 | 5.2 |
| Time since stroke (months) | 6-9 | 13 | 13.4 |
| | >9-12 | 12 | 12.4 |
| | >12-18 | 18 | 18.6 |
| | >18-24 | 54 | 55.7 |
| Orientation to person, place and time | Not fully orientated | 3 | 3.3 |
| | Fully orientated | 94 | 96.7 |
| Participation in family activities: such as family outings | Yes | 82 | 84.5 |
| | No | 15 | 15.5 |
| Active member of the family: included in decision making and conversations | Yes | 75 | 77.3 |
| | No | 22 | 22.7 |
| Emotional support from family members | Always | 82 | 84.5 |
| | Seldom | 11 | 11.3 |
| | Never | 4 | 4.1 |

**Table 2. Co-morbidities reported by stroke survivors (N = 97)**

| Co-Morbidity | n (%) | % |
|---|---|---|
| Hypertension | 61 | 62.9 |
| Fatigue | 54 | 55.7 |
| Headaches | 34 | 35.0 |
| Depression | 34 | 35.0 |
| Cardiovascular problems | 17 | 17.5 |
| Diabetes | 16 | 16.5 |
| Arthritis | 13 | 13.4 |
| Epilepsy | 10 | 10.3 |
| Chronic Obstructive Pulmonary Disease | 6 | 6.2 |

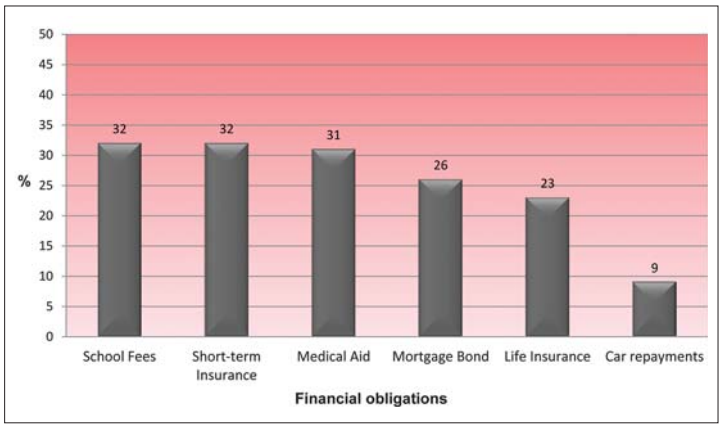



**Figure 1. Major monthly financial obligations (N = 97)**

research assistants acceptable. The intra-rater reliability scores were adequate.

The modified Rankin (mRS) scale was used to quantify the severity of disability and degree of dependence of the stroke survivors. The mRS is scored on a scale of zero to five, zero being the lowest and five being the most severe level of disability. It is widely applied for evaluating stroke patient outcomes[24] and has been shown to be an excellent tool to assess overall disability.[25] It has excellent test-retest,[26] inter- and intra-rater reliability.[27]

## Statistical analysis

The RTW rate was calculated as a percentage. Stroke survivors' reasons for RTW were summarised using frequencies and percentages. Factors that influence RTW were established through bivariate analysis. Variables with a moderate significance ($p < 0.15$) were included in a logistic stepwise multivariable regression analysis. The significance level for the study was set at 5%.

## RESULTS

### Demographic characteristics of the study participants

Ninety-seven stroke survivors participated in the study, of whom 54 (55.7%) were males. The demographic characteristics of the study participants are shown in Table 1. Their mean age was 51 ± 10.5 years. More than half of the participants (55.7%) were 18 - 24 months post-stroke. The co-morbidities are shown in Table 2. The most common co-morbidity was hypertension (62.9%), followed by fatigue (55.7%).

Sixty-five (67.0%) of the participants were breadwinners before their strokes; 32 of the 65 (49.2%) remained breadwinners post-stroke. Forty-three (44.3%) owned the houses they lived in and had fully paid them off. The major financial obligations for stroke survivors in this study are shown in Figure 1. The most common financial obligations were school fees (33.0%) and short term insurance payments (33.0%).

Almost all stroke survivors (n = 95; 97.9%) received some form of rehabilitation; only one received vocational rehabilitation. Of those who received sick leave (n = 52; 53.6%), almost all (94.2%) received paid sick leave. Prior to stroke, the most common job was that of a physical labourer (46.4%) while, post-stroke, it was a desk job (43.3%). Almost half of the stroke survivors (n = 45; 46.4%) did not receive disability funding.

The majority of the study participants could eat independently (n = 95, 97.9%), groom themselves (n = 94, 96.9%) and use the toilet independently (n = 92, 94.8%); 78.4% required no assistance to walk indoors; 64.9% felt comfortable walking more than 500 m. The mRS revealed that 34.0% and 30.9% had slight and moderate disabilities, respectively, and 26.8% had no significant disability; 4.1% had no residual disability after their stroke.

## Rate of return to work

Sixty-four (66.0%) of the stroke survivors did not RTW after stroke. The majority of those who did RTW returned to their previous employment (86.7%), and returned to full-time work (63.3%). Some had their jobs altered for them (46.7%).

## Perceived factors that influenced return to work

The reasons given for RTW are presented in Figure 2. The two most common reasons were financial and enjoyment of work (both 76.7%). For those who returned to work but later stopped, the possible reasons provided on the questionnaire were all selected equally; no single reason stood out. Figure 3 shows the reasons why stroke survivors chose to not RTW and why they believed they were unable to RTW. The most common reasons given were upper limb dysfunction (60.9%) and walking difficulties (53.1%).

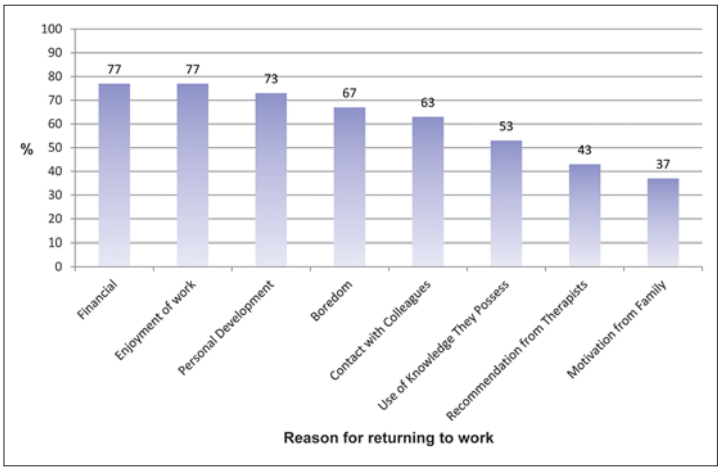



**Figure 2. Reasons that stroke survivors gave for returning to work (N = 30)**

## Factors statistically associated with inability to return to work

The factors found to influence inability to RTW, based on multivariable analysis, are shown in Table 3. Stroke survivors who paid life insurance were 86% less likely to not RTW than those who had no insurance, when the analysis was adjusted for other factors. Those with car repayments were 91% less likely to not RTW than those without repayments. Those who did not receive advice from a dietician were 18.6 times more likely to not RTW than those who received dietary advice. Those who were depressed were 3.97 times more likely to not RTW than those who were not depressed. Smoking status played no role in not returning to work.

## DISCUSSION

Thirty-four percent of the study participants returned to work, which falls within the wide range (1% to 91%) found in developed countries.[9] This is, however, lower than the median value of around 50% which was reported by Morris from a systematic review of the literature from largely European countries.[12] Despite South Africa being a developing country, this rate is higher than the minimum RTW rate found by both Saeki et al.[9] in Japan in 1995, and Gabriele and Renate[11] in Germany in 2009.

A possible explanation for the low rate of RTW in this study could be that very little vocational rehabilitation was received; only one participant received some vocational training. This is despite vocational rehabilitation being promoted as a complex and essential part of rehabilitation.[28] Rehabilitation cannot be considered complete or comprehensive until all possible aspects of vocational rehabilitation have been performed.[16,28] Vocational rehabilitation therapists mediate between employers and employees to ensure that jobs are not lost unecessarily.[10] The type of work participants engaged in prior to the stroke could also have contributed to the low rate of RTW; almost 50% were physical labourers. Being a blue-collar worker is a well-documented factor leading to a decreased chance of RTW as individuals are unable to return to their physically demanding jobs.[5,6,20] Most of the study participants who were physical labourers prior to the stroke returned to desk jobs.

Lack of transport may also have contributed to the low RTW as the resultant disability post-stroke demands that survivors have their own transport. This is unaffordable for some patients, making it difficult to RTW.[18,20] Thirty-five percent of the study participants had difficulty walking more than 500 m. It is possible that having to walk to taxi stations was challenging for some of the participants and therefore

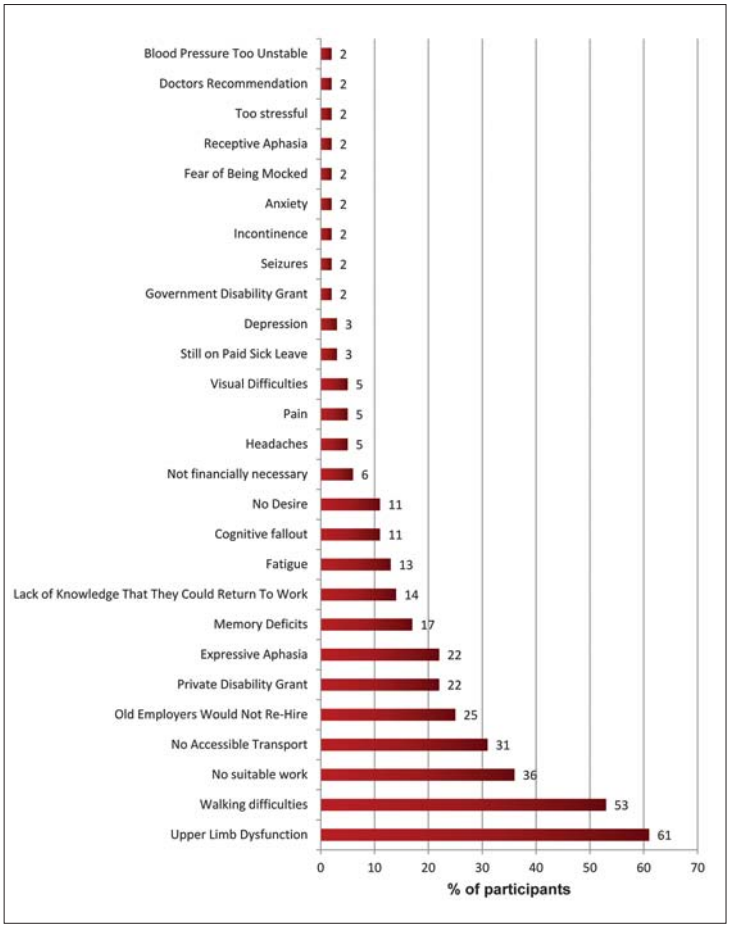



**Figure 3. Reasons that stroke survivors gave for not returning to work (N = 64)**

limited their ability to RTW. Hale and Eales[29] also showed that, post-stroke, most of the younger stroke survivors in their study were unable to catch taxis.

Of those who returned to work, 86.7% returned to their previous employment, with 63.3% returning to full time employment. This showed that either the employers were accommodating or the stroke survivors recovered well enough to RTW. It was, however, the 48% who had their jobs altered that pointed more to the former explanation. Similar results of employers being accommodative were found by Treger et al.[20] who reported that 58% had their job descriptions changed. Employers who provide job flexibility and allow for job modifications allow for a higher rate of RTW.[5]

"... whereas stroke used to be a disease of the elderly, an increasing proportion of stroke survivors are now of working age."

The most common reason for RTW was financial and this is explained, in part, by the fact that 49% of the participants remained the primary breadwinners. Thus, some of the study participants received no income and yet were still responsible for their families, accounting for the strong financial motivation to RTW.

Finance was not the only motivating factor. Many stroke survivors enjoyed their jobs and returned to work for reasons other than money. Positive experiences that one gets from work can bring enriching experiences, challenges, and personal development and fulfilment.[8] Fear of boredom can also be a motivating factor for RTW.[30] Two-thirds of the participants returned to work because they were bored. In as much as the financial pull of work must be recognised, the importance of other factors should not be underestimated.

The two most common reasons for not returning to work were upper limb dysfunction and walking difficulties. Other inhibiting factors that have been reported in other studies include fatigue,[45,46] unsatisfactory rehabilitation,[23] cognitive deficits,[30] depression,[23,30] low self-esteem, fear of social stigma, unsupportive work environment, speech impediment, and motor impairments.[30] Unlike in many studies where fatigue is stated as a major limiting factor in RTW, fatigue was cited as a factor by only 13% of the participants in this study. This could be because fatigue is a more common complaint in the acute phase of stroke and the majority of the participants were more than 18 months post-stroke, thereby having had time to adjust to their disability.

Upper limb dysfunction and walking difficulties are not mentioned in the literature as reasons for stroke survivors not returning to work, but have been found to be highly correlated with decreased RTW rates.[10,16] It is logical that stroke survivors with walking difficulties or poor upper limb use would struggle to RTW, especially if they are blue collar workers. As reported by Van de Porti et al.[31] motor impairment is a significant reason for not returning to work, which concurs with the findings from this study.

Factors that increased the likelihood of not returning to work after stroke were depression and not receiving dietetics advice. This agrees with the well-documented finding that depression can have severe negative effects on RTW.[16,31] Depression can cause tiredness, apathy, anxiety, indifference, mood problems, and loss of inhibition, all of which have all been shown to decrease RTW.[20] Therefore, even if individuals with depression are able to RTW, the sequelae of their depression may inhibit them from remaining employed, and this, in turn, may further exacerbate their depression.

Factors that decreased the likelihood of not returning to work were having regular car and life insurance payments. No literature has been found to date which discusses these specific obligations and their influence on RTW. However, a link has been proposed between education levels and RTW, with those having a high education level

**Table 3. Factors found to influence not returning to work after multivariable step-wise regression analysis**

| Variable | | n | Unadjusted | | Adjusted | |
|---|---|---|---|---|---|---|
| | | | OR | 95% CI | OR | 95% CI |
| Pays life insurance | No (reference) | 75 | 1 | | 1 | |
| | Yes | 22 | 0.13 | 0.04 – 0.36* | 0.1 4 | 0.04 - 0.49* |
| Received dietetic counselling | Yes (reference) | 9 | 1 | | 1 | |
| | No | 87 | 9.74 | 1.89 – 50.31* | 18.63 | 2.54 - 136.62* |
| Pays car repayments | No (reference) | 87 | 1 | | 1 | |
| | Yes | 9 | 0.10 | 0.02 – 0.53* | 0.09 | 0.01 - 0.69* |
| Depressed | No (reference) | 63 | 1 | | 1 | |
| | Yes | 34 | 3.07 | 1.11 – 8.48* | 3.97 | 1.04 - 15.23* |
| Smoker | No (reference) | 65 | 1 | | 1 | |
| | Yes | 32 | 2.71 | 0.98 – 7.50 | 3.42 | 0.89 – 13.13 |

*significant association

showing an improved RTW rate. [9,16,20] There is a strong link between a white collar worker and higher education levels.[10] Companies that employ white collar employees often contribute towards medical aid and insurance payments. Therefore, it may not be that stroke survivors paid regular car and insurance instalments that affected RTW but rather the fact that they were white collar workers, and thus were more likely to RTW than blue collar workers. In addition, the affordability of these monthly repayments is indicative of higher incomes and socio-economic status which have been linked to increased RTW.[10,20]

## Limitations of the study

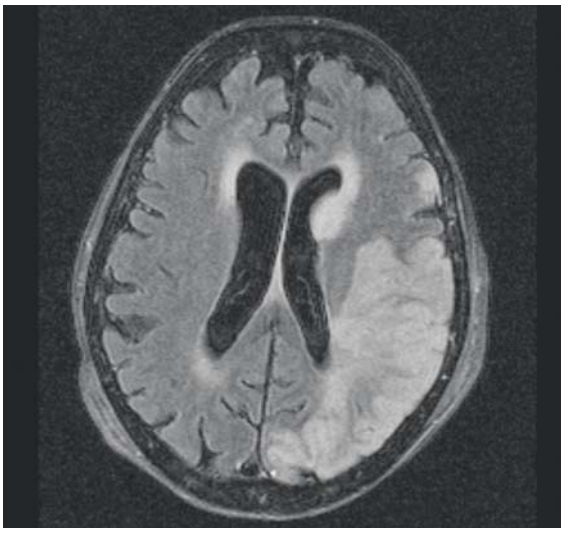
A qualitative study to establish reasons for RTW or no RTW would have enabled the researchers to draw more detailed information from the study participants. Although self-perceived depression was found to increase the odds of not returning to work, less than half of the participants (35%) suffered from self-perceived depression and therefore, strong conclusions cannot be drawn from these findings. A larger study needs to be conducted to validate the results reported here. The small study population also limits the generalisability of the results.

## CONCLUSION

Although the RTW rate reported in this study was not as low as reported in some developed and developing countries, there is room for improvement. More attention needs to be placed on upper and lower limb dysfunction, as these factors are perceived by stroke survivors as having the highest influence on RTW. In addition, there is need for advocacy for provision of vocational rehabilitation post-stroke, in both government and private hospitals. Educating stroke patients about possible job alternatives and changes to their work environments and job descriptions by their employers, to account for their disabilities, is essential. Referring stroke patients to psychologists for depression is also an important part of increasing return to work rates.

## LESSONS LEARNED

1. The RTW rate in this study was comparable with that reported in other studies but, at 34%, is still high.
2. The fact that only one participant received vocational rehabilitation shows that services targeting stroke patients (or the use thereof) are unsatisfactory.
3. The main perceived reasons for not returning to work were physical impairments. Therefore, more attention needs to be provided to stroke patients in terms of vocational rehabilitation.



**MRI of a stroke patient**

## REFERENCES


1. Connor MD, Milne FJ, Casserly B, Collinson M, Dobson C, Kahn K, Mokwena E, Modi G, Ngoma B, Warlow CP (for the SASPI Project Team). Prevalence of stroke survivors in rural South Africa: Results from the Southern Africa Stroke Prevention Initiative (SASPI) Agincourt Field Site. Stroke. 2004; 35:627-632.
2. Kwan J. Clinical epidemiology of stroke. CME Journal Geriatric Medicine. 2001; 3:94-98.
3. Rosman KD. 1986. The epidemiology of stroke in an urban black population. Stroke. 1986; 17(4):667-669.
4. Mennemeyer ST, Taube, Uswatte G, Pearson S. Employment in households with stroke after constraint-induced movement therapy. NeuroRehabilitation. 2006; 21:157-165.
5. Saeki S, Hachisuka K. The association between stroke location and return to work after first stroke. J Stroke Cerebrovasc Dis. 2004; 13(4):160-163.
6. Hofgren C, Birckdahl A, Esbicrnsson E, Stibrant-Sunnerhagen K. Recovery after stroke: cognition, ADL function and return to work. Acta Neurol Scand. 2007; 115:73–80.
7. Sadler E, Daniel K, Wolfe CDA, McKevitt C. Navigating stroke care: the experiences of younger stroke survivors. Disabil Rehabil. 28 January 2014. DOI:10.3109/09638288.2014.882416.
8. Vestling M, Tufvesson B, Iwarsson S. Indicators for return to work after stroke and the importance of work for subjective well-being and life satisfaction. J Rehabil Med. 2003; 35:127-131.
9. Saeki S, Ogata H, Okubo T, Takahashi K, Hoshuyama T. Return to Work After Stroke: A Follow-up Study. Stroke. 1995; 26(3): 399-401.
10. Trygged S, Ahacic K, Kareholt I. Income and education as predictors of return to working life among younger stroke patients. BMC Publ Health. 2012; 11:742-751.
11. Gabriele W, Renate S. Work loss following stroke. Disabil Rehabil. 2009; 31(18):1487-1493.
12. Morris R. Review Article: The Psychology of Stroke in Young Adults: The Roles of Service Provision and Return to Work. Stroke Res Treat. 2011; 1-10. DOI:10.4061/2011/534812.
13. Wozniak MA, Kittner SJ, Price TR, Hebel JR, Sloan MA, Gardner JF. Stroke Location Is Not Associated With Return to Work After First Ischemic Stroke. Stroke. 1999; 30:2568-2573.
14. Saeki S. Disability management after stroke: its medical aspects for workplace accommodation. Disabil Rehabil. 2000; 22(13/14): 578-582.
15. Carod-Artal J, Egido JA, Gonzalez JL, EV de Seijas. Quality of Life Among Stroke Survivors Evaluated 1 Year After Stroke Experience of a Stroke Unit. Stroke. 2000; 31:2995-3000.
16. Gobelet C, Luthi F, Al-Khodairy AT, Chamberlain MA. Vocational rehabilitation: A multidisciplinary intervention. Disabil Rehabil. 2007; 29(17):1405-1410.
17. Henry AD, Banks S, Clark R, Himmelstein J. Mobility Limitations Negatively Impact Work Outcomes among Medicaid Enrolees with Disabilities. J Occup Rehabil. 2007; 17:355-369.
18. Angeleri F, Angeleri VA, Foschi N, Giaquinto S, Nolfe G. The influence of depression, social activity, and family stress on functional outcome after stroke. Stroke. 1993; 24:1478-1483.
19. Williams RM, Westmorland M. Perspectives on workplace disability management: A review of the literature. Work. 2002; 19:87–93.
20. Treger I, Shame J, Giaquinto S, Ring H. Return to work in stroke patients. Disabil Rehabil. 2007; 29(17):1397-1403.
21. Matt SB, Butterfield P. Changing the disability climate: promoting tolerance in the workplace. AAOHN J. 2006; 54(3):129-133.
22. Lock S, Jordan L, Bryan K, Maxim J. Work after stroke: focusing on barriers and enablers. Disabil Soc. 2005; 20(1):33-47.
23. Vestling M, Ramel E, Iwarsson S. Quality of life after stroke: well-being, life satisfaction, and subjective aspects of work. Scand J Occup Ther. 2005; 12:89-95.
24. Banks JL, Marotta CA. Outcomes Validity and Reliability of the Modified Rankin Scale: Implications for Stroke Clinical Trials. A Literature Review and Synthesis. Stroke. 2007; 38:1091-1096.
25. Bonita R, Beaglehole R. Recovery of motor function after stroke. Stroke. 1988; 19(12):1497-1500.
26. Wilson LJT, Hareendran A, Hendry A, Potter J, Bone I, Muir KW. Reliability of the Modified Rankin Scale across multiple raters: Benefits of a structured interview. Stroke. 2005; 36:777-781.
27. Wolfe CD, Taub NA, Woodrow EJ, Burney PG. Assessment of scales of disability and handicap for stroke patients. Stroke. 1991; 22:1242-1244.
28. Sirvastava S, Chamberlain MA. Factors Determining Job Retention and Return to Work for Disabled Employees: A Questionnaire Study of Opinions of Disabled People's Organizations in the UK. J Rehabil Med. 2005; 37:17-22.
29. Hale LA, Eales CJ. Recovery of walking function in stroke patients after minimal rehabilitation. Physiother Res Int. 1998; 3(3):194 -205.
30. Alaszewski A, Alaszewski H, Potter J, Penhale B. Working after a stroke: Survivors' experiences and perceptions of barriers to and facilitators of the return to paid employment. Disabil Rehabil. 2007; 29(24):1858-1869.
31. Van de Porti GL, Van Den Bos GAM, Voorendt M, Kwakkel G, Lindeman E. Identification of risk factors related to perceived unmet demands in patients with chronic stroke. Disabil Rehabil. 1997; 29(24):1841-1846.

# Computer-related symptoms in the workplace: causes and preventive strategies

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## ABSTRACT

**Computers are being used at work, for education and for leisure, their use having brought about change in many work activities and practices. Many computer users experience eyestrain, headaches, blurred vision, general body fatigue, musculoskeletal problems and other symptoms related to computer use. These symptoms occur primarily due to visual disorders or particular computer workstation environmental conditions, such as awkward postures at the computer, long hours without a break, and inadequately designed computer workstations. This article describes common desktop computer-related symptoms in the workplace, and provides basic and practical preventive measures that can be implemented to minimize these symptoms and their consequences among computer users. These measures include maintaining the correct posture and taking regular breaks during computer use, the use of appropriate lighting, correct environmental conditions, and getting regular eye examinations.**

***Keywords:*** **computer, ocular symptoms, posture, musculoskeletal disorders, computer vision syndrome**

## INTRODUCTION

Computers are used by millions of people worldwide for work, education and recreation, on a daily basis. Computer-based technology has become the primary medium through which we access information, which we receive through our eyes and visual system. Long hours of staring at a computer screen have resulted in vision-related problems becoming very common. Collectively, these disorders have been named computer vision syndrome (CVS) by the American Optometric Association[1], resulting in many computer users seeking eye care.[2] Awkward postures at the computer, long hours without a break, and inadequately designed computer workstations can also lead to vision and systemic health symptoms.[3] For some computer users, the symptoms are caused by specific visual disorders, while for others, it is a particular computer workstation environmental condition that causes the symptoms. Symptoms can also be caused by a combination of visual disorders and problems in the workstation environment, all of which need to be resolved for optimal health.[4]

Visual problems of computer users are widespread, with most of the causative factors being known.[5] Systemic symptoms, such as musculoskeletal problems and headaches, can occur with computer use for long hours, and range from minor muscle aches and pains that last less than a few hours to persistent tendon problems that can last for years.[3] The most common body areas affected are the hands, wrists, elbows, shoulders and neck. The problems may vary from aches and pains, to burning, numbness or tingling.[6] These symptoms may be felt when typing or using a mouse or pointing device, or when no work is being done, including during the night.[6] The symptoms can largely be resolved by a careful diagnosis and treatment of visual conditions that cause CVS symptoms, and with proper management of the workstation ergonomic deficiencies.[7] Literature abounds on the association between computer use and various musculoskeletal and visual health symptoms[1-7] but few studies provide primary prevention strategies. This review describes common computer-related symptoms and provides primary prevention strategies among professional and ordinary desktop computer users.

## SYMPTOMS EXPERIENCED BY COMPUTER USERS

### Eye strain (aesthenopia)

Eye strain, or aesthenopia, is one of the most widely reported symptoms among computer users; complaints include word jumping, twitching eye lids, sore eyes and fatigue due to uncorrected binocular vision and accommodative problems.[8] On manifestation of these symptoms, the user should seek advice from an optometrist or the company's health and safety staff, as the earlier eye strain is properly diagnosed and treated, the less chance there is that it will progress to a disabling condition.[2]

### Headaches

Vision-related headaches experienced by computer users are usually due to spasms of accommodation due to long hours at the computer, and uncorrected refractive errors or binocular vision problems.[9] These headaches most often occur toward the front of the head, on one side of the head more than the other, and typically occur toward the middle or end of the day.[9]

### Blurred vision

Uncorrected errors of vision, especially hyperopia, high myopia and accommodative problems, can result in blurred near vision.[9] Poor ergonomic factors in the computer working environment, such as an inappropriate viewing angle, reflected glare and a dirty computer screen, can lead to blurred images.[7]

### Eye irritation

The computer user can experience dryness and burning of eyes, which are often due to a decrease in the blink rate as a result of a slightly higher gaze than normal. Furthermore, with computer use, tear evaporation increases due to wider open eyes, causing tear insufficiency and dry eyes.[10] Ocular allergy and contact lenses can also cause dry eyes in computer users.[10]

### Musculoskeletal symptoms

Musculoskeletal symptoms manifest as neck, back or shoulder pain, and are caused by strain on the carpals in the hands, muscles and tendons due to typing, operating a mouse or pointing device, sitting (lower back pain), static reaching, or when looking from hard copy to screen (neck and shoulder pain).[9] Musculoskeletal symptoms can also result from an improper viewing position when using the computer.[9] For instance, if the computer screen is higher or lower than the eye level, it causes an awkward posture that contributes to sore neck, back and/or shoulders.[7,11] The prevalence of neck, shoulder and arm symptoms in computer workers has been reported to be as high as 63.6% among 440 Sri Lankan computer office workers.[12] Speklé et al.[13] reported in 2010 that conservative estimates of the cost of musculoskeletal disorders to the USA economy, when measured by compensation costs, lost wages and reduced productivity, were between $45 and $54 billion in 2001. In addition to productivity costs, it was estimated in 2002 that employers in the USA paid approximately $20 billion annually in workers' compensation resulting from work-related musculoskeletal disorders.[14] Therefore, this is a major public health concern in the USA. It has been estimated that 30 000 South Africans suffer from neck or back pain annually, 10% of whom become chronic sufferers.[15,16] However, the costs related to these injuries are not available.

### Glare or light sensitivity

Reflections from the computer screen can cause glare or light sensitivity due to eyes becoming accustomed to certain levels of illumination.[17]

## PREVENTIVE STRATEGIES

The primary areas of ergonomics that affect computer users include keyboard and monitor locations, and seating. Computer-related symptoms such as eye strain, headaches, neck and back aches usually result from poor ergonomics and improper work habits.[18] The following are simple strategies that can help prevent these symptoms. These preventive measures apply mainly to desktop monitors that are viewed in a sitting position. Factory production lines, which may be viewed when standing, and the use of multiple monitors, which is becoming more common, are not considered in this review. However, regardless of the computer workstation set up, workstation adjustments should address the following: upright neck and back positions, elbows remaining close to sides with shoulders relaxed, forearms level, and wrists correctly positioned.

### Keyboard position

If the elbows of the computer user are held away from the body, the muscles in the neck, shoulder and upper arms are under a constant static load, resulting in neck and back aches.[19] Therefore, the chair length should be adjusted and the keyboard positioned so that it can be used with the hands in line with the forearms. Keys on the keyboard should have a matt finish to minimize reflection. The height of the keyboard from the floor should range between 60 cm and 82 cm.[19]

### Wrist and hand position

The tendons and nerves that control the fingers run through the wrists, and prolonged incorrect wrist and hand posture can therefore result in numbness in the hands. Placing the keyboard at an angle to the edge of the desk also encourages a poor working posture.[20] Therefore, the seat height should be checked to ensure that the hands are in a straight line with the forearms. The use of a light keying action and having a space in front of the keyboard on which to rest the wrists and forearms are useful strategies to alleviate incorrect wrist and hand positions.[20]

### Head and neck

Computer users tilt their heads back to look at the screen, and twist their necks to look at the reference material, which can lead to neck tension and headaches.[9] These symptoms can be prevented if the user checks and adjusts the distance of the monitor to his or her eyes.[21,22] A document holder should be used to avoid sustained bending of the neck when viewing documents.

### Lower back

Incorrect lower back positioning, such as slouching, causes the inward curve in the lower back to flatten, and places pressure on the spine when seated.[23] The computer user should

adjust the backrest of the chair to give support to the lower spine, and ensure that the seat cushion fits into the small of the back and is not too long.

### Leg and knee position

Incorrect leg and knee positions can lead to pressure that can build up under the thighs and behind the knees if the chair in not adjusted properly.[24] The chair height should therefore be set appropriately and, if the computer user can feel the pressure at the front of the seat cushion, then a footrest is needed.[25] The backrest assembly needs to be adjusted if the computer user cannot sit fully back in the seat.

### Posture

Incorrect posture can lead to muscle strain and pain in the neck, shoulders and lower back.[26] The computer user should ideally have a fully adjustable chair (vertically and laterally) so that he or she has optimal control and maximum comfort at any time. The chair should have a firm back support and feet should be level on the floor or on a foot rest.[26] The keyboard and screen must have the flexibility to tilt for optimal viewer comfort. The angle between the forearm and bicep should be approximately 90° when working on the keyboard.[3,17] The desktop screen must be placed at a comfortable viewing distance and should vary from 50 to 70 cm[17] (see Figure 1).

Attention should also be paid to the distances and angles at the computer workstation in order to prevent computer-related problems. For example, computer screens that are placed at a long viewing distance cause less eye strain than those placed at a closer distance, as longer viewing distances allow the computer users' eyes to relax.[27] The viewing angle from horizontal to the middle of the computer screen should be 20° - 30° and no greater than 40° from the horizontal to the bottom of the screen.[28,29] The viewing distance from the horizontal to the top of the computer screen should range between 18 cm and 28 cm, and from 40 cm to 60 cm from the horizontal to the bottom of the computer screen.[29] The viewing distance from the eyes to the centre of the computer screen should be 50 cm to 70 cm, and from 55 cm to 80 cm from the eyes to the bottom of the computer screen.[29] A viewing distance of 63 cm to 83 cm from the eye to the home row on the keyboard is less likely to cause visual and musculoskeletal discomfort.[29]

### Lighting

Inappropriate lighting on the display screen can disrupt images, making it difficult to clearly see the work, leading to straining of the eyes in order to view objects.[17] For example, if lighting is excessive or causes glare on the monitor, the user may develop eye strain or headaches, and may have to work in awkward postures to view the screen. Similarly, too little light can cause double vision, reduced ability to adjust focus between near and far objects, and musculoskeletal problems from adopting poor postures to compensate for the inadequate light. Thomson[29] recommended lighting levels of 200-500 lux, with the ideal level of approximately 350 lux; the screen brightness should not exceed 150 lux or be less than 75 lux. The office should be arranged to minimize glare from overhead lights, desk lamps and windows. The computer user should not face the window,

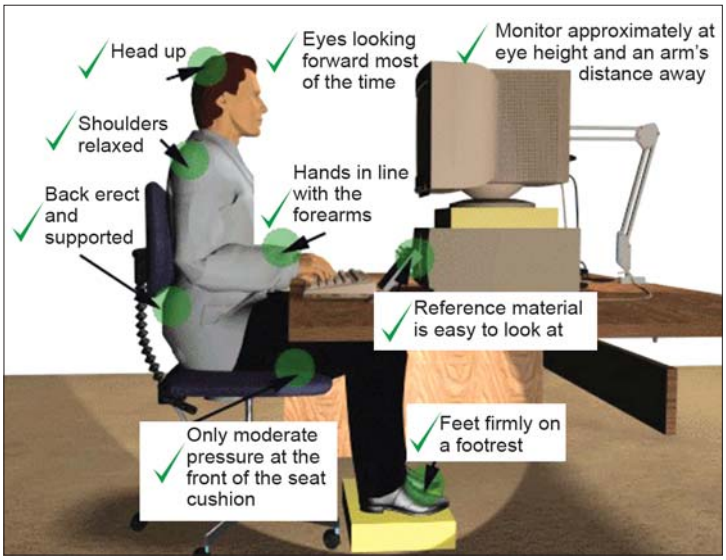


**Figure 1. A simple model of proposed office arrangement in terms of individual-desktop computer interaction (Source: http://www.authorstream.com/Presentation/desaids-402691-computer-safety)**

which could result in glare when looking up. To limit reflection from walls around the computer screen, a medium, non-reflective paint can be used on the walls.[29] Dimming switches can be useful to decrease the background lighting, and the use of an anti-reflection screen or filter over the computer screen absorbs the reflected light and increases the contrast of the screen.[29] Fluorescent lighting should have diffusers and be parallel to the face of the screen.[30]

### Reflections from the screen

Some light is reflected from the front surface of the screen, which acts as a convex mirror, i.e. causes specular reflection. The remainder of the light is reflected from the phosphor coating on the back surface, which is rough and thus reflects the incident light diffusely.[29] Any surround lighting falling on the screen will reduce the contrast of the screen characters and thus their visibility to the operator. This can be reduced by using an anti-reflection screen or filter over the computer screen. Specular reflection can be minimized by using mesh filters that consist of a very fine fabric mesh stretched over a rigid frame.[29] As the ambient light will hit the mesh at an angle, it will not pass through to the screen, but light passing straight from the screen to the user will pass through the mesh filter. The disadvantage of the mesh filter however, is that the clarity of the screen character is reduced. Blinds, awnings or reflective film should be installed on nearby windows from which reflections may often degrade the integrity of the computer image.[17]

### Work breaks

One of the biggest risk factors to developing computer-related problems is static posture, and computer users should ideally take regular breaks before the onset of cumulative fatigue. It has been suggested that the computer user should take a 2-3 minute break after every 30 minutes and a 10-15 minute break after every hour of computer work.[9,17] Alternatively, after 20

minutes of computer use, he or she should look at something six metres away for at least 20 seconds.[9,17]These suggestions are recommended to restore and relax the accommodative system, thereby reducing ocular symptoms and improving work rate and efficiency.[31] Simple exercises, such as tightly clenching the hand into a fist and releasing, and fanning out the fingers, reduces the risk of developing computer-related problems. Simple back and shoulder exercises should be performed by standing up straight and placing the right hand on the left shoulder and moving the head back gently. The same exercises can be performed for the right shoulder.

### Ventilation, humidity and temperature

Factors such as ventilation and humidity levels in office work environments may affect user comfort and productivity. Discomfort can also occur if the indoor climate is too warm, too cool or draughty.[9] Electrical equipment, such as air conditioners and heaters, also dry the air. The quickest and most effective way to maintain appropriate air circulation is by opening the windows. The room temperature should be adjusted (20°C to 24°C) and air humidity should be kept at 40% to 60%.[9,17] Introducing plants into the work area can improve ventilation.

### Ocular examination

Commonly observed computer-related symptoms, such as eye strain and headaches, usually result from improper ergonomics and undetected visual conditions. It is therefore recommended that management for eye strain and headaches includes the use of general and computer glasses for those who use the computer for more than three hours a day, if the cause of the symptoms is due to a visual condition.[9] Computer glasses are "specifically designed for the computer workstation and have a different lens design or prescription than general-wear glasses".[32] These glasses have been shown to be effective in the reduction of vision-related symptoms of computer users.[33] The computer user needs to be advised that computer spectacles may not be satisfactory for normal everyday tasks. The use of anti-reflection coating on glasses improves contrast and reduces glare.[34] Contact lens wearers should follow all care instructions, as contact lenses may contribute to dry eyes. For a bifocal contact lens wearer, the bifocal portion should cover about 75% of the pupil.[17] For symptoms of eye irritation (often related to dry eyes and allergy) an examination of the cornea and conjunctiva should be done. These occur because the eyes are looking straight ahead and are wide open, thereby exposing a greater area of the cornea from which the tears can evaporate.[10] This is exacerbated in an air-conditioned environment, and the blink rate also decreases when concentrating. Lubricating eye drops,[35] increasing the frequency of the blink rate when using the computer, and a warm eyelid massage every day to stimulate the tear glands and increase the blood circulation within the eyes,[36,37] all reduce the chance of developing dry eyes. Thus, the primary visual requirement for a computer user is an up-to-date visual examination and the appropriate corrective action.

## CONCLUSIONS

Computers have become a necessity in our daily lives. However, their continued use is associated with a variety of symptoms. In most cases, preventive measures for these symptoms are relatively simple and inexpensive and include proper ergonomic modifications of the workstation, proper lighting and environmental factors, taking regular breaks during computer use and regular comprehensive eye examinations. It is recommended that computer users who spend extended periods at their workstations seek assistance and guidance from their occupational health practitioners. Adherence to these measures can greatly increase the safety and comfort of the computer user, thereby increasing work productivity.

The limitation of this review is that it relates only to desktop computers that are viewed in a sitting position and involve the use of a keyboard and/or a mouse or pointing device. It is recommended that future reviews and studies widen the scope of the research by also considering, tablets, smartphones and electronic readers such as the Kindle.

### LESSONS LEARNED

1. Many computer users suffer from computer-related symptoms.
2. Common computer-related symptoms include visual (eye strain, headache, blurred vision) and physical (musculoskeletal) problems.
3. Symptoms may be caused by poor seating posture, improper viewing distances, poor lighting, glare on the computer screen, uncorrected vision problems, or a combination of these factors.
4. Measures to prevent symptoms include proper computer ergonomics, correct workplace design and lighting control, and regular professional eye care.

## REFERENCES


1. Rosenfield M. Computer vision syndrome: a review of ocular causes and potential treatments. Ophthalmic Physiol Opt. 2011; 31:502–515.
2. Bhanderi DJ, Choudharg S, Doshi VG. A community based study of asthenopia in computer operators. Indian J Ophthalmol. 2008; 56:51–55.
3. Wahlstrom J. Ergonomics, musculoskeletal disorders and computer work. Occup Med. 2005; 55:168–176.
4. Shikdar AA, Al-Kindi MA. Office Ergonomics: Deficiencies in Computer Workstation Design. Int J Occup Saf Ergon. 2007; 13:215-223.
5. Portello JK, Rosenfield M, Bababekova Y, Estrada JM, Leon A. Computer-related visual symptoms in office workers. Ophthalmic Physiol Opt. 2012; 32:375–382.
6. Waersted M, Hanvold TN, Veiersted KB. Computer work and musculoskeletal disorders of the neck and upper extremity: A systemic review. BMC Muscoskel Disord. 2010; 11:79. Available at: http://www.biomedcentral.com/1471-2474/11/79 (accessed 19 Dec 2012).
7. Mashige KP, Rampersad N, Oduntan OA. A study of ergonomic factors leading to computer vision syndrome among computer users. Ergonomics SA. 2013; 25:3-12.
8. Vertinsky T, Forster B. Prevalence of eye strain among radiologists: influence of viewing variables on symptoms. Am J Roentgenol. 2005; 184:681–686.
9. Anshel J. Visual ergonomics handbook. New York: Taylor & Francis, CRC Press, USA. 2005.
10. Miljanovic B, Dana R, Sullivan DA, Schaumberg DA. Impact of dry eye syndrome on vision-related quality of life. Am J Ophthalmol. 2007; 143:409-415.
11. Iwakiri K, Mori I, Sotoyama M, Horiguchi K, Ochiai T, Jonai H, et al.

Survey on visual and musculoskeletal symptoms in VDT workers. Sangyo Eiseigaku Zasshi. 2004; 46:210–212.
12. Ranasinghe P, Perera YS, Lamabadusuriya DA, Kulatunga S, Jayawardana N, Rajapakse S, et al. Work-related complaints of arm, neck and shoulder among computer office workers in an Asian country: prevalence and validation of a risk-factor questionnaire. BMC Muscoskel Disord. 2011; 12:68. Available at: http://www.biomedcentral.com/1471-2474/12/68 (accessed 19 Dec 2012).
13. Speklé EM, Heinrich J, Hoozemans MJM, Blatter BM, van der Beek A, van Dieen JH, et al. The cost effectiveness of the RSI QuickScan intervention programme for computer workers: results of an economic evaluation alongside a randomized controlled trial. BMC Muscoskel Disord. 2010; 11:259–270.
14. United States Department of Labor. Occupational Safety and Health Administration. 1218- AB58-2014. Prevention of work-related musculoskeletal disorders. Available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=UNIFIED_AGENDA&p_id=4481 (Accessed 22 May 2014).
15. Van Vuuren B, Zinzen E, Van Heerden HJ, et al. Work and family support systems and the prevalence of lower back problems in a South African steel industry. J Occup Rehabil. 2007; 17:409-421.
16. Van Vuuren B, Van Heerden HJ, Zinzen E, et al. Perceptions of work and family assistance and the prevalence of lower back problems in a South African manganese factory. Ind Health. 2006; 44:645-651.
17. Yan Z, Hu L, Chen H, Lu F. Computer Vision Syndrome: A widely spreading but largely unknown epidemic among computer users. Comput Hum Behav. 2008; 24:2026-2042
18. Straker L, Pollock C, Burgess-Limerick R, Skoos R, Coleman J. The impact of computer display height and desk design on muscle activity during information technology work by young adults. J Electromyogr Kinesiol. 2008; 18:606-617.
19. Gerr F, Monteilh CP, Marcus M. Keyboard use and musculoskeletal outcomes among computer users. J Occup Rehabil. 2006; 16:265-277.
20. Simoneau GG, Marklin RW, Berman JE. Musculoskeletal disorders and forearm electromyography of typists without effect of computer keyboard slope on wrist position. Phys Ther. 2003; 83:816-830.
21. Green BN. A literature review of neck pain associated with computer use: public health implications. J Can Chiropr Assoc. 2008; 52:161-168.
22. Straker L, Burgess-Limerick R, Pollock C, Murray K, Netto K, Coleman J, et al. The impact of computer display height and desk design on 3D posture during information technology work by young adults. J Electromyogr Kinesiol. 2008; 18:336-349.
23. Keeping your spine aligned – Fraser Valley Physiotherapy and Rehabilitation centre. Available at: http://www.fraservalleyphysio.com/documents/newspaper-media-articles/FVP1_FVPhysio_7x7_Andrea.pdf (accessed 22 May 2014).
24. Ayanniyi O, Ukpai BOO, Adeniyi AF. Differences in prevalence of self-reported musculoskeletal symptoms among computer and non-computer users in a Nigerian population: a cross-sectional study. BMC Muscoskel Disord. 2010; 11:177. Available at: http://www.biomedcentral.com/1471-2474/11/177 (accessed 12 Feb 2013).
25. Horton SJ, Johnson GM, Skinner MA. Changes in head and neck posture using an office chair with and without lumbar roll support. Spine 2010; 35:E542-548.
26. Hakala PT, Rimpelä AH, Saarni LA, Salminen JJ: Frequent computer-related activities increase the risk of neck-shoulder and low back pain in adolescents. Eur J Publ Health. 2006; 16:536-541.
27. Jaschinski W. The proximity-fixation-disparity curve and the preferred viewing distance at a visual display as an indicator of near visual fatigue. Optom Vis Sci. 2002; 79:158-169.
28. Rempel D, Willms K, Anshel J, Jaschinski W, Sheedy J. The effects of visual display distance on eye accommodation, head posture, and vision and neck symptoms. Hum Factors. 2007; 49:830-838.
29. Thomson WD. Eye problems and visual display terminals – the facts and the fallacies. Ophthalmic Physiol Opt. 1998; 18:111-119.
30. Blehm C, Vishnu S, Khattak A, Mittra S, Yee RW. Computer vision syndrome: A review. Surv Ophthalmol. 2005; 50:253-262.
31. Fenety A, Walker JM. Short-term effects of workstations exercises on musculoskeletal discomfort and postural changes in seated video display unit workers. Phys Ther. 2002; 82:578-589.
32. American Optometric Association (AOA). Impact of computer use on children's vision. Available at: http://www.aoa.org/optometrists/tools-and-resources/clinical-care-publications/environmentaloccupational-vision/computer-use-needs/impact-of-computer-use-on-childrens-vision?sso=y (accessed 21 May 2014).
33. Butzon SP, Sheedy JE, Nilsen E. The efficiency of computer glasses in reduction of computer worker symptoms. Optometry. 2002; 73:221-230.
34. Mashige KP, Thathane NP, Kader F, Nyandoro GD, Sultan AA. The effect of anti-reflection coating on glare threshold and recovery under scotopic conditions. S Afr Optom. 2008; 67:68-76.
35. Biswas NR, Nainiwal SK, Das GK, Langan U, Dadeya SC, Mongre PK, et al. Comparative randomised controlled trial of a herbal eye drop with artificial tear and placebo in computer vision syndrome. J Indian Med Assoc. 2003; 101:208-212.
36. Schirra F, Ruprecht KW. Dry eye: An update on epidemiology, diagnosis, therapy and new concepts. Ophthalmology. 2004; 101:10-18.
37. Takahashi Y, Igaki M, Suzuki A, Takahashi G, Dogru M, Tsubota K. The effect of periocular warming on accommodation. Ophthalmology. 2005; 112:1113-1118.

# Workplace eye injuries: a literature review

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## ABSTRACT

**Although rules and regulations for eye protection in the workplace exist, injuries continue to occur. Non-compliance with existing guidelines and the high rate of not issuing protective eye devices by employers reflect the lack of adherence to the Occupational Health and Safety Act. The purpose of this paper is to highlight the need for eye healthcare providers to provide advice on the use of personal protective equipment and to promote eye health awareness in the workplace. A literature review of studies reporting occupational eye injuries and workplace safety was conducted to identify the common reasons for continued injuries despite safety guidelines. There are differences in the types and incidence rates of eye injuries between developed and developing countries as well as between rural and urban workforces. Although there is legislation that addresses eye protection in South Africa, educating employees and employers about eye safety, and compliance with safety regulations, is necessary to improve ocular health and safety amongst workers.**

***Keywords:*** **compliance, occupational health and safety, ocular health, injuries, prevention**

## INTRODUCTION

In developing countries, healthcare resources in the workplace are often limited and do not reach those in greatest need.[1] This distracts the healthcare focus of workplace managers from instituting prevention controls to providing services to those who have been careless or negligent. As a result, the accident rates remain higher than necessary and the health and lives of workers continue to be at risk.[1] This is also the case for ocular incidence rates, with the possibility of ocular trauma rates being higher in newly established factories, particularly small scale industries in developing countries, due to poor working conditions, long hours at work and poor organisational safety measures.[2] Emerging international literature acknowledges the importance of identifying potential hazards, resulting in ocular accidents in the workplace but, despite measures to reduce risks and prevent these injuries, the use of safe machinery and proper protective devices is generally inadequate.[1,3] Occupational ocular trauma remains the most common cause of acquired monocular blindness, particularly in industrialised countries.[3] Knowledge about the epidemiology of workplace injuries will therefore serve as an essential tool in the formulation of workplace safety measures.

Ocular injuries can occur anywhere in the environment; however, the risks appear to be higher among workers in industries such as mining, manufacturing, construction and agriculture.[4] The location where the injury occurs is related to the environmental hazards present.[4] Eye injuries occur in the workplace through exposure to chemicals, lasers or heat from expansion of industrial products, without adequate safety precautions.[5] Previous studies have reported that the workplace is the most common location in which adults experience eye injuries.[6-8] Islam et al.[9] and Mackiewicz et al.[10] reported a higher incidence of injuries in the agriculture, fisheries and forestry industries than manufacturing and construction sectors in the United States of America (USA) and Poland, respectively. The main causes of injuries in rural poor communities are agricultural practices whereas, in more developed communities, industrial activities are more likely to be responsible for the injuries.

### Epidemiology of ocular injuries

The number of cases of ocular trauma causing temporary or permanent visual loss has been reported to be close to 70 000 each year in the USA, while approximately 1 000 preventable ocular injuries are incurred every day in the workplace.[9] In 1998, the annual incidence rate of work-related ocular injuries was 567 per 100 000 employees in the USA (3 699 injuries among 652 956).[9] Data released by the National Institute for Occupational Safety and Health (NIOSH) estimated that 900 000 occupational eye injuries occurred in 1982 and that most were caused by ocular foreign bodies, 84% of which were minor, as cited in a study by Islam et al.[9] Ocular injuries were reported to account for 5.0% - 6.1% of all workers compensation claims in Singapore in 2006.[7,8]

Reports have indicated that ocular trauma victims are predominantly active middle-aged men,[4,11] the resultant visual loss imposing an enduring burden of social, psychological, economic and financial implications.[12] Males appear to be more affected than females: Islam et al.[9] highlighted that, in industries where a greater proportion of females is

employed, a higher incidence rate is still seen among male employees.

## Industry

Rates of work-related eye trauma vary worldwide, with studies reporting estimates of 70% in the United Kingdom (UK), 38.9% in Taiwan, 32.8% in Greece, 19.6% in Scotland and 14.3% in the USA.[7,8] In Singapore, the annual incidence of work-related eye injuries accounted for 8% of all occupational injuries in 2006[7,8] with 56.4% of all eye injuries being work-related, and 54.1% of patients being injured on industrial premises. It was reported in 1967 to 1976 that more than 70% of all serious eye injuries occurred in the workplace due to the lack of knowledge about protective devices, especially in heavy industry, in Glasgow, Scotland.[13,14] In rapidly developing economies, occupational accidents occur mostly in the manufacturing sector.[2,3,15] According to Kanski,[16] two-thirds of accidental burns occur at work. Saini and Sharma[17] also reported that 80% of chemical injuries in the workplace in Finland were as a result of accidental exposure to acids and alkalis.

## Causes/hazards of ocular injuries in the workplace

Lamellar lacerations have been reported to be the most frequent type of ocular injury in the construction industry, with 71.3% of cases of superficial corneal foreign body being associated with welding, grinding, cutting, metal, hammering and drilling, and 60% being associated with high-speed machinery, involving grinding activities and hacking.[7] A survey conducted in Portugal showed a prevalence rate of 29.6% of intraocular foreign bodies (IOFBs) which was more frequent when working with metallic objects (50%).[18] The incidence of endophthalmitis was 5.7% with a trend for a higher risk with IOFBs.[18] Dhir et al.[19] reported that the use of a hammer and chisel was responsible for IOFBs in 61.1% patients followed by working on power driven machines and tools (24.4%) in India in 1980. The other reported modes of injury were dynamite blasts, gun shots and glass bottles. Murillo-Lopez et al.[6] also showed that work-related injuries were often as a result of IOFBs made of metal in 79.0% of cases, wood in 9.7%, stone in 7.0% and glass in 4.3%, with subsequent presentation to an emergency department for evaluation being essential.[6,18]

## Agriculture

The risks of eye injuries in agriculture remain high, as preventive measures are often insufficient or absent. Agriculture-related incidence of eye injuries is approximately four times higher than in industry, as there is a greater range of possible eye hazards when a worker undertakes a number of different tasks during the course of the day and measures to protect the eyes cannot be readily applied.[10] In the early 1990s, Thylefors[11] reported that injuries sustained in agricultural societies were superficial, but often led to rapidly progressing corneal ulceration and blindness. Khatry et al.[20] estimated "the annual incidence of eye injuries in agriculture to be 3.46 per 10 000 people, which was higher than in industry (1.9 per 10 000 people) but lower than in construction (5.3 per 10 000 people)". Saari and Aine[21] found that the blindness rate was 21.9% after analysing various eye injuries in agricultural workers (superficial, blunt and penetrating) in Finland. A study conducted by Gyasi et al.[22] in Ghana showed that most ocular injuries occurred in the agriculture industry.

In agricultural workers, vegetation such as twigs and branches cause many eye injuries. Abraham et al.[23] showed that 67.0% of injuries in rural Tanzania were caused by a stick and that, after treatment, most patients had poor visual acuity in the affected eye. A study in Malawi, where 80% of the working population engaged in agriculture and lived in rural areas, only 1.5% of the ocular injuries were related to agricultural activities.[24] This finding may be attributed to the fact that eye injuries occurring in the fields are often too minor to warrant admission to hospital as well as the low level of farm mechanisation in Malawi.[24] According to a study by Canavan and Archer.[25] in Ireland, only 4.0% of the total eye injuries in the period 1976 to 1979 resulted from agricultural pursuits, despite the study hospital being situated in a community with a large rural population. Mechanisation in the agriculture industry in Ireland resulted in a greater number of injuries,[25] despite a corresponding reduction in the number of workers employed in the industry.

## Personal protective equipment

Personal protective equipment (PPE) can be used to protect the wearer's face, including the eyes, from a variety of hazards such as particles, light, heat, wind blast, sea spray, and balls and pucks used in sports.[26,27] According to Cockerhem,[26] protective devices are divided into two types, depending on their function: primary protectors which are devices worn in


conjunction with a secondary protector, e.g. goggles, or alone; and secondary protectors which are devices used only in conjunction with a primary protector,[26] e.g. face shields made of polycarbonate to stop low-velocity projectiles, windblown dust, or sand, which will also afford some protection against a direct blow to the eye.[26,27] The conditions under which people work will determine which type of PPE they are required to use for their personal protection to minimize the risk of an eye injury. In addition, the type of work done will determine what kind of device is suitable for that environment.[15,27,28]

Despite the improvements in recent years in the development of PPE, particularly safety goggles, the incidence of eye injuries in the UK remains high in the workplace, in sports and at home.[13] Ocular trauma has not decreased in Singapore, despite the work practice policies and legislation of strict guidelines on the mandatory wearing of protective eye devices for workplace safety.[7] This suggests inadequate protection practices and a lack of knowledge among workers about the dangers of operating machines without the use of PPE. It may also be due to inappropriate channelling of available resources that are meant to improve workplace safety. A retrospective study conducted by Ngo and Leo[7] at a tertiary hospital in Singapore showed that 34.0% of patients were not provided with any PPE and that 44.7% were non-compliant with wearing protective eyewear. In 2001, in Singapore, Voon et al.[29] found that 43.7% of patients had not used protective eyewear at the time of injury even though it was available, while 34.6% had not been provided with any PPE. Five years later, Woo and Sundar,[30] in the same country, found that 32.0% of reported cases had not been issued with PPE, while 38.7% had not used the PPE that was available to them. In an iron forging industry in the Eastern Province of Saudi Arabia, Ballal[15] reported, in 1991, that more than a third of those who were injured were not wearing eye protection at the time of injury, and that 76.6% of accidents were as a result of projectile foreign bodies. Similarly, Vasu et al.[3] found that 76.7% of workers from the agriculture and mining industries in India were not wearing the recommended protective device at the time of injury.

The use of alcohol and illicit drugs has been suggested to be a contributor to the non-use of PPE in the workplace. This is because the judgement of people who are intoxicated is impaired, or they exhibit greater risk-taking behaviour.[31] Vasu et al.[3] found that 13.9% of those incurring occupational injuries were under the influence of alcohol and not wearing the recommended PPE. Smith et al.[32] reviewed the National Trauma Eye Registry data from 28 states in the USA from 1985 to 1991 and found that 35.0% of those who incurred eye injuries in the workplace were intoxicated and not using PPE at the time of injury. A few years later, in the period 1987 to 1999, Dannenberg et al.[31] documented the high rate of 52.0% of alcohol/drug usage in the workplace in Kentucky and Alabama, USA, that resulted in the non use of PPE, suggesting an indirect aetiological cause of ocular injuries. Periodic monitoring of the levels of alcohol, and counselling for those affected, can minimize injuries in the workplace.

A limited number of surveys on ocular trauma in South Africa appear in the ophthalmic literature, particularly in the workplace. In 2009, in the Limpopo province, Sithole et al.[33] investigated eye protection practises among welders in the maintenance and construction industry, and found that 89.0% of them reported wearing PPE when working. The most common protective devices used were helmets (57%), goggles (22%), and face shields (15%). However, 60% used inefficient protective devices, such as sunglasses. Sixty-one percent reported occasional exposure to welding flashes when not wearing any eye protection. Although the majority of the welders wore protective devices while welding, a few did not always use such devices. They concluded that eye protection practices among the welders appeared to be inadequate to avoid hazards associated with welding.[33]

A review by Meallet[34] showed that the setting in which an injury occurs has a marked impact on the severity and the prognosis for visual recovery. In many settings, such as the workplace and sports events, eyewear is mandated but is not worn at the time of injury,[30,34] with an estimated 90% of eye injuries being preventable if protective eyewear was worn.[26,34] Desai et al.[35] reported 74 injury cases where protective eyewear should have been worn, with less than half of these (47%) being aware of any risk of injury associated with the activity they were pursuing. Protective eyewear was available for 48.6% of these patients, but only a fifth (19.4%) wore it.

In the USA, a Bureau of Labor Statistics (BLS) study cited by Lombardi et al.[36] estimated that 60% of those experiencing a work-related eye injury were either wearing the wrong type of protective eyewear or not wearing any protective eyewear at the time of injury. The emergent association in the study was with the age of the worker, where young participants were reported to be less likely to use personal protective eyewear and less likely to perceive the risk of eye injury, due to lack of experience.[36]

There are various reasons for the non-compliance of wearing PPE. Fogging, scratching and somatic issues, such as headache or nausea, are significant factors related to the non-use of personal protective eyewear.[34,36] The main risks of being injured were the cheap quality of personal protective eyewear, lack of enforcement or low management priority, laziness, rushing around, invincibility, lack of awareness of hazards, and performance of low risk tasks in studies by Meallet et al.[34] and Lombardi et al.[36] Other reported factors are inconvenience, cost, inappropriateness for the task and interference with prescription glasses.[36] In Canada, Crebolder and Sloan[37] showed that, in a combat military environment, eye gear restricts soldiers' activities, resulting in routine failure to wear protective goggles. However, they face the possibility of injury through exposure to fragmentation, handling of ammunitions, flying debris and equipment. Complaints such as fogging impairing vision have been raised against wearing lenses for protection. New developments suggest that an anti-fog coating applied to the lens surface reduces fog accumulation.[37] Safety devices must provide adequate protection while being both unobstructive and comfortable.[3,37]

## Occupational-related policies and eye safety promotion

Accidents can occur anywhere and anytime but, through training, education and safety practices, they can be prevented or reduced. At managerial position down to the workers, attitudes toward safety should be addressed and analysed to determine if they are occupation-related, sports-related or home-related.[7,15,38] Strict compliance with the use of PPE can result in the reduction of injuries.[3,7,36] The loss of workdays can be greatly reduced by reinforcing strict implementation of occupational eye safety programmes, as well as reviewing eyewear designs.[7,15] Workplace safety is the responsibility of managers, supervisors and workers. Non-compliance among workers over the last few years and the high rate of not issuing PPE by employers, reflect that the guidelines set out by the Factories Act (1918) are not being appropriately implemented.[7,15,38] The South African Occupational Health and Safety (OHS) Act No. 85 of 1993[39] was drawn up in consultation with trade unions and employers, and is the main Act that deals with all aspects of health and safety in the workplace. This Act places the responsibility for the provision of safe working conditions upon the employer and compels the employee to act responsibly.[39] Customers must also be informed about any potential dangers of product use by the manufacturer or supplier of PPE. It is extremely important for all employees in any industry to be aware of potential hazards in order to protect themselves and their fellow employees at all times in the workplace. A suitable protective device can be recommended after determining the concentration and physical nature of the substance being handled. Face shields and goggles can be used for eye protection, but a full face shield is most appropriate as it also protects the skin. Employees wearing spectacles are advised to wear eye shields with side shields over spectacles for maximum protection.

The South African OHS Act of 1993 requires the availability of eye wash facilities at all times. Workers must ensure that they know how to operate these facilities and where they are kept to be able to access them timeously. The Occupational Health and Safety Amendment Act of 1993 (No. 181 of 1993)[39] stipulates that "no employer or user shall permit welding operations to be undertaken, unless: i) the person operating the equipment has been fully instructed in the safe operation and use of such equipment and in the hazards which may arise from its use; ii) effective protection is provided and used for the eyes and where necessary, for the face and body of persons performing such operations, as well as against heat, incandescent or flying particles and dangerous radiations; iii) the workplace is effectively partitioned off where practical and where not practical, all the other persons exposed to the hazards are warned and provided with suitable protective equipment".[39] Both Acts, however, do not include details of the specific types of devices for different types of welding operations and the chemical industry. While the need for an increase in the use of eye protection is indicated by the prevalence of eye injuries in the workplace, most PPE has restrictions, resulting in a reluctance to use it when carrying out risky duties.

> "The use of alcohol and illicit drugs has been suggested to be a contributor to the non-use of PPE in the workplace."

## Socio-economic implications

The nature and circumstances of ocular injuries differ from country to country because they are related to differing levels of industrialisation, safety standards at the work place, access to health services and sociological peculiarities.[40] In developing countries, activities such as carpentry, agriculture, chiselling and hammering are responsible for many eye injuries. The majority of cases involve young and working groups, highlighting the socio-economic burden of ocular injury in these communities.[4,7,41] Lack of access to preventive healthcare at all levels in developing countries has worsened the situation, while industrial workers are the ones that require the most attention. It is therefore of concern that, in rural areas where the necessary healthcare services are scarce, more injuries are reported.[21,42,43] The high cost of ocular trauma results in the loss of income. Similarly, the cost of medical and rehabilitation services necessitates the need for making preventive measures a priority.[4]

## CONCLUSION

The eye remains a high risk organ for work-related accidents,

with industrial blindness being a potential outcome despite efforts for primary prevention. The rate of monocular blindness among rural populations appears to be higher than in industry due to exposure to risky environments, particularly related to farming activities. Preventing eye injuries in industry is, however, more controlled, although eye injuries still occur. In developing countries, the types or modes of injuries may be different to those in developed countries, due to differences in occupations. High risk behaviour in industrialised countries and urban societies creates opportunities that lead to ocular trauma. The lack of proper protective eyewear, appropriately skilled personnel in health facilities, and awareness of the need for protection by manual workers, has contributed to the high risk of eye injuries, suggesting an urgent need for increased education about relevant safety precautions.[7,36]

## CONFLICT OF INTEREST

There is no competing interest.

## LESSONS LEARNED

1. Eye injuries are common in the workplace.
2. The types and incidences of eye injuries differ between developed and developing countries as well as between rural and urban workforces.
3. Eye injuries occur primarily due to non-compliance with protective eyewear and lack of adherence to the Occupational Health and Safety Act.
4. There is a need for increased educational and awareness programmes about eye safety and compliance with safety regulations.

## REFERENCES


1. Marmamula S, Keeffe JE, Rao GN. Rapid assessment methods in eye care: An overview. Indian J Ophthalmol. 2012; 60: 416-422.
2. Edema OT, Omoti AE, Akinsola FB, Aigbotsua PA. Ocular injuries in industrial technical workers in Delta State, Nigeria. Middle East Afr J Ophthalmol. 2009; 15 (3): 106-109.
3. Vasu U, Vasnaik A, Battu RR, Kurian M, George S. Occupational open globe injuries. Indian J Ophthalmol. 2001; 49: 43-47.
4. Negrel AD, Thylefors B. The global impact of eye injuries. Ophthalmic Epidemiol. 1998; 5 (3): 143-169.
5. Cassen JH. Ocular trauma. Hawaii Med J. 1997; 56 (10): 292-294.
6. Murillo-Lopez SA, Perez A, Hernandez F, Suarez-Tata L, Magdalenic R, Fromow J, Dalma-Weiszhausz J. Penetrating ocular injury with retained intraocular foreign body: epidemiological factors, clinical features and visual outcome. Investig Ophthalmol Vis Sci. 2002; 43: 3059-3064.
7. Ngo CS, Leo SW. Industrial accident-related ocular emergencies in a tertiary hospital in Singapore. Singapore Med J. 2008; 49 (4): 280-285.
8. Merle H, Gérard M, Schrage N. [Ocular Burns]. J Fr Ophtalmol. 2008; 31 (7): 723-734.
9. Islam SS, Doyle EJ, Velilla ABA, Martin, CJ, Ducatman AM. Epidemiology of Compensable work-related ocular injuries and illnesses: incidence and risk factors. J Occup Environ Med. 2000; 142 (6): 575-581.
10. Mackiewicz J, Matejko EM, Pylak MS, Sidor MP, Zagórski Z. Work related, penetrating eye injuries in rural environments. Ann Agr Environ Med. 2005; 12: 27-29.
11. Thylefors B. Epidemiological patterns of ocular trauma. Aust New Zeal J Ophthalmol. 1992; 20: 95-98.
12. Klein BR, Sears ML. Pediatric ocular injuries. Pediatr Rev. 1992; 13 (11): 422-428.
13. Macewen CJ. Eye injuries: a prospective survey of 5671 cases. Br J Ophthalmol. 1989; 73: 888-894.
14. Canavan YM, O'Flaherty MJ, Archer DB, Elwood JH. A 10-year survey of eye injuries in Northern Ireland, 1967-1976. Br J Ophthalmol. 1980; 64: 618-625.
15. Ballal SG. Ocular trauma in an iron forging industry in the Eastern Province, Saudi Arabia. Occup Med. 1997; 47: 77-80.
16. Kanski JJ. Clinical ophthalmology. A systemic approach. 5th ed. London: Butterworth-Heinneman, 2003. p. 665-680.
17. Saini JS, Sharma A. Ocular chemical burns-clinical and demographic profile. Burns. 1993; 19 (1): 67-69.
18. Falcão M, Camisa M, Falcão-Reis F. Characteristics of open-globe injuries in Northwestern Portugal. Ophthalmology. 2010; 224: 389-394.
19. Dhir SP, Mohan K, Munjal VP, Jain IS. Peforating ocular injuries with retained intra-ocular foreign bodies. Indian J Ophthalmol. 1984; 32: 289-292.
20. Khatry SK, Lewis AE, Schein OD, Thapa MD. The epidemiology of ocular trauma in rural Nepal. Br J Ophthalmol. 2004; 88: 456-460.
21. Saari KM, Aine E. Eye injuries in agriculture. Acta Ophthalmol Suppl. 1984; 161: 42-51.
22. Gyasi ME, Adjuik MA, Amoaku, WMK. Epidemiology of hospitalized ocular injuries in the Upper East Region of Ghana. Ghana Med J. 2007; 41 (4): 171-175.
23. Abraham D, Isseme I, Vitale S, West S. Epidemiology of eye injuries in rural Tanzania. Ophthalmic Epidemiol. 1999; 6 (2): 85-94.
24. Ilsar M, Chirambo M, Belkin M. Ocular injuries in Malawi. Br J Ophthalmol. 1982; 66: 145-148.
25. Canavan YM, Archer DB. Anterior segment consequences of blunt ocular injury. Br J Ophthalmol. 1982; 66: 549-555.
26. Cockerhem GC. Blunt trauma and nonpenetrating injuries of the anterior segment. Ophthalmology. 1983; 90: 140-148.
27. Wyman JR. Safety and the security professional: a guide to occupational safety and health strategies. Melbourne: Butterworth-Heinemann; 2000. p. 271-272.
28. Purslow C, North R. Eye protection. In: Rosenfield M, Logan N, Edwards K, editors. Optometry: Science, Techniques and Clinical Management. 2nd ed. Philadephia: Butterworth-Heinemann, Elsevier; 2009. p. 461-474.
29. Voon LW, See J, Wong TY. The epidemiology of ocular trauma in Singapore: perspective from the emergency service of a large tertiary hospital. Eye. 2001; 15: 75-81.
30. Woo J, Sundar G. Eye Injuries in Singapore – Don't Risk It. Do More. A Prospective Study. Ann Acad Med Singapore. 2006; 35: 706-718.
31. Dannenberg AL, Parver LM, Brechner RJ, Khoo L. Penetrating injuries in the workplace. Arch Ophthalmol. 1992; 110: 843-849.
32. Smith D, Stack LB, Wrenn K. The epidemiology and diagnosis of penetrating eye injuries. Acad Emerg Med. 2002; 9: 209-213.
33. Sithole HL, Oduntan OA, Oriowo MO. Eye protection practices and symptoms among welders in the Limpopo Province of South Africa. S Afr Optom. 2009; 68 (3): 130-136.
34. Meallet MA. Trauma to the eye and orbit. In: Asensio JA, Trunkey DD, editors. Current therapy of trauma and surgical critical care. California: Elsevier; 2008. p. 181-196.
35. Desai P, Baines P, McEwen CJ, Minassian DC. Incidence of cases of ocular trauma admitted to hospital and incidence of blinding outcome. Br J Ophthalmol. 1996; 80 (7): 592-596.
36. Lombardi DA, Verma SK, Brennan MJ, Perry MJ. Factors influencing worker use of personal protective eyewear. Accid Anal Prev. 2009; 41 (4):755-762.
37. Crebolder JM, Sloan RB. Determining the effects of eyewear fogging on visual task performance. Appl Ergon. 2004; 35 (4):371-381.
38. Capão Filipe JA. Soccer (football) ocular injuries: An important eye health problem. Br J Ophthalmol. 2004; 88 (2):159-160.
39. Department of Labour, Republic of South Africa. Occupational Health and Safety Act, No. 85 of 1993 as amended by the Occupational Health and Safety Amendment Act No. 181 of 1993. Gazette No. 14918, Notice No. 1158, 2 July 1993. Available at: http://www.saflii.org/za/legis/consol_reg/ohasa85o1993rangnr7716/ (accessed 26 May 2014).
40. Gupta AK, Krishna V. Clinical Ophthalmology: Contemporary Perspectives. 9th Ed. Delhi: Elsevier India. 2009: 577-592.
41. McGwin G, Xie A, Owsley C. Rate of eye injury in the United States. Arch Ophthalmol. 2005; 123: 970-976.
42. Adala HS. Ocular injuries in Africa. Soc Sci Med. 1983; 17 (22): 1729-1735.
43. Bejiga A. Causes and visual outcomes of perforating ocular injuries among Ethiopian patients. Community Eye Health. 2001; 14 (39): 45-46.

# SASOM News

## TRIBUTE TO THE LATE DR CHARLES P ROOS (2 FEBRUARY 1941 TO 10 MARCH 2014)

The Chairman, Executive Committee and members of the South African Society of Occupational Medicine (SASOM) mourn the untimely passing of Dr Charles Roos on 10 March 2014. He was 73 years old. An honorary life member of SASOM, Dr Roos contributed immensely to the Society by serving on the Executive Committee for 17 years, filling the portfolio of treasurer, and later as the South African National Secretary of the International Commission on Occupational Health (ICOH). In 2009, Dr Roos was granted a specialist occupational medicine qualification by the HPCSA in recognition of his experience and tremendous contribution to the body of knowledge in occupational medicine.

His passion for aerospace medicine and radiation medicine benefited many SASOM members and occupational health practitioners as he shared his knowledge through articles, presentations and SASOM Guidelines. He was a member of the Emergency Planning, Steering and Oversight Committee of the Koeberg Nuclear Energy Centre.

During his nearly 30-year career at Eskom, Dr Roos did pioneering work on HIV and AIDS in the mid 1980s and established a company policy on the issue that has been used by leading organisations in South Africa.

In his spare time, Dr Roos enjoyed getting out into the "bush" and driving on 4 x 4 tracks. He also loved flying and aviation in general.

To his wife, Annemarie, his two sons, three daughters, grandchildren, family, colleagues and friends, SASOM extends sincere condolences.

## AFRICAN REGIONAL ASSOCIATION OF OCCUPATIONAL HEALTH (ARAOH)/SOUTH AFRICAN SOCIETY OF OCCUPATIONAL MEDICINE (SASOM) CONGRESS

### Occupational health and safety in a rapidly changing work environment in Africa

Commencing at 15h00 on Friday 1 August, and closing at 16h00 on 3 August 2014 at Emperors Palace in Kempton Park, the Congress programme includes presentations by, amongst others:

- the President of the International Commission on Occupational Health (ICOH), Dr Kazutaka Kogi, and ICOH members, Prof. S Porru from Italy and Mr S Lim from Korea.
- Dr Khalifa Cisse (ARAOH Co-Chairman) and Dr Kader Toure (ARAOH Board member) from Senegal, Ms S Tau (Botswana), Dr J Dieuboue (Cameroon), Ms Esther Nzomiwu (Nigeria), Mrs Eva Muzira (Uganda).
- Prof. Uwe Reischl and Dr Judith Green-McKenzie from the United States of America.
- Prof. Cas Badenhorst, Prof. Lucille Blumberg, Prof. Leslie London, Prof. Lynne Webber from South Africa.
- Dr A Combrinck, Dr M Coombs, Dr Frank Fox, Dr Greg Kew, Dr Deodat Kritzinger, Dr Johan Stipp, Dr Grietjie Strydom, Dr Jim Te WaterNaude from South Africa.

SASOM has applied for 20 Continuing Education Units, which include 4 Units for ethics, for delegates who attend the whole Congress.

For the full programme and registration details, visit the SASOM website at www.sasom.org or contact Jenny Acutt in the SASOM National Office, telephone: +27 (0)12 803 7418, fax: +27 (0)11 507 5085, or e-mail: info@sasom.org

*Report by Jenny Acutt in the SASOM National Office, e-mail: info@sasom.org*

# SAIOH news

## FAREWELL TO ONE OF SAIOH'S FAITHFUL

**Bianca Durand**

After many years of faithful service to SAIOH, Bianca Durand has decided to further her career elsewhere (still within the HSE fraternity). Bianca had become synonymous with SAIOH and her prompt and efficient administrative abilities and friendliness are much appreciated by all. We wish Bianca well and know that she will be an asset to her future employer.

## CONFERENCES

There are a number of value-adding conferences scheduled for the second half of 2014. Early August sees the ARAOH / SASOM Congress happening in Kempton Park (1-3 August), with the SAIOH annual conference scheduled for October in Potchefstroom (29-31 October). The SAIOH conference promises to be one of the 'must attend' events of the year, with two professional development courses or PDCs planned for the 29th on cutting edge research within the hygiene space globally, with international presenters lined up.

## SANAS 17020

A specialist technical committee (STC) meeting was held on 28 March. Some of the key discussions at the meeting were:

- **The 30 September 2014 deadline set by the DoL:** SANAS indicated that, at the current pace of applications and assessments, the September 2014 deadline could be met provided that management system re-submissions are not required and provided that AIAs take corrective actions, raised at pre- and initial assessments, sooner than the maximum period allowed. The DoL confirmed that the deadline is fixed and current AIAs will no longer be approved if they are not accredited by 30 September 2014.
- **Minimum equipment needed by AIAs:** After some discussion, the Committee agreed that 17020: 2012 clause 6.2.1 will be applied.
  - "6.2.1 The inspection body shall have available, suitable and adequate facilities and equipment to permit all activities associated with the inspection activities to be carried out in a competent and safe manner."
- Accreditation Statistics (as at 28 March 2014): see table below.

The last STC meeting was held on 5 June. Minutes of all STC meetings are available on the SANAS website.

## LEGAL KNOWLEDGE CERTIFICATE

AIAs are reminded that all occupational hygiene functionaries working within AIAs are required to be in possession of a valid legal knowledge certificate. This applies to all levels of registration, i.e. ROHA, ROHT and ROH.

## CPD RETURNS

SAIOH is developing a mechanism via its website whereby all CPD points will be able to be uploaded electronically in future. SAIOH's Chief Administrative Officer, Bernd Oellermann, has informed me that this system will be operational by the second half of the year – another improvement in our member-offering to which we can look forward.

## COMPENSATION/SALARY SURVEY 2014

The final planning around this survey was done, and the survey is well under way.

The project is being carried out on behalf of SAIOH by a leading market research company – Consulta.

CONSULTA
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This will ensure anonymity as well as a more scientific analysis of research results. The success of this survey depends on your participation so please participate.

## COMMENTS AND VIEWS

Please remember to send us comments, views and any other information you may have about the profession, which you believe can add value. You can either e-mail me directly at saiohpresident@saioh.co.za or send an e-mail to admin@saioh.co.za.

*Report by PJ (Jakes) Jacobs, SAIOH President*,*
*e-mail: Peter.Jacobs2@riotinto.com*

* Cell: 071 672 4916; postal address: PO Box 50772, Randjesfontein,1683

| Enquiries | Applications | Accredited | Suspended | Withdrawn |
|---|---|---|---|---|
| 1 | 49 | 1 | 0 | 0 | 0 |

- ❖ 20% of applicants are in the initial or pre-assessment phase.
- ❖ 18% of applicants are in the management system (manual) review phase.
- ❖ 22% of applicants submitted incomplete applications; these applications will not be processed until all the required documentation is submitted.

# Mine Medical Professionals' Association

# The MMPA Kimberley Symposium

The Mine Medical Professionals' Association's Kimberley Symposium, held on 12 April 2014 at Kalahari Lodge, was well attended and upheld the Association's vision to raise the profile of occupational medicine in the mining industry by promoting best practice and disseminating knowledge. "The MMPA was pleased to provide an opportunity for continued professional development and robust intellectual discussions on a range of critical issues for the mining industry with colleagues from the Northern Cape," said MMPA President, Dr Vusumuzi Nhlapho.

Several speakers of note presented papers, addressing topics as far ranging as compliance and challenges on medical inspections, to compensation guidelines and managing fatigue. Dr Thuthula Balfour-Kaipa from the Chamber of Mines presented the mining industry's 2013 Health Milestones, while Peter Strasheim, an attorney specialising in advanced labour law, spoke about the legislation regarding disability and dismissals in the workplace.

During Dr Lindiwe Ndelu's presentation (Department of Mineral Resources) she reminded delegates of the rules of compliance in maintaining a healthy and safe mine environment as laid out by legislation. The obligation of employers includes the health care of their employees from diagnosis to treatment, as well as the strict keeping of records and managing and reporting of accidents. The biggest challenges for health in the mines include: the different health care models used by the mining industry; the management of contract workers; poor management and investigation of TB cases; poor implementation of TB, HIV and STI programmes at some of the smaller mines; inadequate voluntary counselling and testing awareness programmes; and exit medical examinations not being conducted. Dr Ndelu covered, in more detail, some of the other challenges facing members of the mining industry but concluded with some suggestions for the way forward. These included: proposed new regulation mandating the reporting of occupational diseases; standardising the reporting of fatalities due to occupational diseases across all mines; and an occupational health dialogue planned for later in 2014 to discuss issues of concern and new developments, involving all practitioners in occupational health.

Dr Balfour-Kaipa's presentation looked at the milestones achieved by the members of the Chamber of Mines in the areas of noise and dust control. By 2009, there was found to be no deterioration in hearing greater than 10% among occupationally exposed individuals. The number of noise-induced hearing loss claims has fallen since 1998 from 9 922 to 1 229 in 2011. By last year, the total noise emitted by all equipment installed in any workplace was not allowed to exceed a sound pressure level of 110 dB(A). In the area of dust control, the mining industry was close to the 2012 compliance level target of 0.1 mg/m$^3$ for respirable crystalline silica. The challenges faced by the Chamber have been: unrealistic targets; milestones that were not measured; and a lack of accurate data. Dr Balfour-Kaipa averred that future milestones will be achieved by going back to basics, setting up proper mechanisms for measurement, and taking bold decisions in the setting of milestones.

Dr Frank Fox, from Anglo American, presented a paper on managing fatigue. The link between fatigue and fatal accidents is well

documented and Dr Fox was able to prove, from studies involving 89 729 person-years of data and 1.2 million accidents, that the relative accident risk increases dramatically beyond the 8th hour at work. It was shown that 18 hours without sleep is the equivalent of having a blood alcohol level of 0.05%. Fatigue can be caused by several factors, including long shifts, work overload due to shortage of staff, night shifts disrupting the circadian rhythm, illness and personal factors. Dr Fox emphasised the importance of fatigue risk management and suggested various tools, such as establishing a forum to assess and manage the risk, and worker consultation and involvement. He stated that fatigue risk management is a management function not a medical problem and needs a multidisciplinary team approach. Dr Fox detailed six levels of control, how to run the programme, and key factors for success. He reminded delegates of the obvious – that healthy, well rested, alert employees are critical to safe and productive operations.

Luvuyo Dzingwa from Rand Mutual Assurance Company discussed compensation guidelines for musculo-skeletal disorders. He focused on Work Related Upper Limb Disorders (WRULD) as covered in the Compensation for Occupational Injuries and Diseases Act (COID) of 1993. According to the Act, any disease due to overstraining of muscular tendonous insertions caused by repetitive movements or constant pressure or tension at work, qualifies for compensation. He outlined, in some detail, the many different disorders that exist and the various methods of diagnosis and confirmatory tests that can be conducted by the examining occupational medical practitioner. In closing, Luvuyo stated that the ultimate goal was to be fair and impartial, and stressed that the integrity of the practitioner is all-important.

"A great deal of appreciation was expressed by colleagues in the Northern Cape for the opportunity to learn and interact with other colleagues in the mining industry," stated Dr Nhlapho. "Following the success of this symposium, the MMPA has plans to hold an academic symposium catering for the Northern Cape on an annual basis."

Dr Nhlapho would like to remind all colleagues that a follow-up academic symposium will be held at Aspen Conference Centre in Woodmead on 24 May 2014, where focus will once again be placed on the expectations and challenges of medical inspections in the mining industry.

*Prepared by Anne van Vliet,*
*e-mail: anne@communiquepr.co.za*

# Tribute to Professor Leana Uys

## (18 November 1948 to 26 March 2014)

It is with great sadness that SASOHN bids farewell to a stalwart of nursing in South Africa, through the African continent and many countries internationally. Professor Leana Uys passed away peacefully on 26 March 2014, after a long struggle with cancer. Prof. Uys touched many an OHNP's life as an undergraduate nurse through the countless text books she wrote; some may have been lectured by her and others perhaps supervised during their Masters and Doctoral studies. Prof. Uys leaves a legacy of excellence in nursing which will be hard to emulate but which each one of us should strive for. Her ferocious appetite for scholarship in nursing has meant that nurses who have experienced her mentorship are well placed to continue to develop the scholarship of nursing. Prof. Uys' quest to improve nursing education in many African countries resulted in her reputation permeating the African continent and, no doubt, improving the lives of many Africans who have been subjected to healthcare in their respective countries.

Prof. Leana Uys started her career in nursing in the early 1970s, studying at Pretoria University. She went on to Bloemfontein where she undertook post-graduate studies while working in the School of Nursing at the University of the Free State. After a lengthy career at the University of Natal where she was the Head of the School of Nursing from 1986 to 2001, she retired from the University of KwaZulu-Natal (UKZN) as the Deputy Vice Chancellor of the College of Health Sciences, and went on to be the CEO of the Forum of University Nursing Deans in South Africa (FUNDISA).

Prof. Uys was a National Research Foundation (NRF) B-rated scientist by the National Research Foundation (NRF). She was awarded this rating in 2008 and was the first nurse to achieve this level. According to the NRF, researchers in this category "enjoy considerable international recognition by their peers for the high quality impact of their recent research."

Prof. Uys held a number of leadership positions which included:

- President of the Tau Lambda-at-Large Chapter of Sigma Theta Tau International, 2000 – 2006.
- Interim Executive Dean for the Faculty of Health sciences, University of KwaZulu-Natal, 2004.
- Director: World Health Organization Collaborating Centre for Nursing and Midwifery Development, 1997 – 2004.
- Chairperson of the South African Nurses in HIV/AIDS Care, 2002 until her death.
- Vice President of the World Association for Psychosocial Rehabilitation in Africa, 2000 until her death.
- WHO Consultant to Bahrain, July and December, 1998.
- Founder member of the Joanna Briggs Institute Collaboration site in Durban.

Prof. Uys won numerous awards throughout her career, including 2009/2010 Most Influential Woman in Business and Government in the Education and Training sector; honorary life membership and patron of the Nursing Education Association of South Africa, and winner of the Mary Tolle Wright award for excellence in leadership, amongst others.

In 2013, she created an endowment fund to assist existing students at the UKZN with registration and bridging funds to ensure retention in the health sciences. If anyone would like to contribute to this fund in order to enable disadvantaged students to pursue careers in health sciences, please contact the University of KwaZulu-Natal, College of Health Sciences. If you would like to make a donation, please contact Ms Bridget McBean on mcbean@ukzn.ac.za; for more information, please visit the website www.ukznfoundation.org. This is a befitting legacy to one who inspired and led the nursing profession in South Africa. May her work continue through the many South African nurses whose lives she touched.

May she rest in peace after a life of service.

*Report by Penny Orton,*
*National Education Representative, SASOHN,*
*e-mail: pennyo@dut.ac.za*

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