

**1594e** WHY WE NEED *VISION ZERO*: THE UPS AND DOWNS OF CONSTRUCTION SAFETY IN THE USA

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Between 1990 and 2010, the USA experienced a decline in construction fatality rates of about 40%. By then, as a result of the Great Economic Recession, the industry had lost 25% of all workers and employers. By 2014 the industry was gaining back some of that employment, and suddenly we saw a large increase in fatality rates. By 2015, this increase had wiped out all the gains made between 2000 and 2010. This was not a surprise. In fact, based on past experience, CPWR predicted this would happen when the recession struck. Today there is full employment, and there is a shortage of both contractors and workers. To fill this void, new employers and new workers, with little experience, enter the industry and pose tremendous risks. How can such shortsightedness be mitigated? First, stronger regulations are needed. The requirements to get a business license as a construction contractor are minimal. In most states, there are no requirements for workers to have minimal skills or safety training before they get a job.

While the regulatory approach is essential – the backbone of any safety system – it is also minimal. It is not possible to regulate excellence. Excellence comes from culture, not requirements.

We know this, because there are sectors of construction within the US, and construction companies, that achieve such excellence. But we can also show that conditions can easily be created that foster risk taking.

That's why *Vision Zero* is so important. It provides the core of a safety culture that is easy to grasp. CPWR has created its version of *Vision Zero*, and has developed two implementation tools. The first is the Safety Climate self-assessment tool known as S-CAT, which allows any construction organisation or work site to assess its performance over eight broad indicators. It is now available online, and free of charge. The second is a training program called Foundations for Safety Leadership.

Excellence in safety can be achieved, but it requires commitment from everyone. That's what is captured in *Vision Zero*.

## Dermatology and Radiation

**1616** TITLE OF (JOINT) SPECIAL SESSION 'OED' AND 'RADIATION AT WORK': HOW TO TACKLE THE INCREASING DISEASE BURDEN OF OCCUPATIONAL SKIN CANCER

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**Aim of special session** Obtain better knowledge of epidemiological and clinical aspects, SR exposure mechanisms and biological interactions to raise awareness and implement preventive strategies

Solar Radiation (SR) is associated to various skin cancers: actinic keratosis (AK), squamous cell carcinoma (SCC) basal

cell carcinoma (BCC), and malignant melanoma (MM). Occupational activity is one of the most relevant factors influencing SR exposure. Alone in Europe about 14.5 million outdoor workers (OW) are exposed to SR for at least 75 % of their working time. The prevalence of occupational skin cancer among OW is very high and increasing. Most countries do not recognize skin cancer as an occupational disease.

**1616a** MAIN FACTORS INFLUENCING OCCUPATIONAL SOLAR UV EXPOSURE

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Several factors of various type can influence solar UV exposure of Outdoor Workers (OWs). A significant part of the solar UV is absorbed by stratospheric ozone layer, so the reduction of the ozone layer, that is currently ongoing, is progressively increasing the amount of UV reaching the earth surface and, consequently, the worker's exposure.

Among other, main relevance have geographical factors and first of all the latitude and also the altitude. Furthermore, as UV exposure varies with the elevation angle of the Sun above the horizon, exposure depends on the season and month of the year and hour of the day, being maximal between 11 a.m. and 3 p.m. about. Meteorological factors as clouds have an obvious relevance, but a variable proportion of UV, up to the 90%, can penetrate light clouds. Atmospheric composition/pollution has a variable effect, as suspended particles can absorb or reflect/refract/diffuse UV rays.

Different working factors can significantly interfere with UV exposure in OWs, as the surfaces surrounding the area of work: e.g. fresh snow or metals, especially if polished, reflects a high proportion of UV, while green grass absorbs up to the 98–99%. Working postures can significantly modify the exposure of different parts of the body during outdoor activities. Other occupational factors include the presence of UV shelters, like roofing or vegetation. The organization of task is also important: e.g. activities avoiding direct exposure during the central hours of the day, and work breaks, as meals, in UV protected environments are highly effective to reduce exposure. Other important working factors are the use of sunglasses with adequate UV filtering lenses, brimmed hats, UV absorbing cloths and a correct use of sunscreens SPF $\geq$ 30. A last individual factor that cannot be ignored is the role of personal protective behaviours of the worker, as habits to seek the sun.

**1616b** QUESTIONNAIRE BASED EVALUATION OF THE WHOLE-LIFE HISTORY OF SOLAR UV RADIATION EXPOSURE IN A GROUP OF PATIENTS IN ITALY

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**Introduction** An adequate evaluation of the ultraviolet (UV) cumulative exposure is a major problem in epidemiological studies on chronic skin damage. Questionnaires may be applied as useful tools. For these reasons, a detailed questionnaire for the evaluation of individual cumulative exposure to Solar Radiation (SR) of outdoor workers (OWs) was

developed, to investigate the associations between exposure and the presence of skin damage.

**Method** Based on ICNIRP publications, a detailed questionnaire, considering both working and leisure UV exposure, was developed and applied in group of volunteers and in patients affected by Non Melanoma Skin Cancers (NMSCs), to evaluate whole-life SR exposure and the relevant factors associated, including exposure habits, environmental factors and use of protections.

**Results** In patients with NMSCs, we found that the co-presence of in situ squamous cell carcinoma (SCC) and invasive NMSCs was more frequent in OWs than in indoor workers (IW), as was also the frequency of multiple skin lesions. The prevalence of lesions in the most exposed body areas, as the face, was significantly higher in OWs, while working in shades was negatively associated with skin lesions. Also working posture was relevant: adopting a bent-over position was associated with lesions on the head. For leisure activities, the questionnaire application confirms the relevant role of tanning beds, in particular for body areas usually not highly exposed to SR, and the relevance of intense exposure in the middle hours of the vacation days ('sunbaths'), significantly associated with NMSCs presence.

**Conclusion** A detailed questionnaire-based evaluation in subjects with NMSCs can be very useful for estimating the whole-life individual UV exposure and the relevancy of occupation. Furthermore, an integration with personal dosimetric UV measurements can lead to a semi-quantitative evaluation, to set out exposure levels and different exposure modalities (e.g. intermittent vs cumulative) for various occupations and, possibly, for the different SCs.

1616c

**INTEGRATED CARE FOR WORKERS WITH OCCUPATIONAL SKIN CANCER IN THE GERMAN SOCIAL ACCIDENT INSURANCE SCHEME – REHABILITATION WITH ALL APPROPRIATE MEANS PROVIDED BY THE STATUTORY SOCIAL ACCIDENT INSURANCE IN GERMANY**

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**Introduction** Skin cancer caused by exposure to certain harmful substances has been a part of the list of occupational diseases in Germany for some time. In 2015 certain types of skin cancer (squamous cell carcinoma or multiple actinic keratosis of the skin caused by natural UV-irradiation) were added as a new occupational disease to the list of occupational diseases. These types of skin cancer are recognised as occupational disease if the insured person has been exposed to certain effective doses of sunlight at his or her workplace. There is a rising number of such cases reported to the statutory social accident insurance and its institutions which are the entities in charge of prevention, rehabilitation and compensation of occupational diseases in accordance with the German social security system. The institutions for statutory social accident insurance have developed concepts to handle the growing numbers of these cases.

**Methods** Based on research and the discussion with medical experts, standards for the procedure, for the medical

treatment, the rehabilitation of workers affected by occupational skin cancer and the prevention of occupational skin cancer have been established. Concepts for follow-up care have been developed and new methods of therapy have been admitted for the medical treatment of patients suffering from occupational skin cancer.

**Results** The statutory social accident insurance has established measures to provide effective methods of rehabilitation for the patients concerned in accordance with the basic principle governing this social security scheme in Germany – acting 'with all appropriate means'.

**Discussion** Apart from providing effective help for the workers affected a major aim for the institutions of statutory accident insurance is the prevention of occupational skin cancer caused by exposure to natural UV-irradiation. The institutions of statutory social accident insurance will continue their efforts to reduce the risk for workers of contracting skin cancer caused by exposure to natural UV-irradiation at the workplace.

1616d

**ON THE UV EXPOSURE OF WORKERS IN EUROPE IN GENERAL AND GERMANY IN PARTICULAR: WHAT DO WE KNOW? RESULTS OF THE GENESIS-UV PROJECT**

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**Introduction** We are exposed to solar ultraviolet radiation (UVR) every day, during work and leisure time. To date, there is only little knowledge about the level of irradiance. Already in 1992, UVR has been graded a group 1 carcinogen by the International Agency for Research on Cancer (IARC). In an ageing society, along with an ideal of a brown skin, non-melanoma skin cancer (NMSC) incidence rates rapidly increase.

**Methods** For risk assessment and deduction of protective measures, real measured data serve best. Regarding solar UVR exposure, long-term personal dosimetry measurements is required. With GENESIS-UV, we designed a suitable system. With only little impairment, each test persons measures autonomously. Data are transferred via mobile service or internet to a data server once a week automatically. GENESIS-UV has proven to be feasible in collaborations in the whole world without any changes in the system.

**Results** Since 2014, about 800 test persons delivered data points representing about 80 000 days of measurement – in Germany. We derived the annual irradiance for more than 100 occupations, and far more occupational activities as well. Interestingly, the irradiance values for the occupations cover a very wide range ([www.dguv.de/genesis](http://www.dguv.de/genesis)). Going deeper into the occupational activities, prevention-relevant information could be obtained. Since 2016, measurements have been expanded at European level.

**Discussion** Outdoor workers have to be protected from UVR exposure. During working hours, their exposure can be up to 4.5 times the leisure dose. Our approach from occupations to occupational activities enables us to suggest very distinct protective measures, and drawing a full picture of workers exposure. Particularly, we showed that already short exposure times may lead to a notable hazard. Thus, the definition of an outdoor worker has to be reviewed.

The study with GENESIS-UV is by far the largest study on UV irradiance of workers worldwide.