

**Innovative solutions to
safety and health risks
in the construction,
healthcare and
HORECA sectors**

Written by the following members of the Topic Centre

Heleen den Besten, Janneke Richter, Maartje Bakhuys Roozeboom, Jan-Harmen Kwantes, TNO, The Netherlands,

Lieven Eeckelaert, Sylvie De Meyer, Prevent, Belgium,

Paul Johnson, Colleen Butler, Roxane Gervais, [HSL](#), UK,

Isabel López Nunes, DEMI, Portugal,

Karolina Farin and Malgorzata Pecillo, Agnieszka Młodzka-Stybel, Marcin Jachowicz, CIOP, Poland,

Ferenc Kudász, [OMFI](#), Hungary

Ellen Schmitz-Felten, KOOP, Germany,

Juliet Hassard and Tom Cox, [IWHO](#), University of Nottingham, UK,

Adriano Papale and Alessia Williams, [INAIL](#), Italy,

Harald Wilhelm, DGUV, Germany,

Cross-checker: Irja Laamanen FIOH, Finland

Edited by:

Dietmar Elsler EU-OSHA

EU-OSHA would like to thank its Focal Point network for their valuable feedback on the draft report.

**Europe Direct is a service to help you find answers
to your questions about the European Union**

**Freephone number (*):
00 800 6 7 8 9 10 11**

(*) Certain mobile telephone operators do not allow access to 00 800 numbers, or these calls may be billed.

More information on the European Union is available on the Internet (<http://europa.eu>).

Cataloguing data can be found on the cover of this publication.

Luxembourg: Publications Office of the European Union, 2011

ISBN: 978-92-9191-730-3

doi:10.2802/8768

© European Agency for Safety and Health at Work, 2011

Reproduction is authorised provided the source is acknowledged.

Table of contents

1.	Introduction.....	4
1.1.	Background	4
1.2.	Aim and scope.....	4
1.3.	Methodology.....	5
1.3.1.	Introduction.....	5
1.3.2.	Description of risk categories	5
1.3.3.	Identification of main risk factors	7
1.3.4.	Selection of preventive solutions.....	15
1.3.5.	Structure of the report	19
2.	Preventive solutions in Construction Sector.....	20
2.1.	Introduction.....	20
2.2.	Solutions.....	20
2.2.1.	Solutions physical load.....	20
2.2.2.	Solutions slip, trips, and falls	36
2.2.3.	Solutions psychosocial load	38
2.2.4.	Solutions dangerous substances	66
3.	Preventive solutions in Health Care Sector.....	87
3.1.	Introduction.....	87
3.2.	Solutions.....	87
3.2.1.	Solutions physical load.....	87
3.2.2.	Solutions slip, trips, and falls	90
3.2.3.	Solutions psychosocial load	94
3.2.4.	Solutions dangerous substances	127
3.3.	Checklist Health Care Sector	151
4.	Preventive solutions in HORECA.....	156
4.1.	Introduction.....	156
4.2.	Solutions.....	156
4.2.1.	Solutions physical load.....	156
4.2.2.	Solutions slips, trips, and falls	159
4.2.3.	Solutions psychosocial load	165
4.2.4.	Solutions dangerous substances	187
4.3.	Checklist Construction Sector	202
4.4.	Checklist Health Care Sector	208
4.5.	Checklist Horeca	213
5.	Conclusions and recommendations	215
5.1.	From research into practice.....	215
5.2.	Preventive solutions	215
5.3.	Checklists	217

5.4. Limitations and recommendations	218
6. References.....	220

List of figures and tables

Table 1: Summary of the main risks arising from dangerous substances in the European construction sector	11
Table 2: Summary of the main risks arising from dangerous substances in the European healthcare sector	13
Table 3: Summary of the main risks arising from dangerous substances in the European HORECA sector	14

1. Introduction

1.1. Background

Prevention is the cornerstone of the European approach to occupational safety and health (OSH). This means anticipating and analysing aspects of work to identify short and long-term risks, then taking action to eliminate or mitigate those risks. It applies to both occupational health risks and occupational safety risks. Prevention, based on risk assessment, is also the basis of European health and safety at work legislation. This chief principle is described in article 6 of the Framework Directive of 12 June 1989 (89/391/EEC) on the introduction of measures to encourage improvements in safety and health at work.

In 2008-2009 the European Agency for Safety and Health at Work (EU-OSHA) ran a 'Healthy Workplaces Campaign' (HWC)¹ to raise awareness of the risk assessment approach. This is the start of the risk management process. and if not done, or badly done, the correct preventive solution is unlikely to be found.² Within the 2012-2013 Healthy Workplace Campaign theme of 'better health and safety at work through prevention', the EU-OSHA will further address the promotion of prevention as the cornerstone of the European approach to achieve better OSH. The campaign is focused on the prevention process and the implementation of suitable, practical solutions that are sustainable over time.

One ambitious aim of the European Commission (COM) in its Community Strategy on Health and Safety at Work for the period 2007-2012 (COM, 2007), is to reduce the occupational incident rate within the European Union (EU) by 25%. The Community Strategy recognises that there is a need for economic incentives to motivate enterprises to use good practice in their prevention work. Successful incentive schemes lead to a significant decrease in occupational accident and disease rates for participating enterprises. Effective economic incentive models can help to reach the objective of a 25% accident reduction (e.g. EU-OSHA, 2010a).

In 2007 the EU-OSHA established a major, long-term project on economic incentives in relation to OSH. Economic incentives in OSH refer to processes that reward organisations that develop and maintain safe and healthy working environments (EU-OSHA, 2005, 2010a). The aim of the EU-OSHA economic incentives project is to stimulate a mutual learning process. This includes the exchange of information between the different economic incentives organisations and experts of the EU Member States. One conclusion from this project is that incentives schemes should not only reward past results of good OSH management, but should also reward specific prevention efforts which aim to reduce future accidents and ill-health (EU-OSHA, 2010a). Experts from this project have therefore suggested the development of compilations of innovative and evidence-based preventive solutions. The preventive measures should be promoted, and if possible applied in economic incentives schemes.

1.2. Aim and scope

This report seeks to contribute to, and inform the development of compilations of preventive solutions. These aim to describe a wide range of innovative and, preferably, evidenced-based preventive solutions that organisations can integrate into their daily workplace practices.

In order to narrow the scope, the report focuses on three specific occupational sectors:

1. healthcare
2. construction
3. the hotel and food service sector, further referred to as HORECA.

¹ Visit <http://osha.europa.eu/en/campaigns/hw2008/> for more information on the 2008-2009 HWC.

² Risk assessment is the process of evaluating the risks to workers' safety and health from workplace hazards. It is a systematic examination of all aspects of work that considers: what could cause injury or harm; whether the hazards could be eliminated and if not; what preventive or protective measures are, or should be, in place to control the risks (COM, 1996). Visit <http://osha.europa.eu/en/topics/riskassessment> for more information on the topic of risk assessment.

Some of the solutions are occupation-specific, while other approaches and tools are applicable across occupational sectors and can be tailored to meet the unique and/or commonly experienced risks faced in each occupational sector.

In addition to the scope per sector, only a limited number of risk categories in each of the three sectors has been analysed and evaluated, namely:

1. risks from psychosocial load
2. risks from physical load
3. risks of slips, trips and falls
4. risks caused by dangerous substances.

1.3. Methodology

1.3.1. Introduction

The first step of the research project aimed to identify and describe the four main risk categories and their main risk factors in each of the three selected sectors. The second was a review of the scientific and grey literature, to identify preventive solutions that directly addressed a number of the main risks and risk factors present in each of the occupational sectors.

1.3.2. Description of risk categories

• Psychosocial load

Psychosocial risks, commonly referred to as work and organisational stressors, are defined as ‘those aspects of work design and the organisation and management of work, and their social and environmental contexts, which have the potential for causing psychological, social or physical harm’ (Cox and Griffiths, 1995). There is considerable evidence and reasonable consensus within the research community to identify those aspects of work that are experienced as stressful and/or have the potential to harm (EU-OSHA, 2000). Psychosocial risks can be broadly categorised into 10 key dimensions (see Table 1): job content, workload and work pace, work schedule, job control, work environment and equipment, organisational culture and function, interpersonal relationships at work, role in organisation, opportunities for career development, and work-home interface (Cox and Griffiths, 1995; Leka, Griffiths and Cox, 2003).

Table 1: Psychosocial risks (adapted from Leka, Griffiths and Cox, 2003)

Job content	Lack of variety or short work cycles, fragmented or meaningless work, under use of skills, high uncertainty, continuous exposure to people through work
Workload and work pace	Work overload or under load, machine pacing, high levels of time pressure, continually subject to deadlines
Work schedule	Shift working, night shifts, inflexible work schedules, unpredictable hours, long or unsociable hours
Control	Low participation in decision making, lack of control over workload, pacing, shift working, etc.
Environment and equipment	Inadequate equipment availability, suitability or maintenance; poor environmental conditions such as lack of space, poor lighting, excessive noise

Organisational culture and function	Poor communication, low levels of support for problem solving and personal development, lack of definition of, or agreement on, organisational objectives
Interpersonal relationships at work	Social or physical isolation, poor relationships with superiors, interpersonal conflict, lack of social support
Role in organisation	Role ambiguity, role conflict, and responsibility for people
Career development	Career stagnation and uncertainty, under promotion or over promotion, poor pay, job insecurity, low social value to work
Home-work interface	Conflicting demands of work and home, low support at home, dual career problems

Exposure to psychosocial risks has been demonstrated to have a direct impact on:

- employee's physical, mental and social health
- the performance and productivity of workers
- the overall healthiness and resilience of the organisation (EU-OSHA, 2000)

Worker's physical, mental and social health can be affected by their work and working conditions in a direct or indirect manner. A direct physical pathway can be observed between the physical work environment and its associated risks, and workers' health. Additionally, there is much evidence of a relationship between the psychosocial working environment and health of workers. This indirect pathway is mediated by the individual's experience of stress (EU-OSHA, 2000). It is important to note that negative physical and psychosocial working conditions have a detrimental impact and can extend beyond the health of workers. They can also affect the healthiness of organisations and the employee's work record.

• **Physical load**

Physical load or physical risk factors include movements such as bending, straightening, gripping, holding, twisting, clenching, squatting, kneeling and reaching (EU-OSHA, 2008, 2010). Although these are common movements, continued repetition often forceful, and the speed of the movements and lack of time for recovery between them makes them hazardous in work situations. These risk factors can lead to musculoskeletal disorders (MSDs).

MSDs are a group of painful disorders of muscles, tendons, joints and nerves. All parts of the body can be affected, although upper limb and back are the most common areas. The term MSD denotes health problems of the locomotor apparatus, i.e. muscles, tendons, the skeleton, cartilage, the vascular system, ligaments and nerves. Work-related MSDs include all musculoskeletal disorders that are induced or aggravated by work and the circumstances of its performance. They cover a wide range of inflammatory and degenerative diseases of the locomotor system.

There are usually several causes of work-related MSDs, and there are numerous well-established work-related risk factors including physical as well as psychosocial factors.

• **Slips, trips and falls**

Slips, trips and falls are the largest cause of accidents in all sectors, from heavy manufacturing to office work. In the Member States they are the main reason for work absences of more than three days. Accident risks are higher for those employed in SMEs, particularly those in enterprises with less than 50 employees (EU-OSHA, 2001; HSE, 2003). Slips, trips and falls may have serious consequences, causing severe injuries such as broken bones or concussion.

Slips, trips and falls, and the distinction between these three risks, can be described as follows (adapted from EU-OSHA, 2008b):

Slips happen when there is too little friction between footwear and the walking surface. A combination of the following factors will determine whether a slip accident may take place: type of flooring; contamination on the floor (for instance water, oil or dust); type and condition of footwear; environmental factors such as lighting and the capabilities of the individual who slips. The vast majority of flooring surfaces have good slip resistance when they are clean and dry. But slip resistance is greatly affected by contamination. Tiny amounts of water create a film between the shoe and floor, and if the floor's surface roughness is not able to break through this film there is no contact between footwear and flooring, making a slip likely. As a general rule, if a floor is shiny it is likely to pose a high slip risk when wet

Trips may happen when your foot hits an object and you lose your balance. Tripping accidents, and subsequent falls, are caused by: changes in levels or surfaces, such as uneven walking surfaces; risks such as trailing cables or cleaning buckets; footwear; environmental factors such as poor lighting and the capability of the individual who trips. Studies have shown that changes of as little as 8mm in levels can pose a risk for fit, healthy people. When you trip the forward motion of the foot is stopped suddenly by an obstacle, such as a training cable, but your body continues its forward motion. You may be unable to recover your balance and therefore fall forwards, injuring your head, leg or wrist.

Most, but not all, falls are usually the result of slips and trips. There are two basic types of falls: same-level falls and falls from heights. Falls can happen due to the incorrect use of ladders and scaffolding.

• ***Dangerous substances***

Dangerous substances are found in many workplaces (EU-OSHA, 2003a). Exposure to dangerous substances can occur anywhere at work, for instance on farms, in hairdressers' shops, in motor-vehicle repair shops and at chemical plants. Almost all of us will face some sort of dangerous substances at work or during our daily life and it's important that we understand how to deal with the risks.

The legal definition of a dangerous substance covers any liquid, solid, gas, chemical or biological material that could pose a risk to workers' health and safety (EU-OSHA, 2010). Most chemicals in the workplace are not harmful at all if used properly, although some will need more careful treatment than others. A dangerous substance can be anything that could potentially cause you harm, including many everyday products such as glue and paint. Some of the most common substances include cleaning products, adhesives and solvents.

Further risks can be created by processes in the workplace. Welding fumes or wood dust, for example, can cause serious health problems. The harm caused can vary dramatically, ranging from mild eye and skin irritations to asthma, reproductive problems and birth defects to cancer. This can be through a single short exposure, or multiple exposures and long-term accumulation of substances in the body.

1.3.3. Identification of main risk factors

• ***Introduction***

The key risk factors of psychosocial load, physical load, slips, trips and falls, and dangerous substances, observed within the aforementioned three occupational sectors have been identified. A pan-European survey of the scientific literature was conducted with a focus on epidemiological sources of European data (such as the European Working Conditions Survey, EWCS), in order to identify the major risk factors. It is important to note that this survey of scientific literature did not aim

to be exhaustive, but to highlight a majority of key factors encountered at a sectoral level across the EU.³

- **Main psychosocial risk factors**

Above and beyond those risks highlighted in the previous section, there are a number of additional psychosocial risk factors that are commonly experienced in the **healthcare sector** (McNeely, 2005; Cox and Griffiths, 1995; EU-OSHA, 2007), including:

- high expectations combined with insufficient time, skills and social support
- confrontation with pain
- dealing with dying people
- emergencies
- exposure to traumatic events
- complaints and litigation
- violence and harassment.

Some of the key psychosocial risk factors identified to be highly prevalent in the **HORECA sector** are (Jettinghof and Houtman, 2009):

- time pressure/workload
- lack of training or education for the job
- working hours (long working hours; regular overtime, often unpaid; shift work and irregular/unusual working times; no time for breaks; uncertainty about finishing time)
- customer demands/behaviour
- shortage of staff
- continuous pressure on HORECA sector to innovate and adapt, to reduce costs and to increase efficiency.
- lack of autonomy and control
- lack of communication
- monotonous work or work without creativity/initiative
- checks by superiors
- low predictability of work
- work-life balance problems
- violence, harassment and discrimination.

Some of the key psychosocial risk factors identified to be encountered within the **construction sector** are:

- Time pressure and deadlines

³ There is no known European database that would compile risks identified by companies during their risk assessment processes. Although the consequences of risks (diseases and ill health: EODS-Eurostat) are collected, it suffers from highly variable diagnostic and registration procedures and incomplete Member State involvement. These circumstances permitted only the overview of existing expert opinions (textbooks, reports, studies) and concerning scientific literature. The following effects can bias the results: self-augmentation of commonly accepted risks and risks that are widely talked about are more likely to be mentioned in reports and to be subjects of investigation and publication.

- Undeclared work
- Low control
- High demands (physical workload)
- Training (or lack thereof)
- Job certainty
- Safety climate
- Skill under-utilisation
- Responsibility for safety of others
- Safety compliance
- Hours of exposure
- Tenure
- Harassment/discrimination
- Lack of communication
- Posture
- High turnover
- Unsafe work practices.

• **Main physical risk factors**

A recent EU-OSHA publication (2010b) revealed that blue-collar and service workers generally tend to be more exposed to physical risk factors such as carrying or moving heavy loads, painful and tiring positions and vibrations, while repetitive work and working at high speed affect all occupations. Prolonged standing and walking is a notable risk factor in construction, but also greatly affects workers in service professions, above all in HORECA and retail.

In the **healthcare sector**, the nursing profession has been shown as one of the most at risk occupation for low back pain, primarily due to patient handling tasks such as lifting, transferring, and repositioning of patients (EU-OSHA, 2008c). MSD problems also arise from awkward or static postures when treating patients (HSE, undated).

Musculoskeletal disorders are some of the most common forms of ill health in the **construction sector** (EU-OSHA, 2004, 2007c). Risk factors for MSDs arising from construction are: accidents; manual handling of (heavy) loads; the work environment (e.g. not enough room, uneven or slippery floor, cold); awkward postures (e.g. stretched arms, bent postures, kneeling and squatting), working above shoulder/head level, repetitive work (e.g. hammering, drilling, driving screws, sawing, painting with brushes, plastering, cutting sheet metal with scissors, loading and unloading small pieces like tiles or bricks), high force applications, vibration (see also EU-OSHA, 2007b), local compression of tools and surfaces, and psychosocial factors.

A number of tasks carried out in specific construction jobs expose the workers concerned to a higher risk of developing work-related MSDs of the upper limb (EU-OSHA, 2007c):

- plasterers, including plaster spraying
- pointers, when filling joints between bricks
- screeders making floors level (and exposed to vibration, pulling mechanic tools, manual spreading)
- scaffold erectors
- tilers
- carpenters, when working above shoulder level
- glaziers, manual handling, kit cutting, applying kit

- bricklayers, especially when handling large blocks
- insulation workers, when applying mineral wool or polystyrene
- plumbers
- architects' staff, undertaking Computer Aided Design (CAD)
- paviours, carrying out repetitive movements, handling heavy materials, and using vibrating equipment.

MSDs arising from physical workload (prolonged standing, constant movements, raising of loads such as beds, furniture, merchandise, etc.) are widespread in the **HORECA sector** (EU-OSHA, 2008f). Many activities in the sector involve manual handling: lifting full pots and pans and dishwasher trays, carrying piles of plates, bending into deep fat fryers to clean them and vacuuming. HORECA workers may have a higher risk of developing MSDs because their job often involves prolonged standing and working in awkward postures. Much of their work is physically demanding, stressful and involves long working hours.

• ***Main risk factors related to slips, trips and falls***

Slips and trips are the most common form of major injury affecting nurses, housekeepers, carers, ambulance staff and cleaners. In addition, members of the public (including patients) are at risk as well (HSE, 2003, 2004). The main causes of slips and trips accidents in the **healthcare sector** are (EU-OSHA, 2008b):

- slippery/wet surfaces, caused by water and other fluids
- slippery surfaces caused by dry or dusty floor contamination, such as plastic, lint or talcum
- obstructions, both temporary and permanent
- uneven surfaces and changes of level, such as unmarked ramps.

Other causes include factors such as a poor level of lighting and external glare; human factors such as employees rushing, running or carrying heavy/bulky items; unsuitable footwear or the use of improper cleaning regimes.

Slips, trips and falls are the most common cause of accidents in the **HORECA sector**, especially in kitchens (EU-OSHA, 2008e). People working in kitchens and serving food are more likely to be injured through slips and trips than by anything else. The vast majority of slip injuries happen on floors that are wet or contaminated, whether by food debris, cooking oil or other spillages. Most slip injuries happen on wet floors, while most trips are due to poor housekeeping.

The most common cause of injuries and death in the construction sector is falling from heights (EU-OSHA, 2003b). The main causes include: working on a scaffold or platform without guard rails, or without a safety harness correctly attached; fragile roofs and ladders that are badly maintained, positioned and secured.

• **Main risks caused by dangerous substances 4**

Skin problems (dermatosis) are common in all three sectors. They may not be linked exclusively to a specific agent but to work circumstances, such as contact with irritant chemicals or dust, or the use of gloves or wet-work.

Compared to accident risk, exposure to dangerous substances varies more in different subgroups of the **construction sector** and jobs. In a sector-based point of view tunnel construction, demolition and renovation all have different exposure profiles. Size also matters: there are big differences between civil engineering and the building of sole apartments. Various jobs also lead to different exposures (e.g. painters, carpenters, bricklayers). The main risks arising from dangerous substances in the European construction sector are shown in Table 2.

Table 1: Summary of the main risks arising from dangerous substances in the European construction sector

Risks in the construction sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Woods (dusts)	Allergy: skin, lung. Carcinogen: nasal cancers	Carpenter. Sawing, etc. is only a problem for parquet layer and cabinet maker
Lead	Poisoning: colic, anaemia, reprotoxic Long term: neuropathy	Pigment removal, renovation of old plumbing (is no real risk)
Nickel	Allergy: skin. Long term: lung cancer	Work with stainless steel, plumbing
Cyanates and isocyanates	Allergy: asthma, skin	Gluing, painting, corrosion prevention
Asbestos fibres should be detected and removed under safe conditions, no exposure is allowed since the 1990s	Asbestosis (mass exposure) Carcinogen: lung cancer, mesothelioma	Demolition, renovation/repair of tubing, installation of cables, etc. in certain old buildings
Cement	Dermatitis	Bricklayers: concrete preparation and use
Resins (urea formaldehyde, epoxy: e.g. Diglycidyl ether of bisphenol A)	Allergy: skin, lung	Industrial flooring, concrete restoration, corrosion proofing
Solvents, thinners, paints, varnishes, lacquers, mastics, glues	Dependent of solvent (see organic solvents) and active agent/pigment (eg. lead, chromium, cadmium), dermatitis	Painting, surface treatment, Gluing, flooring
Black products (incl. asphalt, tar, pitch) containing PAHs	Carcinogen, dermatitis	Paving, insulation of roof, etc. against water

⁴ The data collection for this section was based on existing and available sources and, where available, efforts have been made to use the raw data sources. The results are based on the findings of a literature survey (CAREX database FIOH); ILO, 1998; Hathaway and Proctor; 2004; LaDou, 2006, EU-OSHA, 2009b; EU-OSHA, 2009c), European Occupational Diseases Statistics (EODS) occupational disease statistics in sectors Construction, HORECA and Health and Social Care of reference period 2001-2007, the Haz-Map: Occupational Exposure to Hazardous Agents website (<http://hazmap.nlm.nih.gov/index.html>) and, where appropriate, decisions were influenced by personal experiences and expert opinion.

Risks in the construction sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Industrial oils and fats	Dermatitis	Maintenance of power tools, cranes, machines
(Crystalline) silica dust	Long term: mild silicosis, lung cancer	Abrasive blasting, sawing, drilling, cutting, etc. of solid concrete and certain stones
Engine exhaust fumes (Diesel particles, PAHs, CO)	Acute: asphyxia (CO). Long term carcinogen: lung cancer (PAHs), cardiovascular diseases (microparticles)	Vehicle/machine/generator use
Mineral fibres including ceramic and glass wool (MMMMF)	Dermatitis. Long term: carcinogen?	Insulation. Repair/installation of tubes/cables
Organic solvents (n-hexane, toluene, styrene, xylene, ethylbenzene, tetrachloroethylene, dichloromethane (DCM), trichloromethane)	Dizziness, dermatitis. Compound dependent long term: toxic polyneuropathy, neurological diseases, liver and kidney disease. Possible carcinogens: DCM, trichloromethane, tetrachloroethylene	Painting, paint removal, degreasing
Welding fumes	Respiratory diseases (from irritation to cancers)	Welding
Calcium oxide (quicklime)	Dermatitis, chemical burns	Mortar and plaster preparation
Polyurethane foam	Inert if totally cured. Irritation to eye and lung, dermatitis. (for health effects during breakdown see isocyanates)	Sealing and thermal insulation. High temperature results breakdown e.g. motor cutting
Tick borne diseases: <i>Borrelia burgdorferi</i> (Lyme disease), TBE (tick-borne encephalitis virus)	BB: acute: dermatitis. If untreated, long term: neurological disease. TBE: encephalitis	Outdoor work (in bushes and grass)
Arsenic preservatives (chromated copper arsenate, CCA)	Skin, hematological, liver diseases. Toxic polyneuropathy	Wood-preservation works and work with these timber

The **healthcare sector** is broad enough, as a hospital may be a little town with maintenance staff and kitchen. Cleaners are very important but unseen associates in health care establishments. Between the strictly healthcare personnel there are wide exposure differences: the pathology and histology ward, operating theatre, dentistry, the laboratory and the wards curing cancer patients have special exposures unlikely to occur in other sites. Due to the high number of medicines mostly grouping of agents is provided. Note that medicines do not fall under the classical chemical legislation thus there are no Material Safety Data Sheets (MSDS), labelling is different etc., resulting in poor risk communication to workers. The main risks arising from dangerous substances in the healthcare sector are summarised in Table 3.

Table 2: Summary of the main risks arising from dangerous substances in the European healthcare sector

Hazards and risks in the health care sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Mycobacterium	Tuberculosis	Respiratory therapists, microbiology laboratory technicians, pathologists
Acarina (mites, manges, scabies)	Scabies infestation	Nursing/care of patients (old and homeless)
Blood-borne diseases (HCV, HBV and HIV/AIDS)	Chronic diseases	Invasive interventions (sharps from blood taking to surgery). Cleaning of contaminated surfaces. Nursing/care, transfer of patients (needlestick).
Faeco-orally transmitted diseases (Norwalk-Virus, HAV, Salmonella, Shigella, Toroviridae)	Gastroenteritis, hepatitis	Nursing/care of patients
Herpes zoster virus, varicella-zoster virus (HZV, VZV)	Herpes, varicella	Nursing/care of patients
Nickel, Chromium	Allergy: dermatitis	Handling or cleaning of medical instruments
Staphylococcus (especially MRSA)	(Resistant) infection. MRSA-carrier: symptom-free (patient-safety issue) needs eradication treatment!	Nursing/care of patients
Acrylates+Methacrylates, resins (bisphenol A, epoxy-, isocyanate-, formaldehyde resin)	Allergy: asthma	Dental practice
Glutaraldehyde (pentanedial)	Respiratory diseases. Allergy: asthma	Sterilisation of medical devices
Rubber, natural latex, thiurams	Allergy: dermatitis, asthma	Use of gloves
Aqueous solution	Dermatitis	Wet work
Other disinfectant (formaldehyde, chloramine T, hexachlorophene, chlorhexidine, isononoyl oxybenzene sulfonate, lauryl dimethyl benzyl ammonium and benzalkonium chloride, OPA).	Allergy: asthma, dermatitis	Disinfecting or sterilisation of medical equipment
Influenza (including seasonal, avian, pandemic)	Influenza	Nursing/care of patients

Hazards and risks in the health care sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Ethylene oxide	Toxic polyneuropathy Carcinogenicity	Sterilisation of sensitive medical equipment.
Cytostatics-antineoplastic drugs (e.g. cisplatin, Adriamycin, Bischloroethyl nitrosourea, etc.)	Carcinogenicity	Preparation and administering of cytotoxics. Nursing/care of patients treated with cytostatics.
Anaesthetic gases (Nitrous oxide, Methoxiflurane, Enflurane, Halothane, Isoflurane)	Central nervous system symptoms, reprotoxic	Surgery team, recovery & emergency room staff
Laboratory reagents (Sodium azide, Methanol, Xylene, formaldehyde, picric acid)	Sodium azide: acute poisoning, (mutagenity) Methanol: acute poisoning Xylene: neurotoxicity Picric acid: acute poisoning	Laboratory work
Formaldehyde	Respiratory diseases, allergy: asthma, dermatitis. Carcinogen	Laboratory work, sterilisation of medical devices

Table 4 contains a summary of the main risks arising from dangerous substances in the **HORECA sector**. This sector is not well separated and it is hard to identify in research articles. This is a composition of various jobs and it could even be broadened to hairdressers and gardeners (hotels). Meanwhile there is a huge overlap with cleaners. The specific agents are hardly identified.

More information on the risks caused by dangerous substances in the HORECA sector can be found in recent EU-OSHA publications (EU-OSHA, 2008c, 2008f).

Table 3: Summary of the main risks arising from dangerous substances in the European HORECA sector

Risks in the HORECA sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Flours	Allergy: asthma, dermatitis	Cooking
Nickel	Allergy: dermatitis	Cleaning
Foods (especially vegetables, fish and crustaceans)	Allergy: dermatitis, asthma	Cooking
Aqueous solutions (wet work)	Dermatitis	Cleaning, washing-up, food preparation

Risks in the HORECA sector	Possible harmful effects	Jobs and tasks (task used due to overlapping jobs and exposures)
Cleaning products (Washing detergents, soaps, quaternary ammonium compounds, glycol ethers (2-butoxyethanol), alcohols, organic sulphonates)	Dermatitis	Cleaning
Asbestos fibres (If free asbestos is detected it must be removed under safe conditions)	Asbestosis (mass exposure). Carcinogen: lung cancer, mesothelioma	Maintenance of buildings
Rubber, natural latex	Allergy: dermatitis, asthma	Wearing gloves (during cleaning)
Resins, polishes	Dermatitis	Cleaning, polishing
House dust, moulds	Allergy: rhinitis, conjunctivitis, asthma	Vacuum cleaning
Acids (hydrochloric, sulphuric, acetic, citric, phosphoric)	Dermatitis, chemical burn, eye injury	Cleaning
Sodium hydroxide (lye)	Dermatitis, chemical burn, eye injury	Degreasing-cleaning
Hypochlorite	Dermatitis, chemical burn, eye injury	Cleaning
Infectious agents: (Norovirus, Hepatitis A virus)	Infections (hepatitis, gastroenteritis)	Cleaning (especially bathroom)
Mutagenic aldehydes and particulate matter	Respiratory diseases, lung cancer	Pan-frying

1.3.4. Selection of preventive solutions

• *Introduction*

With the main risk factors related to physical and psychosocial load, slips, trips and falls, and dangerous substances identified, a review of preventive solutions seeking to address and manage these risks and risk factors was conducted. This review was informed and based on the scientific literature, the grey literature and other web-based resources. Emphasis was placed on finding preventive solutions from across Europe with a focus on the implementation in one of the three occupational sectors, or where the aim of the programme was to address one of the major identified risks in those respective occupational sectors.

In this review and selection of preventive solutions, the general legislative requirements from the Framework Directive (89/391/EEC) were taken into account, and a set of criteria was defined to guide the selection of appropriate preventive measures.

• **Legislative background**

The Framework Directive of 12 June 1989 (89/391/EEC) on the introduction of measures to encourage improvements in the safety and health of workers at work, and the national legislation to transpose and implement the Directive in the EU Member States, stress a **hierarchy of preventive measures** to be followed:⁵

1. Are risks preventable or avoidable? Is it possible to get rid of the risk? This can be done, for example, by considering whether the task or job is necessary; removing the risk and using different substances or work processes.

2. If risks are not avoidable or preventable, how can they be reduced to a level at which the health and safety of those exposed is not compromised? The following additional general principles of prevention should be followed:

- combating the risk at source
- adapting the work to the individual; especially as regards the design of workplaces, the choice of work equipment and the choice of working and production methods with a view to alleviating monotonous work or a predetermined work-rate and to reducing their effect on health
- adapting to technical progress
- substituting the dangerous with the non-dangerous or the less dangerous (e.g. replacing the machine or material or other feature that introduces the risk with an alternative)
- developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors related to the working environment
- giving collective protective measures priority over individual protective measures (e.g. controlling exposure to fumes through local exhaust ventilation rather than personal respirators)
- giving appropriate instruction to workers

• **Selection criteria**

The EU-OSHA (2009a) has listed a number of criteria for 'good practice' solutions in OSH. A good practice should:

- reduce the whole potential to cause harm to workers or other persons affected by the enterprise arising from an identified cause of harm
- improve the working conditions in general and be effective in promoting health, safety and efficiency
- achieve a permanent and identifiable reduction in the risk of harm to workers
- demonstrate steps and methods that can be taken within a workplace or within an organisation to improve working/living conditions and/or reduce health and safety risks at enterprise level
- focus where possible on preventing the identified risk at source
- be effective and ethically tolerable
- meet the relevant legislative requirements of the Member State in which it has been implemented⁶
- be current and relevant to intended users and existing work practices within the European Union
- contain sufficient information such that it can be applied where relevant to other EU workplaces

⁵ Adapted from: EU-OSHA, <http://osha.europa.eu/en/topics/riskassessment/step3>

⁶ This may mean that the good practice information is not directly transferable between Member States.

- include the strong involvement of all relevant parties, in particular those workers and their representatives who will be directly affected by the action taken

Taking into account the aim of this research project (drafting sector-specific compilations that include preventive measures/solutions worthy of being promoted and applied in economic incentives schemes), a set of specific criteria was used to guide the selection of these preventive solutions. These criteria are more stringent than and go beyond the aforementioned good practice criteria set by the EU-OSHA.

A preventive solution can be included in a sectoral compilation under the condition that:

- it goes beyond the minimum legal requirements
- it focuses on primary prevention⁷
- it is 'evidence-based', taking into account the following hierarchy of evidence (adapted from the evidence-based medicine philosophy; see Greenhalgh, 1997): (1) systematic reviews and meta-analyses,⁸ (2) randomised controlled trials (RCT), (3) cohort studies, (4) case-control studies, (5) cross sectional surveys, (6) case reports, or (7) at least expert opinion
- it is 'innovative', offering some kind of solution that has not been applied or implemented by many companies yet
- it is easy to use and SME-friendly⁹
- it is measurable (quantifiable), enabling it to be controlled without a high administrative burden
- it is designed in such a way that it could be possibly used for an economic incentive scheme, rewarding specific prevention efforts (see below)

• **Template**

A template was collaboratively developed between several European research centres and EU-OSHA. The template was used to describe each of the selected preventive solutions, and was piloted using several identified preventive solutions, then reviewed. The results and feedback from the piloting phase was used to further develop the template. The developed template contains the following key areas:

- the name of the solution
- the country where the solution was implemented and language(s) of the toolkit
- a description of the risk(s) that the preventive solutions seek to address or manage
- the occupational sector in which the preventive solution was implemented or targeted
- the focus of the preventive solution at the human, organisation or technology

⁷ The concept of the prevention of accidents/diseases has three levels in the scientific literature: (1) primary prevention targets the first occurrence of accidents or diseases; (2) secondary prevention focuses on the recurrence of symptoms after the first occurrence, reducing the initial effects through effective medical and social care; (3) tertiary prevention targets the rehabilitation and return-to-work process. (E.g., EU-OSHA, 2008a; Spangenberg, 2010)

⁸ *Systematic reviews* attempt to collate all empirical evidence that fits pre-specified eligibility criteria to answer a specific research question. They use explicit, systematic methods that are selected with a view to minimising bias, thus providing reliable findings from which conclusions can be drawn and decisions made. Systematic reviews usually contain several primary studies. *Meta-analysis* is the use of statistical techniques to integrate and summarise the results of included studies. In the USA it is also used as a synonym for a systematic review. (Adapted from Liberati et al, 2009 in Perosh, 2011)

⁹ An SME (Small and Medium sized Enterprise) can be defined here as an organisation having less than 250 employees. In general, three SME categories can be distinguished: (1) micro-enterprises with a workforce of less than 10 employees, (2) small enterprises with a workforce of between 10 and 49 employees, and (3) medium-sized enterprises with a workforce of between 50 and 249 employees. SMEs might be hindered in applying certain preventive solutions because the involvement of qualified persons (e.g. researchers, consultants, etc.) is required (e.g. for the support of implementation and evaluation processes), or because a lot of time and/or staff is needed.

- the target group of interest for the preventive solutions (managers, workers, OSH representatives)
- the nature of the evaluation and the relative strength of the evidence base for the preventive solution. The strength of the preventive solutions was categorised by high, medium and low
- a concise description of the nature and content of the practical solution/toolkit
- observed benefits accrued from the preventive solution to individual or organisation
- reference to national legislation by the preventive solution
- further information on the preventive solution
- additional comments on the nature and content of the preventive solution
- whether there was any reference to an economic incentive programme

Each selected preventive solution was described using this developed template.

• **Checklists and economic incentives in OSH**

Based on the selected and described preventive solutions, a checklist was developed for each sector. These checklists contain an overview of possible preventive solutions in the four identified risk areas, and could be used as a basis to develop an economic incentives scheme in OSH.

Economic incentives in OSH refer to ways of rewarding organisations for having safe and healthy workplaces. Two major categories can be distinguished: (a) financial incentives, such as insurance-related incentives; funding schemes and tax-based incentives, and (b) non-financial incentives including recognition schemes such as awards; aiming at positive recognition but not having substantial direct financial implications.

As mentioned in the introduction, there is a growing recognition at EU level of the need to use economic incentives to motivate enterprises to apply good practice in their prevention work. The EU-OSHA project on economic incentives has demonstrated that successful incentive schemes lead to a significant decrease in occupational accident and disease rates for participating enterprises.¹⁰ One of the conclusions of a recent EU-OSHA report on economic incentives in OSH (EU-OSHA, 2010a) concluded that, with respect to SMEs, economic incentives have to go beyond simple accident-based experience rating. Therefore incentive schemes that focus on prevention efforts, such as training or investment in safer machinery, are more attractive for SMEs. If enterprises see a clear link between their prevention effort and the reward by an insurance or funding scheme, the motivational effect will be much higher.

The idea of using checklists as a basis and input for economic incentives schemes is partly based on the positive experiences and results from a Funding Programme (the 'Prämienverfahren') by the German Statutory Accident Insurance Body of the Butchery Industry (Fleischerei Berufsgenossenschaft, FBG). The complete description of the incentive system including the translated checklist can be found in the EU-OSHA economic incentives report, which is freely available on the website (EU-OSHA, 2010a, p37 and pp106-118). Since 2002 FBG has been offering a premium model for its member companies. This programme aims explicitly at the prevention of future accidents at work. It funds in-house prevention programmes and measures in the member companies. The award is linked to certain quality standards and to certain focal points defined by FBG: the proposed measures have to exceed normal accident prevention standards set out in laws and regulation, representing good practice in the company. In order to participate in the Funding Programme companies simply have to complete a two-page questionnaire/checklist every year. This can be done online or using a paper version. For each preventive activity described in the questionnaire, the company gets a certain number of bonus points. This bonus point system is transparent and easy to apply as every enterprise can directly link certain preventive solutions with the bonus points and the resulting premium reduction. SMEs have no problem in implementing at least some of the measures as the list is quite long and is amended annually. Analyses of the

¹⁰ Visit <http://osha.europa.eu/en/topics/economic-incentives> for more information,

effectiveness of the Funding Programme revealed that general accident rates of companies that participate are significantly below the accident rates of companies that have never participated. A positive correlation between investing in safety and health, and reducing accidents, is shown as well.

1.3.5. Structure of the report

The following three chapters contain the selected preventive solutions for, respectively, the Construction sector (chapter 2), the Healthcare sector (chapter 3), and HORECA (chapter 4). The solutions are for each sector divided per risk category, namely: (1) risks from physical load, (2) risk of slips, trips, and falls, (3) risks from psychosocial load, and (4) risks caused by dangerous substances. For each sector a checklist with references to the described preventive solutions is provided, in order to facilitate a user-friendly search for specific solution, which can be applied individually to an organisation or enterprise.

A final, fifth, chapter draws some conclusions on the identification and selection of preventive solutions, the usability of the sectoral checklists, and provides some recommendations for policy and research in OSH.

2. Preventive solutions in Construction Sector

2.1. Introduction

The three projects 'Evidence-based prevention state of the art review' detected a number of solutions for the construction sector.

Eight solutions are offered to reduce the physical load. One of these solutions can also be used in the other sectors.

Only two solutions deal with the reduction of slip, trips, and falls during construction work, although this is a major risk for construction workers. One reason for this surprising result is that the vast majority of technical, human factors and organisational interventions which are recommended by standard texts of safety consultants and safety courses, have not been adequately evaluated (Spangenberg 2010). Therefore, these interventions were not included in the review.

Ten solutions describe methods to reduce the psychosocial load. The implementation of nearly all of these solutions requires activities of all groups in the organisation, from management to workers.

Nine solutions offer means to reduce contact with dangerous substances. Some solutions suggest guidelines for single dangerous substances, some describe better working methods.

The Checklist Construction Sector contains questions for each solution. Due to the complexity of some solutions, more than one question has to be asked to reach a successful implementation of the proposed practical solution.

2.2. Solutions

2.2.1. Solutions physical load

Solution
1. Ergonomic interventions and mechanisation aides for bricklayers
Country of origin
The Netherlands
Description of risk
Frequent bending and rotation of the trunk and lifting are important risk factors particularly for lower back problems in bricklayers and their assistants. Hazardous tasks are the manual transport of bricks and mortar (lifting and carrying bricks, pushing and pulling wheelbarrows) and the repetitive lifting and laying of bricks. Bricklayers are often continually bending their backs when working on a wall less than 50cm high, thereby rotating from stacks of bricks to the low wall.
Sector
Construction

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ Medium <ul style="list-style-type: none"> These findings are consistent with a number of other studies and therefore there appears to be a considerable evidence base to support their findings (van der Molen, 1998; Vink and Koningsveld, 1990).
Practical solutions
<p>Two practical solutions have been suggested by De Jong <i>et al.</i> (2003) to mitigate against the risk factor of lower back pain in bricklayers and bricklayers' assistants.</p> <p>The solutions are:</p> <ol style="list-style-type: none"> 1. Higher placement of bricks above the floor: <p>It has been shown that higher placement of the bricks above the floor reduces musculoskeletal load when working on a wall less than 50cm high (De Jong <i>et al.</i>, 2003) This higher placement of the bricks can be achieved by one of three ways (i) split floor in scaffolding (ii) platforms made of wood or aluminium (iii) height adjustable scaffolding floors e.g. Hoist-Console scaffolding floors may be used – there are simple to install wire rope hoists for light lifts (see Lifting Safety, 2010).</p> 2. Mechanisation of transport to carry bricks <p>Bricks may be transported by cranes or crane-trucks in combination with crane clamps which load or unload large stacks of bricks. An automatic version of the crane clamp has also been developed to enable bricks to be placed in the scaffolding. An electric cart is an option for small stacks of bricks.</p>
Benefits
<ul style="list-style-type: none"> ▪ There was a reduction of musculoskeletal workload for bricklayers and bricklayers' assistants when bricks were raised 50cm above the scaffolding floor, and when special crane devices and electric carts were used to transport bricks and mortar (Vink <i>et al.</i>, 2002; Miedema and Vink, 1996, van der Molen, 1998);

<ul style="list-style-type: none"> ▪ The majority of bricklayers and bricklayers' assistants were satisfied with the use of the new working methods (De Jong et al., 2003). Bricklayers indicated that they were satisfied or very satisfied with the Hoist-Console scaffoldings (100%), stools to raise bricks (80%) and consoles (90%); ▪ Companies found that the initial costs of purchasing and implementing the new working methods were outweighed by the benefits of these changes (De Jong et al., 2003); <p>The advantages of the new working methods were the increase in productivity and reduction of physical load on the back (De Jong <i>et al.</i>, 2003).</p>
Legislation
<p>European Directive 90/269/EEC transposed into law in all Member States gives the minimum Health and Safety requirements for the manual handling of loads.</p>
Further information
<p>De Jong, A.M., Vink, P. and De Kroon, J.C.A. 'Reasons for adopting technological innovations reducing physical workload in bricklaying'. <i>Ergonomics</i>, 2003, Vol. 46, No. 11, pp. 1091-1108.</p> <p>Latza, U.; Karmaus, W.; Sturmer, T.; Steiner, M.; Neth, A. and Rehder, U. 'Cohort study of occupational risk factors of low back pain in construction workers'. <i>Occupational and Environmental Medicine</i>, 2000, Vol. 57, No. 1, pp.28-34.</p> <p>Lifting Safety Wire Rope Scaffold Hoists, 2010. Available at: http://www.liftingsafety.co.uk/category/scaffold-hoists-and-winchers-205.html</p> <p>Miedema, M. and Vink, P. 'Whistling during mechanical transport of bricks' [in Dutch]. In: <i>Ergonomie in Uitvoering, Conference of the National Society of Ergonomics</i>, TNO Work and Employment Hoofddorp, September 2-21, 1996, pp.154-162.</p> <p>van der Molen, H.F.; Bulthuis, B.M. and van Duivenbooden J.C. 'A prevention strategy for reducing gypsum bricklayers' physical workload and increasing productivity'. <i>International Journal of Industrial Ergonomics</i>, 1998, No. 21, pp.59-68.</p> <p>Vink, P. and Koningsveld, E.A.P. 'Bricklaying: a step by step approach to better work'. <i>Ergonomics</i>, 1990, Vol. 33, No. 3, pp.349-352.</p> <p>Vink, P.; Miedema, M.; Koningsveld, E. and van der Molen, H. 'Physical effects of new devices for bricklayers', <i>Journal of Occupational Safety Engineering</i>, 2002, No. 8, pp. 71-82.</p>
Questions
<p>Is the manual transport of bricks and mortar (lifting and carrying bricks and pushing and pulling wheelbarrows) reduced?</p> <p>Are cranes or crane-trucks in combination with crane clamps used which load or unload large stacks of bricks?</p> <p>Is the repetitive lifting and laying of bricks on walls less than 50 cm in height reduced by:</p> <ul style="list-style-type: none"> ▪ split floor in scaffolding ▪ platforms made of wood or aluminium ▪ height adjustable scaffolding floors?

<p>Is an automatic version of the crane clamp used to enable bricks to be placed in the scaffolding? Are electric carts used for the transport of small stacks of bricks?</p>
<p>Part of incentive system **</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

<p>Solution</p>
<p>2. Implementation strategy and training on new working methods for floor layers</p>
<p>Country of origin</p>
<p>Denmark</p>
<p>Description of risk</p>
<p>Musculoskeletal disorders: Knee Problems in Floor layers Floor layers spend more than half of their working day in knee-straining working positions and have an increased frequency of knee disorders. Kneeling work increases the risk of knee disorders. Radiographic changes are observed that might be an initial sign of knee degeneration.</p>
<p>Sector</p>
<p>Construction</p>
<p>HOT</p>
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives

<ul style="list-style-type: none"> ▪ OSH experts
<p>Evaluation</p>
<ul style="list-style-type: none"> ▪ medium <p>A three month and two year follow up to assess the effectiveness of the intervention showed that there was continued use of the working methods. However the percentage of employees using the working methods was the same at three months and two years after the training, indicating that the strategy and training was not effective in encouraging uptake of working methods by other floor layers.</p>
<p>Practical solutions</p>
<p>Implementation strategy and training on new working methods for floor layers:</p> <p>The development of tools has enabled some tasks undertaken by floor and carpet layers, such as gluing and welding, to be carried out from a standing position. The new tools are based on a telescopic stick, an intercostal fitting and specific fittings for various tasks (e.g. for gluing, welding filling) (Jensen and Friche, 2007). However, the use of these tools by floor layers was not initially adopted. One of the reasons given for this was that educational training in the use of the tools was necessary. In addition, floor layers were reluctant to accept suggestions for improving their working methods unless it was from people experienced in their trade.</p> <p>It has now been shown that a ‘participatory ergonomics implementation strategy’ consisting of ‘information, education and facilitation on the use of new tools and working methods’ was effective in the floor laying trade.</p> <p>A number of factors have been highlighted as important to include in an implementation strategy and training programme, to bring about behaviour change (van der Molen, 2005). These include:</p> <ol style="list-style-type: none"> 1. The provision of information to workers about the physical work demands and health risks associated with using/not using the suggested new working method 2. Motivation, intention and ability (of users and management) to use the ergonomic measures <p>In line with the above ‘recommendations’, an implementation strategy to bring about behaviour change in floor layers was developed that involved the following phases:</p> <ol style="list-style-type: none"> 1. Information-dissemination – this involved local meetings with 174 floor layers to provide information about health risks and how to use the tools. They were also necessary to gain support from trade unions and employers’ associations 2. Training of supervisors and floor layers — a two-week training course for supervisors (the course included training in the new working techniques, teaching skills, communication and ergonomics training). A two-day training course for floor layers involved theoretical instruction in the different kinds of new tools, practical instruction when priming, gluing, welding, cutting welding wire and linoleum. Floor layers were provided with a free set of tools (funded by trade unions and employers associations).
<p>Benefits</p>
<ul style="list-style-type: none"> ▪ There was an increased frequency of floor layers using the new working methods (Jenson and Friche, 2007). A two-year follow up study showed that 38% used the new working methods weekly or daily compared to 37% when reviewed just three months after the training (Jenson and Friche, 2008); ▪ The degree of knee complaints was reduced and the new working methods did not result in

<p>MSDs in other parts of the musculoskeletal system. This was evident from a comparison of floor layers who used the new working methods and those that did not (Jenson and Friche, 2007). The reduction in severe knee complaints was greatest if floor layers began using the new working methods before they developed knee problems (Jenson and Friche, 2008).</p>
<p>Further information</p>
<p>Jensen, L.K. and Friche, C. 'Effects of training to implement new tools and working methods to reduce knee load in floor layers', <i>Applied Ergonomics</i>, 2007, No. 38, pp.655-665.</p> <p>Jensen, L.K. and Friche, C. 'Effects of training to implement new working methods to reduce knee strain in floor layers', A two-year follow up. <i>Occupational Environmental Medicine</i>, 2008, No. 65, pp.20-27.</p> <p>Jensen L.; Mikkelsen S. and Loft I. 'Work-related knee disorders in floor layers and carpenters', <i>Journal of Occupational Environmental Medicine</i>, 2000, No. 42, pp.835-842.</p> <p>Kivimaki, J.; Riihimaki, H. and Hanninen, K. 'Knee disorders in carpet and floor layers and painters', <i>Scandinavian Journal of Work and Environmental Health</i>, 1992, No. 18, pp. 310-316.</p> <p>van der Molen, H.F.; Sluiter, J.K.; Hulshof, C.T.; Vink, P.; van Duivenbooden, C.; Holman, R. and Frings-Dresen, M.H. 'Implementation of participatory ergonomics intervention in construction companies', <i>Scandinavian Journal of Work and Environmental Health</i>, 2005, No. 31, pp.191-204.</p>
<p>Questions</p>
<p>Floor and carpet layers: Are telescopic sticks, intercostal and specific fittings for various tasks used for gluing and is welding carried out from a standing position?</p> <p>Are the workers informed about physical work demands and health risks associated with not using working method carried out from a standing position?</p>
<p>Part of incentive system **</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

<p>Solution</p>
<p>3. Use of a hydraulic ladder rack for all maintenance workers</p>
<p>Country of origin</p>
<p>Canada</p>

Description of risk
The repetitive lifting of ladders on and off vans puts maintenance workers at risk of musculoskeletal disorders to the back and shoulders, because of the weight of the ladder and the required extended reach (Kramer et al., 2009).
Sector
Construction
HOT
The solution concerns: <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ medium <p>Both biomedical analysis and questionnaire data both consistently provided evidence of a beneficial effect of the hydraulic drop-down ladder rack in reducing worker effort. However the study involved a very small sample of workers (n=13).</p>
Practical solutions
<p>A hydraulic aluminium drop down ladder rack system that allows workers to unload the ladder from the side of a van was recommended by a sub-committee of the Construction Safety Association of Ontario (CSAO) (Kramer <i>et al.</i>, 2009). By using the drop-down ladder rack, workers can load/unload their ladders from the side of the van handling them from the top of the van, and in this way, eliminate overhead lifting. To raise or lower the ladder, the operator turns a control rod that allows a hydraulic cylinder to assist with raising or lowering the ladder rack. Workers were required to take their vans to the distributor of the racks where they had to be installed. During installation, the users of the ladders were trained on the proper use of the racks – this included procedures about trouble shooting and ladder rack maintenance.</p>

Benefits
<p>Findings from biomechanical analysis indicate that the hydraulic ladder lift reduced low back loading. Based on the questionnaires, all workers endorsed the ladder as significant improvements.</p> <p>Based on 36 usability questionnaires, workers endorsed the lift as a significant improvement to what they had been using. They found that working with the ladder lift was easier, it reduced their workload and the possibility of them slipping. They reported that the load on their shoulders was reduced during loading and off-loading because their reach was shorter, and that their balance was improved because the ladders were held in the middle. This meant that they were no longer required to stand on the back of the van's bumper to remove the ladder.</p> <p>Smaller firms indicated that they would be inclined to purchase the racks despite the additional cost (\$900 to \$1300).</p>
Further information
<p>Kramer, D.; Bigelow, P.; Vi, P.; Garritano, E.; Carlan, N. and Wells, R. 'Spreading good ideas: A case study of the adoption of an innovation in the construction sector', <i>Applied Ergonomics</i>, 2009, No. 40, pp.826-832</p>
Questions
<p>Is a hydraulic drop-down ladder rack installed to lift ladders on and off vans? Are the users of the ladders trained on the proper use of the rack?</p>
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

Solution
4. Mechanical aids for plasterers
Country of origin
Canada/USA
Description of risk
<p>Plasterers have the highest prevalence rates for MSDs in the construction industry. Awkward postures involving bending and twisting, repetitive movements and lifting and handling of awkward and/or heavy objects are recognised as regular features of plasterers' work and may cause MSDs.</p>

Specifically, drywall finishing by hand forces the body into awkward positions that can lead to serious wrist, shoulder, arm and back injuries.
Sector
Construction
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ Medium <p>Independent studies have found consistent results on the benefits of this system.</p>
Practical solutions
<p>In a recent report on interventions to improve manual handling for plasterers in Great Britain the provision of mechanical aids, where possible, was recommended (Wynn, 2010). Handling aids were discussed that can assist plasterers with tasks associated with plasterboard finishing, by reducing the amount of force required by plasterers and/or by reducing the amount of manual handling time required. One of these handling aids was a pneumatic drywall finishing system.</p> <p>A pneumatic drywall finishing system uses an air compressor that forces the drywall compound from the hopper into the tube. The compound does not need to be hand pumped. Instead, air forces the compound through the head of the tool when the trigger is pulled. The tool requires an airline from the hopper to the applicator. Electrical power for the air compressor is also required (NIOSH, 2007).</p> <p>Two studies have demonstrated benefits of such a system:</p> <p>In a study by Shaw <i>et al.</i> (2002), participants used a variety of devices including spring-powered plaster boxes, corner applicators and a power finisher that uses compressed air to fill the plaster box and push the jointing compound onto the wall. Results indicate a 75% decrease in force was required for finishing with the spring powered tools, and that only 2% of the muscle activity was required when using the compressed air finisher compared with traditional plaster boxes.</p>

Smith *et al.* (2004) conducted an intervention study under controlled conditions at the Interior Finishing Systems Training Center (IFTC), Ontario: Canada. During each experimental trial, participants were asked to perform a simulated plasterboard-finishing task (compound coating and sanding), using both traditional manual methods and an alternative intervention method (a pneumatic drywall finishing system). Their working postures and muscular activities were recorded, and dust-monitoring samples were collected. On average, using the traditional method (i.e. using a hawk and trowel) the participants finished with a total time period of 31.62 minutes to apply joint compound. Using the pneumatic drywall system, the participants finished with an average total time of 11.05 minutes, a decrease of 65% in comparison to the traditional method.

Benefits

- Although the muscular effort is higher for the pneumatic system, the exposure level does not impose risk of musculoskeletal injuries. When comparing loads on the left forearm flexor muscles, the pneumatic system exposed the worker to significantly lower muscular exertion than the traditional method (Smith *et al.*, 2004, Wynn, 2010).
- Time spent working on ladders, scaffolds and benches was also reduced when working with the pneumatic tool, which can lead to a reduction in the risk of slip and fall-related injuries (Smith *et al.*, 2004)

Further information

National Institute for Occupational Safety and Health Simple Solutions – *Ergonomics for Construction Workers*. August 2007, No. 2007-122.

Reid, A.; Pinder, A.D.J. and Monnington, S. 'Musculoskeletal problems in bricklayers, carpenters and plasterers: Literature review and results of site visits', *Health and Safety Laboratory*, 2001, No. 13.

Shaw, G.; Pan, C.S.; Chiou, S. and Davis, G. Drywall Ergonomics. In: The proceedings of the 12th Annual Construction Safety and Health Conference, Rosemont: Illinois, 2002.

Smallwood, J.J.; Haupt, T. and Shakantu, W. 'Construction Health & Safety in South Africa', Pretoria: South Africa: Construction Industry Development Board. 2006.

Smith, G.; Vi, P.; Laird, H. and Sahai, D. 'Ergonomic & hygiene interventions to improve health & safety of drywall finishing workers'. Canada, *The Construction Safety Association of Ontario*, 2004, WSIB Grant #02034

Wynn, T. 'An investigation into the use of plasterboard manual handling aids in the GB construction industry and factors helping and hindering the practicability of their application'. *Health and Safety Laboratory ERG*, 2010, 10, 14.

Question

Are pneumatic drywall finishing systems used?

Part of incentive system **

- Yes, reference to incentive system
- no

Solution
5. Use of prefabricated steel and self compacting concrete (SCC)
Country of origin
Sweden
Description of risk
About a quarter of the average day for construction sector workers consists of concrete casting and steel reinforcement fixing. This work is often carried out in awkward postures with heavy material when placing steel reinforcements piece by piece, or with heavy equipment (e.g. vibration tools) to compact traditional concrete. Compared to other occupations concrete workers in particular have the highest frequency of reported MSDs.
Sector
Construction
HOT
The solution concerns: <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ Medium <p>Risk analysis and interview data provided evidence to support the conclusions in this study however it is unknown whether other studies also support the conclusions drawn.</p>

Practical solutions

According to Rwamamara (2007), the use of prefabricated components (e.g. prefabricated steel) and self-compacting concrete (SCC) has musculoskeletal health benefits for concrete workers.

Prefabrication involves the assembly of pieces in a factory, followed by the transportation of the assembled component to its permanent location. Toole and Gambatese (2006) have outlined how prefabrication reduces the hazard level in two ways: 1) It allows the work location to be shifted to a lower hazard environment where risks such as working at height or in confined spaces are reduced. 2) It allows work to be shifted from the construction site to a factory where the use of safer automated equipment reduces the risks of MSDs. Prefabricated steel reinforcement cages can be assembled in a factory using automated machinery and shipped to the construction site. The use of such steel means that the traditional working position, of bending over to place separate steel reinforcement piece by piece, is eliminated.

SCC is a concrete to which no additional inner or outer vibration is necessary for compaction. It compacts itself due to its own weight and is deaerated almost completely while flowing into its formwork. Concrete workers do not need to compact the concrete so tasks related to lifting or use of vibration tools are not required. Before using SCC, it is crucial to define how it should perform. This can be determined by three parameters: 1) its filling ability, 2) passing ability, and 3) segregation proneness (Emborg et al., 2005).

Simonsson and Rwamamara (2007) observed steel reinforcement and concrete casting activity work cycles by walking through sites and via video films of such activity. According to Simonsson and Rwamamara (2007) their risk analysis indicated that working with prefabricated steel and SCC reduced physical loading on the musculoskeletal system of the worker. They attributed this reduction to the elimination of physical strain associated with traditional methods of steel reinforcement and the use of conventional concrete.

Benefits

- Improved material handling with less heavy lifting and carrying of material. Available at: <http://www.bamtec.co.nz/elements/BAMTECsystem.pdf>

Further information

Emborg, M.; Jonasson J-E.; Nilsson M.; Utsi S. and Simonsson P. Designing robust SCC for industrial construction with cast in place concrete, Proceedings of Fourth International Rilem Symposium on SCC, Chicago, 2005, Oct 30 – Nov 2.

Lundholm, L. and Swartz, H. 'Musculoskeletal ergonomics in the construction industry. Facts and Figures' Swedish Work Environment Authority in brief No. 5.2006. Available at: http://www.av.se/dokument/inenglish/statistics/Sf_2006_05_en.pdf.

Nielsen, C. 'New results regarding SCC and working environment', The Nordic SCC Network Workshop, SCC, Vision and Reality 19th June 2006, Copenhagen, Danish Technological University.

Rwamamara, R.A. 'Planning the Healthy Construction Workplace through Risk Assessment and Design Methods', Doctoral Thesis. Lulea University of Technology, Sweden, 2007.

Simonsson, P. and Rwamamara, R. 'Consequence of Industrialized Construction Methods on the Working Environment, Proceedings IGLC-15, Michigan, USA, July 2007.

Toole, T.M. and Gambatese, J. 'The Future of Designing for Construction Safety', 2006. Available at: <http://www.designforconstructionsafety.org/Link%20Images/P75%20Future%20of%20DfCS%20toole%20and%20gambatese.doc>

Question
<p>Are prefabricated components (e.g. prefabricated steel) used instead of placing steel reinforcements piece by piece?</p> <p>Is self compacting concrete (SCC) used whenever possible in order to avoid the use of vibration tools?</p> <p>Are risks such as working at height or in confined spaces reduced by prefabrication and assembly of steel reinforcement cages in a factory using automated machinery?</p>
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

Solution
6. Mechanisation aids for road workers and floor layers
Country of origin
The Netherlands
Description of risk
<p>MSDs: Low back pain in road workers and floor layers</p> <p>Manual handling of materials and awkward back postures are risk factors for low-back pain and are relevant to road workers and floor layers (Burdorf, 2007).</p>
Sector
Construction
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology

Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/ employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ Low quality <p>Conclusions must be interpreted with care because a cross sectional design was used, so it is unknown if benefits would also be found if the same group of participants were compared before and after using the mechanisation aids.</p>
Practical solutions
<p>Mechanisation aids: Hydraulic clamp and mixing machine with remote control pump system.</p> <p>Traditionally, road building involves a hodman, to transport sand and bricks, and a road maker to prepare a sand bed and lay down the bricks one by one. Burdof <i>et al.</i> (2007) described a machine known as a hydraulic clamp, which enables the user to pick up a batch of 43-44 bricks at a time and reduce the number of bricks to be placed manually per m² by 80%. With a hydraulic clamp, the road maker can prepare the sand bed, manoeuvre the hydraulic clamp manually and lay down bricks so that they are aligned with other bricks.</p> <p>In the installation of sand-cement floors, a hodman spends most of this time shoveling sand into a mixer. A pump attached to the mixer pushes the cement through a hose to a room in a building where the floor layer pours the mixture over the surface and levels it. A proposed improvement to this is a mixing machine equivalent to a container of sand with a pump attached. This eliminates the need for the hodman to spend most of his time shoveling sand. Instead his time is spent operating the pump and controlling the supply of mixture. The pump can also be operated by remote control so that the hodman is free to assist the floor layer with levelling the floor surface.</p> <p>Results from Burdof <i>et al.</i> (2007) showed that a hydraulic clamp reduced work time in a kneeling/squatting position by 43-53% and frequency of lifting loads of 5-15kg and above 15kg by between 46-59% and 84-88% respectively. The frequency of mixing loads was reduced by 66% for 5-15kg and by 15% for over 15kg by the use of a mixing machine with a pump system during pouring of sand cement floors, but there was no discernable effect on awkward back postures.</p>
Benefits
<p>Floor layers and hodmen using the equipment reported that they had a lower prevalence of low back pain and less associated sick leave (Burdof <i>et al.</i>, 2007).</p>
Further information
<p>Burdof, A.; Windhorst, J.; van der Beek, A.J.; van der Molen, H. and Swuste, P.H.J.J. 'The effects of mechanised equipment on physical load among road workers and floor layers in the construction industry'. <i>International Journal of Industrial Ergonomics</i>, 2007, No. 37, pp. 133-143.</p>

Question
<p>Are mechanisation aids used to reduce manual handling of materials and awkward back postures with road workers?</p> <p>Is a hydraulic clamp used for road making instead of manually laying down the bricks one by one?</p> <p>Are mechanisation aids used to reduce manual handling of materials and awkward back postures with floor layers?</p> <p>Is a mixing machine with remote control pump system used instead of the hodman shoveling sand into the mixer manually for the installation of sand-cement floors?</p>
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

Solution
7. Use of alternative methods for pile cropping
Country of origin
UK
Description of risk
<p>The hand-arm vibration syndrome (HAVS) can be caused by regular and frequent exposure to hand-transmitted vibration from operating handheld power tools such as road breakers or jackhammers (HSE, 2005). Traditionally jackhammers have been used by construction workers to crop concrete piles to the correct level, to allow the subsequent construction of pile caps or capping beams (HSE, 2002). HSE's Construction Sector recommends the use of mechanical pile cropping in order to reduce the incidence of HAVS.</p>
Sector
Construction
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human

<ul style="list-style-type: none"> ▪ Organisation ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
<p>Evaluation</p>
<p>Medium – Further empirical evidence is required to support current findings.</p>
<p>Practical solutions</p>
<p>The Elliot Pile Breaking method:</p> <p>The Elliot Pile Breaking method is suitable for use on cast in situ piles. The technique involves the removal of an unwanted pile section in one piece by exploiting the physics behind crack propagation (Loughborough University, 2010). A reinforcement cage is prepared by placing polyurethane foam sleeves over each reinforcing steel bar. The sleeves prevent the steel reinforcement from bonding with the concrete. The cage is pushed into the fresh concrete pile so that the foam sleeves are at the correct level for cut off. When the concrete has set for a minimum of seven days, cropping work can proceed. Cropping is carried out by drilling a hole at cut-off level to just beyond the centre of the pile. A hydraulic splitter is then inserted and activated and after about 30 seconds the concrete cracks at the desired level. The surplus concrete is then removed with a crane or excavator as a single piece.</p> <p>This pile breaking method was a finalist in the 2007 Safety Awards (Elliot Europe Ltd., 2010).</p>
<p>Benefits</p>
<p>Time and cost savings have been reported when compared to the traditional jackhammer method (HSE, 2002).</p> <p>Reduction of hand-arm vibration risk (HSE, 2002; Loughborough University, 2010).</p>
<p>Legislation</p>
<p>Control of Vibration at Work Regulations 2005</p>
<p>Further information</p>
<p>Elliot Europe Ltd., <i>Revolutionary Pile Breaking Method</i>, 2010. www.elliott-europe.com</p> <p>HSE - Pile cropping: <i>A review of current practice</i>. HSE Inspector Information Leaflet, 2002. Available at: http://www.hse.gov.uk/vibration/hav/campaign/construction/pilecrop.pdf</p>

<p>HSE – <i>Hand-arm vibration: Control of Vibration at Work Regulations</i> 2005. Guidance on Regulations L140 HSE Books 2005.</p> <p>Loughborough University, 2010 Piling. Available at: http://www.lboro.ac.uk/research/design4health/public_area/press_rel/pile_case/pile_case.html</p> <p>Useful website: http://www.hse.gov.uk/vibration/hav/campaign/construction.htm#altprocesses provides good practice solutions for employers by suggesting alternative processes to reduce/avoid use of hand-held vibrating equipment and ways to manage HAVS where the use of vibrating equipment is unavoidable.</p> <p>http://www.youtube.com/watch?v=pequurjQeuo –This video clip illustrates the Elliot method.</p>
Question
Are mechanical pile-cropping methods used in order to reduce the incidence of hand-arm vibration syndromes (HAVS)?
Part of incentive system **
<ul style="list-style-type: none"> ▪ no

2.2.2. Solutions slip, trips, and falls

Solution
8. Information for training/toolbox talks on the use of Mobile Elevating Work Platforms (MEWPs)
Country of origin
UK
Description of risk
<p>Trapping/crushing risk in the use of MEWPs while working at height.</p> <p>MEWP operators, particularly of boom-type MEWPs, have been trapped/crushed between the MEWP platform and an overhead obstruction. This has resulted in a significant number of serious accidents in the UK in recent years, including several deaths (Strategic Forum for Construction Plant Safety Group, 2010)</p>
Sector
Construction

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<p>Low quality (this guidance has just been published) there is no information yet on its usefulness for training/toolbox talks in the use of MEWPs.</p>
Practical solutions
<p>The Strategic Forum for Construction Plant Safety Group has recently produced Best Practice Guidance on the use of MEWPs. Part 2 of the guidance includes particularly useful information that could be used in briefings and toolbox talks to users of MEWPs. It stipulates that management should explain (in toolbox talks/briefings/training) 10 steps to users of MEWPs to minimise the risks of trapping/crushing MEWP accidents. A summary of 10 steps is shown below:</p> <p>Plan the MEWP route carefully – keep a sensible distance from obstructions. The distance needs to be greater for a boom-type MEWP driven at height to allow for 'bounce' and 'see-saw' effects. Avoid drive/elevate/slew controls when close to an obstruction and minimise driving at height.</p> <p>Select MEWP carefully – the MEWP selected should be suitable for the specific manoeuvre to be carried out. Attention should be paid to the reach and clearance of the machine.</p> <p>Ensure familiarisation is specific – operators should be trained on using the exact type of MEWP that they will be using.</p> <p>Ensure good ground conditions – there should be no obstructions in the operating zone.</p> <p>Ensure good visibility at height – particularly pertinent to working inside in low light, or at night.</p> <p>Minimise distractions – e.g. mobile phones/trailing cables or any loose materials on MEWPs should be strongly discouraged.</p> <p>Do not obstruct MEWP controls – platform hand and foot controls and emergency controls should not be obstructed.</p> <p>Slow down and don't crouch over controls – driving speed should be slow particularly when reversing, and operators should not crouch over the controls.</p> <p>Do not override MEWP controls or use faulty MEWPs – daily checks of MEWPs should be carried out and faults reported.</p>

Rehearse rescue procedure – a ground key should be available and ground rescue person appointed. Decisions should be made prior to use on how to raise the alarm and how and who will be involved in the rescue.
Benefits
This guidance has just been published – there is no information yet on its usefulness for training/toolbox talks in the use of MEWPS.
Further information
Strategic Forum for Construction Plant Safety Group (2010) Best Practice Guidance for MEWPs – Avoiding Trapping/Crushing Injuries to People in the Platform. Construction Plant Hire Association copyright – July 2010. Available at: http://www.cpa.uk.net/p/MEWPS-and-overhead-crushing/
Questions
Are the users of Mobile Elevating Work Platforms (MEWPS) properly informed and trained to avoid the risk of being trapped or crushed while working at height with a MEWPS? Is the MEWP selected suitable for the specific manoeuvre and work to be carried out?
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

2.2.3. Solutions psychosocial load

Solution
9. The Risk Management Framework for Work-related Stress
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: This tool has been developed and implemented in the United Kingdom. ▪ Instrument is available: English

Description of risk
<p>This practical solution is a flexible approach that has been used to address a number of health risks and health outcomes. The primary focus of this tool is to address organisational and psychosocial factors.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA ▪ Across occupational sectors
HOT
<ul style="list-style-type: none"> ▪ <u>The solution concerns:</u> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>The objectives of the evaluation stage are to determine whether the intervention was implemented effectively, and whether the intervention had any impact on the problems identified during the risk assessment. This can be accomplished through several methods, which can be tailored/adapted to the size of the group being assessed and the nature of work in the particular organisational context. Several evaluation tools can be utilized, such as interviews with key stakeholders, interviews with staff, surveys (including measures of work and well-being used in the risk assessment), group discussions and review of organisational data. The evaluation tools contain three elements, each of which yields important information. Specifically, they measure the level of awareness, participation and reaction to the intervention; the impact of the intervention and of changes to working conditions; and whether the intervention has made an impact on the health and wellbeing of employees.</p>

Practical solutions
<p>The risk management process is driven by active participation of employees in a series of stages: familiarisation (including the formation of the steering group and workplace visits), risk assessment (using methods such as surveys, group discussions and individual interviews), audit of management systems and employee support, action innovation (defining risk reduction interventions on the basis of the risk assessment results) and evaluation. The process promotes a continuous improvement cycle. The tools and methods used to conduct an effective risk assessment are tailored to the size of the group and the nature of work in the organisation.</p> <p>In planning the risk management there are several guiding principles and practical issues of importance:</p> <ul style="list-style-type: none"> ▪ Work with defined groups: each risk assessment is carried out within a specified and defined group (a department, company or profession). ▪ Focus on work not the individual: The aim of the risk assessment is to identify the aspects of work giving rise to stress, not the individuals experiencing stress. ▪ Focus on 'big issues': the focus is on problems that staff agree on, rather than individual complaints. ▪ Use of reliable measures: all methods of data collection are designed to be reliable and valid. ▪ Confidentiality of information given by employees must be guaranteed; thus, data collected must be stored securely and not disclosed. <p>At the beginning of the risk management process, a steering group should be established. Its central responsibility is overseeing and facilitating the process. Typically, this group is comprised of management, worker representatives (including union representatives), occupational health, health and safety and human resources specialists. Publicity in the organisation of the risk management project is of central importance.</p> <p><u>Risk Assessment:</u> The aim of the risk assessment stage is to identify, for a defined group, significant potential sources of stress (psychosocial hazards) related to employees' work and working conditions; and examine their overall indices relating to the health of the individual and the organisation.</p> <p><u>Translation/Action Innovation:</u> The results of the risk assessment are fed back to the organisation and the steering group. This information and the resulting discussion are used to develop a plan of action. It must be decided upon what is being targeted, the methods being used, those responsible, the proposed time schedule, the resources required and how the intervention will be evaluated. The action plan should be discussed with workers so as they are actively involved in the design of the interventions and have ownership of the actions to be taken.</p> <p><u>Intervention/Risk Reduction:</u> The primary aim of the action plan is in reducing likely risk factors that have the potential to cause stress. The change initiatives identified through this process can be integrated into existing management plans for change; thus, minimising the degree of disruption within the organisation.</p> <p><u>Evaluation:</u> The next step in the risk management process is the evaluation of the action plan. This is achieved through both quantitative and qualitative methods and depending on the size of the organisation. The processes of the intervention implementation as well as the outcomes are evaluated.</p>
Benefits
<p>The risk management framework has been used effectively to identify and reduce work-related stress (and manage psychosocial risks) in a number of organisations. It is applicable in large enterprises as well as SMEs. A number of benefits have been demonstrated in research and implementation in organisations.</p>

The majority of groups involved in the risk management process improved their working conditions, and employees' reactions to the risk management interventions have been favourable and generally positive. There were observed positive trends towards improvement of employee wellbeing. Additional benefits were observed in regards to the risk management process. Firstly, it was seen as a useful tool for stimulating new ideas and ways of thinking about problems. Secondly, it quantified problems, which could be used to inform prioritisation of the identified issues and the resources required. Thirdly, it focused efforts and actions to promote a coherent and targeted approach to action. Finally, it yielded a framework for evaluating progress and monitoring change.

Legislation

This toolkit does make specific reference to legislation.

Further information

Cox, T.; Randall, R. and Griffiths, A., 'Interventions to control stress at work in hospital staff', *HSE books*, Norwich, 2002.

PRIMA-EF- *Best Practice Inventory*. Retrieved 15 November 2010, from: www.prima-ef.org.

Leka, S.; Hassard, J.; Jain, A.; Makrinov, N.; Cox, T. et al., 'Towards the Development of a European Framework for Psychosocial Risk Management at the Workplace'. *Institute of Work, Health and Organisations*, Nottingham, 2008.

Question

Is a framework implemented for the risk management process, especially when assessing and reducing risk factors that have the potential to cause stress?

Part of incentive system **

No reference to incentive system. However, this is an established method and could be integrated into an incentive system.

Solution

10. Increasing Construction Workers' Use of Hearing Protection Devices (HPDs)

Country of origin

Name of country where the solution is applied: This tool has been developed and implemented in the United States of America.

Languages of instrument: English

Description of risk
<p>Noise-induced hearing loss (NIHL) is a major concern for construction workers. One factor that contributes to the risk is that construction work is not conducive to engineering noise controls, which limits the control that workers have over their environment. They need to take greater responsibility for their own safety. This tool seeks to promote safety behaviours and overall compliance to organisational mandated safety measures: more specifically, the use of hearing protection devices.</p>
Practical solutions
<p>This tool was developed for construction workers (operating engineers, carpenters and plumber/pipe-fitters) to improve their use of hearing protection devices (HPDs), and thereby reduce the likelihood of them suffering from noise-induced hearing loss.</p> <p>The programme involves four key steps.</p> <ul style="list-style-type: none"> ▪ <i>The first step:</i> Participants watch the first half of a 20-minute video, which includes a discussion between the worker/narrator and an occupational health nurse on the rationale for using HPDs and the need to start using them. ▪ <i>The second step:</i> A trainer facilitates a 15-minute hands-on practice session, using various types of HPDs. During this session mastery skill training is provided in the proper selection, fit and use of the HPDs. Participants learn how to use their devices effectively. ▪ <i>The third step:</i> Participants watch the second part of the video, which entails workers sharing hearing protection information with each other. This part of the video allows the participants to interact with what is happening on the screen. ▪ <i>The fourth step:</i> The trainers and any other assistants meet to debrief and write field notes. <p>This approach requires a number of trained facilitators to deliver the training. As such, this cost may make it too expensive for micro-sized or small companies.</p>
Sector
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ Organisation ▪ Technology <p>This tool focuses at the level of the individual (human). The primary aim focuses on the changing of safety behaviour, as well as increasing the compliance and knowledge of workers of HPDs.</p>

Target group
<ul style="list-style-type: none"> ▪ Employees/employee representatives
Evaluation
<ul style="list-style-type: none"> ▪ High <p>The facilitators of the programme used a <i>pre-test-intervention-post-test</i> design to test the effectiveness of the intervention. This method of evaluation collects data both prior to, during and following the intervention to see if there is significant and real difference following the intervention in the increased use of HPD.</p>
Benefits
<p>The participants were engaged fully in the training sessions. The intervention did have an impact as the behaviour of some of the construction workers did change and they were consistent in their use of HPDs one year after the intervention. The results of the assessment reveal that there was a 20% improvement in HPD use by workers.</p>
Legislation
<p>This toolkit does not make specific reference to any legislation.</p>
Further information
<p>European Agency for Safety and Health at Work (EU-OSHA). <i>Work-related Hearing loss, no date</i>. Retrieved 11 May 2010. Available at: http://osha.europa.eu/en/riskobservatory/hearinglosssummary</p> <p>Lusk, S.L.; Hong, O.S.; Ronis, D.L.; Eakin, B.L.; Kerr, M.J. and Early, M.R., 'Effectiveness of an Intervention to Increase Construction Workers' Use of Hearing Protection', <i>Human Factors: The Journal of the Human Factors and Ergonomics Society</i>, 1999, Vol. 41, pp. 487-494.</p> <p>Lusk, S.L., 'Preventing Noise-Induced Hearing Loss in Construction Workers', National Institute for Occupational Safety and Health, 1997. Best Practices in Hearing Loss Prevention, October 28 1999, Detroit, Michigan, p.49. Retrieved 21 May 2010. Available at: http://www.cdc.gov/niosh/pdfs/2001-157.pdf</p>
Questions
<p>Are noise control schemes implemented by the health and safety co-ordinator on construction sites with more than one company?</p> <p>Are safety behaviours promoted within the company, more specifically, the use of hearing protection devices or other PPE?</p> <p>Have workers learned how to use their hearing protection devices effectively?</p>

Part of incentive system
No reference to incentive system.

Solution
11. A Job Safety Programme Using Tool Box Training Sessions and Computer-Assisted Biofeedback Stress Management Techniques
Country of origin
<p><i>Name of country where the solution is applied:</i> This tool has been developed and implemented in the United States of America.</p> <p><i>Languages of instrument:</i> English</p>
Description of risk
The primary focus of this tool is to address those exposures to psychosocial risks that could lead to <i>occupational injury</i> . As such it focuses on managing psychosocial risks in order to reduce occupational injuries.
Sector
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology <p>The aim of this prevention solution is changing human behaviour.</p>
Target group
<ul style="list-style-type: none"> ▪ Employees/employee representatives

Practical solutions

This tool was developed for construction workers (carpenters and drywall tapers) to reduce the likelihood of them sustaining *injuries* when at work.

- *The first step:* Gain management cooperation for any necessary intervention as well as any required follow-up study. Collect tangible outputs on productivity and performance.
- *The second step:* Assess the workers, their job duties and work schedules to determine the most relevant design for the tool. This assessment allowed the design of a combination of 'Tool Box Training Sessions' with 'Computer-Assisted Biofeedback Stress Management Techniques'.
- *The third step:* Organise training sessions within a workshop format. Ensure that workshop presenters are experts in their fields and familiar with any diversity or cultural issues of the participants. There are a number of training sessions that are compulsory for all staff members to complete: including,
 - Fire prevention: Review fire hazards on sites. Provide an emergency action plan in case of a fire emergency. Review fire accidents and relevant stress-related factors.
 - Blood-borne pathogen: Review of hepatitis, incidence rates and the first aid practices and safe guards that should be followed.
 - Ergonomics: Review risks of pneumatic nail guns including manufacturer specifications and safety precautions. Examine past injuries that are incurred with these tools and safe guards to prevent them occurring.
 - Job stress: Review individual differences and work related behaviour that contribute to job stress.
 - Slips, trips and falls: Review how to prevent and treat soft tissue injuries. Explore the relationship between stress and accidents, incident reporting and prevention techniques, inclusive of awareness and exercises.
 - Electrical safety: Review of specific electrical hazards associated with construction safety.
 - Biofeedback: Calculate individual stress levels using the Perceived Stress Scale and explore these in one-to-one session: including, how to identify stressors, explore stress management techniques, and computer-assisted feedback (electromyography).
- *The fourth step:* Evaluate the success of the intervention against tangible outputs such as performance and productivity.

This approach requires a number of trained facilitators to deliver the training as well as to conduct the personal counselling, and the use of computer-assisted biofeedback equipment in order to effectively implement.

Evaluation

- Medium

The facilitators compared the number of hours worked, the number of injuries and lost workdays in the year prior to the intervention and the two years after the intervention was put in place.

Benefits

The participants were engaged fully in the training sessions and appreciated the training they received. The safety record and productivity levels of the participants improved after the intervention.

The results (1997 data prior to intervention) showed an increase in working hours, a reduction in injuries and a reduction in lost workdays. See Table 1.

Table 1: Comparison of pre-intervention (1997) and post-intervention data (1998, 1999)

Year	Hours worked	First aid injuries	Lost work days reported
1997	59,600	8	7
1998	68,700	4	0
1999	85,000	6	2

In addition, morale improved and the participants worked well together.

Legislation

This toolkit does not make specific reference to any legislation.

Further information

Johnson, K. A. and Ruppe, J., 'A job safety programme for construction workers designed to reduce the potential for occupational injury using tool box training sessions and computer-assisted biofeedback stress management techniques', *International Journal of Occupational Safety and Ergonomics*, 2002, Vol. 8, No. 3, pp. 321-329.

Questions

Are training sessions organised for all workers?

Are the most relevant risks assessed and will the workers be trained?

Is the information presented by experts in their fields?

Are individual differences and work related behaviours that contribute to job stress reviewed?

Is the success of safety and health interventions evaluated against tangible outputs such as performance and productivity?

Part of incentive system

No reference to an incentive system.

Solution

12. Improving lifestyle among male construction workers at risk for cardiovascular disease

Country of origin
<p><i>Name of country where the solution is applied:</i> This tool has been developed and implemented in the Netherlands.</p> <p><i>Languages of instrument:</i> Dutch.</p>
Description of risk
<p>Research shows that one-fifth of those who are employed within the Dutch construction industry have an elevated risk of cardiovascular disease, and contributors may be the prevalence of being <i>overweight or obese</i> in the construction industry, which is considerably higher than in the general Dutch population (64% vs. 51% and 15% vs. 10%, respectively; Groeneveld et al., 2008).</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ The solution concerns: ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Employees
Practical solutions
<p>The focus of this tool is to prevent cardiovascular disease among those with an elevated risk related to obesity and being overweight, by using counselling sessions to make the participants aware of their health problems, change their behaviour, and maintain these changes and gains in health over the long term.</p> <p><i>The first step:</i> Preliminary pre-intervention information was collected from the individuals. This was accomplished by conducting a health screening of the workers.</p> <p><i>The second step:</i> At the first session of the programme the counsellor explains the goals and procedure of the intervention, exploring the participant's knowledge of CVD risk factors and health consequences, and of his own risk. The counsellor explains a personal risk profile on the participant's values on five important risks and does not move on to the next subject until the worker understands this information.</p>

The third step: Based on the information collected from the participant the counsellor and the worker select the type of intervention appropriate to their current health status. Two types of intervention are offered: 1) an energy balance intervention and 2) a smoking cessation intervention. He or she will be encouraged to make their choice during the first meeting, and to stick to their first choice. The participant can switch intervention types later in the intervention or, if he prefers, can address both smoking and energy balance. If during the first session the participant is not ready to choose, e.g. because he is confused by his risk profile, he will be allowed to do this during the 2nd contact session.

The fourth step: In the fourth step the counsellor seeks to explore worker's ambivalence by discussing with the participant the advantages and disadvantages of one of their current underlying behaviours (e.g. eating too many snacks, not participating in any sports) as well as of the 'desired' healthy behaviour. On a 'decisional balance quadrant', the worker will fill in the 'pros of their current behaviour', 'cons of their current behaviour', 'pros of behaviour change' and 'cons of behaviour change'. By exploring these options the participant may become aware of the discrepancy between his current behaviour and the desired behaviour, and react accordingly.

The fifth step: The fifth step of the programme seeks to determine worker's readiness, willingness and ability. The participant is asked by the counsellor to indicate his perceived *importance* of change, his perceived *confidence* in his ability to change, and his *readiness* to change. Thereafter it is determined which of these items is the most important barrier for change.

Subsequent sessions

The sixth step (goal setting): In order to encourage goal-setting behaviours, the counsellor discusses with the participant his or her environment and those other factors that may influence behaviour. At the end of each meeting, the participant and his or her counsellor defines a specific short-term goal. For example, visiting the sports centre, reducing the number of snacks per week, or informing family and friends about the intended lifestyle change. This goal is to be accomplished before the next meeting. Also, after the first meeting the participant defines one or more long-term goals. For example, losing 20 pounds or quitting smoking. These goals should be accomplished within six months.

Providing written information

The counsellor provides the participant with several brochures on cardiovascular diseases, smoking, physical activity and with dietary guidelines. More information is provided about low-fat food, caloric values of foods and recipes for healthy meals.

Incentives

The participants receive incentives to encourage participation and reduce drop out from the programme.

- After three months – the participants receive a t-shirt with the study logo.
- At the 6th and 12th month assessments – the participants receive a lottery ticket with their invitations to attend the assessments.

At the 12th month assessment a heart rate measurement instrument was raffled for those participants who attended. The participant who completed all measurements and completed the best slogan won a 3-day stay in a bungalow holiday park.

Evaluation

- High

An assessment of main changes in lifestyle behaviours: such as daily physical exercise, dietary intake and smoking status. Other secondary outcomes (such as, body mass index (BMI), systolic and diastolic blood pressure, total and HDL blood cholesterol, Hba1c and cardio-respiratory fitness) will be considered also, along with sickness absenteeism and cost-effectiveness. Six and 12 month assessment data are compared to baseline data.

IMPORTANT:

Results:

1. Relatively older workers participated, and younger workers were more likely to drop out;
2. In most cases five instead of seven sessions were held, participants were satisfied but MI was not well performed.
3. Intervention effects: lower snack intake at six and 12 months, significant effects of fruit and smoking only at six months. In energy balance group: significant effect on body weight, i.e. a difference of 2kg between intervention and control group, at six and 12 months, and on HDL and HbA1c at 12 months.
4. Economic evaluation: Intervention was more effective and more expensive than usual care. No effect on sickness absenteeism at six or 12 months.

RECOMMENDATION:

Provide at least three days MI training, and if possible some feedback during the intervention; counsellors must have sufficient knowledge about physical activity and diet; counsellors need good registration forms on which to describe steps 2-5.

The intervention occurs over six months. After the baseline has been established, the counselling sessions last six months. There is a six-month assessment and then a 12-month assessment and the facilitators need to be trained counsellors. These conditions may limit the amount of resources that micro-sized or small companies are able to invest in the intervention. Obviously, as this is a research project, not all of these measurements (i.e. those at 12 months) have to be carried out.

Benefits

The participants may benefit from having an improved lifestyle and also being at a lower risk of CVD. In addition, employers benefit as their employees are healthier and the rate of sickness absenteeism might lower in the long-term.

Legislation

This toolkit does not make specific reference to any legislation.

Further information

Groeneveld, I.F.; Proper, K.I.; van der Beek, A.J.; van Duivenbooden, C. and van Mechelen, W., 'Design of a RCT evaluating the (cost-) effectiveness of a lifestyle intervention for male construction workers at risk for cardiovascular disease: the health under construction study', *BMC Public Health*, 2008 Jan 3; 8:1. Available at: <http://www.biomedcentral.com/content/pdf/1471-2458-8-1.pdf>

Groeneveld, I.F.; Proper, K.I.; van der Beek, A. and van Mechelen, W., 'Sustained body weight reduction by an individual-based lifestyle intervention for workers in the construction industry at risk for cardiovascular disease: Results of a randomized controlled trial', *Preventive Medicine*, in Press.

Groeneveld, I.F.; Proper, K.I.; van der Beek, A.J.; Hildebrandt, V.H. and van Mechelen, W., 'Factors associated with non-participation and drop-out in a lifestyle intervention for workers with an elevated risk of cardiovascular disease', *International Journal of Behavioral Nutrition and Physical Activity*, 2009, Vol. 6, pp.80.

<p>Groeneveld, I.F.; Proper, K.I.; van der Beek, A.J.; Hildebrandt, V.H. and van Mechelen, W., 'Lifestyle-focused interventions at the workplace to reduce the risk of cardiovascular disease – a systematic review', <i>Scandinavian Journal of Work Environment & Health</i>, Vol. 36, No 3, 2010, pp.202-215.</p> <p>Miller, W. R. and Rollnick, S. Building motivation for change. In Miller, W. R. and Rollnick, S., <i>Motivational interviewing. Preparing people for change</i>, 2nd edition. New York, The Guilford Press, 2002, pp.52-84.</p>
<p>Questions</p>
<p>Are counselling sessions offered to make construction workers aware of health problems and to change their behaviour?</p> <p>Does the company support smoking cessation intervention or is diet and physical activity addressed on the construction site?</p> <p>Are brochures on smoking, diet and nutrition available for the workers?</p> <p>Is it a topic in the company that the workers are healthier and less sick?</p>
<p>Part of incentive system</p>
<p>No reference is made to an incentive system.</p>

<p>Solution</p>
<p>13. Reducing the level of sickness absence by organising healthier work</p>
<p>Country of origin</p>
<p><i>Name of country where the solution is applied:</i> This tool has been developed and implemented in The Netherlands.</p> <p><i>Languages of instrument:</i> Dutch</p>
<p>Description of risk</p>
<p>The risk within this company was the ill health of the employees. This led to a fairly high level of sickness absence, as well as high numbers of applications for disability benefit.</p>
<p>Sector</p>
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction

<ul style="list-style-type: none"> ▪ Healthcare ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ The solution concerns: ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management <p>Employees/employee representatives</p>
Practical solutions
<p>This project was developed as a model project for the construction industry. There are five key steps to the implementation of this programme.</p> <p><u><i>The first step: Identify the problem.</i></u></p> <p>Set up a monitoring committee. Members could include: HR personnel, management, company doctor, project leaders, members of the Works Council, employee representatives. Introduce the project to the rest of the organisation by appropriate means: for example, through an open introductory letter that could be published in the staff bulletin. Arrange meetings at which employees could raise questions, as well as make comments and suggestions to the monitoring committee.</p> <p><u><i>The second step: Understand the problem.</i></u></p> <p>This could be done via a questionnaire to all staff within the organisation. The questionnaire should be accompanied by a covering letter from the management and facilitators stating the reasons for the questionnaire and maybe an overview of the project. The questionnaire could cover both organisational and individual concerns, as well as the workers' lifestyle.</p> <p><u><i>The third step: Focus the intervention.</i></u></p> <p>Based on the responses to the questionnaire, decide the best option to follow. Set up working parties, which are monitored by the monitoring committee.</p> <p><u><i>The fourth step: Implement measures to encourage change</i></u></p> <p>Introduce a new absence reporting procedure, which should include reporting to the immediate supervisor – at the same time involve managerial staff in a discussion. Then provide a training scheme on 'sickness reporting and follow-up contacts'.</p> <ul style="list-style-type: none"> ▪ Conduct a stress management course for senior staff. ▪ Adapt the consultation structure (link-pin structure). ▪ Implement a training scheme on communication and work consultation for senior staff. ▪ Undertake a work consultation-training scheme for building site staff. ▪ Conduct a course on ergonomic lifting for building site staff. ▪ Explore the possibilities of reintegration activities for blue-collar and managerial staff.

<p><u>The fifth step: Evaluation the process against tangible outputs.</u></p> <ul style="list-style-type: none"> ▪ Administer a post intervention questionnaire. ▪ Compare sickness absence figures before and after the intervention. <p>While this approach relies on the need for some experts, employees of the company do most of the process. As such, it may be useful for micro-sized or small companies to explore this as one option to reduce the impact of sickness absence.</p>
<p>Evaluation</p>
<ul style="list-style-type: none"> ▪ Medium <p>A comparison of sickness absence figures before and after the intervention. Administering a post intervention questionnaire. A cost-benefit analysis of the intervention was recommended and completed. The cost-benefit analysis showed a positive result, as the benefits of the project (1667NLG per person¹¹ - 758€) exceeded the costs of the project (1333NLG per person - 606€), mainly due to lower absenteeism.</p>
<p>Benefits</p>
<p>As the project advanced, the workers were more aware of their personal responsibility for good health, while the managerial staff became more aware of the need for good working conditions, and the ways they could support this. The workers' well-being improved, as did the relationship between employers and workers. The workers felt more involved in the company.</p> <p>Another result of the project was a growth in problem solving capacity. During the course of the project the organisation learned better how to deal with such work and health related problems.</p> <p>In addition, there was an impact on sickness absence rates. When figures were compared from 1991, the year the project started, the figures showed a 30% drop, as well as a frequency drop of 20%. The cost benefit analysis showed a return on investment, as the amount spent during the project was lower than the returns gained by fewer sickness absenteeism spells.</p>
<p>Legislation</p>
<p>This toolkit does not make specific reference to any legislation.</p>
<p>Further information</p>
<p>Gründemann, R. W. M. and Van-Vuuren, C. V., <i>Preventing absenteeism at the workplace: A European portfolio of case studies</i>, European Foundation for the Improvement of Living and Working Conditions Loughlinstown, Co. Dublin, Ireland, 1998, pp.64-68.</p>
<p>Questions</p>
<p>Is a programme implemented to encourage change for healthier work?</p>

¹¹ Dutch Guilder (NLG)

<p>Are work consultation-training schemes for building site staff established?</p> <p>Are courses on ergonomic lifting conducted for building site staff?</p> <p>Is the managerial staff aware of the need for good working conditions? Do they know the ways they could support this?</p>
<p>Part of incentive system</p>
<p>No reference to an incentive system</p>

<p>Solution</p>
<p>14. Working Well Together Campaign (WWT) to improve health and safety</p>
<p>Country of origin</p>
<p><i>Name of country where the solution is applied:</i> This process has been developed and implemented in the United Kingdom.</p> <p><i>Languages of instrument:</i> English.</p>
<p>Description of risk</p>
<p>Within the UK each year thousands of construction workers are killed, injured or become ill. The hazards and risks that cause such occurrences need to be reduced.</p>
<p>Sector</p>
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
<p>HOT</p>
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology

Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives
Evaluation
<ul style="list-style-type: none"> ▪ Low <p>The recording of attendance levels by size of organisations, to gauge the numbers of employees the campaign is reaching.</p>
Practical solutions
<p>The Working Well Together campaign has as its aim the improvement of health and safety in the construction industry, especially in small and micro-sized businesses. It is the country's leading construction health and safety campaign and is supported by the construction industry, trade unions and the Health and Safety Executive in the UK. Regular involvement also comes from members of the Construction Group Committee and IOSH.</p> <p>The focus of Working Well Together campaign covers all those involved in construction:</p> <ul style="list-style-type: none"> ▪ Contractors, both large and small ▪ Clients ▪ Designers ▪ Suppliers ▪ H&S professionals ▪ The Workforce ▪ Trade Unions ▪ Trade Federations <p>This campaign provides a nationwide network of groups where members can support and advise each other and share good practice throughout the industry.</p> <p>More specifically, it encourages new members to join the network. It runs events where at least half the people invited will be from small businesses (fewer than 15 employees) or micro businesses (fewer than five employees).</p> <p>At present, 16 regional WWT groups are in place and run events, most of which are free to attend. A number of the regional WWT groups have IOSH members on their committees.</p> <p>The events provide practical, hands-on experience with expert speakers from the industry. There is usually a demonstration and exhibition area for participants to see the latest equipment and services to help them and their business.</p> <p>The events may include any of those listed below:</p> <ul style="list-style-type: none"> ▪ Safety & Health Awareness Days ▪ WWT Regional Groups ▪ National Roadshow ▪ White Van Tour

- WWT Awards
- WWT Newsletter
 - Free to WWT members
 - Current circulation of 7,000
 - Issued Quarterly
- WWT website – <http://www.wwt.uk.com/>

Freely available to all

Lots of information and advice

Free leaflets and information

Designed for the small builder/contractor

Benefits

The campaign has proven to be a sustainable and effective tool for hard-to-reach audiences (SMEs) and provides a platform for delivering key health and safety advice in an informal and non-threatening way.

Legislation

This toolkit does not make specific reference to any legislation.

Further information

This process benefits micro-sized and small companies, as direct training is made available to both employees and managers/supervisors. Other information is freely available on-line.

Tim Shambrook, Working Well Together, c/o Health & Safety Executive, Marshall's Mill, Marshall Street, Leeds. LS11 9YJ. Available at: <http://www.wwt.uk.com/>

Questions

Is the company engaged in a network where members support and advise each other and share good practice throughout the construction industry?

Are demonstrations and exhibitions visited where the latest equipment and services to help the construction business can be seen?

Is practical and hands-on experience presented by expert speakers from the industry for the development of the owner's business?

Part of incentive system

No reference to an incentive system.

Solution
15. Worker engagement decision tool – a pilot phase
Country of origin
<p><i>Name of country where the solution is applied:</i> This process has been developed and implemented in the United Kingdom.</p> <p><i>Languages of instrument:</i> English.</p>
Description of risk
<p>Within the UK each year thousands of construction workers are killed, injured or become ill. The hazards and risks that cause such occurrences need to be reduced.</p>
Sector
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives
Evaluation
<ul style="list-style-type: none"> ▪ Low <p>The tool is in its development phase and comments are sought on its usability during this pilot phase.</p>

Practical solutions

The tool was designed to help those responsible for managing construction workers to be better able to reduce accidents and ill health among this group through worker engagement. It will help managers to identify whether the arrangements at present on their sites meet the minimum legal requirements, and if not what improvements can be made. There are several key steps to this programme.

Step one

Provide the necessary leadership to set targets and expectations. Train site-based staff and provide the resources to manage consultation effectively.

Step two

Put in place the methods of site-based consultation, which will lead to effective engagement with the workforce.

Step three

- Engage employees.
- Engage workers fully in risk assessment.
- Communicate effectively, safe and healthy methods of work.
- Brief workers on the day-to-day risks of the job.
- Check that workers themselves understand how the risks are to be controlled.

Step four

Gather the evidence that effective consultation and engagement is taking place.

The collection of evidence, of course, depends on the organisation, but can include daily walks around the site by managers who obtain direct feedback from workers on what is working well and what is not.

Benefits

The business benefits that are expected from this tool are:

- A reduction in risk and accidents
- Improved retention of skilled staff
- Enhanced reputation and ability to attract quality work
- Better rating by insurers
- Demonstration of corporate social responsibility

However, it is important to note that this tool is in its early development stages and these benefits are anticipated, but have not been systematically tested nor demonstrated to date.

Legislation







This tool supports:

- Construction Design and Management Regulations 2007
- Health and Safety (Consultation with Employees) Regulations 1996.
-

Further information
<p>Health and Safety Executive (HSE). Available at: http://www.hse.gov.uk/construction/engagement/decision.htm http://www.hse.gov.uk/construction/engagement/background.htm</p> <p>This process benefits micro-sized and small companies as direct training is made available to both employees and managers/supervisors. Other information is freely available on-line (see links provided in the 'further information' section).</p>
Questions
<p>Is the company engaged in a network where members support and advise each other and share good practice throughout the construction industry?</p> <p>Are demonstrations and exhibitions visited where the latest equipment and services to help the construction business can be seen?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes <p>It is hoped that insurers will provide better premiums for those organisations with fewer accidents and overall better well-being.</p>

Solution
16. Achieving behavioural change by the TASK card and other means
Country of origin
<p><i>Name of country where the solution is applied:</i> This process has been developed and implemented in the United Kingdom.</p> <p><i>Languages of instrument:</i> English.</p>
Description of risk
<p>Within the UK each year thousands of construction workers are killed, injured or become ill. The hazards and risks that cause such occurrences need to be reduced.</p>
Sector
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare

<ul style="list-style-type: none"> ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH Experts
Evaluation
<ul style="list-style-type: none"> ▪ High <p>Several procedures were conducted in order to assess the quality of the initiative.</p> <ul style="list-style-type: none"> ▪ Audit and report on worker engagement. ▪ Review quality of projects on completion. ▪ Assess the effectiveness of done projects. ▪ Determine numbers train to establish who is receiving the information. ▪ Conduct a cost benefit analysis.
Practical solutions
<p>The 'achieving behavioural change' (ABC) training course provides delegates with an understanding of how attitude, behaviour, communication and worker engagement at all levels can help prevent the chances of accidents occurring.</p> <p>The objective of the course is to enable delegates to:</p> <p>List the Basic Legal Duties of Employers and Employees</p> <p>Define Hazards, Risks and Control Measures</p> <p>List Possible Causes of Accidents</p> <ul style="list-style-type: none"> ▪ Appreciate the Link between Attitude and Behaviour ▪ Appreciate the Costs of Poor Safety Performance ▪ Appreciate the Benefits of Good Safety Performance ▪ Putting 'ABC' into Practice using the 'TASK' Card ▪ Successfully Complete the Course Assessment <p>The TASK Card</p>

<p>Task is: Think First, Act Safe, Stop if Hazardous and Keep Safe.</p> <p>This is a card designed to prompt a simple point of work risk assessment by the work team, led by a supervisor, before a task is started.</p> <p>The relevant parts of the ABC course are as detailed below and can be downloaded at no cost:</p> <ul style="list-style-type: none"> ▪ Tutor Notes  ▪ Training Exercises  ▪ The Test  ▪ The TASK Card  ▪ Video clips ▪ ABC course presentation  ▪ Approximate timetable  <p>Another useful resource</p> <p>NAPO, the cartoon character that puts messages over without using words. NAPO is available on DVD from HSE Books. Available at: http://www.hse.gov.uk/pubns/books/napolighen.htm</p> <p>Case study (ABC in action)</p> <p>Office of Government Commerce (OGC) – Achieving Excellence in Construction initiative. Available at: http://www.hse.gov.uk/construction/engagement/ogc.pdf</p>
<p>Benefits</p>
<ul style="list-style-type: none"> ▪ The course could be an effective tool, and has achieved significant results in the four years that it has been used. The quality of the outcome on projects has improved, as well as a cost savings on projected use of resources, and changes in the way that contractors do their jobs.
<p>Legislation</p>
<ul style="list-style-type: none"> ▪ This toolkit does not make specific reference to any legislation.
<p>Further information</p>
<p>Lunt, J.; Bates, S.; Bennett, V. and Hopkinson, J. 'Behaviour change and worker engagement practices within the construction sector'. 2008, RR660. www.hse.gov.uk/research/rrhtm/rr660.htm</p> <p>HSE. Achieving behavioural change. Available at: http://www.hse.gov.uk/construction/engagement/</p> <p>DWP Jobcentre Plus roll-out. Occupational Health and Safety. Public and private sector in partnership – making a difference. Available at: http://www.hse.gov.uk/construction/engagement/ogc.pdf</p> <p>This process benefits micro-sized and small companies as direct training is made available to both employees and managers/supervisors. Other information is freely available on-line</p>

Questions
<p>Are systems like the TASK-card supported and implemented in the company to achieve behavioural change to prevent the chances of accidents occurring?</p> <p>Are achieving behavioural change (ABC) courses carried out in the company? Are documents freely available on the internet used for training sessions?</p> <p>Is improving health and safety on construction sites through effective worker involvement a topic for the company?</p>
Part of incentive system
No reference to an incentive system.

Solution
17. Better Health Under Construction through a supportive national framework
Country of origin
<p><i>Name of country where the solution is applied:</i> United Kingdom</p> <p><i>Languages of instrument:</i> English</p>
Description of risk
<p>Most site-level interventions focus on improving safety, despite the fact that the construction industry loses twice as many working days a year to work-related ill health as it does to workplace injuries. Across the construction industry there is no real consensus about, or coordinated approach towards, managing Occupational Health and Safety risks.</p>
Practical solutions
<p>Constructing Better Health (CBH) is an Occupational Health Scheme for the construction industry and is supported by government, industry and unions. CBH aims to improve the health and wellbeing of employees in the construction industry through a supportive national framework.</p> <p>CBH started in 2004 with the launch of a £1million Occupational Health pilot in Leicestershire, funded by industry, government and trade unions.</p> <p>The services provided included free on-site health checks toolbox talks, health surveillance and case management by Occupational Health Professionals. Working with more than 360 employers, the pilot delivered over 1,700 free and confidential health checks, with approximately 2,800 workers attending awareness-raising toolbox talks on workplace health topics.</p> <p>The CBH has now become a not-for-profit organisation and offers the following as a national scheme:</p>

<ul style="list-style-type: none"> ▪ Setting industry standards for both work-related health issues and competency of Occupational Health provision ▪ Building a construction-specific Occupational Health information service centralising the collection of work-related ill-health data ▪ Transmitting "fitness-for-task" data to enable employers to check workers are fit for safety-critical work. <p>The CBH has set the construction industry Occupational Health standards; the two-part standards aim to provide employers and Occupational Health providers with a best-practice guide for workplace health and fitness-for-task requirements that meet legislative and non-legislative requirements.</p> <p>The part one fitness-for-task standards include health assessments for safety-critical employees, legal requirements for health surveillance and monitoring, general health checks, Occupational Health competency requirements and an easy-to-use health assessment matrix to help users establish quickly which health assessments are necessary for employees working on site, broken down into 32 job types.</p> <p>A coding system in the matrix identifies whether health assessments are required to comply with legislation, are best practice or are simply discretionary.</p> <p>Part two of the standards covers clinical standards and is aimed at Occupational Health providers. It sets benchmarks for Occupational Health delivery and health surveillance, and includes links to downloadable exemplar forms, surveillance questionnaires and consent forms.</p>
Sector
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u> <p>This intervention focuses at the level of the individual (human) and organisational. The primary aim focuses on changing employees' health behaviour.</p>
Target group
<ul style="list-style-type: none"> ▪ Employees/Employers
Evaluation
<ul style="list-style-type: none"> ▪ Medium

Independent evaluation.
Benefits
<p>Approximately one third of those employees who took part in the health checks were referred for further advice. This was either for general health issues, such as undiagnosed diabetes or raised blood pressure, or for work-related issues, such as noise-induced hearing loss.</p> <p>The pilot scheme was evaluated by an independent organisation and the conclusions were: free worker health checks, site visits and toolbox training were very popular, and that worker participation far surpassed expectations. But it also found that few employers had proper occupational procedures in place and managers were often complacent about workers' health.</p>
Legislation
The Health and Safety at Work etc Act 1974 – employers have a duty of care to prevent the ill-health of their workers.
Further information
<p>Available at: http://www.constructingbetterhealth.co.uk http://www.constructingbetterhealth.co.uk/Publications</p> <p>A not-for-profit organisation providing advice and support on Occupational Health Issues in the construction sector, suitable for all construction organisations regardless of size.</p>
Questions
<p>Does the company record how many working days a year are lost due to work-related ill health or to workplace injuries?</p> <p>Is illness caused or made worse by work in construction, a topic for the company?</p> <p>Is health and wellbeing of employees in the construction company a goal?</p> <p>Should the employer check workers on whether they are fit for safety-critical work?</p>
Part of incentive system
No reference to incentive system.

Solution
18. Organisational Health Management Interventions to improve work life balance
Country of origin

<p><i>Name of country where the solution is applied:</i> Australia</p> <p><i>Languages of instrument:</i> English</p>
<p>Description of risk</p>
<p>Problems of job dissatisfaction, increased turnover intention, lack of general wellbeing, substance abuse and, psychological and psychiatric problems have all been associated with a lack of work-life balance. Project-based construction staff work significantly longer hours and experience higher levels of work-life conflict, job stress and burnout than their office-based counterparts in the same organisation.</p>
<p>Practical solutions</p>
<p>A three-pronged employee healthy lifestyle promotion intervention was introduced at a large Australian infrastructure construction project. The three complementary initiatives were introduced simultaneously during the construction stage of case study project.</p> <p>1 - Compressed work week</p> <p>This involved reducing the length of the working week, but increasing the length of the working day. At the commencement of the construction project, the site was operating on average, a 58-hour week, spread over six days. This consisted of five ten-hour days (Monday to Friday) plus an eight-hour day on Saturday. Part way through the project the site moved to a five-day week, with working hours extended to 11.5 hour per day on week days with no weekend working. During the winter months, work hours were reduced further to 10.5 hours per day. Participation in this initiative was compulsory and the intervention was available to both salaried (office based professionals and managerial) and wages workers (site-based blue collar) on the project.</p> <p>2 - Energy 4 Life</p> <p>The Energy 4 Life programme involved providing training to salaried employees (office-based professionals and managerial) on the importance of maintaining regular exercise, healthy eating and getting enough rest. The programme was paid for by the project organisation, but delivered by an independent provider. Participants were asked to review their current lifestyle and commit to a personal exercise plan consisting of a minimum of 35 minutes of physical exercise three times each week. Participants also used self-help tapes as part of the process. Taking part was voluntary.</p> <p>3 - Leadership Management Australia – Effective Personal Productivity</p> <p>The LMA – Effective Personal Productivity programme is a training programme designed to help those with managerial or supervisory responsibility to enhance their personal productivity. The programme investigates the issue of productivity and facilitates time management and goal setting skills. Further, the programme encourages participants to set priorities in both their work and non-work lives and provides training on communication and teamwork. One key learning objective is learning the ability to say 'no' and how to feel at ease with leaving work at the end of the working day. Taking part was voluntary.</p>
<p>Sector</p>
<ul style="list-style-type: none"> • Applicable for the following sector: <ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u> <p>This intervention focuses at the level of the individual (human). The primary aim focuses on changing of health behaviours.</p>
Target group
<ul style="list-style-type: none"> ▪ Employees/Employees with supervisory responsibility
Evaluation
<ul style="list-style-type: none"> ▪ Medium <p>Qualitative post hoc evaluation of the health promotion intervention. The researchers got involved in the evaluation after the intervention had been implemented so no pre and post comparisons could be made.</p>
Benefits
<p>Post intervention interview data suggests the compressed working week received almost unanimous support from both salaried (office-based professionals and managerial) and waged (site-based blue collar workers) and the change was regarded as very positive. Stated benefits included improved productivity, increased involvement with family and home, decreased work-family conflict, increased opportunity for rest and increased organisational commitment.</p> <p>Those taking part in the energy for life programme, which was only available to salaried employees, indicated they had changed their behaviour as a result of the programme, and it had motivated them to take more exercise and eat more healthily. Some interviewees indicated it had also increased their energy levels; however some also commented that it is hard to fit in the exercise goals with work and family commitments.</p> <p>The LMA programme was only available to salaried employees. All interviewed spoke favourably about the programme and how it had helped them plan and prioritise their activities and work more efficiently. The only negative comment was that the time committed to taking part in the programme had impacted on their outside work activities.</p> <p>The interview data suggest that introducing the three-pronged health promotion initiative has had a positive impact on employees' work-life balance and well-being.</p>
Legislation
<p>The intervention does not make specific reference to any legislation.</p>

Further information
<p>As the three initiatives were introduced simultaneously it is difficult to predict whether these components would have the same benefits if introduced in isolation. The compressed working week actually made changes to the way the construction project was organised and this may not be practical for all organisations. Additionally, the LMA programme was facilitated by an external organisation so financial resources are needed as well as time commitment from employees; and this may not be practical for SMEs.</p> <p>Lingard, H. C.; Bradley, L. M.; Brown, K. A.; Bailey, C. and Townsend, K. J. (2006) Organisational Health Management Interventions in the Australian Construction Industry: An Evaluation of One Case Study Project. In: Global Unity for Safety and Health in Construction: CIB W99 International Conference, 28-30 June 2006, China. Available at: http://eprints.qut.edu.au/8124/ http://www.leadershipmanagement.com.au/</p>
Questions
<p>Does the working scheme of project-based construction workers (length of the working week, working hours per day) fit in with their personal needs?</p> <p>Is work-life balance a topic for the company to reduce problems of job dissatisfaction, increased turnover intention, lack of general well-being or substance abuse?</p> <p>Are managers and site supervisors motivated to do regular exercise or to eat healthy?</p> <p>Is the personal with managerial or supervisory responsibility encouraged to set priorities in both their work and non-work lives?</p> <p>Is training provided on communication and teamwork?</p>
Part of incentive system
No reference to an incentive system.

2.2.4. Solutions dangerous substances

Solution
19. Dibasic esters can replace dichloromethane in paint strippers
Country of origin
International

Description of risk
A very strong paint stripper is dichloromethane, a colourless chemical substance, classified as a carcinogen (category 3). It causes several adverse health effects to workers, such as headaches or loss of consciousness, with fatalities after high exposures. It is an extremely volatile substance – by the time users can smell it, they are already exposed to levels well above occupational limits.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case reports</p>
Practical solutions
<p>The European Parliament and European Council decided to ban dichloromethane (DCM) from paint strippers intended for consumer use and have strengthened the restrictions on commercial applications of these products (455/2009/EC). Different substances are proposed to substitute DCM. Different proposals to substitute DCM can be found in the German Technical Rule for Hazardous Substances 612 (TRGS 612): Substitute substances, substitute processes and restrictions on the use of methylene chloride-based paint strippers.</p>

<p>One of the alternatives substances for DCM are dibasic esters (DBE). DBE is used as environmentally friendly paint stripper. It is a clear, colourless liquid that contains a mixture of dimethyl esters (dimethyl succinate, dimethyl adipate, dimethyl glutarate). DBE is readily biodegradable and characterised by a good solubility with other solvents, high boiling point and a high flash point (non-flammable). It has a mild and fruity odour. DBE is not classified as carcinogen and skin sensitising.</p> <p>DBE can strip various kinds of paints even if they are difficult to remove, such as paints on the base of epoxy resin. They macerate the paint layers so that the worker can remove the paint easily with putty or the paint can be simply washed off using hot water.</p> <p>DBE can be used for the restoration of antique furniture, because it doesn't affect wood.</p> <p>DBE is completely biodegradable and much more environmentally friendly than traditional paint removers.</p>
<p>Benefits</p>
<p>Dibasic esters solvents are considered as non flammable and have low toxicity and non irritant properties.</p> <p>The high boiling points of these solvents increases the range of applications for products containing DBE compared to DCM.</p> <p>Dibasic ester solvents enables compliance with various volatile organic compound (VOC) legislation (European directive 1999/13/EC, and US directive CARB/ EPA 40FR 59.203(f)1).</p> <p>Dibasic esters are readily biodegradable and have low toxicity, making them an Ecofriendly alternative to methylene chloride or NMP.</p> <p>Dibasic Esters are powerful solvents in terms of dissolving time, and their low evaporation rates allow for less product being required compared with many traditional solvents This presents a cost-effective alternative.</p>
<p>Legislation</p>
<p>Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC)</p> <p>Carcinogens and Mutagens at Work Directive (2004/37/EC replacing 90/394/EEC)</p>
<p>Further information</p>
<p>Abbeizen ohne Dichlormethan, BG Bau. Available at: http://www.bgbau-medien.de/site/asp/dms.asp?url=/bau/G_abbeizen/titel.htm, http://www.gisbau.de/service/brosch/Abbeizen.pdf</p> <p>Altnau, G., Alternative Maler leben länger, Sachon Fachzeitschriftenarchiv, 2003. Available at: http://fzarchiv.sachon.de/index.php?pdf=Fachzeitschriften/Maler-und_Lackierermeister/2003/07_03/ML_07-03_Alternative_Maler_leben_laenger.pdf</p> <p>Einsatz dichlormethanhaltiger Abbeizer beschränkt, baua aktuell. Available at: http://www.baua.de/cae/servlet/contentblob/762340/publicationFile/46289/ba3-09-s12-13.pdf http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:137:0003:0006:EN:PDF</p> <p>European Commission, Effectiveness of vapour retardants in reducing risks to human health from paint strippers containing dichloromethane, Final report, 2004. Available at: http://ec.europa.eu/enterprise/sectors/chemicals/files/studies/etvaread-paint_stripper_dcm_en.pdf</p>

Question
Are alternatives to dichloromethane (DCM) for paint strippers being used?
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
20. OSH preventing solutions for fire accidents
Country of origin
Poland
Description of risk
<p>The main sources of risk for these works are:</p> <ul style="list-style-type: none"> ▪ Danger of the fire accidents and explosion, ▪ Emission of harmful chemical substances during fire of combustible materials, ▪ Restricted visibility by smoke, ▪ Using of flammable materials.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology

Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews and meta-analyses, randomized controlled trials and expert opinion</p>
Practical solutions
<p>Preventing fire accidents is easy to do, but workers often ignore fire safety and prevention. As a result, around 85% of these incidents reportedly happened in personal residences. So in this regard it is very important to follow certain important fire prevention services at home, place of work etc. to keep the fire accidents at bay. These services generally mean assessing the several potential dangers and risks within your home or workplace premises (also in construction) that can cause fire.</p> <p>Firstly, it will help to identify any potential hazards within your home that can cause fire. Secondly, it will help to know how to overcome those potential hazards. Thirdly, it will also assist you to devise effective escape plans in the event of any fire accidents.</p> <p>The next articles show the most toxic gases released during flammability of plastics materials used in construction sector.</p>
Benefits
<p>The information contained in this solution is general and broad in scope. Application of this solution ensures that the potential dangers and risks within the workplace in construction premises are assessed regarding fire.</p>
Legislation
<p>Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC)</p> <p>ATEX Workplace Directive (99/92/EC)</p> <p>Carcinogens and Mutagens at Work Directive (2004/37/EC replacing 90/394/EEC)</p> <p>Restricting the use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC)</p> <p>Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC)</p>

Further information
<p>http://www.watra.hufiecrawicz.org/wiedza%20pozarnicza/V.htm http://www.ciop.pl/8909</p>
Question
<p>Are the potential dangers and risks within the workplace in construction premises assessed regarding fire?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
21. OSH preventing solutions during the painting processes
Country of origin
Poland
Description of risk
<p>The main sources of risk for these works are:</p> <ul style="list-style-type: none"> ▪ Using harmful chemical substances ▪ Applying allergenic substances ▪ Work at height ▪ Using of the pressure-works electro devices and other tools. ▪ Danger of fire accidents.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA

HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews and meta-analyses, randomized controlled trials and expert opinion</p>
Practical solutions
<p>This solution states the occupational safety and hygiene requirements and preventing solution applicable to the painting process. It contains: generalities; site of painting operations; fire and explosions hazard ranking of types of paint; workshop hygiene; electrical equipment and ignition sources; ventilation and air purification; paint material; air paint spraying; airless paint spraying etc.</p> <p>A checklist is also included for painting works concerning main hazard problems.</p> <ul style="list-style-type: none"> ▪ Falls from a height, e.g. from a ladder ▪ Explosion of steam: solvents, paints and varnishes ▪ Poisoning properties: solvents, varnishes and paints ▪ Splashes to body and eyes by: solvents, paints and varnishes ▪ Ignition of clothes during painting work
Benefits
<p>The information contained in this solution is general and broad in scope. Application of this solution ensures that the general occupational safety and hygiene requirements are taken into account during the painting process.</p>
Legislation

Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC) ATEX Workplace Directive (99/92/EC)
Further information
http://www.ciop.pl/5600.html
Question
Are the general occupational safety and hygiene requirements taken into account during the painting process?
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
22. OSH preventing solutions during the welding processes
Country of origin
Poland
Description of risk
<p>The main sources of risk for this work are:</p> <ul style="list-style-type: none"> ▪ Threat of severe burns ▪ Release of harmful chemical substances (gases and dust) ▪ Hazards of welding chips ▪ Damage to sight and skin by ultraviolet and infra-red radiation ▪ Threat of paralysis by electric current during electric welding ▪ Danger of explosion and fire accidents.
Sector
<ul style="list-style-type: none"> ▪ Construction

<ul style="list-style-type: none"> ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews and meta-analyses, randomised controlled trials and expert opinion</p>
Practical solutions
<p>The main objective of the material is to make employees aware of the hazards associated with welding and measures to prevent injuries during welding operations.</p> <p>It contains:</p> <ul style="list-style-type: none"> ▪ General good practice in safety welding processes ▪ Proper organisation of welding workplace ▪ Proper performance of gas and electrical welding ▪ Description of the forbidden actions <p>The information contained herein, may be useful to companies with a full-time welding programme if they are experiencing problems in that area.</p>
Benefits
<p>The information contained in this solution is general and broad in scope. Application of this solution ensures that the general occupational safety and hygiene requirements are taken into account during the welding process.</p>

Legislation
Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC) ATEX Workplace Directive (99/92/EC)
Further information
http://www.ciop.pl/5594.html
Question
Are the general occupational safety and hygiene requirements taken into account during the welding process?
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
23. OSH preventing solutions during work with spray polyurethane systems
Country of origin
Poland
Description of risk
<p>The main sources of risk for these works are:</p> <ul style="list-style-type: none"> ▪ Isocyanates and other chemical compounds being exposed ▪ Emission of harmful chemical substances if polyurethane materials burn ▪ Sustaining burns ▪ Splashing liquid compounds
Sector
<ul style="list-style-type: none"> ▪ Construction

<ul style="list-style-type: none"> ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews and meta-analyses, randomised controlled trials and expert opinion</p>
Practical solutions
<p>Polyurethane (PU) applications in the construction industry include PU sandwich elements, a 'classic' for decades now; PU insulation materials for low and passive energy buildings; a wide array of PU pipe insulation materials and vacuum insulation panels (VIP) with a PU core. Polyurethane rigid foam used in modern construction methods, for example, not only increases the amount of living space thanks to its relative thinness, but also reduces energy and costs. Polyurethane foam injection systems for thermal insulation in roofs also play an important role in the construction industry. Here are more examples of our PU applications:</p> <ul style="list-style-type: none"> ▪ Rigid foam systems ▪ Cold cast elastomers ▪ Cold cast systems and coatings ▪ Rigid integral ▪ Cellular Special Elastomers in elevator construction. <p>Health effects of isocyanate (main compounds in PU synthesis) exposure include irritation of skin and mucous membranes, chest tightness and difficult breathing. Isocyanates can also sensitise workers, making them subject to severe asthma attacks if they are exposed again. During the synthesis of PU materials potentially harmful (different amines, tin derivatives) and explosive (pentane) chemicals are used.</p>

<p>This solution states the occupational safety and hygiene requirements and prevention solution applicable to the polyurethane process. It contains: generalities, site of painting operations, fire and explosions hazard ranking of types of paint, workshop hygiene, electrical equipment and ignition sources, ventilation and air purification, paint material, air paint spraying, airless paint spraying and more.</p>
<p>Benefits</p>
<p>The information contained in this solution is general and broad in scope. Application of this solution ensures that the general occupational safety and hygiene requirements are taken into account during the application of polyurethane.</p>
<p>Legislation</p>
<p>Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC) ATEX Workplace Directive (99/92/EC)</p>
<p>Further information</p>
<p>http://www.watra.hufiecrawicz.org/wiedza%20pozarnicza/V.htm http://www.ciop.pl/8909</p>
<p>Question</p>
<p>Are the general occupational safety and hygiene requirements taken into account during the application of polyurethane?</p>
<p>Part of incentive system</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No
<p>Solution</p>
<p>24. Dust-free construction materials reduce inhalable dust concentrations</p>
<p>Country of origin</p>
<p>Germany</p>

Description of risk
The dust generated during construction work can damage the health of workers. For example, mixing tile adhesive can lead to high concentrations of dust that may remain in the air for a long period. Particulate matter often leads to skin and eye irritation, asthma or allergic reactions. A durable dust exposure can trigger cardiovascular disease and even lead to heart attacks.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case control studies</p>
Practical solutions
<p>Henkel developed innovative dust-free construction materials (e.g. tile adhesive, mortar, and filler) where the fine-dust development during opening, distributing and mixing has been reduced in comparison to conventional material. The dust particles are bonded together in fine microgranulates. The dust of the new filler, especially the fine dust, is under the detection limit. This reduces the health risks of construction workers.</p> <p>Thus, when mixing the low-dust tile adhesive and grout from Ceresit the dust is reduced by more than 90% relative to conventional powder products.</p>

<p>Even with the first dust-free filler, Thomsit RX-20 Premium, the levels of dust – especially fine dust – is in some cases lowered to below the detection limit, as the German statutory accident, insurance and trade association of construction industry BG BAU identified in measurements.</p> <p>The use of low-dust materials is therefore recommended by the BG BAU as a consultant for questions of occupational safety. Comprehensive information and practical assistance in the prevention of dust are also available there.</p>
<p>Benefits</p>
<p>A drastic reduction in dust emissions and pollution, up to 90% less dust compared with conventional tile adhesives. This not only spares the user's health, but results in far less dust in the work environment and neighbouring areas. Another advantage is the 30% higher coverage per kilogram of adhesive. 18 kilograms of Ceresit 'Highly Flexible' microgranular tile adhesive can cover an area that would otherwise require 25 kilograms. Moreover, far less effort is needed to apply the new tile adhesive.</p>
<p>Legislation</p>
<p>Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC)</p>
<p>Further information</p>
<p>Inqua publication about the German Hazardous Material Protection Award. Available at: http://www.inqa.de/Inqa/Navigation/Gute-Praxis/datenbank-gute-praxis,eDid=6652.html</p> <p>. Available at the company's website: http://www.henkel.com/sustainability/adhesive-technologies-14480.htm</p> <p>Gisbau, dust-free product proposals. Available at: http://www.gisbau.de/service/sonstiges/staub/produkte/flies.htm</p>
<p>Question</p>
<p>Are measures in place to reduce or to prevent the generation of dust from construction materials?</p>
<p>Part of incentive system</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
25. Dust free sanding of wood
Country of origin
Germany and UK
Description of risk
Wood dust can adversely affect the health of workers and has been associated with health problems such as skin disorders, obstruction in the nose, asthma and nasal cancer. Hardwood dusts are classified as carcinogenic. The occupational exposure limit for hardwood dust is set to 5mg/m ³ of inhalable dust in workroom air. Those exposed to the dust are parquet layer and cabinet makers who use woodworking machines indoors.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case reports</p>

<p>Practical solutions</p>
<p>German company Bona (Bona Vertriebsgesellschaft mbH) developed a special mobile exhaust system (Bona dust care). It works with a very efficient filter system: combining a Bona exclusive two-step cyclonic intake system. It removes almost all (99.9%) of the sanding dust. The fine dust amount is reduced to 0.1mg/m³. Bona dust care is designed to be attached to sanding machines via a hose.</p> <p>UK company Mirka has produced a sanding net with thousands of holes to provide improved dust extraction. The maximum distance from each sanding particle to the closest dust extraction hole is 0.5mm. Abranet's clever construction provides many advantages. Because the dust is being continuously sucked away, sanding is virtually dust-free. Tests have shown that the dust release from Abranet is only minuscule when compared to the dust released from traditional abrasives with dust extraction. When the abrasive and the sanding surface are constantly kept dust free, the lifespan of the abrasive is extended. And since the abrasive maintains its aggressive properties over the entire surface, sanding becomes more even and efficient. Abranet is available for use with random orbital sanders, hand sanding blocks, orbital and deco sanders.</p> <p>Laboratory tests show that Abranet has solved the dust problem. The amount of dust in the air when machine sanding with Abranet is 6,900 times less than when sanding using traditional abrasives without dust extraction. When Abranet was compared to a traditional six-hole sanding disc with dust extraction system, Abranet also proved itself to be completely superior. The dust concentration from Abranet was a maximum 0.15mg/m³, while the corresponding figure for the traditional sanding disc was 1.6mg/m³.</p> <p>The solutions offered here are obviously only samples of available products; they have been chosen to demonstrate a range of applications.</p>
<p>Benefits</p>
<p>The health benefits from dust-free, or virtually dust-free, sanding are obvious in that the hazard is removed. In addition the lifespan of the products is increased, sanding quality is improved due to better visibility of the sanded surface, efficiency is improved as other construction tasks can be carried out at the same time and time is saved as there is less tidying up to be done.</p>
<p>Legislation</p>
<p>Carcinogens and Mutagens at Work Directive (2004/37/EC replacing 90/394/EEC). Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:158:0050:0076:EN:PDF</p>
<p>Further information</p>
<p>http://www.inqa.de/Inqa/Navigation/Gute-Praxis/datenbank-gute-praxis_eDid=6840.html http://www.bona.com/Global/PDFs/Corporate/Close%20Up%20090312%20EN%20lowres_16.pdf http://www.bona.com/de/Deutschland/tools/Bona-System/Schleifen/Bona-DCS-70/ http://www.mirkadustfreesanding.co.uk/pdf/Abranet.pdf</p>
<p>Question</p>
<p>Are measures in place to reduce dust concentration when sanding wood?</p>

Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No
Solution
26. Innovative application solution to prevent skin contact with epoxy resin
Country of origin
Germany
Description of risk
Cement workers, floor layers, painters, tillers, plumbers and brick workers can be exposed to epoxy resins. They are used as coatings, adhesives, in wood and in concrete repair. Epoxy resins are highly irritating to the skin, they can cause irritant contact dermatitis, and they are strong sensitisers possibly leading to allergic contact dermatitis. Especially hazardous is the mixing of the two components.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts

Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case reports</p>
Practical solutions
<p>MC Bauchemie developed an application system for the optimal usage of epoxy resins which enables safe mixing of the epoxy resin components, but also guarantees the correct mixing ratio. Estrifan RIS JET is an epoxy-resin for the filling and repair of screed-cracks. The application system is made of a double-cartridge-set containing a 2-component-epoxy-resin for the filling of cracks in screeds and concrete. The two components are mixed at the tip of the cartridge so that the worker has no skin contact with the sensitising components and can apply the product very precisely.</p>
Benefits
<p>The hazard due to contact with epoxy resin is effectively eliminated, greatly reducing exposure and the risk of dermatitis.</p>
Legislation
<p>Dangerous substance directive (67/548/EEC)</p>
Further information
<p>http://www.cpwr.com/pdfs/epoxy_final%20hires_043008.pdf http://www.inqa.de/Inqa/Navigation/Gute-Praxis/datenbank-gute-praxis,eDid=6670.html http://www.mc-bauchemie.de/2093.aspx http://www.gisbau.de/service/epoxi/Leitfaden.pdf http://www3.interscience.wiley.com/journal/120175758/abstract?CRETRY=1&SRETRY=0</p>
Question
<p>Are measures in place to prevent skin contact when applying epoxy resin?</p>

Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No
Solution
27. Use of warm mixed asphalt to reduced exposition to fumes and aerosols
Country of origin
Germany, Europe
Description of risk
Construction workers are at risk of being exposed to dangerous substances (fumes and aerosols) when working with hot asphalt. Fumes are generated during the production or application of asphalt. Health risks are associated with skin contact, eye contact and or inhalation of fumes and vapours. Asphalt (bitumen) is carcinogenic (Kat 2) and skin absorptive.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts

Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Most likely based on case reports</p>
Practical solutions
<p>Workers' exposure to dangerous substances (fumes and aerosols) during the application of asphalt can be reduced by lowering the temperature of asphalt. The German asphalt industry developed asphalt that can be applied at cooler asphalt temperatures.</p> <p>There are three technologies that have been developed to produce warm-mix asphalt :</p> <p>The addition of mineral substances such as zeolite and the addition of organic substances such as long-chained paraffins, fatty acid amines or montan wax and mineral substances such as zeolite.</p> <p>In Germany a Bitumen Forum was created at the beginning of 1996 to discuss less dangerous methods and to promote warm-mix asphalt. Members of the Bitumen Forum are producers of all kinds of bitumen products (industry), trade unions and institutions for safety and health at work (e.g. the statutory accident insurance for construction).</p>
Benefits
<p>The benefits of warm-mix asphalt are:</p> <ul style="list-style-type: none"> ▪ Reduced emissions at the mixing plant ▪ Reduced energy consumption ▪ Reduced CO² output ▪ Reduced wear of the mixing plant ▪ Less ageing of the bitumen ▪ Reduced fumes and emissions during application ▪ Better quality of the utility properties <p>The use of warm-mix asphalt can reduce the risk of being exposed to fumes and aerosols about two to 10 times.</p>
Legislation
<p>Risks Related to Chemical Agents at Work Directive (98/24/EC) Carcinogens and Mutagens at Work Directive (2004/37/EC replacing 90/394/EEC)</p>
Further information
<p>The German Bitumen Forum. Available at: http://www.gisbau.de/bitumen/Wien.pdf</p>

<p>Gesprächskreis Bitumen. Available at: http://www.gisbau.de/bitumen/aktuelles.htm</p> <p>Sachstandsbericht, Gesprächskreis Bitumen. Available at: http://www.bfg-strassenbau.de/bitumen/Sachstand.pdf</p> <p>http://www.asphalt.de/media/exe/134/c773c33a550afb325b42ca50226f1e7/temperaturabgesenkte_asphalte.pdf</p> <p>http://www.asphalt.de/media/exe/134/5f3af3a506f6acd1078d6bd3a7f1778d/sonderdruckabgesenktetemperatur0708.pdf</p> <p>http://www.gisbau.de/bitumen/eng/pdf/progress_low.pdf</p> <p>Merkblatt für Temperaturabsenkung von Asphalt (MTA), Ausgabe 2006. FGSV-Nr. 766</p> <p>Nur noch mit abgesenkter Temperatur, Reinhold Rühl, BG Bau und Obmann des Gesprächskreises Bitumen. asphalt, Heft 4/2008</p> <p>Erfahrungssammlung über die Verwendung von Fertigprodukten und Zusätzen zur Temperaturabsenkung von Asphalt, veröffentlicht durch die Bundesanstalt für Straßenwesen, Bergisch-Gladbach (www.bast.de Fachthemen Straßenbautechnik _temperaturreduzierte Asphaltbauweisen_Erfahrungssammlung). Stand bei Drucklegung dieses Leitfadens: Mai 2008</p> <p>Warm-mix asphalt: European practice. Publication no. FHWA-PL-08-007 of the US Federal Highway Administration, Februar 2008 (www.international.fhwa.dot.gov, Fax: 42 001 202 366 9626)</p>
Question
<p>Is it possible to use warm-mix asphalt instead of hot-mix asphalt to reduce the emission of fumes and aerosols?</p>
Part of incentive system
<ul style="list-style-type: none">▪ Yes, reference to incentive system▪ No

3. Preventive solutions in Health Care Sector

3.1. Introduction

Presented here is a compilation with preventive solutions for the Health Care sector. Twenty Good Practices from various European Union countries have been selected in order to facilitate an exchange of experiences. This chapter reflects the major risks of the health care sector, which causes the greatest human suffering and economic damage. In particular, there are prevention solutions to manage the risk from:

- manual handling of patients
- slips, trips and falls
- psychosocial load (stress, burnout, mental and physical violence, substance abuse)
- contact with irritant substances, cytostatic agents and percutaneous exposures to blood-borne pathogens
- needle stick and sharps injuries
- air transmitted infectious diseases
- exposures to antineoplastic and other hazardous drugs
- exposure to waste anaesthetic gases

This has been done to provide health professionals an easy-to-use tool to improve the health and safety of health care workers through:

- the development of specific initiatives for the protection of workers in hospitals
- the increase of the interest in hospital management and in the structure, for the purpose of not only curing illnesses but also safeguarding the health of workers
- development of good practices that have a good level of technical and organisational practice with documentation and evaluation, so that they can be transferred to other hospitals
- facilitation and encouragement of the cooperation and exchange of experiences and projects between hospitals
- identification of areas of common interest to develop risk assessment procedures and preventive programmes

3.2. Solutions

3.2.1. Solutions physical load

Solution
1. Comprehensive patient handling approach (multi-component)
Description of risk
<p>Manual handling of patients involves multiple physical risk factors due to bending or forceful exertions, i.e. the combination of awkward back postures with force.</p> <p>Healthcare workers face a high risk of developing musculoskeletal disorders (MSD). In particular, they</p>

<p>are at risk of developing low back pain (LBP).</p> <p>One of the main causes of LBP in healthcare workers arises from handling patients. Activities such as lifting or transferring patients place high levels of force on the lower back, far exceeding the recommended lifting limits.</p>
<p>Sector</p>
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p>* it is possible to mark more than one sector for solutions that are applicable generally</p>
<p>HOT</p>
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human - XX ▪ Organisation - XX ▪ Technology - XX
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives - XX ▪ OSH experts
<p>Grading/label</p>
<ul style="list-style-type: none"> ▪ Systematic reviews and meta-analyses -XX ▪ Randomised controlled trials ▪ Cohort studies ▪ Case-control studies ▪ Cross sectional surveys ▪ Case reports ▪ Expert opinion
<p>Practical solutions</p>
<p>Several systematic reviews on the scientific evidence of the effectiveness of intervention strategies showed:</p>

- There is strong evidence that interventions based on methods of manual handling training are not effective if it used as the only measure to prevent injuries
- There is moderate evidence that technical ergonomic measures can reduce the occurrence of MSDs
- There is moderate evidence that a combination of several kinds of interventions (including technical, organisational and human measures) is better than single measures of intervention
- There is moderate to strong evidence supporting the use of physical exercise for the prevention of LBP among general workers

Thus, the intervention strategies must consider multiple components that should include a change in policy at the worksite (1), the implementation of new patient handling equipment (2) and training (3), as well as physical exercise (4).

1. Policy change: One of the policy changes that must be promoted is the 'no-lift' policy, where patient handling equipment is provided and manual lifting is eliminated.
2. Patient handling equipment: The equipment for patient handling includes mechanical and handling aids. Examples of such devices are electrically or hydraulically adjusted beds, hoists, anti-slip mats, sliding mat, glide board and transfer belt. These pieces of equipment are used, for example, on patients' lateral transfer, repositioning, lifting, bathtub, shower and toilet activities.
3. Patient handling training:

Training must be integrated in the safety culture of the organisation. Basic and continued training for healthcare workers should include:

- Training in individual risk assessment of the care situation (e.g., task, patient, environment, aids)
- Training in MSD protection during patient handling and use of handling aids in a manner that is safe for both nursing staff and patient
- Problem-solving training to deal with difficult patient handling situations
- Analysis and training of psychomotor capabilities of patients and healthcare workers

4. Physical exercise:

Physical exercise is recommended as an intervention for prevention of LBP. However, the type of exercise that is most effective is not known. In literature we can find recommendations for strengthening and stretching exercises over other strategies, while others recommend the utilisation of strengthening and trunk stabilising exercises. Programmes of specific stabilisation exercises involving deep spinal and abdominal muscles have been shown to be more effective than usual medical care and education in treating chronic LBP, and as effective as spinal manipulative therapy. [Dawson et al, 2007, p.648]

Legislation

The applicable European legislation is the COUNCIL DIRECTIVE 90/269/EEC, 29 May 1990, on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (fourth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC). As amended by Directive 2007/30/EC of the European Parliament and of the Council of 20 June 2007.

Further information
<ul style="list-style-type: none"> ▪ References to further information (e.g. tools and instruments) and useful links to websites <p>References:</p> <p>[1] European Commission, <i>Occupational health and safety risks in the healthcare sector – Guide to prevention and good practice</i>, 2009, pp. 282. Available in English at: http://www.eurogip.fr/docs/Commission_europeenne_guide_secteur_sante_2009_EN.pdf</p> <p>[2] NIOSH, <i>Ergonomics for the Prevention of Musculoskeletal Disorders Guidelines for Nursing Homes</i>, 2009. Available at: http://www.osha.gov/ergonomics/guidelines/nursinghome/final_nh_guidelines.pdf</p> <p>[3] NIOSH, <i>Safe Lifting and Movement of Nursing Home Residents</i> NIOSH Publication, 2006, No. 2006, pp.117. Available at: http://www.cdc.gov/niosh/docs/2006-117/pdfs/2006-117.pdf</p> <p>[4] Dawson, A. et al <i>Interventions to prevent back pain and back injury in nurses: a systematic review</i>, 2007.</p> <p>[5] Hignett, S. <i>Intervention strategies to reduce musculoskeletal injuries associated with handling patients: a systematic review</i>, 2007.</p> <p>[6] IWH, <i>Best evidence. Prevention programmes for health-care workers</i>, 2007. (www.ihw.on.ca)</p>
Question
<ul style="list-style-type: none"> ▪ Does the activity require patient-handling? <p>If Yes:</p> <ul style="list-style-type: none"> ▪ is adequate training of workers on the correct handling of patients provided? ▪ are technical ergonomic measures taken to reduce the occurrence of MSDs? ▪ are physical exercise programmes for the workers offered for the prevention of LBP?
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

3.2.2. Solutions slip, trips, and falls

Solution
2 E-Learning and Web-based training tools to increase healthcare employees' awareness regarding the risks of slips, trips and falls
Country of origin

- Name of country where the solution is applied:

Great Britain

USA

- Languages of instrument:

English

English/Spanish

Description of risk

Employee injuries from slipping, tripping and/or falling in the hospital, homecare, long-term care or other healthcare setting are the second most frequent type of employee injury for most healthcare providers. These incidents may be very costly and result in serious injury to the employee. They are usually preventable and avoidable if strong loss prevention measures are followed on a regular basis.

A 'slip' is defined as the slipping of one or both feet when the grip between the shoe and the floor is too low, while a 'trip' is a sudden stop of the movement of the foot by an obstacle, with continued forward movement of the body.

Slips happen when there is too little friction between footwear and the walking surface. A combination of the following factors will determine whether a slip accident may take place:

- type of flooring
- contamination on the floor (e.g. water, oil or dust)
- type and condition of the footwear
- environmental factors such as lighting
- capabilities of the individual who slips

The vast majority of flooring surfaces have good slip resistance when they are clean and dry. But slip resistance is greatly affected by contamination. Tiny amounts of water will form a film between the sole of the shoe and the floor, and if the surface roughness of the floor is not able to break through this film there will be no contact between footwear and flooring making a slip likely to happen. As a general rule, if a floor is shiny it is likely to pose a high slip risk when it is wet.

Trips

Trips may happen when your foot hits an object and, as a result, you lose balance. Tripping accidents are caused by a combination of the following factors:

- changes in level or surface such as uneven walking surfaces
- hazards such as trailing cables
- type of footwear
- environmental factors such as poor lighting
- capability of the individual who trips.

A change in level of as little as 8mm can potentially pose a hazard for the normal walking of fit healthy people. When you trip the forward motion of the foot is stopped suddenly by an obstacle, such as a training cable, but your body continues its forward motion. You may be unable to recover your balance and, as a result, may fall forwards and typically injure your head, leg or wrist.

Falls

Falls are usually the result of slips and trips. But falls also occur without slipping or tripping. There are two basic types of falls: same-level falls and falls from heights.

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p>* it is possible to mark more than one sector for solutions that are applicable generally</p>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality ▪ Description in a few sentences how the solution was evaluated (a useful description for SMEs, if scientific information is described it should be translated in understandable language for SMEs)
Practical solutions
<p>We will present some web-based solutions offered by the UK's HSE and the US's OSHA, addressing the prevention of slips, trips and falls.</p> <p>Health and Safety Executive (HSE) offers some general information and guidance regarding this topic in its website. This website provides links to several resources.</p> <p>One of the most relevant is STEP, which is an eLearning package specifically designed to address the risks of slips and trips. This is a tool meant for employees, managers and specialists.</p> <p>The tool explains how slips and trips are caused, how to spot hazards, why preventing them is important and what you can do to tackle them. It is an interactive package that includes quizzes, animations and video and can run directly over the Internet or can be loaded onto your computer via a DVD.</p>

Another solution is the eTools provided by OSHA in 'OSHA. Hospital eTool' and in 'OSHA. Nursing Home eTool' which are Web-based training tools on occupational safety and health topics on the healthcare sector.

These tools include specific information and training on slips, trips and falls. They are highly illustrated and utilise graphical menus as well as expert system modules.

The tool offers advice about possible solutions to prevent the risks, and also refers to the applicable OSHA recommendations.

Besides the e-Learning tools HSE also offers a tool to assess the slip potential of the walkway surfaces, named Slips Assessment Tools (SAT). The Slips Assessment Tool is a freely downloadable computer software package that is used to gather relevant information concerning floor surface properties, contamination, cleaning regimes, and footwear.

Benefits

- Description of benefits if solution is applied before

Legislation

- Reference to European legislation and the directive involved.

European directives set minimum standards to protect workers. These have been transposed into the law of Member States. The most important of these is the Framework Directive (89/391/EEC). Workers have the right to work in a safe and healthy environment; employers have the responsibility for the health and safety of their workers. First and foremost, the employer has to conduct a risk assessment and inform and train the workers about the hazards and risks of their jobs and workplaces. The employer has to apply the necessary prevention measures and to appoint contact persons to deal with any problems. Workers and/or their representatives have to be consulted and should be allowed to take part in discussions on all questions relating to safety and health at work.

Further information

- References to further information (e.g. tools and instruments) and useful links to websites

HSE. Slips and trips in the healthcare services, Healthservices sheet, 2003, No. 2. Available at: <http://www.hse.gov.uk/pubns/hsis2.pdf>

European Agency for Health and Safety at Work. E-Facts 37 – Slips, trips, falls and cleaners. Available at: <http://osha.europa.eu/en/publications/e-facts/efact37>

European Agency for Health and Safety at Work. E-Facts 14 – Preventing Work-Related Slips Trips and Falls. Available at: <http://osha.europa.eu/en/publications/factsheets/14>

HSE. Preventing slips and trips at work. Available at: <http://www.hse.gov.uk/pubns/indg225.pdf>

HSE. Slips and trips: The importance of floor cleaning. HSE information sheet. Available at: <http://www.hse.gov.uk/pubns/web/slips02.pdf>

HSE - Health and Safety Executive. Available at: <http://www.hse.gov.uk/slips/step/index.htm>

Zurich. Slip, trip and fall prevention for employees in the healthcare setting. Available at: [http://www.zurichservices.com/ZSC/REEL.nsf/26b077e07e53090385256d7200638720/f36f81c964176ac086257177006b754f/\\$FILE/slip_trip_fall_for_hc_setting_rt_7-1.009_20071231.pdf](http://www.zurichservices.com/ZSC/REEL.nsf/26b077e07e53090385256d7200638720/f36f81c964176ac086257177006b754f/$FILE/slip_trip_fall_for_hc_setting_rt_7-1.009_20071231.pdf)

NIOSH. NIOSH Hazard Review. Occupational Hazards in Home Healthcare. Available at:

http://www.cdc.gov/niosh/docs/2010-125/pdfs/2010-125.pdf
Question *
<ul style="list-style-type: none"> ▪ Question related to questionnaire <p>Are employees aware of the risks of slip, trip and fall, and the factors that contribute to them?</p> <p>Do the employees know how to control risks of slip, trip and fall?</p> <p>Does the floor present loose finishes, holes and cracks, or worn rugs and mats?</p> <p>Does the lighting enable people to see obstructions, potentially slippery areas?</p> <p>Are there obstructions or objects left lying around that can easily go unnoticed and cause a trip?</p> <p>Does the footwear prevent slips and trips? Where floors can't be kept dry do the shoes/boots have slip-resistant soles?</p>
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

3.2.3. Solutions psychosocial load

Solution
3 Health Circles
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: This tool was developed in Germany, but has been used internationally to address a wide variety of workplace health issues: including work-related stress. ▪ Language: German
Description of risk
<p>This practical solution is a flexible approach that has been used to address a number of health risks and health outcomes. The primary focus of this tool is to address organisational and psychosocial factors.</p>

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>Health circles have been applied in hundreds of companies since its inception. In the last stage (meeting) of the approach, the evaluation stage, all participants are asked to evaluate what has been achieved. The objectives of the evaluation stage are to determine: whether the proposed solutions were implemented effectively, and whether the solutions had any impact on the problems identified. Additionally, it is commonplace to conduct a follow-up meeting with the participants to complete the evaluation of the process. In some cases, the employee survey is repeated in the department where changes were implemented; thus allowing an assessment of the changes in the outcomes.</p>
Practical solutions
<p>Health circles were designed in Germany to facilitate health promotion in the workplace with an emphasis on organisational and psychosocial factors. The Health Circle approach is a flexible approach that can be tailored for various different companies and situations. The overall aim of the health circles is to improve working conditions, and thereby improve and promote the health and wellbeing of employees. The Health Circles use a participative problem-solving approach; which is underpinned by the ethos that the employee/worker are the experts on their work and the management of that work environment. Health circles use this 'employee expertise' to develop suggestions to improve the situation at the workplace and, in turn, promote their health and wellbeing.</p>

Health circles are based on structured group discussions of employees, where employees evaluate psychosocial risk factors and define solutions to address the identified problems. These meetings are conducted under the guidance of a specially trained facilitator, whose primary role is to act as a moderator. Meetings are generally conducted during paid working hours lasting a total of 90 minutes. In most cases, the process includes between six to 10 meetings.

The process has six steps:

Commitment and Infrastructure: A contract is signed between management and employees, thus ensuring commitment of all parties throughout the intervention process and with the project goals.

Needs Assessment: A health surveillance report is produced from company or insurance data. This identifies absenteeism rates, length and causes of sick leave, 'high risk' departments of absenteeism and the identification of possible psychosocial hazards. Following the health report, an employee survey assessing hazards (both physical and psychosocial), employee health and wellbeing is conducted.

Health Circles: A steering group is formed by those responsible for health and safety in the company; with the overall intention of overseeing the process. Approximately, 10-15 participants are invited to each health circle (these include representatives from the employees, company and the union, and the facilitators). Results of the needs assessment provides structure to the discussion. Participants discuss the identified problems, as perceived by a larger number of employees, and develop proposed solutions to the identified issues. These meetings are formally recorded and disseminated to all employees in the affected department.

Feedback to the management team: The management team is informed of the progress and suggestions developed by the health circle. The management team makes the decision on which suggestions will be implemented, and in which order.

Implementation of solutions: Proposed solutions are implemented throughout the process. These provide the basis for health improvements.

Review and transfer: In the last health circle meeting, all participants are asked to evaluate what has been achieved. Additionally, it is commonplace to conduct a follow-up meeting with the participants to complete the evaluation of the process. In some cases, the employee survey is repeated in the department where changes were implemented; thus allowing an assessment of the change in outcomes.

Benefits

Health circles have been found to be an effective tool for the improvement of physical and psychosocial working conditions in many organisations and industrial sectors.

Health circles have also been demonstrated to have a positive effect on outcomes, including enhanced employee health and wellbeing and reduced sickness absence.

Legislation

This approach was developed as a result of changes in OSH legalisation in Germany during the 1980s, which placed greater emphasis on prevention activities.

Further information

Aust, B. and Ducki, A., 'Comprehensive health promotion interventions at the workplace: experiences with health circles in Germany'. *Journal of Occupational Health Psychology*, .Vol. 9, No. 3, 2004, pp.258-270.

Schröer, A. and Sochert, M. 'Health promotion circles at the workplace', *Federal Association of Company Health Insurance Funds*, Essen Germany, 2000.

Leka, S.; Hassard, J.; Jain, A.; Makrinov, N. and Cox, T. et al, 'Towards the Development of a European Framework for Psychosocial Risk Management at the Workplace', Institute of Work, *Health and Organisations Press*, Nottingham, 2008.

PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org

Question

Is an assessment of psychosocial risks carried out?

Is a participative problem-solving approach used based on 'employee expertise' to evaluate psychosocial risk factors and define solutions?

Part of incentive system **

No reference to incentive system. However, the method and effectiveness of Health Circles is well established, and could be integrated into an incentive scheme.

Solution

4 Survey feedback as a method of stress management

Country of origin

Name of country where the solution is applied: Finland

Languages of instrument: Finnish

Description of risk

The survey feedback process is used as a method of reducing stressors found in the workplace, and thereby enhancing and promoting employee health and wellbeing.

Sector

- **Construction**
- **Health**
- **HORECA**

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ <u>OSH experts</u>
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>The evaluation of the intervention was based on both quantitative and qualitative data. Post measurements were carried out three years later in one of the departments where the intervention had been conducted. Additionally, qualitative interviews were conducted with the planning group members, participating occupational health personnel and the department's directors, charting their opinions on the new model of OHS in health promotion and the overall satisfaction with the survey feedback method. The employees' opinions were surveyed during routine monitoring of the workplaces and during health examinations.</p>
Practical solutions
<p>The reduction of stressors, through a survey feedback method, was planned as a two-phase process where: (a) the researcher-consultant supports the organisation's occupational health personnel in developing a practical action model; and (b) the occupational health personnel supported the superiors and employees of the participating work units to reduce stressors. This work was a collaborative initiative between the research-consultant and the occupational health department personnel. The researcher-consultant's primary task was to structure the process, whereas the role of the occupational health personnel was implementing the devised process at the workshop level.</p> <p><u>Training Programme for Occupational Health Personnel</u></p> <p>A three-day training course for the participating occupational health personnel, consisting of physicians and nurses, was delivered. This was done simultaneously with the model survey. The training course concentrated on the survey feedback as a method, and on the process-centred consultative role of the occupational health personnel in the collaborative partnership when working with worksites. In between the training sessions, the OH personnel began their own projects in their own area. These projects were used as training material. Additionally, the training sessions acted an evaluative forum, allowing individuals to discuss the use of the survey feedback method.</p> <p><u>The survey feedback method</u></p>

The survey was carried out using an occupational health questionnaire. This questionnaire was developed as a useful tool for occupational health personnel to identify and assess problems in the workplace associated with stress. It could then be used to outline the development needs and necessary actions. The comprehensive version of this questionnaire covers five areas: socio-demographics, perceived work environment, factors modifying stress, response to stress, and the need for work development and individual support. The aim during the development of this questionnaire was to keep it concise and easily applicable as a routine tool, including feedback of the results to the employees.

Following implementation, feedback of the results was delivered to each work unit over 10 sessions. This was organised to reach the natural work teams and to allow shift workers to actively participate in the process either directly prior to, or directly following their shift. The employees, during these feedback sessions, participated in a discussion of the survey results to set developmental aims. Emphasis was placed on the development of aims that could be achieved through the supervisors' and employees' own efforts. The aims were defined separately for each department.

An action model outlined the phases of organisation and society change, which involves seven implementation phases of the overall intervention. This action model underpinned the implementation of the survey feedback method. The seven phases were as follows: (1) analysis of need for change; (2) assessment of prerequisites for change; (3) definition of goals; (4) choice of strategy and methods; (5) feedback and interpretation; (6) carrying out the change; (7) evaluation.

The questionnaire, used as the basis of the survey feedback method, was consciously developed to be a user-friendly tool for organisations. It was designed to identify stressors in the workplace contributing to poor occupational health of employees, and provided evidence-based guidance on generating possible solutions.

The implementation of the intervention is driven by the organisation, using the knowledge of the personnel within the company, and is guided by the employees, thus making this process easily applicable at a practical level.

Benefits

Several benefits were demonstrated by using the evidence gathered from one department followed up as a case study. The results of the evaluation demonstrate a change in work content, namely an observed increase in the variability of work, while the overall mental and physical strenuousness decreased. Further, based on the follow-up, it was observed that the occupational health personnel shifted their working model towards a more active cooperation with the work units. The authors at the organisation continued to use the survey feedback method as a routine method of the occupational health.

Legislation

Since the implementation of the occupational safety act of 1987, which included several clauses referring to psychosocial factors, it became the employers' obligation to plan the work and the work environment in a way that was not detrimental to the physical or mental health of the employees. This was the motivation for an intervention seeking to reduce stressors in the workplace and promote employee wellbeing and health. The organisation's board of directors appointed internal experts to clarify the possibilities of satisfying the organisation's legal duty and, in turn, promote employee health and wellbeing. This expert group consisted of management, occupational health personnel, safety personnel and union members. The group decided to use a survey feedback process to reduce stressors found in the workplace, and to enhance and promote employee health and wellbeing.

Further information
Elo, A.L.; Leppaenen, A. and Silanpaa, P., 'Applicability of survey feedback for an occupational health method in stress management', <i>Occupational Medicine</i> , Vol. 48, 1998, pp.31-34. PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org
Questions
Is survey feedback used to reduce stressors in the workplace?
Part of incentive system **
Does not make reference to an incentive system.

Solution
5 The Work Site Profile (Arbetsplatsprofilen: Ett verktyg för systematiskt arbetsmiljöarbete)
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Sweden. ▪ Language: Swedish.
Description of risk
This toolkit is designed to address organisational and psychosocial risks in the workplace.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium <ul style="list-style-type: none"> ○ low quality <p>The Worksite Profile method has been tested in different occupational sectors and at different organisational levels. The method has been evaluated by taking into account the validity of the questionnaires and usefulness of the method for a Systematic work environment management. Using</p>

this method, two key factors have emerged as important: time for worksite discussions and manager engagement. The method is less useful in organisations with a lack of time and non-engaged managers.

The intervention effects have been evaluated in some studies by a comprehensive questionnaire prior to (baseline) and after (follow-up) the intervention. In some cases research teams not involved in the implementation have evaluated the effects of the intervention by questionnaires before and after the programme, using a wide range of measures. The method was found to be effective, leading to sustainable outcomes.

Practical solutions

The Worksite Profile method is a self-instructive tool (in a CD-package) with a questionnaire and instructions to improve the work environment and health of employees in occupational settings. It facilitates Systematic Work Environment Management (SWEN), which involves:

Making decisions and taking measures in the workplace that ensure employees are not injured, do not become ill and are not harmed in any other way.

This means observing and considering psychological and social conditions, as well as work environment issues of a 'technical' nature.

Work environment management also applies to work not done at a permanent workplace, e.g. transport work or work in other people's homes.

According to the Swedish Work Environment Act, SWEN is the responsibility of the employer. The aim of the Worksite Profile is to get employees and managers to participate in the development and improvement of their own work conditions. The questionnaires have been developed based on extensive research. The intervention is easily applied, practical and can be self-administered. Instructions are included in the CD-package. The self-instructive method has been used by Occupational Safety and Health Services, the Swedish Church and smaller enterprises.

Key components:

Intervention is carried out in three steps:

Competence programme: The first activity, a competence and training programme, is directed at a selected group of employees.

Worksite competence circles: The second activity is directed at all worksite staff, the aim of the competence circles is to initiate a learning organisation.

Local worksite projects: The third activity targets separate worksites and organisations. As part of the worksite improvement projects, project plans are elaborated jointly by the participating employees.

Each step is a separate activity connected by a main thread and implemented successively, with each activity a necessary basis for the next step. Different activities are directed towards the individual, the worksite, and the organisation. As a tool to initiate and stimulate discussions across occupational groups and to assess the stressors, each unit uses the feedback of their baseline questionnaire results presented as local work quality profiles. The questionnaire is comprehensive, including more than 100 questions about work demands, job control, support, evaluations of quality of care, musculoskeletal, psychosomatic, and stress symptoms, well-being and measures of personal resources such as coping, self-esteem, and mastery. Most of the questions have been used in research and some of the scales are internationally known and well established.

Local reference groups, consisting of the unit manager, the project co-ordinator, the innovation leaders (those who undergo the competence and training programme), and representatives of employee groups, support the projects on the worksite level. A support network of all innovation leaders and unit managers is created at the organisational level. The started projects generally refer to issues such as the introduction of new employees, quality development, the meaning of quality to employees, customers, routines for staff meetings and communication, and communication between personnel.

Benefits
The method is flexible and can be tailored to suit each organisation. The CD-package is economical, making it accessible for smaller workplaces.
Legislation
The tool makes reference to the Swedish Work Environment Act.
Further information
<p>Petterson, I.L.; Donnersvärd, H.Å.; Lagerström, M. and Toomingas, A, 'Evaluation of an intervention programme based on empowerment for eldercare nursing staff', <i>Work & Stress</i>, Vol. 20, No. 4, 2006, pp.353- 369.</p> <p>PRIMA-EF– Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org</p> <p>The Swedish Work Environment Authority – Systematic work environment management: Guidelines. Work Environment Authority, <i>Publication Services</i>. Retrieved 15 November 2010. Available at: http://www.av.se/dokument/inenglish/books/h367eng.pdf.</p>
Question
<p>Do employees and managers participate in the development and improvement of work conditions?</p> <p>Were tools (CD-package, leaflets, etc.) used to facilitate the involvement of workers in the development and improvement of work conditions?</p>
Part of incentive system **
No reference to incentive system. However, as the method and effectiveness has been established, this could be integrated into an incentive scheme.

Solution
6 The systematic approach model – how to prevent and overcome undesirable interaction
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Netherlands ▪ Language: Dutch
Description of risk

<p>The model tackles a large variety of undesired behaviour and takes into consideration different stages, from prevention to management and support.</p>
<p>Sector</p>
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
<p>HOT</p>
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
<p>Evaluation</p>
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>The effectiveness of the model has not been systematically evaluated.</p>
<p>Practical solutions</p>
<p>The phases of the programme are as follows:</p> <p>Prevention: setting up a preventive policy for the company (including a policy statement), developing knowledge and raising manager awareness on bullying and harassment at work, on their financial consequences, and on the organisation's legal obligations. Subsequently, developing a code of conduct as a more profound policy to outline procedures for reporting undesirable behaviour, assign responsibility, and continuously evaluate the developed and existing procedures.</p> <p>Uncovering: developing knowledge about the nature of bullying and harassment and making the phenomena visible.</p> <p>Support: for the victim, mainly social and psychological help. For example confidential counsellors in the organisation can provide support, occupational health care and psychological support.</p>

<p>Intervention: can be: a) an informal solution (victim talks directly to the perpetrator and mediation or mediation/correction is provided by the supervisor), b) a formal complaint or c) transfer to another department or outplacement.</p> <p>After-care: should match the chosen intervention strategy. After-care can take many forms, for example in cases of undesirable group behaviour the supervisor remains alert to signals of objectionable behaviour. In the case of mediation, after-care means that the counsellor remains in contact with the victim and continues to provide him/her with support</p> <p>Four times a year ‘a day of return’ including feedback and counselling is organised. During these days a lot has been learned about the functioning of the model in practice.</p>
<p>Benefits</p>
<p>Due to the comprehensive nature of the model, this approach promotes deeper change in the workplace in relation to undesirable behaviour, bullying and harassment. The goal of the method is to create a lasting solution.</p>
<p>Legislation</p>
<p>The Systematic Approach Model was designed to prevent and manage undesirable behaviour (bullying/harassment) at work. It is a Dutch intervention but can be modified to policies and other national contexts. The Model is a five-phase approach, which seeks to provide advice and guidance to organisations on how to build and develop a systematic and comprehensive programme to address bullying and harassment at work effectively.</p>
<p>Further information</p>
<p>Hubert, A.B, ‘To prevent and overcome undesirable interaction: A systematic approach mode’, In S. Einarsen, H. Hoel, D. Zapf and C.L. Cooper (Eds.) <i>Bullying and Emotional Abuse in the Workplace. International perspectives in research and practice</i>, Taylor & Francis, London & New York, 2003, pp.299-311.</p> <p>PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org</p>
<p>Question</p>
<p>Are procedures established for reporting and registration of unwanted undesirable behavior?</p> <p>Are strategies implemented to improve the workplace in relation to undesirable behaviour, bullying and harassment?</p>
<p>Part of incentive system</p>
<p>No reference to incentive system. However, this is an established model and therefore could be integrated into an incentive scheme.</p>

Solution
7 'Safe care' programme
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: The Netherlands ▪ Language: Dutch
Description of risk
Violence and aggression towards staff in hospitals.
Sector
<ul style="list-style-type: none"> ▪ <u>Health</u> ▪ HORECA ▪ Construction
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ Management ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ <u>medium</u> ▪ low quality <p>As outlined in the policy, all incidents of violence and aggression are reported to provide an overview of the prevalence of aggressive and violent incidents within the hospital. Information from reported incidences of violence is used to evaluate the effectiveness of the policy and to identify prevalent</p>

trends in perpetrator behaviour.

Practical solutions

Recent research on aggression and violence within a hospital setting demonstrated that 90% of surveyed doctors and nurses reported suffering from mental and physical violence, 78% experienced sexual intimidation and 51% considered the workplace to be unsafe. In Westfries Gasthuis Hospital an alarmingly high number of incidents of violence and intimidation were recorded, (300 in one year). The Safe Care programme was developed in order to address this issue. The Westfries Hospital was the pilot-hospital for the programme.

The aim of the Safe Care programme is to decrease the number of incidents of aggression and violence in hospitals (verbal or physical), by implementing a zero-tolerance policy. There are a number of key steps to the Safe Care programme. The method is based on the policy cycle: global inventory of problems, declaration of intent, problem analysis, set goals/prioritise, develop strategy, implementation of strategy, evaluation and adjustment of goals/measures. More specifically, the policy consists of different components. First, a collective agreement is made between the hospital, the police department and the Public Prosecutor. Visitors and patients who misbehave receive a warning, and after two warnings the person can be banned from entering the hospital.

Incidents of violence are reported by the head of the in-house emergency and first-aid service who are responsible for dealing with the situation. Furthermore, workplace safety is increased by additional camera surveillance and an increased availability of security officers for emergencies. The house regulations are presented and communicated using posters. An 'aggression-protocol' is used in the hospital so that employees are familiar with the necessary procedures required to handle cases of aggression.

In addition, the following steps are included in the 'Safe Care' programme:

- A zero measurement is carried out based on incident reports, existing preventive measures and interviews with staff in at-risk departments
- A work group identifies the at-risk zones by assigning all rooms in the hospital a colour

Red: high risk of aggression and violence; area contains valuable goods attractive to criminals

Yellow: no considerable risk of aggression and violence; area contains goods which are attractive but not valuable;

Green: No valuables; chance of aggression is small

- The different types of aggression are divided via a 'card system':

'Verbal aggression' (swearing, threatening behaviour sexual intimidation): in these cases the nurse/doctor tries to calm down the patient or visitor. If he/she is unsuccessful, he/she can push an alarm button carried by all staff members. The security officer(s) will assist in the situation and try to calm down the patient/visitor. The incident is recorded.

'Serious threats' (attempts to hurt, following a person, attempts to kick, discriminatory remarks, etc): in these situations the alarm button is pushed immediately and a security officer will come to assist. The security officer presents a 'yellow card' to the aggressor. This means that the incident is reported to the police automatically.

'Physical threats' (assault, smashing and breaking things, pushing, biting, scratching, inflicting injury): in these situations the alarm button is pushed immediately and a security officer will come to assist. Security presents a 'red card' to the aggressor. This means the incident is reported to the police automatically and the aggressor is brought before the assistant public prosecutor. He decides whether to further prosecute or settle.

- If a violent incident button is pressed it sets off a security alarm and all security cameras are automatically activated in order to record the incident.

<ul style="list-style-type: none"> ▪ Reception has moving screens that warn when an incident is taking place. This gives reception the opportunity to warn visitors that there may be a delay in appointments due to this incident. ▪ Staff are trained in customer care, dealing with violence, self-defence and trauma counselling. ▪ Other parts of the hospital organisation and other external relations/institutions are informed about the 'Safe Care' programme via posters and flyers.
<p>Benefits</p>
<p>Reduction of reported violent incidents. A recent survey shows that violence and verbal aggression in this hospital dropped by 30% and 27% respectively.</p>
<p>Legislation</p>
<p>No reference to legislation</p>
<p>Further information</p>
<p>EU-OSHA-European Agency for Safety and Health at Work, 'Prevention of psychosocial risks and stress at work in practice', 2002. Available at: http://osha.europa.eu/en/publications/reports/104/view PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org</p>
<p>Question</p>
<p>Are programmes used to decrease mental and physical violence and sexual intimidation in hospitals?</p>
<p>Part of incentive system **</p>
<p>No reference to an incentive system. However, this method could be integrated into an incentive scheme.</p>

<p>Solution</p>
<p>8 Violent Incident Form (VIF) & feedback programme</p>
<p>Country of origin</p>
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Sweden ▪ Language: Swedish

Description of risk
Practical intervention programme designed to help staff in health care workplaces to deal with patient violence towards staff
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Healthcare ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>The Violent Incident Form (VIF) was implemented as a working tool at 47 health care workplaces in Stockholm, Sweden. The workplaces were randomly assigned to either the intervention or control group and approximately 1,500 healthcare workers were involved. A structured feedback programme that included regular discussions with staff involved in violent incidents registered at the intervention workplaces was implemented. A follow-up study was carried out after one year to compare the amount of violent incidents reported, and to assess staff perceptions surrounding the year-long project.</p>
Practical solutions
<p>The VIF is a practical instrument developed for the registration of all types of violent and threatening behaviour directed towards staff in the healthcare sector. The method is designed for implementation into the daily routines of high-risk workplaces.</p>

<p>The VIF is a user-friendly instrument to register violent events directed towards healthcare workers. It includes a checklist of 20 items and summarises information pertinent to the incident. This includes time and place, details describing the aggressor, the circumstances, the actual incident, how the incident was handled, and the staff victim's injuries and/or reactions. Information concerning the VIF checklist is disseminated to all participating workplaces. Following a threatening violent incident the employee is required to fill in the VIF.</p> <p>VIF can be viewed as a user-friendly approach, as the implementation of the method requires no training and is easy to use. The method aims to minimise the stigma associated with violence and encourages employees to act and speak out after the incident, thereby building social cooperation in the workplace</p>
<p>Benefits</p>
<p>During the one-year study 50% more violent incidents were reported in the intervention group than in the control group. The intervention groups reported better awareness of risk situations for violence, how to avoid potentially dangerous situations and how to deal with aggressive patients. Thanks to the structured feedback programme staff knowledge of risks for violence in the intervention group was improved.</p>
<p>Legislation</p>
<p>No reference to legislation</p>
<p>Further information</p>
<p>Arnetz, J.E.and Arnetz, B.B., 'Implementation and evaluation of a practical intervention programme for dealing with violence towards health care workers', <i>Journal of Advanced Nursing</i>, Vol. 31, No. 3, 2000, pp.668-680.</p> <p>PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org</p>
<p>Question</p>
<p>Are practical instruments established for reporting and registration of violent and threatening behaviour directed towards staff?</p> <p>Are strategies used to reduce violent and threatening behaviour directed towards staff?</p>
<p>Part of incentive system **</p>
<p>No reference to incentive system. However, the method could be integrated into an incentive system.</p>
<p>Solution</p>
<p>9 Participative Intervention Programme</p>

Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Canada ▪ Language: English
Description of risk
Adverse psychosocial work factors: high psychological demands, low decision latitude, low social support and low reward.
Sector
<ul style="list-style-type: none"> ▪ <u>Health</u> ▪ HORECA ▪ Construction
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>In the study the researchers used an intervention group and a reference non-intervention group, in order to evaluate relative benefits of the intervention. Information was collected pre-intervention and post-intervention (after one year) using questionnaires, in order to assess the effectiveness of the intervention.</p>

Practical solutions

In total, 500 care providers in an acute care hospital participated in the intervention. A risk assessment was conducted prior to implementing the intervention, in order to determine the prevalence of adverse psychosocial work factors and psychosocial distress. Additionally, qualitative information was collected such as observation in the care unit, interviews with key informants and collaborative work with an intervention team.

The aim of this participative intervention was to reduce four adverse psychosocial work factors:

- high psychological demands
- low decision latitude
- low social support
- low reward

The participative approach includes the intervention team, care providers and other important stakeholders. This group is responsible for determining which changes should be made to reduce adverse psychosocial work factors. There are a number of key components to this intervention. Each key component will be outlined and concisely described.

As a preliminary step to this programme an in-house 'Intervention Team' was established. The responsibilities of the Intervention Team were as follows:

1. Identify adverse psychosocial factors
2. Recommend interventions to reduce them
3. Determine feasibility and priorities of interventions
4. Dissemination of information to colleagues
5. Promote diffusion of the intervention process to management and staff of other care units

Recruitment criteria for the Intervention Team were as follows:

1. Willing to participate actively in the Intervention Team
2. Good knowledge of the organisation (own care unit and other care units): operations, characteristics, clientele
3. Ability to motivate and mobilise co-workers
4. Sound judgement and open-mindedness
5. Interest in the learning process and willingness to share new information with colleagues
6. Ability to work in a team

In a four-month period the Intervention Team met eight times and had three-hour meetings. During these meetings the Intervention Team worked on the following aspects:

6. Identifying specific adverse psychosocial work factors and solutions
7. Learning to work together
8. Creating sub-committees to work on specific topics

Through meetings with the intervention group a list with adverse psychosocial factors was created, and the suggested solutions were written down in a report after each meeting. The developed report was widely disseminated within the workplace.

Benefits
<p>The Intervention Team meetings provided the staff with a communication forum, taught them how to work together and communicate better. The staff of the intervention group reported the following benefits, as compared to the reference (non-intervention) group:</p> <ul style="list-style-type: none"> ▪ Reduced burnout ▪ Decrease in psychological demands ▪ Improvement of social support
Legislation
No reference to legislation
Further information
<p>Bourbonnais, R.; Brisson, C.; Vinet, A.; Vézina, M. and Lower, A., 'Development and implementation of a participative intervention to improve the psychosocial work environment and mental health in an acute care hospital', <i>Occupational and Environmental Medicine</i>, Vol. 63, 2006, pp.326-334.</p>
Question
<p>Are risk assessments conducted to determine the prevalence of adverse psychosocial work factors and psychosocial distress?</p> <p>Are interventions made to reduce adverse psychosocial work factors and psychosocial distress?</p> <p>Are activities developed to promote diffusion of the interventions to reduce adverse psychosocial work factors and psychosocial distress?</p>
Part of incentive system **
No reference to incentive system

Solution
10 Project "Health in working life": Standardised Participatory Organisational Intervention
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Norway ▪ Languages of instrument: Article is in English

Description of risk
<ul style="list-style-type: none"> ▪ Job stress
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ <u>Health</u> ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>Before the start of the intervention a baseline survey was done to measure the pre-intervention results. After the intervention was finished (12 weeks), and one year after the study, the same survey was conducted to compare the results. These were also compared with a control group.</p>
Practical solutions
<p><u>Context:</u></p> <p>The national research programme 'health in working life' in Norway included the 'standardised participatory organisational intervention'. This intervention is based on three research assumptions:</p> <ol style="list-style-type: none"> 1. participation, dialogue and workplace democracy. In order to reduce staff alienation and stress, it is important to increase participation in identifying and solving problems. This enhances the feeling of workplace democracy. 2. Occupational stress and health. Increased control in the job is perceived as an important factor

in reducing the effect of job demands on stress-related ill health.

3. Organisational learning theory. In this theory employees learn, via organisational enquiry, how to improve performance of organisational tasks and to learn the value system of the organisation.

Two health care institutions were included in the study. Before the intervention employees and supervisors were informed about its procedure. A facilitator and steering committee were assigned to the project as well as the manager, supervisor, a union representative and the employee safety representative

Aim:

The intervention aims to improve workplace health and organisational performance continuously and on a long-term basis. This aim is reached by activating a learning process with the employees on how to identify and solve problems. This learning process can lead to better workplace health and performance.

Different steps are included in the intervention process:

- Start

A six-hour seminar in which a group creates a plan to implement themselves. This type of seminar tries to improve the openness of group processes, communication, and intra-group trust.

Two main questions were asked during the seminar:

 1. What are the key factors in this work unit for a good work environment?
 2. What kind of actions do you want to be instituted to reduce the gap between the wanted situation and reality?
- Individual-level work, small group activity and plenary sessions

Through the activities in the smaller groups and plenary discussions, the work unit was able to detect the seven most important elements that needed improvement.
- Work groups

Seven work groups were created to deal with the seven important elements. The groups needed to be divided equally according to gender, age and work tasks of the participants. Each group met to discuss the following topics:

 - Respective topic
 - Stressors related to topic
 - Causes of stressors
 - Solutions for addressing the causes/stressors
- Report

Each group wrote a report on their most important conclusions and suggestions. The steering committee met once every week, received the reports of the groups and wrote feedback reports to each group. This process improved communications between the management, the union representative and the work groups. During this process, concrete action plans were developed.
- Feedback and final meeting

In a plenary feedback session, the researchers gave participants the main results of the baseline survey conducted at the beginning of the intervention. In a final session all groups worked together to provide the steering committee with an overview of results, suggestions, actions, and formulated suggestions on how to proceed with the implementation after the intervention ended.

Benefits
The participatory intervention had a positive but limited effect on work-related stress, job characteristics, learning climate, and management style.
Legislation
No reference to legislation.
Further information
Mikkelsen, A.; Saksvik, P. and Landsbergis, P., 'The impact of a participatory organisational intervention on job stress in community health care institutions', <i>Work & Stress</i> , Vol.14, No.2,2000, pp.156–170.
Question
Are activities developed to increase staff participation in identifying and solving work problems?
Part of incentive system **
No, reference to incentive system. However, it could be integrated into an incentive scheme.

Solution
11 Participatory Action Research project
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: England ▪ Languages of instrument: Article is in English
Description of risk
The current programme seeks to address work-related stress.

Sector
<ul style="list-style-type: none"> ▪ <u>Health</u> ▪ Construction ▪ HORECA ▪ All occupational sectors
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u>
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ <u>low quality</u> <p>Qualitative information was collected from the workers.</p>
Practical solutions
<p>Two large organisations were involved in the Participatory Action Research (PAR) project, namely a Healthcare Trust and a Social Services Organisation. A team from the Anglia Polytechnic University (APU) conducted the research. The aim of the Participatory Action Research project was to reduce the negative consequences of stress in the workplace.</p> <p>Surveys were distributed in order to define the problems of staff and the effects these problems had on their working and personal life. As part of this programme stakeholders were actively involved in the project and in the implementation of the solutions throughout the process.</p> <p>PAR has a number of key components. The current section will concisely detail them.</p> <p><u>Workshops</u></p> <p>The members of staff of the participating organisations were involved in five participatory workshops. The workshop usually lasted about 2.5 hours. The workshops were based on different exercises:</p> <ol style="list-style-type: none"> 1. Vignettes 2. Small group exercises

<p>3. Discussions</p> <p>4. Presentations on key aspects of stress</p> <p>5. Role play</p> <p>All information and suggestions that came up during the workshops were noted and distributed to the staff. These reports could be used as input into the content of the next workshop. At the end of the five workshops the staff had created a stress reduction strategy document which described core causes of stress and suggestions for actions in the short and long term.</p> <p><u>Surveys</u></p> <p>Alongside the workshops, surveys were distributed among staff members. The primary aim of the survey was to get a better view on the nature and causes of work-related stress among the employees. These results were added to the strategy document.</p>
<p>Benefits</p>
<p>Thanks to the PAR processes staff were able to effectively address work-related stress, and the problems associated with it. Throughout the process staff were also able to formulate solutions to these problems.</p>
<p>Legislation</p>
<p>No reference to legislation.</p>
<p>Further information</p>
<p>Munn-Giddings, C.; Hart, C. and Raom, S., 'A participatory approach to the promotion of well-being in the workplace: Lessons from empirical research', <i>International Review of Psychiatry</i>, Vol. 17, No. 5, 2005, pp.409–417.</p>
<p>Question</p>
<p>Are workers involved in the identification of core causes of stress and suggestions for preventive actions?</p>
<p>Part of incentive system **</p>
<p>No, reference to incentive system</p>

<p>Solution</p>
<p>12 Peer support groups</p>

Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Sweden ▪ Languages of instrument: Article is in English
Description of risk
This programme seeks to address and manage work-related stress and burn-out.
Sector
<ul style="list-style-type: none"> ▪ <u>Health</u> ▪ Construction ▪ HORECA
HOT
<p>The solution concerns:</p> <p>Human</p> <p>Organisation</p>
Target group
<p>Management</p> <p>Employees/employee representatives</p> <p>OSH experts</p>
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>All participants were randomly assigned to an active treatment group (receiving intervention and follow-up questionnaires) or a control group (received only follow-up questionnaires). Both groups were statistically analysed and compared. Positive results were found in the intervention group, showing the positive effect of peer support groups.</p>
Practical solutions
One of the most common causes for long term sick leave is stress-related conditions. Evidence on

the effectiveness of person-directed interventions to reduce stress in employees in the healthcare sector is scarce. This study tries to prove the effectiveness of the use of peer support groups as a solution for stress reduction.

The work procedure in the peer support groups was structured according to the problem-based method developed by Ekberg. This method was slightly modified to fit the preventive approach that the work group was aiming for.

The study population included physicians, registered nurses, nursing assistants, social workers, occupational therapists, physiotherapists, psychologists, dental nurses and hygienists, dentists, service staff, administrators, teachers and technicians.

Different steps are included in the process of peer support groups:

- *Purpose of the peer support group:*

The peer support group should be seen as a working group, and not as a therapeutic group. The purpose of the group was:

1. To give colleagues a time and place for discussion and reflection on stress and burn-out. Everyone can tell their own story, with their own experiences.
2. To give every individual the opportunity to find their own goals for change, in order to cope with stressful situations.
3. To provide an environment where colleagues can learn from each other by sharing and comparing experiences

- *Procedure*

Weekly sessions took place on 10 occasions, each session lasting two hours.

Group leader

In each group a group leader was assigned. His/her task was to supervise and facilitate the procedures and processes in the work group. He/she did not intervene in the discussions, but was merely a moderator. Selection criteria for a group leader were (1) working in the occupational health service (physicians, social workers, physiotherapists) and (2) previous group leader experiences.

The group leaders received training in the problem-based method, as well as a manual in which the aim and different steps of the method were described.

- a. First session

The group leader presented the purpose of the intervention and the work procedures. Participants started to work in groups of two. They interviewed each other, and presented their colleague to the group. Also a confidentiality agreement was signed.

- b. Second session

The second session started with the question "What do you believe causes stress and burnout?" Participants then had to brainstorm and write down all possible causes both on individual and organisational level. All answers were collected and put on a board. This made it possible for each participant to see what answers their colleagues gave and where similarities and discrepancies were. This list was used in the following sessions as an input for discussion.

- c. Remaining sessions

The remaining sessions focused on prevention and finding solutions.

Benefits

The peer support group intervention had positive effects on general health, perceived quantitative demands at work, perceived change of work conditions, participation, development opportunities and support at work. In order to reduce work-related stress and burn-out, peer support groups reflecting the problem-based method can be used as a tool.

Legislation
No reference to legislation.
Further information
Peterson, U.; Bergström, G.; Samuelsson, M.; Asberg, M. and Nygren, A., 'Reflecting peer-support groups in the prevention of stress and burnout: randomised controlled trial'. <i>Journal of Advanced Nursing</i> , Vol. 3, No. 5, 2008, pp.506-516.
Question
Are peer support groups reflecting the problem-based method to address and manage work-related stress and burn-out used?
Part of incentive system **
No reference to incentive system. However, this established method could be integrated into an incentive system.

Solution
13 Project WISE: Workplace Initiative in Substance Education
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: New Mexico, USA ▪ Languages of instrument: Article is in English
Description of risk
<ul style="list-style-type: none"> ▪ Substance abuse (alcohol and other drugs)
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ <u>Health</u> ▪ HORECA

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> • <u>Human</u> • <u>Organisation</u> • Technology
Target group
<ul style="list-style-type: none"> • <u>Management</u> • <u>Employees/employee representatives</u> • OSH experts
Evaluation
<ul style="list-style-type: none"> • high • medium • low quality <p>Project WISE was a two-year intervention project, with a control group where no interventions took place. The researchers also used a two-year preceding implementation phase to compare results of the post-implementation phase. Elements such as healthcare utilisation, job turnover and absences are registered pre and post implementation.</p>
Practical solutions
<p>The target group of the 'Workplace managed Care Cooperative Agreement' project are 3,300 healthcare professionals in New Mexico, USA. Already different programmes exist to increase awareness and reduce substance abuse. The project WISE (Workplace Initiative in Substance Education) aims to evaluate whether an improved prevention programme can prevent risky drinking, reduce the prevalence of distress and improve employee wellness. The project was implemented at Lovelace Health Systems. Project WISE has different elements such as training, information and motivational counselling.</p> <p>The main aim of the project is to evaluate whether an improved prevention programme can prevent risky drinking, reduce the prevalence of distress and improve employee wellbeing. The project aims to:</p> <ol style="list-style-type: none"> 1. prevent the onset of risky drinking 2. reduce prevalence of risky drinking 3. better identify employees who abuse alcohol and drugs 4. improve employee wellness <p><u>Different steps are included in the process of peer support groups:</u></p> <p>The WISE project consists of different components. These components were selected based on the following criteria:</p> <ol style="list-style-type: none"> 9. acceptable to the health system,

10. could be integrated into existing programmes following termination of the research project,
11. would use existing resources and not be overly costly,
12. perceived as offering the greatest value.

- *Substance abuse class*

Supervisors and managers attended a class in substance abuse awareness. Trainers were the EAP (Employee Assistance Programme) manager and a physician certified in addiction medicine.

The presentations consisted of:

- Cost of alcohol and drug abuse to company and employee
- Warning signs for problems
- Company policies
- Importance of preventive interventions

Two-thirds of the supervisors and managers attended these five two-hour sessions. People who did not attend the classes received a self-instruction packet. The intention is to repeat these sessions yearly.

- *Seminars*

The seminars are for the employees, giving answers to the following questions: how to recognize alcohol and drug problems (among family members and colleagues)? How to access the EAP services? How to develop a healthy coping strategy when stressed?

The supervisor training sessions were planned first so that they were aware of the importance of the topic and could stimulate in a later phase the participation of their employees in the seminars.

- *Specialised education*

Employees that were identified as moderate or high-risk drinkers received extra education. They received a self-help manual and a video which shows that a healthy coping strategy is better for dealing with stress than substance abuse.

Employees not identified as moderate or high-risk drinkers but who are at risk because of their poor nutrition, inactivity or stress, received three videos (Connection Series). These videos showed how to live healthier, and how to deal with obesity or stress. Also the relation between obesity, inactivity, stress and substance abuse is explained.

All videos were free of charge, and accessible in the employee lounge.

- *Counselling sessions*

All employees and family had access to personal, motivational counselling sessions. These sessions aimed to reach mainly high-risk drinkers and employees with other health risks. The sessions were held off-site to ensure anonymity and the employees received additional information on professional help. The sessions were built on the FRAME principle:

- Feedback regarding the health implications of behaviour
- Responsibility for one's own actions
- A Menu of options for strategies for change
- Empathy
- Self-efficacy reinforcement

Benefits

This WISE project should prevent non-risky drinkers from becoming risky drinkers and decrease the number of risky drinkers among the personnel. Managers more aware of the problem and signals will recognise the problem faster, so preventive strategies can be integrated sooner which will lead to

improved wellness among all employees.
Legislation
No reference to legislation
Further information
Lapham, S.; Chang, I. and Gregory, C., 'Substance abuse intervention for health care workers: a preliminary report', <i>Journal of Behavioural Health Services and Research</i> , Vol. 27, No. 2, 200, pp. 131-143.
Question
Are prevention programmes used to reduce the abuse of alcohol and drugs?
Part of incentive system **
No reference to incentive system

Solution
14. Healthy working for health using the WEBA method
Country of origin
<ul style="list-style-type: none"> ▪ Name of country where the solution is applied: Netherlands ▪ Languages of instrument: Dutch
Description of risk
This strategy for risk prevention and management was implemented with the aim of reducing the high absenteeism rates reported.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ <u>HORECA</u>

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ <u>OSH experts</u>
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>The programme was evaluated for six months after implementation of the interventions. It involved a repetition of the survey, absenteeism data analysis and cost benefit analysis. Results indicated that employees expressed significantly fewer complaints related to aspects of job content, emotional stress and working environment. The survey also indicated a number of improvements in the workplace which are (possibly) associated with the measures already implemented. A significant reduction in absenteeism was also found.</p>
Practical solutions
<p>A tailor-made and step-by step strategy for risk prevention and management was implemented at in a hospital employing around 850 people in five sectors with the aim of reducing the high absenteeism rates reported.</p> <p>From the start, the project programme was integrated into the hospital's normal working conditions policy. To create support for the project an initial meeting was organised with the complete workforce to explain the goals and structure of the project. To gain a general impression of the problems at work in the hospital, a limited number of staff (all levels), known as 'key respondents', were interviewed using existing checklists on job content and organisation of work, on working conditions, on social relations at work and on terms of employment. The interviews were followed by an organisation-wide survey to analyse stress and health problems in more details. On the basis of the survey, a number of positions were selected for further analysis using the WEBA (Dutch abbreviation for Well-being at work). This method can be used to determine job-related stress risks and learning and developing opportunities. The WEBA method complies with the provisions of Section 3 of the Dutch Working Environment Act.</p> <p>The results of the survey revealed that there were a number of organisation-related problems, which lead to organisation-related and sector-specific health complaints. Although no direct statistical relationship and absenteeism could be demonstrated, the literature on absenteeism suggested that the organisational problems were likely to influence it. Consequently, the choice of measures was based on a 'multi-track' policy aimed at both the improvement of working conditions and employee's physical and mental health, and the intensification of inspection and absentees. An approach that</p>

combines three types of measures and positively influences employees' health and wellbeing in a more structured manner is an instance of integrated health promotion. Such an approach intends to go further than solely removing health hazards at the workplace.

In order to arrive at a coordinated set of measures, the steering committee first examined the question of whether the problems identified could be solved. The criteria used were: whether the cause of the problem was sufficiently clear, what measures the hospital could take, and the cost of such measures and expected (additional) yield. Following this examination, the committee decided to start sub-projects (interventions) to address work pressure, interior climate, physical load, provision of information, working hours and rosters, training and career opportunities, managerial style and lifestyle. The purpose of the sub-projects was to further elaborate and implement measures and solutions. The sequence of the interventions was mainly determined by the clarity of the solutions and time and manpower available to carry out the sub-projects. Each intervention was assigned a steering committee member as a coordinator. Responsibility for the implementation of each intervention was given to a single project group and the progress and coordination of the intervention was monitored by the steering committee.

The intervention requires external expertise to initiate the process, but the programme is flexible as it relies on in-house expertise in the form of employees and management of the organisation to design and implement the interventions. Such a programme is easily applicable in most large companies across industrial sectors.

Benefits

More employees thought they were more involved in improving the work situation and were more critical of their work situation. There was a shift in the organisational culture with a move from 'a wait-and-see attitude' when it came to bringing about improvements, to actively engaging in bringing change. The overall programme made the employees more aware of what was going on the various departments of the hospital, which led to a better understanding of each other and a more pleasant atmosphere. A cost-benefit analysis conducted indicated an overall financial benefit. The results of the inventions were also expected to continue to bear fruit in the future.

Legislation

In the Netherlands, work stress has been an important policy issue. It was in 1990, with the enforcement of Article 3 of the Working Conditions Act, that work stress became a high priority. This legislation has also promoted risk management at source. Since 1994 the legislation on Working Conditions was amended to fit the European Framework Directive (89/391/EEC), this resulted in more responsibility for employers and employees with respect to risk management and social security aspects. The shift to preventive action is considered effective by many practitioners as well many employers. Under this legislative framework, a tailor-made and step-by step strategy for risk prevention and management was implemented in a hospital employing around 850 people in five sectors with the aim of reducing the high absenteeism rates reported. Based on the idea that a risk prevention strategy can only work if it is supported by the entire organisation, a steering committee with a broad-based composition was selected to carry out the project. The 'Healthy Working for Health' steering committee comprised: the head of the care sector (also chair person), the head of personnel affairs, two supervisory staff members, the organisational expert, a work council member, a nurse, and an operational member of the radiology department and two consultants. The steering committee was responsible for the implementation and progress of the project programme.

Further information
Lourijzen, E.; Houtman, I.; Kompier, M. and Grundeman, R., 'The Netherlands: A hospital, Healthy working for health'. In C.L. Cooper and M. Kompier <i>Preventing Stress, Improving Productivity: European Case Studies in the Workplace</i> , Routledge, London, 1999, pp.85-120.
Questions
Are job-related stress risks in the work organisation analysed?
Part of incentive system **
No, reference to incentive system. However this established method could be integrated into an incentive scheme.

3.2.4. Solutions dangerous substances

Solution
15. Gloves - Innovations
Country of origin
EU
Description of risk
<p>Hand dermatitis (also known as hand eczema) often results from a combination of causes, including genetic makeup (constitutional factors), injury (contact with irritants) and allergy. It is frequently caused or aggravated by work, when it is known as occupational dermatitis. Hand dermatitis is particularly common in industries involving cleaning, catering, metalwork, hairdressing, healthcare and mechanical work.</p> <p>Hand dermatitis varies in severity. It may affect the backs of the hands, the palms or both sites. Often it starts as a mild intermittent complaint, but it can become increasingly severe and persistent. The affected skin initially becomes red and dry, and then progresses to itchy bumps (papules) and fluid-filled blisters (vesicles), scaling, cracking (fissures), weeping (exudation) and swelling (oedema). Bacterial infection can result in pustules, crusting and pain. Longstanding dermatitis at the ends of the fingers may result in deformed nails. Hand dermatitis can spread to affect other sites, particularly the forearms and feet.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction

<ul style="list-style-type: none"> ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews, case studies and expert opinions</p>
Practical solutions
<p>Occupational contact dermatitis can be prevented by applying the normal hierarchy of controls: i.e. hazard elimination, hazard substitution, engineering controls, safe work practices and, where this is not possible, personal protective equipment. Gloves have only been shown to help reduce the incidence of irritant occupational contact dermatitis when coupled with other preventive measures. They must be selected according to their chemical and physical resistance properties and their general suitability for the job tasks. Wet work is a significant risk factor for irritant contact dermatitis and occurs when the hands are in contact with water (including water diluted detergents) or where the prolonged wearing of gloves causes the hands to become moist from perspiration. Thin cotton gloves that absorb sweat may be worn inside occlusive gloves.</p> <p>The NHS Plus and the Royal College of Physicians subsequently published a systematic review of dermatitis [1, 2]. Among the recommendations from the review is that employers 'provide appropriate gloves and cotton liners where the risk of developing occupational contact dermatitis or urticaria can not be eliminated by removing exposure to its causes'. They state that limited wearing of gloves can help to reduce the incidence of irritant occupational contact dermatitis when coupled with other preventive measures and that wearing cotton glove liners can prevent the development of impaired skin barrier function that can be caused by prolonged wearing of occlusive gloves.</p> <p>The leading glove manufacturers, such as Comasec and Marigold, offer ranges of gloves that are designed for specific tasks and have 100% cotton liners incorporated into their design. Examples of these are the Comasec Multitop, Multipost and Multiplus gloves, Figure 1, offering mechanical,</p>



Figure 1. Comasec Multitop, Multipost and Multiplus gloves with integrated cotton liners

micro-organism and chemical protection while allowing perspiration to wick away from the hands. These gloves are stated as being suitable for applications where there are severe mechanical and chemical hazards.

In the food preparation and healthcare sectors antibacterial additives can be used to offer greater protection to the user as well as the recipient of the service. Two examples of this are the Marigold Ultrablade™ and the Ansell GMMEX. The Ultrablade™ is a cut resistant glove appropriate for meat preparation and has the AlphaSan® Antimicrobial protection system, an additive containing silver ions and offering active protection against a wide range of micro-organisms at low use levels. AlphaSan® antimicrobial additive will not vaporise or decompose during high temperature processing. Silver is safe for human contact and effective against a broad spectrum of micro-organisms. Marigold gloves are also available with Microban®.

The Ansell GMMEX® Powder-Free glove with AMT™ Antimicrobial Technology incorporates a proprietary antimicrobial coating to provide an additional level of protection to surgical staff against viruses and bacteria, in the event of a breach during surgery. The unique and proprietary inner coating contains skin-friendly agents and chlorhexidine gluconate (CHG), an effective antimicrobial agent commonly found in products such as antiseptics and mouthwash.

Extensive in vitro laboratory testing showed that the antimicrobial coating killed >99% of Hepatitis C1 and 99% of HIV-1 (strain Mn) within 60 seconds of exposure through a simulated glove breach. The glove also kills between 99.7% and >99.999% of eight common healthcare infectious bacteria, comprising gram-positive, gram-negative and drug-resistant bacteria (e.g. MRSA, VRE) within 60 seconds from exposure.

The problems with latex gloves, especially powdered gloves, are well documented [3]. Medical gloves are needed that provide excellent barrier protection, user comfort and acceptable cost. Latex gloves fulfil these criteria but should be powder free, very low in extractable latex protein, and have the smallest concentration and the fewest number of residual chemicals from manufacture [4]. There are gloves available that allow easy donning, even with damp hands, despite being powder free. The Gammex® PF which incorporates a water-based synthetic (polyurethane) inner-coating. A combination of hydrophilic and hydrophobic components are integrated within the inner coating. Friction and blocking is reduced by the hydrophobic components. Upon contact with wet hands, the hydrophilic components release a lubricant that improves ease of donning. The result is much easier intra-operative changes. Comasec/Marigold offer Biogel®, a thin inner coating of acrylate terpolymer. This smooth inner surface allows treated gloves (generally disposable gloves) to be easily donned with damp or dry hands without the need for a powder lubricant. This eliminates the risk of powder-related reactions and can aid in ensuring a powder-free environment.

Reducing the extractable latex protein can be achieved by avoiding latex altogether and several synthetic rubber alternatives are available e.g. Ansell Dermaprene®. Extracting the proteins that cause allergic reactions is also common [4,5] and so many latex gloves are low in extractable proteins, e.g. Ansell Encore® MicrOptic® states a very low protein content at 30µg/g or less of

water/extractable protein per gram. Barriers are also used to reduce skin contact with the latex, the Gammex® PF glove reduces possible contact with potential latex allergens, due to its synthetic inner coating, which provides a protective shield. The lengthy leaching processes and post-production washing cycles achieve the glove's very low protein content.

Reduced chemical residues also assure low allergenicity. Some manufacturers such as Caomsec/Marigold use the Oeko-Tex Standard 100 to demonstrate the low residue levels of its products, such as the Nitrotough™, figure 2. Other manufacturers state low residue levels for specific chemicals such as thiurams and MBT (mercaptobenzothiazoles).



Figure 2. Marigold Nitrotough Gloves

Due to the rising number of cancer cases and the increasing use of chemotherapy, laboratory workers are having more and more contact with hazardous cytostatic products. In collaboration with the Université Catholique de Louvain in Belgium, Ansell has participated in studies into glove permeation by cytostatic agents. This research has led to the development of a new product: the Ansell Gammex® PF XP™ (extra protection) glove, specifically designed to meet the safety requirements of cytostatics handling.

In tests, the Gammex® PF XP™ withstands a selection of cytostatics for up to 60 minutes, even after exposure to ethanol (which can degrade latex and result in faster permeation rates). An optimised wall thickness – 10% thicker – and a low risk of pinholes (AQL 0.65) both help to reduce permeability.

Healthcare workers are at risk of receiving percutaneous exposures to bloodborne pathogens, such as hepatitis (HBV and HCV) and HIV – especially in the operating room. Glove puncture during surgery can occur often. Orthopaedic surgery has the highest incidence of perforation, closely followed by gastrointestinal surgery. Most punctures occur without the wearer's knowledge. In many cases a breached glove barrier is not noticed until gloves are removed and blood is seen on the hand. Studies recommend that surgeons should change their gloves at least once an hour to avoid contamination with patient fluids.

Combined with frequent glove changes, double gloving (wearing two pairs of gloves) is probably one of the most effective methods to reduce exposure to blood-borne pathogens, as it reduces by a factor of 10 the number of potential exposures. Double gloving significantly reduces the perforation rate of the inner glove by at least 70% compared to single gloving.

Gammex PF® Underglove's inner coating integrates Ansell's exclusive HydraSoft® technology. It actively retains moisture and rehydrates your skin, defending against the negative effects of continual glove-wearing and frequent contact with severe anti-bacterials. HydraSoft helps keep your skin moist, supple and fulfilling its natural barrier function. The odourless innercoating made with HydraSoft technology contains a skin-friendly humectant moisturiser that attracts and retains water in the stratum corneum, and dimethicone forms a protective barrier to prevent skin from drying out.

Users benefit from reduced risk of latex sensitisation thanks to the Protein and Endogenous Allergen Reduction Leaching (PEARL) technology. Moreover, contact dermatitis is lessened because the accelerator is completely consumed during the manufacturing process. The Gammex PF® Underglove provides a high-strength barrier to infection with great tear resistance. This gives you an effective shield against viral penetration. A tough inner coating withstands alcohol-based

disinfectants. The Gammex® PF Underglove minimises hand fatigue due to the use of special formers during the manufacturing process. And its unique design – with an adhesive band at the top of a straight cuff – relieves pressure on the forearm while operating.

Extensive customer testing has been performed with 60 surgeons and nurses in hospitals in the United Kingdom, Germany and Finland. The result: 78% evaluated the Gammex® PF Underglove combined with the Gammex® PF as equal to or better than their current double gloving system.

The cuff length of the glove is also an important consideration as splashes and spills can lead to exposure beyond just the hands. Long cuff like those shown on the Marigold Pro-Tech™, figure 3 offer greater protection than normal length gloves.



Figure 3. Marigold Pro-Tech Gloves

Benefits

There is plenty of evidence to demonstrate the benefits of gloves in reducing exposure to hazardous substances. Many manufacturers are constantly improving the design of gloves to improve protection and limit the disadvantages of gloves, e.g. dermatitis.

Legislation

Biological Agents at Work Directive (2000/54/EC)
 Workplace Health and Safety Directive (89/391/EEC)
 Use of Work Equipment Directive (89/655/EEC)

Further information

- [1] Nicholson P.J. and Llewellyn D. (Editors). Occupational contact dermatitis and urticaria. *British Occupational Health Research Foundation*. London. 2010.
- [2] NHS Plus/Royal College of Physicians. Dermatitis: occupational health aspects of management: a national guideline. *RCP*. London. 2009.
- [3] <http://www.hse.gov.uk/pubns/indg320.pdf>
- [4] Sussman, G.L. and Beezhold, D.H. 'Safe use of natural rubber latex'. *Allergy and Asthma*

Proceedings, 1996, Vol. 17 No 2, pp.101-102,.

- [5] Baur X.; Rennert J. and Chen Z., 'Latex allergen elimination in natural latex sap and latex gloves by treatment with alkaline potassium hydroxide solution', *Allergy*, 1997, Vol. 52, pp.306-311.
- [6] Yeang H.Y.; Sunderasan E. and Hafisah Mohd Ghazali. 'Latex Allergy Studies: Extraction of natural rubber latex proteins with reference to film thickness, latex d.r.c. and protein migration behavior', *Journal of natural Rubber Research*, 1995 Vol. 10, No 1, pp.46-62.

Question

In the selection of gloves: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?

In the selection of gloves: are their general suitability for the job task taken into account?

Were specific instructions given regarding the proper use of gloves (frequent glove changes, double gloving, etc.) to offer greater protection to the user?

If latex gloves are used: are they powder free, very low in extractable latex protein, and have the smallest concentration and the fewest number of residual chemicals from manufacture?

Many improvements have been made in the design of gloves for PPE, have these been taken into account in selecting appropriate gloves?

Part of incentive system

- Yes, reference to incentive system
- **No**

Solution
16. Needle Stick and Other Sharps Injuries - Safe Instruments
Country of origin
Germany
Description of risk
<p>Health care workers are at risk of infection of blood-borne viruses due to needlestick injuries and other injuries from sharp objects. The main viruses of concern are the hepatitis B virus, hepatitis C virus, and HIV. The risk of transmission after exposure to HIV-infected blood is about 0.3%, for hepatitis B virus 30% and for hepatitis C virus about 10%. According to the WHO report 2002, 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV infections of all health care workers are due to needlestick injuries.</p> <p>Causes of needle stick injuries:</p> <p>According to a German survey about 39% of needlestick injuries occur during a process with needles, and about 27% occur during disposal of needles</p> <p>Main causes of needlestick injuries are :</p> <ul style="list-style-type: none"> ▪ Recapping ▪ Needle removal manually ▪ Inadequate disposal of needles ▪ Process related ▪ Due to third party fault <p>CCOHS, needle stick injuries. Available at: http://www.ccohs.ca/oshanswers/diseases/needlestick_injuries.html</p> <p>WHO, needlestick injuries. Available at: http://www.who.int/occupational_health/topics/needinjuries/en/index.html</p> <p>Wicker, S. et al, Prevalence and prevention of needlestick injuries among health care workers in a German university hospital, Int Arch Occup Environ Health, 2007. Available at: http://www.safetysyringes.com/healthcare/files/Prevalence.pdf</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human

<ul style="list-style-type: none"> ▪ Organisation ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
<p>Evaluation</p>
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case reports</p>
<p>Practical solutions</p>
<p>Safe instruments can prevent injuries with active or passive safety measures:</p> <p>Passive means that prevention measures are automatically activated. Passive systems are e.g. safe needles that are automatically and instantly retracted from the patient into the barrel of the syringe and then rendered not reusable (Venflon™ Pro Safety, BD Nexiva™).</p> <p>Active means that the user has to activate the safety measures by him or herself. Examples are safety shields that are attached to a needle. After removal of the needle from the vein the shields are activated by using e.g. the thumb to push forward on the shield (BD Eclipse™ over the BD SafetyGlide™).</p>
<p>Benefits</p>
<p>The use of appropriate innovative products that can reduce accidental punctures by contaminated needles will reduce or eliminate the injection of hazardous fluids into the body through the skin.</p>
<p>Legislation</p>
<p>Biological Agents at Work Directive (2000/54/EC) Workplace Health and Safety Directive (89/391/EEC) Use of Work Equipment Directive (89/655/EEC)</p>
<p>Further information</p>
<p>BAuA, Stop Nadelstich. Available at: http://www.stopnadelstich.de/images/daten/stop-broschuere.pdf</p>

TRG 250,

Haamann, BGW, 'Überblick über Produkte zum Schutz vor Nadelstichverletzungen'. Available at: http://www.infektionsschutz.gesundheitsdienstportal.de/docs/handlungshilfen/sichere_instrumente.pdf

'Safety first, Nadelstichverletzungen stoppen'. Available at: http://www.nadelstichverletzung.de/wie_koennen_sie_sich_schuetzen.html

'Safety needles and sharp devices'. Available at: http://www.sustainablehospitals.org/cgi-bin/DB_Report.cgi?px=M&rpt=Cat&id=19

The German statutory accident insurance for health care provides a list of safe instruments to prevent needlestick injuries: Liste sicherer Produkte, Schutz vor Stich und Schnittverletzungen, BGW themen. Available at: http://www.kv-hessen.de/kvhmedia/Downloads_neu/Mitglieder/Qualit%C3%A4t/Team_QM-p-4033/Infos_alphabetisch-p-5413/Liste_sichere_Produkte_pdf.pdf

Question

Are safe instruments used to prevent needle stick injuries?

Are passive safety measures (e.g. safe needles that are automatically and instantly retracted from the patient into the barrel of the syringe and then rendered not reusable) used to prevent needle stick and other sharp injuries?

Are active safety measures (e.g. safety shields attached to a needle that after use are activated by using the thumb to push forward on them) used to prevent needle stick and other sharp injuries?

Part of incentive system

- Yes, reference to incentive system
- No

Solution

17 .Needle Stick and Other Sharps Injuries - Various

Country of origin

EU and USA

Description of risk

There are more than 100,000 needlestick injuries in hospitals in the UK each year. Needlestick injuries are virtually undocumented in many developing countries, but probably equal or exceed those in the industrial world.

<p>Some 10 million needles are used every year in the NHS in Scotland with around 4,000 needlestick injuries, two-thirds of which are suffered by nurses. Healthcare workers worldwide are concerned about needlesticks and other sharps injuries that result in life-threatening infections. Far too often healthcare workers are becoming patients themselves after being injured by contaminated medical sharps. These healthcare workers are contracting potentially deadly infections from sharps injuries that are largely preventable.</p> <p>Discarded needles are commonly found in parks, playing fields, beaches, public toilets, communal stairways and alleyways. Thousands of Australian hospital workers suffer needle-stick injuries each year and the incidence is increasing. Doctors, nurses and scientists warn that the problem is far greater than statistics reveal, claiming that many injuries go unreported. Australian ambulance drivers indicate that needle-stick injuries are an occupational hazard to them because they are often called to treat drug-overdose and psychiatric patients, the homeless, victims of severe trauma and the dying. The risk of occupational sharps injuries can confront ambulance workers while helping in car wrecks, toilets and dingy corridors when an ambulance officer has precious seconds to save a life.</p> <p>There is potential for injection of hazardous drugs, but injection of infectious fluids, especially blood, is by far the greatest concern. Even small amounts of infectious fluid can spread certain diseases effectively.</p> <p>Accidental injection of blood-borne viruses is the major hazard of needlestick injuries, especially the viruses that cause AIDS, hepatitis B, and hepatitis C.</p> <p>The risk of infection after exposure to infected blood varies by blood-borne pathogen. The risk of transmission after exposure to HIV-infected blood is about 0.3%, whereas it is estimated to be up to 100 times greater for hepatitis B virus (30%) and could be as high as 10% for hepatitis C virus.</p>
<p>Sector</p>
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
<p>HOT</p>
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
<p>Evaluation</p>

- High
- Medium
- **Low quality**

Based on expert opinions

Practical solutions

The International Sharps Injury Prevention Society, ISIPS, was formed to reduce the number of accidental needle stick and other sharps injuries that occur globally by promoting the use of safety-engineered products and services.

ISIPS is an international group of medical device and pharmaceutical manufacturers, health organisations, healthcare professionals and medical waste disposal experts. They have the following aims: to provide education, information and product knowledge that help reduce the number of sharps injuries.

ISIPS promotes the products and services that encompass the entire universe of safety products from modified sharps to alternative products that actually eliminate the sharp. They frequently conduct and promote a variety of activities that promote sharps safety. These activities include:

- Annual International Sharps Injury Prevention Awareness Month held every December.
- Sharps Injury Prevention Award given to recipients who have made outstanding achievements in needlestick reduction each year.
- Participation in seminars that provide outreach programmes to state hospital associations, local APIC chapters, and large hospital systems.
- Provide presentations at national and international safety conferences.
- Provide articles for a number of infection control and clinician-focused medical journals.
- Provide on-line educational programmes on a variety of sharps safety and blood-borne pathogen exposure prevention topics.

The ISIPS website provides a list of safety products designed to reduce needlestick and sharps injuries. Available at: http://www.isips.org/the_list.php

It also provides evaluation forms for workers to evaluate safety products. Available at: <http://www.isips.org/ispef.php>
<http://www.isips.org/tdict.php>

Benefits

The use of appropriate innovative products that can reduce accidental punctures by contaminated needles will reduce or eliminate the injection of hazardous fluids into the body through the skin.

Legislation

Biological Agents at Work Directive (2000/54/EC)
 Workplace Health and Safety Directive (89/391/EEC)
 Use of Work Equipment Directive (89/655/EEC)

Further information
<p>http://www.isips.org/index.php</p> <p>Further advice on avoiding needlestick injuries is available: http://www.hse.gov.uk/healthservices/needlesticks/</p>
Question
<p>Are new innovations regularly considered to control the risk of needlestick injuries?</p> <p>Is education, information and product knowledge provided to help reduce the number of needle stick and sharps injuries?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
18. Needle Stick Injuries - StickSafe
Country of origin
UK
Description of risk
<p>Needlestick injuries are accidental skin puncture wounds caused by needles and other medical sharps after they have already been used to treat patients. Such injuries are a daily risk to healthcare workers, occurring in the course of performing routine and frequent procedures using needles. Needlesticks carry the risk of infection of many potentially lethal diseases including HIV and Hepatitis, which can require a lengthy and expensive treatment process, including tracing the source of contact, blood tests, post-exposure drug prophylaxis and, in instances of proven infection, long-term drug treatment. In the UK alone needlesticks are the second biggest cause of injury in the NHS, affecting more than 100,000 healthcare workers and costing the NHS at least £300million per year in prevention and treatment.</p> <p>It is a huge and dangerous global problem, especially in developing countries and, according to the WHO, is costing around £5billion to prevent and treat.</p>

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case reports</p>
Practical solutions
<p>StickSafe is an award winning product* that will significantly reduce the incidence of needlestick injury by ensuring that standard needles can be used and disposed of safely.</p> <p>StickSafe is a simple, environmentally-friendly, low-cost device that can significantly reduce needlestick injuries from hypodermic needles and vacutainers. Its innovative design intuitively encourages healthcare workers to adopt safer workplace practices. StickSafe is a redesigned medical tray which incorporates a patented, easy-to-use clutch mechanism that allows the healthcare worker to safely unsheath the needle from the cap. Once they have completed their procedure it allows them to safely recap the needle. The risk of carrying an unsheathed needle around a busy ward is eliminated and, as needles can now be disposed of capped instead of uncapped, so too is the risk of needlesticks from incorrect disposal. StickSafe will also greatly reduce the amount of sharps waste, as the needle can now be disposed of without the syringe attached. In the UK, this means a potential cost saving for the NHS of £160 million. Initial user testing indicates that StickSafe can eliminate up to 53% of needlestick injuries.</p> <p>Impact of Use of StickSafe SpectraShield</p>



*Imperial College London's New Business Challenge 2007

Instructions for the use of SafeStick along with a video demonstration is available at: <http://www.sticksafe.com/demo/> (last accessed August 2010)

Benefits

The key benefits of SafeStick are:

- Low cost solution;
- Highly intuitive, easy-to-use
- Requires very little training to become proficient
- Compatible with familiar needle devices and techniques
- Simple and reliable
- Will save money on disposal costs – as a result of improved use of sharps bins, and through being able to safely use the more efficient and lower cost larger bins
- Reduces risk and fear of NSI to staff and patients
- Reduces risk of transmitting HCAI if replacing plastic trays that are not always cleaned before each use. New paper pulp trays are single use, and also eliminate the need or time to clean equipment

Legislation

Biological Agents at Work Directive (2000/54/EC)

Workplace Health and Safety Directive (89/391/EEC)

Use of Work Equipment Directive (89/655/EEC)

Further information

<http://www.sticksafe.com/>


<http://www.showcase.nic.nhs.uk/ShowcaseDetails.aspx?id=13>

Further advice on avoiding needlestick injuries is available:

<http://www.hse.gov.uk/healthservices/needlesticks/>

Question
<p>Are safety procedures developed for the disposal of used needle sticks and sharp objects? Are the diffusion of the procedures for the disposal of used needle sticks and sharp objects promoted?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
19 SpectraShield
Country of origin
Canada & EU
Description of risk
<p>Methicillin-resistant Staphylococcus Aureus (MRSA)</p> <p>Health-care workers who are nasal carriers can serve as sources of MRSA transmission, although they are not nearly as important a reservoir as are colonised or infected patients. Failure to identify health-care workers who are persistently colonised or infected can lead to continuing transmission despite implementation of barrier precautions and hand hygiene.</p> <p>Tuberculosis</p> <p>Transmission to hospital staff occurs through airborne droplet nuclei, usually from patients with pulmonary tuberculosis. The association of tuberculosis with HIV infection and multidrug-resistant tuberculosis are a current major concern</p> <p>Influenza</p> <p>The risks of having a workforce with poor levels of flu immunisation were highlighted by the speed of the outbreak at Royal Liverpool University Hospital (UK) over Christmas 2008.</p> <p>Data released by the Health Protection Agency (HPA) shows that a patient in a haematology ward was found to be suffering from a flu infection at the end of November. Within 10 days 11 cases were identified in haematology, the renal ward, accident and emergency and outpatients – while five members of staff were also affected. The strain was found to be resistant to a common antiviral treatment, oseltamivir, and a second drug had to be used. The virus was passed around the hospital, mainly by health workers. In total 115 cases of influenza A were confirmed.</p>

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case studies and trials</p>
Practical solutions
<p>The SpectraShield™ 9900 and SpectraShield™ Plus FFP3 Antimicrobial Respirator Masks are claimed by the manufacturer (Nexera Medical, Inc) to offer defence against infectious diseases, including the Avian Flu H5N1 Virus (commonly known as the bird flu), Tuberculosis, Streptococcus, Staphylococcus, MRSA, and more.</p> <div style="text-align: center;">  </div>

Based on a fabric (Fosshield®) produced by Foss Manufacturing Company, LLC, it incorporates Agion®, an antibacterial agent containing silver and copper ions which is claimed to be proven safe for extended contact with individuals.

With tested filtration performance equivalent to an N99 or greater (meaning 99% of contaminants are trapped in the filter and do not get through the mask), the SpectraShield™ 9900 and Plus FFP3 Antimicrobial Respirator Masks are claimed to exceed the guidelines for infectious disease exposure control established by the World Health Organization ("WHO") and the Center for Disease Control ("CDC"). The masks are stated to be scientifically proven to continuously combat the growth of harmful micro-organisms and biological pathogens and should be considered the number one choice in personal protection. Government, medical facility, utility, corporations, and families should have a stockpile of SpectraShield™ masks available.

Benefits

Respirators are certified by the National Institute for Occupational Safety and Health (NIOSH) and are rated based on the percentage of inhalable particles that they are able to filter from the air. Therefore, an N99 mask is able to filter 99% of small inhalable particles from the air. The SpectraShield masks are stated to be scientifically proven to continuously combat the growth of harmful microorganisms and biological pathogens. Available at:

http://www.cadth.ca/media/pdf/K0096_N99_Respirator_Masks_final.pdf

<http://www.flu.gov/professional/hospital/maskguidancehc.html>

Legislation

Workplace Health and Safety Directive (89/391/EEC)

Biological Agents at Work (2000/54/EC)

Use of Work Equipment Directive (89/655/EEC)

Further information

<http://www.agion-tech.com/>

<http://www.fosshield.com/index.cfm>

<http://www.nexeramed.com/cfiles/home.cfm>

The effectiveness of masks against influenza bioaerosols. Available at:

http://www.hsl.gov.uk/media/50561/evaluating%20the%20protection%20offered%20by_layout%201.pdf

The SpectraShield™ Plus FFP3 is approved in the EU for commercialisation as a FFP3 (French Standard) Antimicrobial Respirator Mask under EN149: 2001. Available at:

<http://www.nexeramed.com/cfiles/regulatory.cfm?region=eu>

Performance testing is given in full. Available at:

http://www.nexeramed.com/cfiles/products_ptesting.cfm

Question
<p>Are respirator masks used to defend workers against air transmitted infectious diseases?</p> <p>In the selection of respirator masks: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?</p> <p>In the selection of respirator masks: are their general suitability for the job task taken into account?</p> <p>Are specific instructions given regarding the proper use of respirator masks to offer greater protection to the user?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
20. Hazardous Pharmaceutical Drugs
Country of origin
EU
Description of risk
<p>A NIOSH alert issued in 2004 on 'Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings' starkly outlines the risks associated with working with or near hazardous drugs (for example, pharmacy and nursing personnel, physicians, operating room personnel, environmental services workers, workers in research laboratories, veterinary care workers, and shipping and receiving personnel). Although not all workers in these categories handle hazardous drugs, the number of exposed workers exceeds 5.5 million in the USA. Available at: http://www.cdc.gov/niosh/docs/2004-165/pdfs/2004-165.pdf (accessed November 2010)</p> <p>The alert provides the evidence for this occupation risk as well as detailing those at risk, exposure routes and the health effects.</p> <p>Pharmaceutical drugs have been successfully used in treating illnesses and/or injuries but often come with side effects. Whilst the potential therapeutic benefits of these drugs outweigh the risk of side effects for ill patients, exposed health care workers risk these same side effects with no therapeutic benefit. Drugs are classified as hazardous if studies in animals or humans indicate that exposures to them have a potential for causing cancer, developmental or reproductive toxicity, or harm to organs. Occupational exposures to hazardous drugs can lead to acute effects such as skin rashes, chronic effects, including adverse reproductive events and possibly cancer.</p> <p>The following list of activities may result in exposures through inhalation, skin contact, ingestion, or injection:</p>

- Reconstituting powdered or lyophilized drugs and further diluting either the reconstituted powder or concentrated liquid forms of hazardous drugs
- Expelling air from syringes filled with hazardous drugs
- Administering hazardous drugs by intramuscular, subcutaneous, or intravenous (IV) routes
- Counting out individual, uncoated oral doses and tablets from multidose bottles
- Unit-dosing uncoated tablets in a unit-dose machine
- Crushing tablets to make oral liquid doses
- Compounding potent powders into custom-dosage capsules
- Contacting measurable concentrations of drugs present on drug vial exteriors, work surfaces, floors, and final drug products (bottles, bags, cassettes, and syringes)
- Generating aerosols during the administration of drugs, either by direct IV push or by IV infusion
- Priming the IV set with a drug-containing solution at the patient bedside (this procedure should be done in the pharmacy)
- Handling body fluids or body-fluid-contaminated clothing, dressings, linens, and other materials
- Handling contaminated wastes generated at any step of the preparation or administration process
- Performing certain specialised procedures (such as intraoperative intraperitoneal chemotherapy) in the operating room
- Handling unused hazardous drugs or hazardous-drug-contaminated waste
- Decontaminating and cleaning drug preparation or clinical areas
- Transporting infectious, chemical, or hazardous waste containers
- Removing and disposing of personal protective equipment (PPE) after handling hazardous drugs or waste

There is very little, if any scope for the elimination and/or substitution of the chemicals and so preventative procedures and appropriate controls and PPE are required.

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology

Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews, case studies and expert opinions</p>
Practical solutions
<p>The basis of any solution will revolve around administrative controls and work practice controls. Administrative controls will include having policies and procedures in place to identify the hazards, limit the numbers of workers potentially exposed and on-going training and revision. Work practice controls will include specific ways of handling hazardous drugs that reduce worker exposure and may include using negative pressure technique when reconstituting powder drugs, locking connections on IV equipment or using needleless systems.</p> <p>Engineering controls includes equipment designed to contain the hazardous substance and reduce or eliminate worker exposure. Ventilated cabinets, such as a biological safety cabinet (BSC) or isolator are examples of engineering controls. These devices are designed to protect workers by containing aerosols that are generated during drug preparation. A Class II BSC has an open front and relies on airflow to move contamination away from the worker. Class III BSCs and isolators are closed during drug preparation, which takes place using gloved sleeves. All types of ventilated cabinets filter exhaust air through a high efficiency particulate air (HEPA) filter. Each can be exhausted outside or a certain amount of filtered air may be recirculated. Innovation in this area appears limited but advanced designs are available.</p> <p>A good example of this is Thermo Scientific's Safe 2020 Class II Biological Safety Cabinets. They claim advanced design features and compliance with stringent regulatory standards and certification to EN 12469. The relevant features of this cabinet are:</p> <ul style="list-style-type: none"> ▪ comfortable ergonomic design prevents user fatigue and promotes safe working habits ▪ Smart Flow* digital technology maintains consistent airflow during normal filter loading or temporary airflow obstruction. Pressure sensor monitoring ensures safe airflow across the entire work surface and an independent alarm system immediately alerts to any airflow obstruction ▪ Supply/exhaust air filter: H14 HEPA EN 1822, 99.995% at the most penetrating particle size (MPPS) ▪ Sash opening: 20cm working height; can be fully opened to 77.3cm for thorough cleaning ▪ Optional crossbeam UV irradiation in both side walls illuminates entire working area and ensures thorough disinfection for maximum sample protection ▪ Quiet: noise levels 56 or 58dbA, depending on model ▪ Frameless front sash and side glass window yields unobstructed view of the total work area

- Aerosol-tight window sealing for additional protection when cabinet is in stand-by mode
- Scratch-resistant stainless-steel work surface with indentations that trap spilled liquids

Closed system drug transfer device is also an engineering control designed to prevent leaking of drug during transfer from one container to another. While no substitute for a ventilated cabinet, they are valuable additions to the administration of hazardous pharmaceuticals.

Two products illustrate the innovations in the preparation of hazardous drugs. Problems can occur during transfer of pharmaceuticals from vials to syringes and infusion bag. Pressure disparities during drug transfer expel vapors, droplets and aerosols into the work environment, and are considered as one of the main routes of exposure. Two products that remove this risk are the EQUASHIELD® and the ICU Medical Genie™. EQUASHIELD® is a self contained drug transfer device that equalises pressure preventing the escape of vapours and aerosols whilst preventing transfer of environmental contaminants into the system. EQUASHIELD® claims that it is the only system to fully comply with NIOSH's definition of a closed system (NIOSH 2004). Once the correct dose has been transferred to the airtight syringe it can be transferred to the infusion or IV line adaptor. Available at: <http://www.cdc.gov/niosh/docs/2004-165/pdfs/2004-165.pdf> (accessed November 2010)

Other features of this product are that it prevents barrel and plunger contamination and has a fixed and fully shielded needle to offer protection against stick injuries.

The Genie™ is a closed, needle free vial access device that automatically equalises vial pressure. It reduces aerosols, vapours and leaks caused by pressurisation when accessing the vial. It removes the need to push contaminated air into the vial to extract the desired amount of drug.

No Needles are used in the Genie to ensure compliance with any needle-free policy and its literature states that closed; needle-free devices are recommended by NIOSH for the safe preparation of hazardous drugs.

The final line of defence is personal protective equipment (PPE) to provide a barrier between the worker and chemotherapy during mixing and drug administration. PPE that has been tested with hazardous drugs protects the worker from direct contact with the drug through absorption or inhalation. For hazardous drugs, the recommended PPE includes:

- Double gloves: tested with hazardous drugs, powder-free, latex, nitrile or neoprene
- Gowns: chemical protective, disposable, single-use, cuffs, back closure
- Eye protection: when splashing is likely
- Respirator/masks: for aerosols and spill clean-up

Benefits

The toxic effects of modern pharmaceuticals are well documented and with elimination and substitution not being options control is the only appropriate measure. These, and similar, devices will greatly reduce the potential for exposure to workers in the healthcare sector.

Legislation

Biological Agents at Work Directive (2000/54/EC)
 Workplace Health and Safety Directive (89/391/EEC)
 Use of Work Equipment Directive (89/655/EEC)

Further information
<p>http://thermoscientific.com/wps/portal/ts/products/catalog?navigationId=10447&categoryId=80429</p> <p>http://www.equashield.com/</p> <p>http://www.icumed.com/Docs-Oncology/M1-1186-Genie-Brochure-Rev7-web.pdf</p> <p>HSE guidance. Available at: http://www.hse.gov.uk/pubns/misc615.pdf</p>
Question
<p>Are appropriate technical control measures used (e.g. ventilated cabinet, self contained drug transfer device) to minimise the risk of exposure to hazardous pharmaceutical drugs?</p> <p>Are policies and procedures developed to identify hazards and limit the numbers of workers potentially exposed?</p> <p>Are appropriate personal protective equipment (PPE) used to protect the worker from direct contact (skin absorption or inhalation) with the chemotherapy during mixing and drug administration?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
21 Anaesthetic Gases
Country of origin
International
Description of risk
<p>NIOSH estimated that more than 200,000 (presumably US) health care professionals including anaesthesiologists, nurse anaesthetists, surgical and obstetric nurses, operating room (OR) technicians, nurses aides, surgeons, anaesthesia technicians, post anaesthesia care nurses, dentists, dental assistants, dental hygienists, veterinarians and their assistants, emergency room staff, and radiology department personnel are potentially exposed to waste anaesthetic gases and are at risk of occupational illness. Over the years there have been significant improvements in the control of anaesthetic gas pollution in healthcare facilities. These have been accomplished through the use and improved design of scavenging systems, installation of more effective general ventilation systems, and increased attention to equipment maintenance and leak detection as well as to careful anaesthetic practice. However, occupational exposure to waste gases still occurs.</p>

Inhaled anaesthetic agents include two different classes of chemicals: nitrous oxide and halogenated agents. The UK HSE has a long-term exposure limit (eight-hour TWA) of $183\text{mg}\cdot\text{m}^{-3}$ but no limit for the halogenated gases. OSHA has no permissible exposure limits regulating these agents. NIOSH issued recommended exposure limits (RELs) for both nitrous oxide and halogenated agents. The NIOSH REL for nitrous oxide, when nitrous oxide is used as the sole inhaled anaesthetic agent, is 25 parts per million (ppm) measured as a time-weighted average (TWA) during the period of anaesthetic administration. NIOSH also recommended that no worker should be exposed at ceiling concentrations greater than two ppm of any halogenated anaesthetic agent over a sampling period not to exceed one hour.

There is a degree of controversy regarding the health effects of anaesthetic gases although the weight of evidence does appear to show there should be concern among health care professionals regarding exposure to these compounds. While mutagenicity testing of nitrous oxide (N_2O) has demonstrated negative results, reproductive and teratogenic studies in several animal species have raised concern about the possible effects of nitrous oxide exposure in humans. Halogenated agents are used with, and without, N_2O and have been linked to reproductive problems in women and developmental defects in their offspring.

Baden, J.M. and Simmon, V.F. 1980. Mutagenic Effects of Inhalation Anesthetics. *Mutat Res* 75: 169-189.

Sector

- Construction
- **Health**
- HORECA

HOT

- **Human**
- **Organisation**
- **Technology**

Target group

- **Management**
- **Employees/employee representatives**
- **OSH experts**

Evaluation

- **High**
- Medium
- Low quality

Based on systematic reviews, case studies and expert opinions

Practical solutions

The preferred method to reduce occupational exposure to waste anaesthetic gases in both operating rooms (OR) and non-operating rooms settings is collection and disposal. Anaesthetic gas scavenging systems are the first line of defence and the preferred method of control to protect employees from exposure to anaesthetic gases. An effective anaesthetic gas scavenging system traps waste gases at the site of overflow from the breathing circuit and disposes of these gases to the outside atmosphere. The heating, ventilating, and air conditioning (HVAC) system also contributes to the dilution and removal of waste gases not collected by the scavenging system or from other sources such as leaks in the anaesthetic apparatus or improper work practices.

The exhalation of residual gases by patients in the post anaesthesia care unit (PACU) or recovery room may result in significant levels of waste anaesthetic gases when appropriate work practices are not used at the conclusion of the anaesthetic or inadequate ventilation exists. A non-recirculation ventilation system can reduce waste gas levels in this area. Waste gas emissions to the outside atmosphere must meet appropriate regulatory requirements.

A scavenging system consists of five basic components (ASTM, F 1343-91): A gas collection assembly to capture excess anaesthetic gases at the site of emission, and deliver it to the transfer tubing. Transfer tubing, which conveys the excess anaesthetic gases to the interface. The interface, which provides positive (and sometimes negative) pressure relief and may provide reservoir capacity. It is designed to protect the patient's lungs from excessive positive or negative scavenging system pressure. Gas disposal assembly tubing, which conducts the excess anaesthetic gases from the interface to the gas disposal assembly. The gas disposal assembly, which conveys the excess gases to a point where they can be discharged safely into the atmosphere. Several methods in use include a non-recirculating or recirculating ventilation system, a central vacuum system, a dedicated (single-purpose) waste gas exhaust system, a passive duct system, and an adsorber. A machine-specific interface must be integrated with a facility's system for gas removal.

Removal of excess anaesthetic gases from the anaesthesia circuit can be accomplished by either active or passive scavenging. When a vacuum or source of negative pressure is connected to the scavenging interface, the system is described as an active system. When a vacuum or negative pressure is not used, the system is described as a passive system. An effective room HVAC system when used in combination with an anaesthetic gas scavenging system should reduce, although not entirely eliminate, the contaminating anaesthetic gases. If excessive concentrations of anaesthetic gases are present, then airflow should be increased in the room to allow for more air mixing and further dilution of the anaesthetic gases. Supply register louvres located in the ceiling should be designed to direct the fresh air toward the floor and toward the health-care workers to provide dilution and removal of the contaminated air from the operatory or PACU. Exhaust register louvres should be properly located (usually low on the wall near the floor level) in the room to provide adequate air distribution. They should not be located near the supply air vents because this will short-circuit the airflow and prevent proper air mixing and flushing of the contaminants from the room.

The 3M Face Mask 6200 with 3M vapour cartridges F6005/6075 are marketed by Australian company Advanced Anaesthesia Specialists (AAS) as suitable PPE for anaesthetic gases.



Benefits

Whilst the health effects of exposure to waste anaesthetic gases (WAG) appear to be debatable it is generally considered to be of concern. A WAG scavenging system effectively reduces the potential for exposure to workers in the healthcare sector.

Legislation
Workplace Health and Safety Directive (89/391/EEC) Use of Work Equipment Directive (89/655/EEC)
Further information
http://www.osha.gov/dts/osta/anestheticgases/index.html#E1
Question
<p>Have anaesthetic gas scavenging systems for the recovery of waste anaesthetic gases been installed in the operating room?</p> <p>Are operating rooms equipped with adequate heating, ventilating and air conditioning systems that contribute to the dilution and removal of waste gases?</p> <p>Are appropriate work practices used to reduce waste gas level in operating rooms and post anaesthesia care unit?</p> <p>Are appropriate control measures taken to minimise the risk of exposure to waste anaesthetic gases?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

3.3. Checklist Health Care Sector

	Name of solution	Questions	Yes/no
Solutions physical load			
1.	Comprehensive patient handling approach (multi-component)	<p>Does the activity require patient-handling?</p> <p>If Yes:</p> <ul style="list-style-type: none"> ▪ is adequate training of workers on the correct handling of patients provided? ▪ are technical ergonomic measures taken to reduce the occurrence of MSDs? ▪ are physical exercise programmes for the workers offered for the prevention of LBP? 	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
<i>Solutions slips, trips and falls</i>			
2.	E-Learning and Web-based training tools to increase healthcare employees' awareness regarding the risks of slips, trips and falls	<p>Are employees aware of the risks of slip, trip and fall, and the factors that contribute to them?</p> <p>Do the employees know how to control risks of slip, trip and fall?</p> <p>Does the floor present loose finishes, holes and cracks, or worn rugs and mats?</p> <p>Does the lighting enable people to see obstructions, potentially slippery areas?</p> <p>Are there obstructions or objects left lying around that can easily go unnoticed and cause a trip?</p> <p>Does the footwear prevent slips and trips?</p> <p>Where floors can't be kept dry the shoes/boots have slip-resistant soles?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
<i>Solutions psychosocial risk factors</i>			
3.	Health Circles	<p>Is an assessment of psychosocial risks carried out?</p> <p>Is a participative problem-solving approach used based on 'employee expertise' to evaluate psychosocial risk factors and define solutions?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
4.	Survey feedback as a method of stress management	Is survey feedback used to reduce stressors in the workplace?	<input type="checkbox"/> yes <input type="checkbox"/> no
5.	The Work Site Profile (Arbetsplatsprofilen: Ett verktyg för systematiskt arbetsmiljöarbete)	<p>Are employees and managers involved to participate in the development and improvement of work conditions?</p> <p>Were tools (CD-package, leaflets, etc.) used to facilitate the involvement of workers in the development and improvement of work conditions?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
6.	The systematic approach model – how to prevent and overcome undesirable interaction	<p>Are procedures established for reporting and registration of unwanted undesirable behaviour?</p> <p>Are strategies implemented to improve the workplace in relation to undesirable</p>	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
		behaviour, bullying and harassment?	<input type="checkbox"/> yes <input type="checkbox"/> no
7.	'Safe care' programme	Are programmes used to decrease mental and physical violence and sexual intimidation in hospital?	<input type="checkbox"/> yes <input type="checkbox"/> no
8.	Violent Incident Form (VIF) and feedback programme	Are practical instruments established for reporting and registration of violent and threatening behaviour directed towards staff? Are strategies used to reduce violent and threatening behaviour directed towards staff?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
9.	Participative Intervention Programme	Are risk assessments conducted to determine the prevalence of adverse psychosocial work factors and psychosocial distress? Are interventions made to reduce adverse psychosocial work factors and psychosocial distress? Are activities developed to promote diffusion of the interventions to reduce adverse psychosocial work factors and psychosocial distress?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
10.	Project 'Health in working life': Standardised Participatory Organisational Intervention	Are activities developed to increase staff participation in identifying and solving work problems?	<input type="checkbox"/> yes <input type="checkbox"/> no
11.	Participatory Action Research project	Are workers involved in the identification of core causes of stress and suggestions for preventive actions?	<input type="checkbox"/> yes <input type="checkbox"/> no
12.	Peer support groups	Are peer support groups based on the problem-based method to address and manage work-related stress and burn-out used?	<input type="checkbox"/> yes <input type="checkbox"/> no
13.	Project WISE: Workplace Initiative in Substance Education	Are prevention programmes used to reduce the abuse of alcohol and drugs?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
14.	Healthy working for health – using the WEBA method	Are job related stress risks in the work organisation analysed?	<input type="checkbox"/> yes <input type="checkbox"/> no
Solutions for dangerous substances			
15.	Gloves – Innovations	<p>In the selection of gloves: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?</p> <p>In the selection of gloves: are their general suitability for the job task taken into account?</p> <p>Were specific instructions given regarding the proper use of gloves (frequent glove changes, double gloving, etc.) to offer greater protection to the user ?</p> <p>If latex gloves are used: are they powder free, very low in extractable latex protein, and have the smallest concentration and the fewest number of residual chemicals from manufacture?</p> <p>Many improvements have been made in the design of gloves for PPE, have these been taken into account in selecting appropriate gloves?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
16.	Needle Stick and Other Sharps Injuries – Safe Instruments	<p>Are safe instruments used to prevent needle stick injuries?</p> <p>Are passive safety measures (e.g. safe needles that are automatically and instantly retracted from the patient into the barrel of the syringe and then rendered not reusable) used to prevent needle stick and other sharp injuries?</p> <p>Are active safety measures (e.g. safety shields attached to a needle that after use are activated by using the thumb to push forward on them) used to prevent needle stick and other sharp injuries?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
17	Needle Stick and Other Sharps Injuries – Various	<p>Are new innovations regularly considered to control the risk of needle stick injuries?</p> <p>Is education, information and product knowledge that help reduce the number of</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
		needle stick and sharps injuries provided?	
18	Needle Stick Injuries – StickSafe	<p>Are safety procedures developed for the disposal of used needle sticks and sharp objects?</p> <p>Are the diffusion of the procedures for the disposal of used needle sticks and sharp objects promoted?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
19	SpectraShield	<p>Are respirator masks used to defend workers against air transmitted infectious diseases?</p> <p>In the selection of respirator masks: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?</p> <p>In the selection of respirator masks: are their general suitability for the job task taken into account?</p> <p>Are specific instructions given regarding the proper use of respirator masks to offer greater protection to the user?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
20.	Hazardous Pharmaceutical Drugs	<p>Are appropriate technical control measures used (e.g. ventilated cabinet, self contained drug transfer device) to minimise the risk of exposure to hazardous pharmaceutical drugs?</p> <p>Are policies and procedures developed to identify hazards and limit the numbers of workers potentially exposed?</p> <p>Are appropriate personal protective equipment (PPE) used to protect the worker from direct contact (skin absorption or inhalation) with the chemotherapy during mixing and drug administration?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

4. Preventive solutions in HORECA

4.1. Introduction

The hotel, restaurant and catering (HORECA) sector is an important, significantly growing service sector in the EU economy. It covers a wide range of different businesses including hotels, pubs, cafes, restaurants, as well as caterers and fast-food takeaways. The workforce in the sector is faced with a large number of physical and psychosocial risks such as: manual handling; slips, trips and falls; hazardous substances and biological allergen; irregular working hours; aggression by guests and colleagues; stress and more. A large number of jobs in the hotel and restaurant sector require no education and only a low level of training and experience. For that reason, the sector attracts many employees with a low educational level. Education activities and proper management of the risks and prevention of accidents and ill health could be efficiently supported by a set of selected solutions, applicable in the HORECA sector.

Presented solutions concern, among others, the particular safety issues in HORECA:

- musculoskeletal disorders
- aggression and bullying by colleagues and supervisors and guests
- job satisfaction
- work-life balance
- stress at work
- respiratory diseases
- skin problems
- biological risks
- improvement of safety culture

4.2. Solutions

4.2.1. Solutions physical load

Solution
1. Beds with a lift mechanism
Country of origin
Spain, Mallorca Languages of instrument: Spanish
Description of risk
Key risks for hotel cleaners arise from making beds, vacuuming, working in bent, twisted and other uncomfortable postures while cleaning, handling trolleys and trays etc (33% of total sick leave in the hotels of the group were registered among maids and 40% of this was due to back injuries).

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p><i>* it is possible to mark more than one sector for solutions that are general applicable</i></p>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>The replacement of beds in the rest of the hotels has not been completed yet. Improvements were carried out as part of the firm's investment project to enhance the quality of the facilities in order to meet market requirements. It also complies with the investment plan supported by the Balearic Islands Authority Tourism Department, to encourage public and private investments in order to attract younger, 'quality', tourism. Balearic Island's Health and Safety Secretary of the Union of Hotel Workers' of Comisiones Obreras expressed the Union's dissatisfaction with the pace of the process. According to them, the reason behind the slow pace is that the replacement schedule does not depend on the preventive requirements (effectively recognised by the employer) but on the general restoration plan that is being carried out by the company in different hotels of the Meliá brand in the Balearic Islands. Thus, it can be said that linking preventive measures to a company's general improvement plan has the advantage that the company is ready to accept a plan that requires a vast investment effort. But at the same time, it has the inconvenience of depending on strategic changes in the company, more than on the company's preventive policy and programme.</p>

Practical solutions

Preventive criteria for the acquisition of new beds included a mechanism to elevate the bed, thus making the maids' work easier. The idea was to lift the bedstead to reduce lower back efforts and torsion. Workers could use a lever to place the bedstead in either of two positions: 'high' or 'low'. The high position makes it easier to clean that part of the floor under the bedstead.

A hydraulic company developed a prototype model. The modified beds can be raised to a height of 90cm, which makes it possible to clean and the vacuum underneath with no need to move the bed. A preliminary assessment was carried out on the model by the preventive service and experts of the mutual insurance agency (Mutua Universal). The assessment consisted of watching a worker perform her tasks and taping the scene for ergonomic research.

Three different methods were used for research:

- postural research, comparing the posture adopted with the regular beds and with the new prototype
- bio-mechanical research to define the movements involved
- research on physical load measuring heartbeat rates

The opportunity to replace the beds came when a thorough overhaul was conducted in one of the hotels: the Palas-Athenea in Palma de Mallorca. A total reconditioning was carried out aimed at raising the quality standard of the facility from Sol standards to Melia's (a higher category), including the upgrading of the infrastructure. Workers expressed a high level of satisfaction with this solution. A significant reduction of absenteeism was observed within the next two years.

During health surveillance activities, the Preventive Service staff identified complaints among the chambermaids concerning shoulder aches and strain. A new risk assessment was carried out to find the reasons and to identify the efforts related to the new work process. As a result, a new protocol was implemented for bed tasks specifying which parts of the process must be carried out when the bed is lifted or lowered (for example, spreading the sheets in the lower position, since it is the most adequate method, and then to continue with the bed lifted).



Using an adjustable bed to reduce the risk of MSDs.	
Benefits	
<ul style="list-style-type: none"> ▪ A significant reduction of absenteeism among maids was observed within the next two years. ▪ The reduction of efforts in the arrangement of beds and the cleaning of the rooms was highly valued. ▪ These improvements and the higher category achieved by the hotel generated a side effect: an increase in the number of rooms to be cleaned by one maid and an increase in the tasks to be carried out in each room 	
Legislation	
<ul style="list-style-type: none"> ▪ Council Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace ▪ Reference to European legislation and the directives Council Directives: 89/391 (Framework Directive) and 90/269 (Manual Handling of Loads) 	
Further information	
Available at: http://osha.europa.eu/en/publications/reports/TE7007132ENC_horeca	
Question *	
Do you use beds with a lift mechanism?	
Part of incentive system **	
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no 	

4.2.2. Solutions slips, trips, and falls

Solution
2. Slips Assessment Tool (SAT).
Country of origin
:United Kingdom

Languages of instrument: English
Description of risk
Slips risk – wet or otherwise dangerous floors directly cause most slips and falls that occur in the foodservice industry (according to HSE slips and trips injuries comprise 38% of 'major' injuries in the food and drink industries for example causing a broken arm or requiring hospitalisation). Slips injuries are more prevalent in the food and drink industries than in most other industries.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p><i>* it is possible to mark more than one sector for solutions that are general applicable</i></p>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality
Practical solutions
Slips Assessment Tool (SAT) is a computer software package to assess the slip potential of pedestrian walkway/surfaces. It is used in conjunction with a portable surface roughness meter. This tool has been produced as a result of a research project commissioned by the Health and Safety

Executive and Health and Safety Laboratory in the United Kingdom

Many traditional slip test methods have only considered the physical nature of the floor. However, there are a number of contributory factors that cause pedestrians to slip. Slips Assessment Tool has therefore been designed to take a holistic approach in assessing the risk of slipping in a given location.

The slips risk is calculated using information supplied by the user during an assessment. Information such as: the surface microroughness data (collected using a hand-held meter); the causes of floor surface contamination; the regimes used to clean the floor surface (both in terms of their effectiveness and frequency); the footwear types worn in the area along with associated human factors (for example presence of elderly/vulnerable persons) and environmental factors. These are all considered by the system.

All the above mentioned data can be entered into a laptop computer (preloaded with the SAT software) on site for an immediate assessment of slip risk, what is the preferred method of operation. Alternatively, data can be recorded on site using proforma (an example attached) and entered into a PC later.

As a result a slip risk classification that gives an indication of the potential for a slip, is supplied to the user.

The SAT produces a summary page containing all the data input for a particular assessment and a 'score' from 0 to 40+ where:

- 0-20 indicates low slip risk
- 21 – 30 indicates medium slip risk
- 31 – 40 indicates significant slip risk
- more than 40 indicates high slip risk

The summary is saved as a computer file. The assessment can then, if desired, be repeated using alternative data such as reduced amount of floor contamination, better footwear etc.

SAT is designed to assist in the decision-making process when considering the risk of slipping in a defined area and can be used to show the influence of different control measures.

Because the slip risk produced by the tool may be strongly influenced by the information provided by the user, it should be stressed that the outcome generated by the tool is a subjective figure.

Benefits

The SAT was also designed to allow non-specialists to undertake informal slipperiness assessments without the need for formal assessment using complex or expensive test methods.

A bar chart in the summary indicates the control measures that would have the greatest impact on reducing the risk. The programme can be run several times in this way to produce a set of summary pages and scores which can then be saved and compared, to determine what changes or improvements would result in the best and/or most cost-effective reduction in the slip risk on a particular floor. The saved report includes the results bar chart.

SAT may be found by inspectors and other visiting staff as a useful aid during interventions on slips issues.

Legislation

- Council Directive 89/654/EEC concerning the minimum safety and health requirements for the workplace.

Further information
<ul style="list-style-type: none"> ▪ The Slips Assessment Tool (SAT) is a development of software which was produced by the Health and Safety Laboratory (HSL) to assist inspectors to assess slips risks on contaminated floors in, initially, the food processing industries. This was known as the Pedestrian Slipping Expert System (PSES). ▪ SAT version 1.0 was launched in October 2004. Following a survey of users a number of enhancements were incorporated and SAT version. 1.1.0 was issued in December 2006. ▪ The SAT software can be downloaded free from www.hse.gov.uk/slips/sat/satlaunch.htm (full instructions are available at http://www.hse.gov.uk/slips/sat/satlocalinstructions-zip.htm), but essentially the user saves SAT to a suitable folder on the hard drive of their PC, e.g. C:\Work\SAT. Any assessment reports that the system generates will normally be saved to this folder, too. ▪ To run SAT, users need to obtain a surface roughness meter. Available (commercially) are the following, that are thought to be suitable for the generation of roughness information for use with the SAT software: the Taylor Hobson Surtonic Duo (used by HSE/HSL), the Mitutoyo SJ-201P, the Mahr PS1.
Question *
Is a Slips Assessment Tool (SAT) used to assess the slip potential of pedestrian walkway / surfaces?
Part of incentive system **
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

Solution
3. Slips and Trips eLearning Package
Country of origin
United Kingdom Languages of instrument: English
Description of risk
<p>The main risk areas in catering and hospitality are caused by slips and trips, contact dermatitis and manual handling accidents.</p> <p>According to HSE data in 2006/07 1,863 people received an injury that kept them off work for more than three days, and 640 received a major injury (many resulting in broken bones).</p>

<p>As well as the personal cost, accidents can leave you shorthanded and can cost you money (e.g. sick pay, compensation claims, increased insurance costs).</p>
<p>Sector</p>
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p><i>* it is possible to mark more than one sector for solutions that are general applicable</i></p>
<p>HOT</p>
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
<p>Target group</p>
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
<p>Evaluation</p>
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality
<p>Practical solutions</p>
<p>A portion of the jobs in the hotel and restaurant sector require no education and only a low level of training and experience. For that reason, the sector attracts many employees with a low educational level. Waiters, reception personnel, and personnel in the catering sector and casinos, for instance, only receive basic training in the skills they need for the job, and are selected on their daily output and performance. Only a few jobs are occupied by trained professionals, including cooks, sommeliers and hotel managers. The hotel sector has the highest occupational level, because most of these professionals are employed here. Education and employee development opportunities in the tourism sector are scarce. The lack of experience and training generally means lower pay levels, which is particularly the case in times of recession. This causes a downward spiral. Only some of the countries report indications of an increase in educational level of the regular personnel in the sector.</p>

<p>Moreover according to an article of EMCC, the European Monitoring Centre on Change of the European Foundation, more than 40% of employees in the sector were relatively unskilled in the EU15 in 2000. Available at: http://www.eurofound.europa.eu/emcc/content/source/eu05025a.html?p1=ef_publication&p2=null.</p> <p>In 2004 a small increase in the proportion of those with upper secondary or tertiary education was seen, thus the qualification level of workers had improved slightly and the share of workers with relatively low skills had diminished.</p> <p>STEP is an eLearning package developed by the HSE, providing slips and trips guidance through interactive learning. STEP is a free-to-use online tool</p> <p>It is an easy way to learn about slips and trips: how they are caused, why preventing them is important and how to tackle them. STEP includes quizzes, videos, animations, case studies and interactive sequences to enhance the learning experience.</p> <p>Completing this package will help your understanding of slips and trips, but to reduce accidents you will also need to take action in your workplace.</p> <p>The course contains three levels</p>
<p>Benefits</p>
<ul style="list-style-type: none"> ▪ The general course is suitable for many different industries. The four other courses have been specifically designed for Food Manufacturing, Hospitality & Catering, Education and the Health Services. ▪ The Tool contributes to significant higher awareness of and knowledge on risks related to slips and trips at workplaces especially among low educated workers
<p>Legislation</p>
<p>Council Directives: 89/391 (Framework Directive)</p>
<p>Further information</p>
<p>Available at: http://www.hse.gov.uk/slips/step/index.htm</p>
<p>Question *</p>
<p>Are all employees trained in how to prevent slips and trips?</p>
<p>Part of incentive system **</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ no

4.2.3. Solutions psychosocial load

Solution
4. Covenant 'Happy Horeca'
Country of origin
<ul style="list-style-type: none"> ▪ Netherlands ▪ Languages of instrument: Dutch
Description of risk
<ul style="list-style-type: none"> ▪ The Happy HORECA covenant is an agreement between social partners with the purpose of decreasing the level of work pressure by 10% in the period between 2000 and 2004.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ <u>medium</u> ▪ low quality

The covenant and all activities that have been carried out have been evaluated by means of two questionnaires. One was carried out in 2000 and the other one in 2004. Approximately 2,300 employees have responded to the questionnaires.

Practical solutions

- To achieve this goal, a lot of actions and activities have been carried out:
- an information campaign
- website
- information materials
- workshop: 'Dealing with aggression'
- information meetings
- development of the Quicksan work pressure
- sector specific instrument to inventory and evaluate risks (Risk Inventory & Evaluation)
- descriptions of work processes aimed at specific functions and processes

Specific measures have been proved effective for specific target groups:

Receptionists (dealing with complexity and autonomy problems, discrimination and bullying, unwanted behaviour by customers, incorrect payment).

- Risk Inventory and Evaluation
- Task circulation
- Instruments to facilitate carrying heavy loads
- Workshop: 'Dealing with aggression'

Kitchen personnel (dealing with lack of social support and autonomy, possibilities for conversation, unwanted behaviour by colleagues and supervisors and incorrect payment).

- Regular meeting with supervisors about employability of employee
- Introducing machinery and equipment
- Improvement of work environment
- Variation of tasks

Waiters (lack of autonomy and information/feedback, discrimination, unwanted behaviour by colleagues and supervisors, incorrect payment).

- Risk Inventory and Evaluation
- Monitoring employees
- Variation and circulation of tasks
- Workshop: 'Dealing with aggression'
- Introducing machinery and equipment
- Improvement of work schedule
- Work meetings

Other HORECA personnel (dealing with lack of autonomy, bullying by colleagues and supervisors, threats by guests).

- Guidance in case of sickness absence

<ul style="list-style-type: none"> Improvement of work schedule
Benefits
The pressure of work in the HORECA has decreased by 31.2%. Measures seem to be most effective when tailored to specific sectors of functions. All measures mentioned above appear to be effective for the target group they are aimed at.
Legislation
This intervention does not make specific reference to any legislation.
Further information
Available at: http://www.arbobondgenoten.nl/arbothem/arboconv/sektdoku/horeca/eindrapportwerkdrukoreca.pdf (In Dutch)
Question
Do you take measures to decrease work pressure?
Part of incentive system
No reference to incentive system. However, could be integrated into an incentive system.

Solution
5. Crime Prevention Through Environmental Design (CPTED) model
Description of risk
More than 66% of workplaces homicides and nearly 20% of nonfatal assaults occur in the course of a robbery. The retail industry accounts for nearly half of all workplace homicides and almost one fifth of all non-fatal assaults, largely due to the frequency of robberies perpetrated against these business types.

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ <u>HORECA</u>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ Low ▪ <u>Medium</u> ▪ High <p>This programme was evaluated using a case-control study; whereby those cases participating the intervention are compared to similar cases not participating in intervention.</p>
Practical solutions
<p>CPTED concepts included several key measures:</p> <ul style="list-style-type: none"> ▪ keeping a minimum amount of cash in the register (eg, reducing available cash to \$50 for businesses with lower customer volumes, keeping a drop safe in the cash counter area) ▪ maintaining good visibility into and outside of the business (eg, removing signs, merchandise displays and advertisements that obstruct views) ▪ maintaining good interior and exterior lighting (eg, balancing lighting so people can see in and employees can see out) ▪ controlling access into and within the business (eg, locking non-customer entrances, minimising escape routes), training employees in crime control and injury prevention (eg, knowing what to do to prevent robberies by maintaining the physical environment; if a robbery occurs, complying with robber's demands to reduce the likelihood of injury)

<ul style="list-style-type: none"> posting security decals (labels) that indicate low cash availability and no employee access to safes <p>Overall, businesses that implemented the CPTED measures found that the rate of violent crimes decreased by 10%, as compared to businesses that did not implement such changes in their workplace. Additionally, those businesses that made such changes to their work environment saw rates of robberies and attempted robberies decrease by 19%.</p>
<p>Legislation</p>
<p>This intervention does not make specific reference to any legislation.</p>
<p>Further information</p>
<p>Casteel C.; Peek-Asa C.; Greenland S.; Chu L.D. and Kraus J.F., 'A study of the effectiveness of a workplace violence intervention for small retail and service establishments', <i>Journal of Occupational and Environmental Medicine</i>, 2008, Vol. 50, No. 12, pp.1365-70.</p>
<p>Questions/comments</p>
<p>Do you protect your business from robberies?</p>
<p>Part of incentive system</p>
<p>No reference to incentive system. However the solution suggested could be integrated into an incentive scheme.</p>

<p>Solution</p>
<p>6. Training Needs Analysis (TNA)</p>
<p>Country of origin</p>
<ul style="list-style-type: none"> United Kingdom, however, the TNA approach can be used in a variety of occupational sectors and sizes of enterprises. Languages of instrument: English
<p>Description of risk</p>
<p>The model tackles a large variety of undesired behaviour and takes into consideration different stages, from prevention to management and support. Targeting training needs aims to increase both individual and organisational skills. Other important topics central to training are knowledge of the nature of violence, violence effects and policies.</p>

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ <u>HORECA</u>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ <u>OSH experts</u>
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>The evaluation of the training package seeks to address whether the training made a difference and how; whether it is effective in delivering its intended outcomes and if legal matters are taken sufficiently into consideration. This was accomplished by conducting a comparative assessment of those individuals participating in the training, and a comparison group that received the same procedure but without the actual training. Measurements were taken prior to training, directly following and with a longer-term follow up.</p>
Practical solutions
<p>Training Needs Analysis (TNA) is a structured approach through which an analysis of incidents, a risk assessment and an examination of legal matters are conducted. Specifically, TNA seeks to address several key aspects when examining violence and bullying in the workplace: 1) exposure to violence, what forms of violence there are; 2) what factors make exposure more likely; 3) vulnerabilities (location, day or night, working alone etc.); 4) the existence of trigger factors and antecedents for violence, learning from employee experience; 5) what is the overall impact of exposure; and 6) how can this impact be changed through coping, managing situations, support etc.</p> <p>Assessment of training needs can be done in several ways: firstly, through incident report forms; secondly, investigations of the antecedents; and finally, consequences of specific incidents and legislative requirements. When designing training, four aspects are of central importance: (1) investigation and assessment of training needs; (2) actual training design; (3) delivering the training;</p>

(4) evaluation of the training.

Several trainer competencies are required to successfully conduct TNA: 1) knowledge, 2) translation from theory to practice, 3) drive to train and empower people, 4) facilitation that helps to build cooperation and change, 5) managing the learning environment for people.

Benefits

Overall the evaluation of the training package was successful in terms of the prevention and management of workplace violence. Positive impact has been judged in terms of the degree of change, pre to post training, in a range of outcomes, namely: fear of violence, anxiety about violence and perceived capability to respond to and manage difficult situations.

Legislation

Training Needs Analysis (TNA) is a structured approach through which an analysis of incidents, a risk assessment and an examination of legal matters are conducted. Following training, staff should feel more capable in front of violence, both in terms of individual capability (employee's own efforts) and collective capability (all community members working together against violence). This intervention does not make specific reference to any legislation.

Further information

Beech B. and Leather P., 'Workplace violence in the health care sector: A review of staff training and integration of training evaluation models', *Aggression and Violent Behavior*, Vol.11, No. 1, 2006, pp.27-43.

Leather, P., Zarola, A. and Santos, A., 'Building Quality Approaches to Work-Related Violence. Training: Pillars of Best practice'. In S. McIntyre and J. Houdmont (Eds.) *Occupational Health Psychology, European Perspectives on research, education and practice*, ISMAI, Castelo da Maia, Portugal, 2006, pp.205-232. : ISMAI.

PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org.

Question

Do you assess training needs in dealing with workplace violence?

Part of incentive system

No, reference to incentive system. However, this method could be integrated into an incentive system.

Solution

7. Organisational interventions in the service sector

Country of origin
<ul style="list-style-type: none"> ▪ Norway ▪ Languages of instrument: Norwegian
Description of risk
<p>Studies focusing on interactive service work that involves face-to-face interactions between employees and customers/clients have shown that employees tend to show symptoms of job dissatisfaction, stress, and emotional exhaustion because they are expected to display or suppress certain emotions in the performance of their jobs.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA <p>Although the interventions have been used in the retail sector, they are based on principles which are applicable in other sectors and therefore the interventions can be tailored for most organisations.</p>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ <u>Technology</u>
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>The intervention was implemented into two different types of work units, both in the service sector: municipal units and in retail units at a shopping mall.</p>

Twelve municipal work units participated in the study; eight units were randomly assigned to the experimental group (i.e., the intervention group), the remaining four units were allocated to a control condition (where the intervention was not implemented). Of the 30 retail work units that participated in the study; 17 were randomly allocated to the intervention condition and the remaining 13 to the control condition. The design of the study consisted of the following steps: pre-survey, interventions, interviews and observation, and post-survey. The variables under investigation and further explored by the survey were: job stress, subjective health complaints, burnout, and sickness absenteeism. During the qualitative element of the evaluation, observations in the workplace and unstructured interviews with participants were conducted during the implementation of the interventions. These were subsequently studied, analysed, and discussed among the researchers throughout the data-collection period. Researchers examined participants' reactions (either positive or negative) to the interventions.

Practical solutions

To meet the health challenges and reduce sickness absenteeism an organisational intervention was implemented in a retail sector.

The method utilised to identify the cause of stress, as perceived by the employees, was a three-step strategy culminating in a meeting where employees and their respective supervisors engaged in group discussion or 'search conferences'. Additionally, these organisational level interventions were underpinned by three theoretical traditions: (1) a focus on participation, dialogue and workplace democracy; (2) a primary emphasis on job redesign/environmental causes of illness rather than behavioural change aimed at the individual or on expressed symptoms of ill-health; and finally (3) using organisational theory as a method of initiating a learning process within the organisation, whereby improvements can be made in the performance of the organisational tasks and the value system of the organisation.

Prior to the start of the project, initial meetings were held between top-level management and researchers to discuss and outline the aims of the intervention. The researchers visited each unit and informed them about the research project. The initial phase of the intervention began with each employee describing a 'typical working day' to the researcher. The aim of this preliminary step was to identify stress-provoking incidents over the past three-week period. During the second phase of the intervention, the researcher analysed the collected information and diagnosed the problem. The identified problems were listed, in no particular order of importance, and distributed among the employees. The employees were then asked to discuss the identified problems in pairs or in groups of three at each work unit, and to prioritise possible solutions to the identified problems. A ranking list of the factors that needed to be reformed or changed was compiled, and this list became the basis of the discussion for the third phase.

During the third stage, managers and union representatives from each establishment were asked to identify one factor they wanted to change, before determining a strategy for how this change could be accomplished. The researchers ensured, through follow up visits, that the work units drew up a strategy for change in accordance with their targeted organisational factor.

Benefits

The survey results demonstrated positive changes on two factors for the retail sector employees; namely: depersonalisation and subjective health complaints. However, no significant differences in any of the outcome measures were observed in employees in the municipal units. The qualitative data demonstrated that constraints relating to interactional and organisational practices acted as a significant barrier in the full participation of employees in the study during the implementation of the interventions.

Legislation
This intervention does not make specific reference to any legislation.
Further information
PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org . Dahl-Jørgensen, C. and Saksvik, P.O., 'The impact of two organisational interventions on the health of service sector workers'. <i>International Journal of Health Services</i> , 2005, Vol.35, No. 3, pp.529-549
Questions
Do you take interventions on the organisational level to reduce stress?
Part of incentive system **
No reference to incentive system

Solution
8. Open Rota System for Work Scheduling
Country of origin
<ul style="list-style-type: none"> ▪ Denmark ▪ Languages of instrument: Danish
Description of risk
This intervention/approach is aimed to address psychosocial issues.
Sector
<ul style="list-style-type: none"> ▪ <u>Construction</u> ▪ <u>Health</u> ▪ <u>HORECA</u>

HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ <u>OSH experts</u>
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ medium ▪ low quality <p>The aim of the evaluation was to assess the impact of an open-rota scheduling system on the health, work-life balance and job satisfaction of nurses working in a psychiatric ward in Denmark. Eight nursing teams volunteered to participate in the study; four of which were randomly allocated to the intervention condition (where the teams implemented the intervention) and the remaining four to the control condition (where the teams did not implement the intervention). The random allocation was done so that the actual effects of the intervention could be compared between the teams implementing and not implementing the intervention. Participants, in both the intervention condition and in the control condition, were asked to complete a questionnaire survey prior to the intervention and 20 months later.</p> <p>An evaluation of the process involved in developing, implementing and maintaining the intervention was also conducted. This was accomplished by recording ongoing discussions between the researcher and the teams, and a series of interviews conducted with members of the teams to identify the potential barriers and facilitators to the process. The outcome measures, used to assess the effectiveness of the intervention, were indices surrounding work scheduling, work-life balance, and health and wellbeing.</p>
Practical solutions
<p>An approach which can involve multiple stakeholders working together for addressing psychosocial issues is the open-rota system for work scheduling. This approach/intervention was introduced into a Danish psychiatric hospital, with the overall objective of improving employee job satisfaction and work-life balance. Described below is an example of a work scheduling intervention developed to improve work scheduling for nurses; with the broader aim of increasing employee control and influence on their work schedule and, in turn, to promote increased job satisfaction and overall experience of work-life balance. Participants were actively involved throughout the entire intervention process: design, implementation and evaluation.</p>

<p>Each of the nursing teams, which volunteered to participate in this project, began by forming a steering group composed of safety, trade union and project representatives. The steering group was supported by a larger project group of five or six employees and two external consultants. The external consultants invited the steering groups to attend a one-day workshop during which case studies of work scheduling interventions were presented and discussed.</p> <p>Following the workshop the steering groups and larger project groups discussed and identified an appropriate work scheduling intervention to be implemented in the nursing teams. The intervention selected by the majority of the intervention groups was implementing an open-rota system. Within an open-rota system employees are asked to schedule their shift preferences into an open (and uncompleted) rota. When completing their preferred shifts into the open-rota, employees were asked to do so responsibly and fairly (i.e., considering the needs and preferences of the work colleagues and the relief required in other departments). One or two employees then had the responsibility of fine-tuning the rota; this responsibility was rotated between staff members each week.</p>
<p>Benefits</p>
<p>Evaluating the results of the intervention indicate the following observed benefits from the open-rota scheduling system: enhanced employee health, wellbeing, job satisfaction and work-life balance. Employees reported a greater level of satisfaction with their work hours and were less likely to swap their shift. Additionally, employees working within the open-rota scheduling system reported a significant increase in their work-life balance. Compared to the non-intervention group (the control group) the positive significant differences observed in the intervention group were: work-life balance, job satisfaction, social support and an overall increase sense of community in the workplace.</p> <p>Employees reported that the open-rota system not only saved time but also provided them with an insight into how the department operated, thereby suggesting a greater influence and greater overall level of satisfaction. Additionally, it was reported that the open-rota system had resulted in a greater understanding by employees of the availability and utilisation of resources, for example the cost of absenteeism. Furthermore, it was reported that the open-rota system increased team awareness within the groups. Based on the overall evaluation of the process-based assessment the authors concluded that the new approach to work scheduling took into account the needs and constraints of the individual, the group and the organisation-at-large.</p>
<p>Legislation</p>
<p>The Working Environment Act of 23 December 1975 lays down the functions and responsibilities of the institutions, authorities and persons responsible for the working environment in most sectors. Its objective is to ensure that working conditions will not be subject workers, in the short term, to accident or disease or, in the long term, to physical and psychological problems.</p> <p>The Act makes it compulsory for work to be conducted in such a way that employees' health and safety are protected. The obligation to produce a result implies findings that means establishing the sort of relationship between the employers and labour organisations (the social partners) which will ensure that health and safety problems at work are solved and working conditions are improved.</p> <p>As in the case of all other working environment problems psychosocial issues, according to the policy of the Danish occupational safety and health authorities, are best addressed by the management and employees of the enterprise. This should possibly be with assistance from their respective organisations, the occupational health service or other external sources.</p>
<p>Further information</p>
<p>PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org.</p>

Pryce, J.; Albertsen, K. and Nielsen, K., 'Evaluation of an open-rota system in a Danish psychiatric hospital: a mechanism for improving job satisfaction and work-life balance', *Journal of Nursing Management*, 2006, Vol. 14, pp.282-288.

Questions

Do you take measures to improve work scheduling?

Part of incentive system **

No reference to incentive system. This practical solution could be integrated into an incentive system.

Solution

9. Multi-disciplinary structured work shift evaluations to enhance team communication

Country of origin

- Netherlands
- Languages of instrument: Dutch

Description of risk

The overall objective of the intervention was to enhance team communication using *multi-disciplinary structured work shift evaluations* to stimulate recovery from work and decrease the persistence of unnecessary worries and bodily stress reactions after working time for employees

Sector

- **Construction**
- **Health**
- **HORECA**

HOT

The solution concerns:

- **Human**
- **Organisation**
- **Technology**

Target group
<ul style="list-style-type: none"> ▪ Management ▪ <u>Employees/employee representatives</u> <p>OSH experts</p>
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>To assess the effectiveness of the intervention, employees were assessed prior to and following the intervention using a series of self-report questionnaires. These examined (a) the quality and process of the intervention, assessed during the first three months of implementation; (b) the perceived effectiveness of the intervention and work organisation; and (c) staff health (i.e., work-related fatigue and emotional exhaustion).</p>
Practical solutions
<p>On two pre-determined days per week, the remaining 30 minutes of the day shift were allocated for the <i>multi-disciplinary structured work shift evaluation</i> within the department. During this meeting, all members of staff working on that shift met to assess how well the working day went and what had occurred during the shift. These meetings were facilitated by the evaluation leader (staff members were trained to lead these discussions) who structured the process, ensured the proper time span, guided the type of interaction between team members (i.e., ensuring a safe environment for feedback) and organised the communication (in regards to emotional events, teamwork, work roles, and organisational aspects) using pre-defined models of communication.</p> <p>Two training courses were conducted to prepare for the implementation phase of the multi-disciplinary structured work shift evaluation:</p> <ul style="list-style-type: none"> ▪ firstly, a one-day training course was provided for all staff members, with the overall objective of improving their interpersonal communication skills; ▪ secondly, a two-day course to train eight selected staff members to supervise the structure of the multi-disciplinary workshift evaluation <p>Prior to designing the intervention a risk assessment was conducted. This identified communication within the targeted worksite and among various staff members as the central issues. The administration of the two training courses was provided by a professional communication trainer. This particular intervention was implemented and evaluated in the healthcare sector. Major components of the intervention were designed to address the concerns identified in the risk assessment previously conducted in the department.</p>
Benefits
<p>Based on the results of the evaluation of the intervention, several benefits were observed:</p> <ul style="list-style-type: none"> ▪ The improvement of team communication was reported by the majority of intervention participants. ▪ Emotional exhaustion problems significantly decreased during the course of the intervention.

- A trend towards a decrease in work-related fatigue was also observed.
- Almost all of the participating employees reported experiencing satisfying communication with colleagues following the intervention.

In general, based on the evaluation of the collected evidence, the authors conclude that the multidisciplinary structured workshift evaluation was successful in improving communication and decreasing problems relating to emotional exhaustion.

Legislation

This intervention does not make specific reference to any legislation.

Further information

PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org.

Sluiter, J.K.; Bos, A.P.; Tol, D.; Calff, M.; Krijnen, M. and Frings-Dresen, M.H.W. , 'Is staff well-being and communication enhanced by multidisciplinary work shift evaluations?', *Intensive Care Medicine*, 2005, Vol. 31, pp.1,409-1,414.

Questions/comments

Do you enhance team communication by structured work shift communication?

Part of incentive system

No reference to incentive system. This practical solution could be integrated into an incentive system.

Solution

10. KAURIS method: Assessment and management of risks of violence in the retail sector

Country of origin

- Finland
- Languages of instrument: Finnish

Description of risk

The KAURIS method (Risks in the retail trade) is a systematic model for the assessment and management of the risks of third party violence in the workplace.

Sector
<ul style="list-style-type: none"> ▪ Construction ▪ <u>Health</u> ▪ <u>HORECA</u>
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ high ▪ <u>medium</u> ▪ low quality <p>The KAURIS method has been tested and evaluated during its development.</p> <p>A pilot study was conducted in several different target organisations. Researchers visited half of the participating organisations while the other half received only the handbook of the method. The pilot study demonstrated that the handbook gave sufficient information for interventions. A subjective assessment of the effectiveness of the KAURIS method observed by staff members was recorded. However, during the evaluation process the reduction of violent incidents was not measured. The authors note that there was no reporting system that would have fulfilled scientific criteria.</p>
Practical solutions
<p>The method includes a set of tools (such as check-lists and information sheets) to assess the risks of violence, and how the workplace is prepared for violent or threatening situations. The method includes the following steps:</p> <ul style="list-style-type: none"> ▪ collection of information on the working group and on the process and situation ▪ distribution of an employee survey about violent and threatening situations ▪ assessing the state of preparation for violent situations in the workplace ▪ development and planning of the interventions needed

<ul style="list-style-type: none"> ▪ training for the entire staff ▪ regular evaluation and development of the management on the risks of violence as part of normal daily life in the workplace. <p>Implementation of the KAURIS process utilises a participative approach in which a team, consisting of the supervisor and employees, is formed for planning and carrying out the necessary operations such as organising training, developing the work environment, supplying the necessary safety equipment etc. The entire staff is involved in the process.</p> <p>A core component of the method is staff training, where the knowledge and skills of staff and managers grow and develop. It is recommended that employees and managers work collectively to address the issues.</p>	
Benefits	
The method was found to be cost-effective and user-friendly.	
Legislation	
It is a basic but comprehensive method where the physical environment, training of the employees, and after care are taken into account. The method includes a set of tools (such as check-lists and information sheets) to assess the risks of violence and how the workplace is prepared for violent or threatening situations. The primary aim of KAURIS is to develop a more safe and secure workplace by training staff with the help of different kinds of technical and functional solutions.	
Further information	
<p>Isotalus, N. and Saarela, K-L, Kauris, 'menetelmä työväkivaltariskien kartoitukseen ja hallintaan (The method to assess and manage workplace violence risks)'. <i>Työterveyslaitos (Finnish Institute of Occupational Health)</i>, Helsinki, 2004.</p> <p>Isotalus, N., 'Prevention of physical violence at work', <i>African Newsletter on Occupational Health and Safety</i>, 2002, Vol. 12, pp.12-15.</p>	
Question	
Do you assess and manage risks of violence?	
Part of incentive system	
Yes, reference to incentive system	

Solution
11. Work Positive pack with HSE's Management Standards

Country of origin
<ul style="list-style-type: none"> ▪ This tool has been developed and implemented in the United Kingdom and Ireland. ▪ Instrument is available in English
Description of risk
<p>This practical solution is a flexible approach that has been used to address a number of health risks and health outcomes. The primary focus of this tool is to address organisational and psychosocial factors.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<p>The solution concerns:</p> <ul style="list-style-type: none"> ▪ <u>Human</u> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ <u>Employees/employee representatives</u> ▪ <u>OSH experts</u>
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>To date, Work Positive has been used on an estimated 25, 000 employees. The original tool was piloted in four organisations. The questionnaire was completed by employees while a co-ordinator from the organisation completed the benchmarking exercise. Both the employees and the co-ordinator completed an evaluation questionnaire and a random selection of employees were interviewed.</p>

There are 11 organisational case studies available on the work positive website, which provided examples of how organisations have tackled the five steps outlined (www.workpositive.co.uk)

Practical solutions

Work Positive is a stress risk management resource that consists of five steps..

Step 1: Look at the Hazards

As an initial step it is important to gather baseline data: for example, sickness absence data, productivity data, employee turnover, exit interviews, performance appraisal, return-to-work interviews. This information will help employers/organisations consider the current impact of stress and psychosocial risk factors on the organisation. It will highlight those employees most at risk and may provide an initial indication of the possible causes of stress.

Step 2: Identify who might be harmed and how

All staff groups can be affected by stress at work and something that is a source of stress for one individual may not be for another. At this stage of the process, it is important to decide how the organisation or 'target group' will be categorised to provide meaningful information. It is important to ensure that groupings are not too small, to ensure anonymity can be protected so that staff are honest and open in responding to the questionnaire.

Step 3: Evaluate the risk

Use the Work Positive risk assessment questionnaire to identify the main sources of pressure for staff. The Work Positive Questionnaire can be managed on-line by sending out paper copies to staff.

Step 4: Take action and record the findings

A good action plan should include the issue to be addressed, the solution, timescales for implementation, a lead person responsible for implementation and a review date. An [action plan template](#) can be used to help guide this process and can be found on the work positive website.

Step 5 Monitor and review

The steering group should meet on a regular basis to review the action plan and make sure that actions have been satisfactorily completed. It should revisit the 'states to be achieved' in the benchmark and consider whether progress is being made. In this stage of the process it is important for organisations to evaluate (or decide how to evaluate) the effectiveness of the actions put in place; and to ask employees for feedback.

Benefits

The work positive programme has been effectively implemented in a variety of sectors. Eleven organisational case studies are currently being written and will soon be posted on their website (www.workpositive.co.uk).

Legislation

This toolkit does not make specific reference to any legislation.

Further information

Healthy Working Lives – Work Positive: Retrieved from 15 November, 2010. Available at:

<p>http://www.healthyworkinglives.com/advice/workplace-health-promotion/workpositive/index.aspx PRIMA-EF- Best Practice Inventory. Retrieved 15 November 2010, from: www.prima-ef.org. Leka et al. (2008). <i>Towards the Development of a European Framework for Psychosocial Risk Management at the Workplace</i>. Nottingham, UK: Institute of Work, Health and Organisations. Available at: www.prima-ef.org.</p>
Question
Do you have a management approach to address stress risks?
Part of incentive system **
No reference to incentive system. This is an established method and could be integrated into an incentive scheme.

Solution
12. SMEs Vital
Country of origin
<ul style="list-style-type: none"> ▪ This tool has been developed and implemented in Switzerland. ▪ Instrument is available in: German, French and Italian.
Description of risk
This practical solution is a flexible approach that has been used to address a number of health risks and health outcomes. The primary focus of this tool is to address organisational and psychosocial factors.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
The solution concerns: <ul style="list-style-type: none"> ▪ <u>Human</u>

<ul style="list-style-type: none"> ▪ <u>Organisation</u> ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ <u>Management</u> ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ <u>high</u> ▪ medium ▪ low quality <p>The toolkit was initially implemented in 10 pilot companies (SMEs). The final assessment was conducted by an external, independent evaluator. A questionnaire covering eight dimensions of the working environment and containing items addressing the health status of employees was handed out prior to the implementation of the toolkit. In a follow-up survey (after 18 months), additional items were included to provide a process evaluation of the intervention. Additional items included assessing the participants' awareness of the programme, their level of participation, the accessibility of the programme, the level of personal competency building, the overall perceived profit derived from the programme and its impact on the working environment and workers health from an employee perspective. The evaluation of the toolkit revealed several positive outcomes. However, an economic evaluation of the programme has not yet been conducted.</p>
Practical solutions
<p>In Switzerland work health promotion practitioners and a group of Small and Medium Enterprises (SMEs) collectively developed and tested a web-based, standardised toolbox for comprehensive workplace health promotion with a concentrated focus on the unique needs of SMEs. This toolbox contains 10 modules that follow the risk management paradigm and have a particular emphasis on psychosocial determinants of health of the working environment. SME-Vital is underpinned by several key principles: participation (of all employees); integration into all areas of organisation (of health circles and employee surveys into organisational structures), project management and comprehensiveness with equal consideration of individual and environmental measures.</p> <p>The toolbox consists of several interrelated modules: basic modules which can be used as a workshop and implementation modules which consist of courses that address health behaviour (i.e., wellness and stress management), personnel development (i.e., team development, and health promoting management style) and organisational development (i.e., participatory job re-design and workplace design).</p> <p><i>Phases for the implementation of SME-Vital:</i></p> <p><u>Initiate Workplace Health Promotion:</u> An information brochure is disseminated within the workplace and a 'starter workshop' is conducted with top-management for initial motivation for workplace health promotion with the overall aim of conducting an organisational analysis.</p> <p><u>Workplace health promotion analysis:</u> Employee and management surveys are distributed with the aim of developing a bottom-up and top-down approach for promoting healthy working conditions.</p>

<p>Development of a work health promotion strategy: A health circle is used during this phase of implementation.</p> <p>Implementation of the action plan: Depending on the specific needs of the company, a variety of approaches can be used.</p> <p>Evaluate the results: This is accomplished by monitoring changes based on a repeated application of employee and management surveys and using the outlined company-specific goals of achievement as a benchmark.</p> <p>Consolidate and institutionalise workplace health promotion strategy: This is accomplished by engaging companies in a continuous-improvement cycle, by establishing 'health circles' as a sustainable structure for the workplace health promotion strategy.</p> <p>SME-Vital is a web-based toolbox currently available in German, French and Italian (www.kmu-vital.ch), free via the internet. It is composed of standardised modules which are flexible enough to be combined and adapted according to specific company needs.</p>
<p>Benefits</p>
<p>The following benefits derived from SME-Vital have been observed: (a) increased degree of communication between employees and management and an overall improved working climate; (b) increased motivation and performance of employees; and (c) increased competency in coping with demands and ongoing organisational change.</p>
<p>Legislation</p>
<p>This toolkit does not make specific reference to any legislation.</p>
<p>Further information</p>
<p>Bauer G.; Schmid M.; Lehmann K.; Kuendig S. and Kissling D., 'Entwicklung und Evaluation eines nationalen Programms für betriebliche Gesundheitsförderung in KMU'. <i>GfA-Press</i>, Dortmund, 2004.</p> <p>PRIMA-EF- <i>Best Practice Inventory</i>. Retrieved 15 November 2010, from: www.prima-ef.org.</p> <p>Leka, S.; Hassard, J.; Jain, A.; Makrinov, N. and Cox, T. Et al, 'Towards the Development of a European Framework for Psychosocial Risk Management at the Workplace', <i>Institute of Work, Health and Organisations Press</i>, Nottingham, 2008.</p>
<p>Question</p>
<p>Are the communication between employees and the management and overall safety climate being improved in the enterprise/organisation?</p>
<p>Part of incentive system **</p>
<p>No reference to incentive system. However, as this is an established method this could be integrated into an incentive scheme.</p>

4.2.4. Solutions dangerous substances

Solution
13. RPE – Selection and Face Fit
Country of origin
EU
Description of risk
<p>Airborne respiratory risks include: flours, house dust, moulds, mutagenic aldehydes and particulate matter.</p> <p>A variety of masks could be used to control many of these risks. Incorrect selection of a mask will significantly reduce the protection provided to the wearer.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality

Based on systematic reviews, case studies and expert opinions

Practical solutions

The use of nuisance dust masks, also known as comfort masks or hygiene masks should be discouraged in favour of approved CE-marked disposable respirators instead. The CE marking (also known as CE mark) is a mandatory conformance mark on many products placed on the single market in the European Economic Area (EEA). The CE marking certifies that a product has met EU consumer safety, health or environmental requirements.

HSE press release E003:03 - 17 January 2003

You should ensure that the wearers of tight fitting facepieces have undergone facepiece fit testing. This is needed to ensure that the selected facepiece can fit the wearer correctly. You could use facepiece fit testing as a training tool to show the consequences to performance of poor fitting and misuse. It is also a good tool for screening out incompatible RPE. The supplier of your RPE can suggest the most appropriate method.



TSI Portacount Plus



3M Qualitative Fit Testing Kit

There are two methods for Fit Testing, Quantitative and Qualitative.

Quantitative tests can be used to fit test all types of tight-fitting masks including disposable, half and full face masks. Quantitative tests give an objective assessment of facial fit and provide a direct numerical result called a Fit Factor. The most widely-used quantitative method for RPE fit testing is the Particle Counting Device method e.g. TSI Portacount Plus.

Qualitative tests rely on the wearer's subjective assessment of faceseal leakage. These methods, during a set of test exercises, use the wearer's sense of smell or taste to detect faceseal leakage of a test agent. Qualitative tests are subject to problems with sensitivity, lack of objectiveness and inability to provide a numerical result. For these reasons Qualitative tests can only be employed for fit testing of filtering facepieces (disposable masks) and half masks, not full-face masks. Kits are available e.g. 3M Qualitative Fit Test Kit.

Facemask fit testing is a legal requirement for checking that a tight-fitting face mask matches the person's facial features and seals adequately to the wearer's face. It will also help ensure that incorrectly fitting face masks are not selected for use.

Benefits

Only after face fit testing can a worker be assured that the mask they are wearing is offering the highest level of protection.

Legislation
<p>Biological Agents at Work Directive (2000/54/EC) Workplace Health and Safety Directive (89/391/EEC) Use of Work Equipment Directive (89/655/EEC)</p>
Further information
<p>Guidance is available for mask selection e.g. HSG53. Available at: http://www.hse.gov.uk/pubns/priced/hsg53.pdf Detailed information can be found in the HSE document "Fit testing of respiratory protective equipment facepieces". Available at: http://www.hse.gov.uk/foi/internalops/fod/oc/200-299/282_28.pdf</p>
Question
<p>Is the Respiratory Protective Equipment ((RPE) being used fit for its purpose of protection?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
14. Innovative system solution for raw material logistic: flour moistening
Country of origin
Germany
Description of risk
<p>Baker's asthma is an allergy caused by the inhalation of flour dust. It is one of the most common forms of occupational asthma. Workers who are allergic to flour dust may be unable to work with flour because the exposure to a very small quantity of it can cause an asthmatic attack.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction

<ul style="list-style-type: none"> ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case studies</p>
Practical solutions
<p>MoisTec system is a dust free technology to prevent baker's asthma.</p> <p>The principle is based on sprinkling the flour with water before dough production. Normally flour has a moisture content of about 11 to 15%. Due to the sprinkling the content goes up to 30%. The flour is immediately processed to dough.</p> <p>MoisTec consists of a storage hopper, a moistening unit and an operation panel.</p> <p>The flour is transported from the storage hopper to the mixing-head by means of a conveying screw. There the flour is moistened with a predefined amount of water. The water binds the fine particles of dust to a harmless particle size, whereby the development of dust is reduced by up to 98%.</p>



Additional positive effect of moistening the flour: the quality of the dough is improved as well as of the end product.

The process is not only an advantage for dust flour but might be useful for other powdery products. Different tests have been started already.

Benefits

- Flour allergy and baker's asthma are prevented
- Great reduction in dust development during flour discharge and the kneading process
- Drastic reduction of the dust concentration during the handling of dusting flour
- Improvement in the working environment
- Shorter kneading time and reduction of kneading energy
- Better dough processing
- Better water absorption of the flour particles
- Easier removal of dough from the kneader
- Accelerated soaking
- Increase in the baked goods yield
- Longer fermentation tolerance
- Longer dough processing possible
- Reduction in the raw material costs by a decrease in flour amount requirements and no need to purchase expensive dust-free flour
- Better baking results – most notably wheat doughs keep their form better and are shown to have improved machine-processing characteristics
- The baked goods remain fresh longer due to the increased moisture content
- Fast and easy cleaning of the system
- Less time and effort in cleaning the bakery

Legislation

Health and Safety of Workers Directive (98/24/EC; within 89/391/EEC)

Further information
<p>Reimelt website. Available at: http://www.reimelt.de/en/area-of-expertise/equipment/area-of-expertise/</p> <p>BGN, Wie das Mehl das Stauben lässt. Available at: http://www.bgn.de/478/1951</p> <p>BGN, Mehlbenetzung und staubarmes Trennmehl verhindern einatembaren Mehlstaub, akzente 2/2009, pp. 20. Available at: http://www.bgn.de/files/9342/22493/1/wcoi4a082bf860609.pdf</p>
Question
<p>Are the employees prevented from risks related with flour dust (in bakeries)?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
15. Microfibre – an alternative way to clean
Country of origin
Sweden
Description of risk
<p>Cleaning products can contain dangerous substances that may enter the body through inhalation and skin contact. If exposure is too high for too long, there is a high risk of developing breathing problems or skin disease such as eczema, see Agency E-Fact.</p> <p>Available at: http://www.arbeitsinspektion.gv.at/NR/rdonlyres/12868056-2A96-4FA3-A189-38509BF412EF/0/Cleanersanddangeroussubstances.pdf.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA

HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case and cost comparison studies</p>
Practical solutions
<p>A new cleaning technology: cleaning with microfibre cloths.</p> <p>The Tergo Ultra Microfiber cloths, an alternative way to clean, were developed in 1990 for the cleaning industry by Olsson Cleaning Technology. Having manufactured cleaning products for 26 years, they developed the technology and a special process to manufacture a fabric with a very thin weave called Ultra Microfiber. Consisting of a nylon blend of polyester and polyamide, the products have optimal cleaning capacity. The Ultra Microfiber is so small that one square centimetre contains more than 30km of microfiber. It's these thousands of individual micro strands in the fabric that does the cleaning, trapping and removing grease, dust and dirt particles from the surface.</p> <p>How it works: Traditional cloths are not designed to pick up dirt particles as efficiently, due to the rounded surface of threads.</p> <p>Ultra Microfiber cloths have millions of wedge-shaped cross sections that remove and trap the dirt.</p> <p>During cleaning, the wiping motion enables the fibre edges to break down and remove dirt and grease particles without damaging the surface. Particles are trapped and absorbed in the fine strands of microfiber. The capillary force activates, thereby locking the dirt into the weave of the cloth. There are more than a million fine tubes that absorb the dirt when the cloth is wet – a force so great that dirt cannot escape. This cloth has incredible absorbency, holding up to four times its weight in dirt, grime and liquid.</p> <p>The dirt remains locked deep inside the cloth, enabling you to continuously clean, without releasing dirt back on to the cleaning surface. The dirt is retained in the material until it is washed, reducing the need for frequent rinsing. The cleaning surface will become so clean that new dirt and dust will not be attracted as easily.</p> <p>(Text from the company's website)</p>

Benefits
<p>The University of California Davis Medical Centre (UCDMC) conducted a cost comparison of microfibre mops compared to standard mops. According to the study the use of microfibre mops reduces costs resulting from worker injuries: the mops are much lighter than conventional mops (fewer problems due to heavy loads) and require less cleaning solution (fewer problems due to dangerous substances). Using Microfiber Mops in Hospitals, US</p> <p>Environmental Protection Agency. Available at: http://www.epa.gov/region9/waste/p2/projects/hospital/mops.pdf</p>
Legislation
Dangerous Substances Directive (67/548/EEC)
Further information
<p>Available at: http://www.ultramicrofibers.com/</p> <p>Available at: http://www.norwex-microfiber-cleaning.com/norwex_questions.html</p>
Question
Is the use of dangerous substances used during cleaning work being controlled?
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
16. Dishwashers - Wet Work & Dermatitis
Country of origin
EU
Description of risk
<p>Activities that cause one or both hands to become wet in contact with detergents or other skin irritating substances or activities that need to be done with occlusive gloves, are considered to be wet work.</p>

Contact dermatitis is typically divided into two groups – toxic exposures and exposures to allergens.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case studies and expert opinions</p>
Practical solutions
<p>Typical advice to reduce dermatitis is:</p> <ul style="list-style-type: none"> ▪ Use a long-handled brush for washing the dishes ▪ Avoid heating or cooling the skin. Sweating within rubber gloves can worsen the dermatitis, so cotton gloves should be worn inside loose-fitting rubber or vinyl gloves ▪ Avoid the temptation of using very hot water, even if wearing gloves ▪ Keep hand washing to a minimum and maintain water at a lukewarm temperature. ▪ Always pat dry your skin ▪ Remove rings before wet work or hand washing, as they can trap moisture and irritants underneath


<ul style="list-style-type: none"> ▪ Apply moisturisers after washing, ointments that are clear and sticky seem to work the best, but they may not be practical due to their 'greasy feel'. Alternatively, try using a skin protectant with petrolatum or silicone, such as Spectro EczemaCare, Vaseline or Prevox ▪ Scratching can worsen your dermatitis and cause cracks to form, allowing bacteria to enter and resulting in infection ▪ To help manage itching, apply a cold compress to the affected area; keep fingernails short, and use over-the-counter (OTC) products containing hydrocortisone or clobetasone butyrate ▪ Consider using a dishwasher instead of hand washing <p>Companies such as Cater-Wash, Electrolux Professional, Hobart, Hobart Bar Aid and Hobart Ecomax produce glass washers and dishwashers specifically aimed at SMEs.</p> <p>The ranges they produce encompass glass washers, front loading dishwashers, pass-through dishwashers and rack conveyor dishwashers. All reducing the need for wet work.</p>
<p>Benefits</p>
<p>Using dishwashers instead of hand washing negates the need for advice on reducing the risks of dermatitis from handwashing dishes.</p>
<p>Legislation</p>
<p>Biological Agents at Work Directive (2000/54/EC) Workplace Health and Safety Directive (89/391/EEC) Use of Work Equipment Directive (89/655/EEC)</p>
<p>Further information</p>
<p>Available at: http://www.electrolux-professional.co.uk/ Available at: http://www.hobartindependent.com/clean-range/</p>
<p>Question</p>
<p>Is dermatitis due to dishwashing being controlled?</p>
<p>Part of incentive system</p>
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
17. Gloves – Wet Work & Dermatitis
Country of origin
EU
Description of risk
Sectors with much wet work, e.g. HORECA, are known to have many employees with skin complaints caused or worsened by the occupational exposures. The importance of such exposures in the development of occupational dermatitis is often underestimated.
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA
HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on systematic reviews, case studies and expert opinions</p>

Practical solutions
<p>Typical advice to reduce dermatitis is:</p> <ul style="list-style-type: none"> ▪ Avoid heating or cooling the skin. Sweating within rubber gloves can worsen the dermatitis, so cotton gloves should be worn inside loose-fitting rubber or vinyl gloves ▪ Avoid the temptation of using very hot water, even if wearing gloves ▪ Keep hand washing to a minimum and maintain water at a lukewarm temperature. Always pat dry your skin ▪ Remove rings before wet work or hand washing, as they can trap moisture and irritants underneath ▪ Apply moisturisers after washing, ointments that are clear and sticky seem to work the best, but they may not be practical due to their 'greasy feel'. Alternatively, try using a skin protectant with petrolatum or silicone, such as Spectro EczemaCare, Vaseline or Prevox ▪ Scratching can worsen your dermatitis and cause cracks to form, allowing bacteria to enter and resulting in infection ▪ To help manage itching, apply a cold compress to the affected area; keep fingernails short, and use over-the-counter (OTC) products containing hydrocortisone or clobetasone butyrate <p>There does not appear to be a good alternative to occlusive gloves, and as such precautions and the right choice of gloves are the best measures to reduce dermatitis.</p> <p>Gloves provide some barrier for the skin but no one glove will resist all chemicals indefinitely. Choosing the right glove design and construction will provide the best protection, provided it also fits well. Similarly, protection against mechanical risk varies with different gloves providing different strengths of abrasion, blade cut, tear and puncture resistance.</p> <ul style="list-style-type: none"> ▪ Latex gloves provide best protection against viruses for healthcare workers ▪ Non-powdered gloves are less irritating and drying than powdered gloves ▪ Nitrile gloves are a suitable alternative for latex allergic people ▪ Vinyl gloves are not suitable for healthcare workers in direct contact with bodily excretions ▪ Avoid petroleum-based emollients under latex gloves as they weaken the rubber ▪ If wearing occlusive gloves for more than 20 minutes, use well-fitting cotton gloves beneath them to reduce irritation caused by sweating <p>It is also very important to know how to remove the glove without contaminating the skin with that substance.</p>
Benefits
<p>The correct use of gloves is more important than all the other advice typically presented for reducing the risks of dermatitis.</p>
Legislation
<p>Biological Agents at Work Directive (2000/54/EC) Workplace Health and Safety Directive (89/391/EEC) Use of Work Equipment Directive (89/655/EEC)</p>

Further information
<p>Selecting protective gloves for work with chemicals Available at: http://www.hse.gov.uk/pubns/indg330.pdf</p> <p>Guidance on the Selection and Use of Disposable Gloves. Available at: http://www.campus.manchester.ac.uk/healthandsafety/CoPs&Guidance/disposable_glove_selection_and_use-g.pdf</p> <p>Available at: Removing gloves without contaminating your hands video</p> <p>Available at: http://www.hse.gov.uk/skin/videos/gloves/removegloves.htm</p>
Question
<p>Do the employees wear properly selected gloves during their wet work? Is dermatitis due to glove wearing being controlled?</p>
Part of incentive system
<ul style="list-style-type: none"> ▪ Yes, reference to incentive system ▪ No

Solution
18. Entotherm – Insects, moulds and pathogens
Country of origin
UK
Description of risk
<p>Skin diseases, dermatitis, allergic reactions and respiratory diseases can be caused by infestations of pests and mould spores in work and waste food storage spaces. Impurities in the air conditioning system such as viruses, bacteria or mould spores can also lead to health issues and mainly affect those performing cleaning tasks.</p>
Sector
<ul style="list-style-type: none"> ▪ Construction ▪ Health ▪ HORECA

HOT
<ul style="list-style-type: none"> ▪ Human ▪ Organisation ▪ Technology
Target group
<ul style="list-style-type: none"> ▪ Management ▪ Employees/employee representatives ▪ OSH experts
Evaluation
<ul style="list-style-type: none"> ▪ High ▪ Medium ▪ Low quality <p>Based on case studies and expert opinions</p>
Practical solutions
<p>Various recommendations are made to control the risk of insects, moulds and pathogens. These include:</p> <ul style="list-style-type: none"> ▪ Regular cleaning, disinfection and pest control according to a cleaning plan ▪ Ventilation, aspiration ▪ Closed containers for the accumulation of organic wastes ▪ Cooled rubbish storage ▪ Periodic maintenance and cleaning of the air conditioning system and the extractor hood ▪ Regular exchange/cleaning of the filters ▪ Regular control of the suction range of the air conditioning system for contamination <div style="text-align: center;">  </div> <p>In the event of an infestation a chemical-free treatment such as Entotherm may be considered a safer option as it leaves no residual chemicals. Entotherm can eliminate pest insects such as bed bugs and cockroaches, through the targeted application of heat. It's a quick and effective treatment that reaches all areas of an infestation without causing structural damage.</p>

Entotherm is also a mobile system delivering dry transferable heat to any contained area, large or small, infested with insect pests. This flexibility means it is suitable for a range of customers including hotels, guest houses, food manufacturers, food retailers, public transportation, shipping containers and residential or care homes. It can be used in a specific contained zone of premises such as a whole room, or it can target a smaller site such as a clothes wardrobe infested with clothes moths.

Entotherm kills all lifecycle stages of pests, from eggs and larvae to adults in one treatment by denaturing the proteins within their bodies and disrupting the waxy layers on the outside of the insect to cause dehydration. It works by heating liquid syrup and delivering it through insulated pipes to heat exchangers placed strategically within the infested treatment area. Heat probes and thermal imaging technology are used to confirm all target insect pests have been eradicated effectively. Entotherm heat treatment is suitable for more than eliminating bed bug and cockroach infestations. It is an effective treatment for wood boring insects, moulds and pathogens and is approved as an International Standard of Phytosanitary Management (ISPM) 15 wood treatment.

Benefits

Treatment without chemicals and no risks of contamination of the treated area. Employees working in these areas have no risk of being contaminated.

Legislation

Biological Agents at Work Directive (2000/54/EC)
 Workplace Health and Safety Directive (89/391/EEC)
 Use of Work Equipment Directive (89/655/EEC)

Further information

E-fact 26. Dangerous substances in HORECA. Available at: <http://osha.europa.eu/en/publications/e-facts/efact26>
 Available at: http://www.rentokil.co.uk/files/file_420202.pdf
 Available at: <http://www.revivalco.co.uk/documents/Overviewdocument.pdf>
 Available at: <http://www.rentokil-initial.com/>

Question

Are the risks from insect and moulds being dealt with safely, with no risks for employees?

Part of incentive system

- Yes, reference to incentive system
- **No**

4.3. Checklist Construction Sector

	Name of solution	Questions	Yes/no
Solutions physical load			
1.	Ergonomic interventions and mechanisation aides for bricklayers	<p>Is the manual transport of bricks and mortar (lifting and carrying bricks and pushing and pulling wheelbarrows) reduced?</p> <p>Are cranes or crane-trucks in combination with crane clamps used which load or unload large stacks of bricks?</p> <p>Is the repetitive lifting and laying of bricks on walls less than 50 cm in height reduced by</p> <ul style="list-style-type: none"> ▪ split floor in scaffolding ▪ platforms made of wood or aluminium ▪ height adjustable scaffolding floors? <p>Is an automatic version of the crane clamp used to enable bricks to be placed in the scaffolding?</p> <p>Are electrical carts used for the transport of small stacks of bricks?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
2.	Implementation strategy and training on new working methods for floor layers	<p>Floor and carpet layers: Are telescopic sticks, intercostal and specific fittings for various tasks used for gluing and is welding carried out from a standing position?</p> <p>Are the workers informed about physical work demands and health risks associated with not using working methods from a standing position?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
3.	Use of a hydraulic ladder rack for all maintenance workers	<p>Is a hydraulic drop-down ladder rack installed to lift ladders on and off vans?</p> <p>Are the users of the ladders trained on the proper use of the rack?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
4.	Mechanical aids for plasterers	Are pneumatic drywall finishing systems used?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
5.	Use of prefabricated steel and self compacting concrete (SCC)	<p>Are prefabricated components (e.g. prefabricated steel) used instead of placing steel reinforcements piece by piece?</p> <p>Is self compacting concrete (SCC) used whenever possible in order to avoid the use of vibration tools?</p> <p>Are risks such as working at height or in confined spaces reduced by prefabrication and assembly of steel reinforcement cages in a factory using automated machinery?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
6.	Mechanisation aids for road workers and floor layers	<p>Are mechanisation aids used to reduce manual handling of materials and awkward back postures for road workers?</p> <p>Is a hydraulic clamp used for road making instead of manually laying down the bricks one by one?</p> <p>Is a mixing machine with remote control pump system used instead of the hodman shoveling sand into the mixer manually for the installation of sand-cement floors?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
7.	Use of alternative methods for pile cropping	<p>Are mechanical pile-cropping methods used in order to reduce the incidence of hand-arm vibration syndromes (HAVS)?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
Solutions slips, trips and falls			
8.	Information for training/toolbox talks on the use of Mobile Elevating Work Platforms (MEWPs)	<p>Are the users of Mobile Elevating Work Platforms (MEWPs) properly informed and trained to avoid the risk of being trapped or crushed while working at height with a MEWP?</p> <p>Is the MEWP selected suitable for the specific manoeuvre and work to be carried out?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
Solutions psychosocial load			
9.	Risk Management Framework for the assessment of Work-related Stress	Is a framework implemented for the risk management process, especially when assessing and reducing risk factors that have the potential to cause stress?	<input type="checkbox"/> yes <input type="checkbox"/> no
10.	Increasing Construction Workers' Use of Hearing Protection Devices (HPDs)	<p>Are noise control schemes implemented by the health and safety co-ordinator on construction sites with more than one company?</p> <p>Are safety behaviours promoted within the company, more specifically, the use of hearing protection devices or other PPE?</p> <p>Have workers learned how to use their hearing protection devices effectively?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
11.	A Job Safety Programme Using Tool Box Training Sessions and Computer-Assisted Biofeedback Stress Management Techniques	<p>Are training sessions organised for all workers?</p> <p>Are the most relevant risks assessed and will the workers be trained?</p> <p>Is the information presented by experts in their fields?</p> <p>Are individual differences and work related behaviour that contribute to job stress reviewed?</p> <p>Is the success of safety and health interventions evaluated against tangible outputs such as performance and productivity?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
12.	Improving lifestyle among male construction workers at risk for cardiovascular disease	<p>Are counselling sessions offered to make construction workers aware of health problems and to change their behaviour?</p> <p>Does the company support smoking cessation intervention or is diet and physical activity addressed on the construction site?</p> <p>Are brochures on smoking, diet and nutrition available for the workers?</p> <p>Is it a topic in the company that the workers are healthier and less sick?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
13.	Reducing the level of sickness absence by organising healthier work	Is a programme implemented to encourage change for healthier work?	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
		Are work consultation-training schemes for building site staff established? Are courses on ergonomic lifting conducted for building site staff? Is the managerial staff aware of the need for good working conditions? Do they know the ways they could support this?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
14.	Working Well Together Campaign (WWT) to improve health and safety	Is the company engaged in a network where members support and advise each other and share good practice throughout the construction industry? Are demonstrations and exhibitions visited where the latest equipment and services to help the construction business can be seen? Is practical and hands-on experience presented by expert speakers from the industry for the development of the owner's business?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
15.	Worker engagement decision tool: a pilot phase	Is it clear whether the arrangements at present on the construction site meet the minimum legal requirements? Is there a scheme detailing improvements and how they can be made? Are methods of site-based consultation put in place to effectively engage with the workforce? Are all staff, including the workers, fully engaged in risk assessment? Do the workers understand how they are to control the risks themselves?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
16.	Achieving behavioural change by the TASK card and other means	Are systems like the TASK-card supported and implemented in the company to achieve behavioural change and prevent the chances of accidents occurring? Is the achieving behavioural change (ABC) course carried out in the company? Are the documents freely available on the internet used for training sessions? Is improving health and safety on construction sites through effective worker involvement a topic for the company?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
17.	Better Health Under Construction through a supportive national framework	<p>Does the company record how many working days a year are lost due to work-related ill health or to workplace injuries?</p> <p>Is illness caused or made worse by work in construction a topic for the company?</p> <p>Is health and wellbeing of employees in the construction company a goal?</p> <p>Should the employer check workers on whether they are fit for safety-critical work?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
18.	Organisational Health Management Interventions to improve work-life balance	<p>Does the working scheme of project-based construction workers (length of the working week, working hours per day) fit in with their personal needs?</p> <p>Is work-life balance a topic for the company to reduce problems of job dissatisfaction, lack of general well-being or substance abuse and to increase turnover intention,?</p> <p>Are managers and site supervisors encouraged to do regular exercise or to eat healthy?</p> <p>Are managers or supervisors encouraged to set priorities in both their work and outside-work lives?</p> <p>Is training provided on communication and teamwork?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
Solutions dangerous substances			
19.	Dibasic esters can replace dichloromethane in paint strippers	Are alternatives to dichloromethane (DCM) for paint strippers being used?	<input type="checkbox"/> yes <input type="checkbox"/> no
20.	OSH preventing solutions for fire accidents	Are the potential dangers and risks within the workplace in construction premises assessed regarding fire?	<input type="checkbox"/> yes <input type="checkbox"/> no
21.	OSH preventing solutions during the painting processes	Are the general occupational safety and hygiene requirements taken into account during the painting process?	<input type="checkbox"/> yes <input type="checkbox"/> no
22.	OSH preventing solutions during the welding processes	Are the general occupational safety and hygiene requirements taken into account during the welding process?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
23.	OSH preventing solutions during work with spray polyurethane systems	Are the general occupational safety and hygiene requirements taken into account during the application of polyurethane?	<input type="checkbox"/> yes <input type="checkbox"/> no
24.	Dust-free construction materials reduce inhalable dust concentrations	Are measures in place to reduce or prevent the generation of dust from construction materials?	<input type="checkbox"/> yes <input type="checkbox"/> no
25.	Dust-free sanding of wood	Are measures in place to reduce dust concentration when sanding wood?	<input type="checkbox"/> yes <input type="checkbox"/> no
26.	Innovative application solution to prevent skin contact with epoxy resin	Are measures in place to prevent skin contact when applying epoxy resin?	<input type="checkbox"/> yes <input type="checkbox"/> no
27.	Use of warm-mix asphalt to reduce exposure to fumes and aerosols	Is it possible to use warm-mix asphalt instead of hot-mix asphalt to reduce the emission of fumes and aerosols?	<input type="checkbox"/> yes <input type="checkbox"/> no

4.4. Checklist Health Care Sector

	Name of solution	Questions	Yes/no
Solutions physical load			
1.	Comprehensive patient handling approach (multi-component)	<p>Does the activity require patient-handling?</p> <p>If Yes:</p> <ul style="list-style-type: none"> ▪ is adequate training of workers on the correct handling of patients provided? ▪ are technical ergonomic measures taken to reduce the occurrence of MSDs? ▪ are physical exercise programmes for the workers offered for the prevention of LBP? 	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
Solutions slips, trips and falls			
2.	E-Learning and Web-based training tools to increase healthcare employees' awareness regarding the risks of slips, trips and falls	<p>Are employees aware of the risks of slip, trip and fall, and the factors that contribute to them?</p> <p>Do the employees know how to control risks of slip, trip and fall?</p> <p>Does the floor present loose finishes, holes and cracks, or worn rugs and mats?</p> <p>Does the lighting enable people to see obstructions, potentially slippery areas?</p> <p>Are there obstructions or objects left lying around that can easily go unnoticed and cause a trip?</p> <p>Does the footwear prevent slips and trips?</p> <p>Where floors can't be kept dry the shoes/boots have slip-resistant soles?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
Solutions psychosocial risk factors			
3.	Health Circles	<p>Is an assessment of psychosocial risks carried out?</p> <p>Is a participative problem-solving approach used based on 'employee expertise' to evaluate psychosocial risk factors and define solutions?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
4.	Survey feedback as a method of stress management	Is survey feedback used to reduce stressors in the workplace?	<input type="checkbox"/> yes <input type="checkbox"/> no
5.	The Work Site Profile (Arbetsplatsprofilen: Ett verktyg för systematiskt arbetsmiljöarbete)	Are employees and managers involved to participate in the development and improvement of work conditions? Were tools (CD-package, leaflets, etc.) used to facilitate the involvement of workers in the development and improvement of work conditions?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
6.	The systematic approach model – how to prevent and overcome undesirable interaction	Are procedures established for reporting and registration of unwanted undesirable behaviour? Are strategies implemented to improve the workplace in relation to undesirable behaviour, bullying and harassment?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
7.	'Safe care' programme	Are programmes used to decrease mental and physical violence and sexual intimidation in hospital?	<input type="checkbox"/> yes <input type="checkbox"/> no
8.	Violent Incident Form (VIF) and feedback programme	Are practical instruments established for reporting and registration of violent and threatening behaviour directed towards staff ? Are strategies used to reduce violent and threatening behaviour directed towards staff?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
9.	Participative Intervention Programme	Are risk assessments conducted to determine the prevalence of adverse psychosocial work factors and psychosocial distress? Are interventions made to reduce adverse psychosocial work factors and psychosocial distress? Are activities developed to promote diffusion of the interventions to reduce adverse psychosocial work factors and psychosocial distress?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> yes <input type="checkbox"/> no
10.	Project 'Health in working life': Standardised Participatory	Are activities developed to increase staff participation in identifying and solving work problems?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
	Organisational Intervention		
11.	Participatory Action Research project	Are workers involved in the identification of core causes of stress and suggestions for preventive actions?	<input type="checkbox"/> yes <input type="checkbox"/> no
12.	Peer support groups	Are peer support groups based on the problem-based method to address and manage work-related stress and burn-out used?	<input type="checkbox"/> yes <input type="checkbox"/> no
13.	Project WISE: Workplace Initiative in Substance Education	Are prevention programmes used to reduce the abuse of alcohol and drugs?	<input type="checkbox"/> yes <input type="checkbox"/> no
14.	Healthy working for health – using the WEBA method	Are job related stress risks in the work organisation analysed?	<input type="checkbox"/> yes <input type="checkbox"/> no
<i>Solutions for dangerous substances</i>			
15.	Gloves – Innovations	<p>In the selection of gloves: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?</p> <p>In the selection of gloves: are their general suitability for the job task taken into account?</p> <p>Were specific instructions given regarding the proper use of gloves (frequent glove changes, double gloving, etc.) to offer greater protection to the user?</p> <p>If latex gloves are used: are they powder free, very low in extractable latex protein, and have the smallest concentration and the fewest number of residual chemicals from manufacture?</p> <p>Many improvements have been made in the design of gloves for PPE, have these been taken into account in selecting appropriate gloves?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
16.	Needle Stick and Other Sharps Injuries – Safe Instruments	Are safe instruments used to prevent needle stick injuries?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Questions	Yes/no
		<p>Are passive safety measures (e.g. safe needles that are automatically and instantly retracted from the patient into the barrel of the syringe and then rendered not reusable) used to prevent needle stick and other sharp injuries?</p> <p>Are active safety measures (e.g. safety shields attached to a needle that after use are activated by using the thumb to push forward on them) used to prevent needle stick and other sharp injuries?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
17	Needle Stick and Other Sharps Injuries – Various	<p>Are new innovations regularly considered to control the risk of needle stick injuries?</p> <p>Is education, information and product knowledge that help reduce the number of needle stick and sharps injuries provided?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
18	Needle Stick Injuries – StickSafe	<p>Are safety procedures developed for the disposal of used needle sticks and sharp objects?</p> <p>Are the diffusion of the procedures for the disposal of used needle sticks and sharp objects promoted?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
19	SpectraShield	<p>Are respirator masks used to defend workers against air transmitted infectious diseases?</p> <p>In the selection of respirator masks: are their resistance properties against chemical, physical or biological agents present in the specific work activities taken into account?</p> <p>In the selection of respirator masks: are their general suitability for the job task taken into account?</p> <p>Are specific instructions given regarding the proper use of respirator masks to offer greater protection to the user?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
20.	Hazardous Pharmaceutical Drugs	<p>Are appropriate technical control measures used (e.g. ventilated cabinet, self contained drug transfer device) to minimise the risk of exposure to hazardous pharmaceutical drugs?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

	Name of solution	Questions	Yes/no
		<p>Are policies and procedures developed to identify hazards and limit the numbers of workers potentially exposed?</p> <p>Are appropriate personal protective equipment (PPE) used to protect the worker from direct contact (skin absorption or inhalation) with the chemotherapy during mixing and drug administration?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>
21	Anaesthetic Gases	<p>Have anaesthetic gas scavenging systems for the recovery of waste anaesthetic gases been installed in the operating room?</p> <p>Are operating rooms equipped with adequate heating, ventilating and air conditioning systems that contribute to the dilution and removal of waste gases?</p> <p>Are appropriate work practices used to reduce waste gas level in operating rooms and post anaesthesia care unit?</p> <p>Are appropriate control measures taken to minimise the risk of exposure to waste anaesthetic gases?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input type="checkbox"/> yes <input type="checkbox"/> no</p>

4.5. Checklist HORECA

	Name of solution	Question	
Solutions for physical load			
1.	Beds with a lift mechanism	Do you use beds with a lift mechanism?	<input type="checkbox"/> yes <input type="checkbox"/> no
Solutions for slips, trips and falls			
2.	2. Slips Assessment Tool (SAT).	Is a Slips Assessment Tool (SAT) used to assess the slip potential of pedestrian walkway/surfaces?	<input type="checkbox"/> yes <input type="checkbox"/> no
3.	3. Slips and Trips eLearning Package	Are all employees trained in how to prevent slips and trips?	<input type="checkbox"/> yes <input type="checkbox"/> no
Solutions for psychosocial load			
4.	Covenant 'Happy HORECA'	Do you take measures to decrease work pressure?	<input type="checkbox"/> yes <input type="checkbox"/> no
5.	Crime Prevention Through Environmental Design (CPTED) model	Do you protect your business from robberies?	<input type="checkbox"/> yes <input type="checkbox"/> no
6.	Training Needs Analysis (TNA)	Do you assess training needs in dealing with workplace violence?	<input type="checkbox"/> yes <input type="checkbox"/> no
7.	Organisational interventions in the service sector	Do you take interventions on the organisational level to reduce stress?	<input type="checkbox"/> yes <input type="checkbox"/> no
8.	Open Rota System for Work Scheduling	Do you take measures to improve work scheduling?	<input type="checkbox"/> yes <input type="checkbox"/> no
9.	Multi-disciplinary structured work shift evaluations to enhance team communication	Do you enhance team communication by structured work shift evaluations?	<input type="checkbox"/> yes <input type="checkbox"/> no
10.	Kauris: risks in the retail sector – assessment and management of these risks of violence by third parties.	Do you assess and manage risks of violence?	<input type="checkbox"/> yes <input type="checkbox"/> no
11.	Work Positive pack with HSE's Management Standards	Do you have a management approach to address stress risks?	<input type="checkbox"/> yes <input type="checkbox"/> no
12.	SMEs Vital	Are the communication between employees and the management and overall safety climate being improved in the enterprise/organisation?	<input type="checkbox"/> yes <input type="checkbox"/> no
Solutions for dangerous substances			
13.	RPE – Selection and Face Fit	Is the Respiratory Protective Equipment (RPE) being used fit for its purpose of protection?	<input type="checkbox"/> yes <input type="checkbox"/> no

	Name of solution	Question	
14.	Innovative system solution for raw material logistic: flour moistening	Are the employees prevented from risks related with flour dust (in bakeries)?	<input type="checkbox"/> yes <input type="checkbox"/> no
15.	Microfibre – an alternative way to clean	Is the use of dangerous substances used during cleaning work being controlled?	<input type="checkbox"/> yes <input type="checkbox"/> no
16.	Dishwashers – Wet Work and Dermatitis	Is dermatitis due to dishwashing being controlled?	<input type="checkbox"/> yes <input type="checkbox"/> no
17.	Gloves – Wet Work and Dermatitis	Is dermatitis due to glove wearing being controlled?	<input type="checkbox"/> yes <input type="checkbox"/> no
18.	Entotherm – Insects, moulds and pathogens	Are the risks from insect and moulds being dealt with safely, with no risks for employees?	<input type="checkbox"/> yes <input type="checkbox"/> no

5. Conclusions and recommendations

5.1. *From research into practice*

The current report aimed to identify innovative interventions and prevention-orientated solutions that can be implemented within economic incentive schemes. The focus is on three occupational sectors (construction, healthcare and HORECA), that cover 20% of the EU working population. The major risk factor of these sectors had to be identified, relation to psychosocial load, physical load, slips, trips and falls, and dangerous substances.

A wide range of preventive solutions and toolkits was identified. These solutions were then used to develop sector-specific checklists. This approach could enable OSH research to be used for preventive solutions in the Member States, and possibly in OSH-related economic incentive schemes. Three different stages can be distinguished in the process from evidence to action (adapted from Schulte et al., 2004, in van Dijk et al., 2010):

1. *knowledge creation*, including first-generation knowledge from primary studies, second-generation knowledge such as reviews and syntheses, and third-generation knowledge comprising the development of practical tools, guidelines and decision aids
2. *knowledge transfer*, including the dissemination process of the knowledge products
3. *knowledge utilisation*, comprising the practical use of the knowledge by OSH professionals and other stakeholders.

Some conclusions on the level of evidence and level of innovation of the collected preventive solutions, and the applicability of the drafted checklists, are summarised in the next sections. Limitations of this review are also discussed and some recommendations are raised.

5.2. *Preventive solutions*

A wide range of preventive solutions was found for the four selected risk categories (physical load, slips, trips and falls, psychosocial load, and dangerous substances) in relation to the three sectors. All these solutions meet a set of predefined inclusion criteria (see section 1.3.4). They are among others considered to be 'evidence-based' and 'innovative' (i.e. offering some kind of solution that has not been applied or implemented by many companies yet).

Most of the identified preventive solutions show that strategies and interventions to improve safety and health at the workplace already exist. However, it should be stressed that the solutions that best met the inclusion criteria, and that are thus considered evidence-based, were/are in many cases supported by some kind of scientific programme. When such programmes finish and the related counsellors, advisers and other support disappear, companies – and in particular SMEs – may encounter difficulties implementing these solutions. In this sense, evidence-based prevention measures do not always guarantee their efficacy in practice.

This review did not focus on the use and implementation of OSH management systems as potential preventive solutions. Robson et al. (2007) carried out in this regard a systematic literature review, to investigate the effectiveness of mandatory and voluntary OSH management system interventions on worker health and safety and associated economic outcomes. Even though mostly positive effects were found in workplaces, the authors concluded that the body of evidence from published, peer-reviewed literature was insufficient to make recommendations either in favour of, or against, OSH management systems.

The innovative and evidence-based preventive solutions specifically tailored to the HORECA sector were limited compared to the other two occupational sectors. This was particularly the case with regard to risks related to psychosocial load and dangerous substances. The reasons for this were not examined but may be down to the high visibility of issues in the healthcare and construction sectors. HORECA work, by comparison, is often undertaken in backrooms or behind the scenes away from the public gaze.

Slips, trips and falls are the largest cause of accidents in all sectors, particularly in SMEs. The risk factors of slips, trips and falls in the three occupational sectors are well known and many

interventions already exist. Most of these preventive measures are, however, not sufficiently evaluated and therefore not included in this review. A recent study in restaurants (Verma et al., 2011) examined risk factors of slipping outside the laboratory environment. It provided support for the use of slip-resistant shoes and measures to increase the coefficient of friction of kitchen floor surfaces as preventive interventions to reduce slips, falls and injuries. Bell et al. (2008) demonstrated that the implementation of a comprehensive prevention programme for hospitals can significantly reduce slip, trip and fall injury claims among hospital employees (by approximately 60%). This broad-scale prevention programme comprised changes to housekeeping procedures and products, general awareness campaigns, programmes for external ice and snow removal, flooring changes and slip-resistant footwear for certain employee subgroups.¹² This study confirms the importance of a multicomponent approach: even though each single component of the prevention programme may seem rather unimportant, all these smaller measures combined in an entire comprehensive programme can have a significant impact (Bell et al., 2008, p. 1923; Collins et al., 2010). A slips, trips and falls prevention programme should be adapted to the unique features and processes of a hospital, and should therefore also include on-site hazard assessment walkthroughs and reviews of injury incident information. The drafted compilations of preventive solutions also comprise, in this regard, some (electronic) tools/packages to assess and tackle the risks of slips and trips at the workplace.

With regard to the prevention of risks from **physical load** (prevention of work-related MSDs), emphasis was put on specific technical and engineering interventions (i.e. ergonomic workplace (re)design, work equipment and tools). Such preventive solutions are available for many construction sector occupations (bricklayers, floor layers, plasterers, etc.) but also in relation to patient handling (patient handling equipment), and in certain activities within the HORECA sector. It should however be stressed that, as work-related MSDs are multifactorial in origin, technical interventions should be part of an overall prevention policy and combined with other preventive measures. Findings from several systematic reviews indicate that successful ergonomic approaches are not about single intervention programmes (specific implementation of technical, organisational or training measures). Conversely, there is more evidence for the effectiveness of integrated implementation strategies, comprising a combination of preventive measures (multicomponent interventions) See e.g., EU-OSHA, 2008; Michaelis, 2009; Tullar et al., 2010. There is, for example, no clear evidence for the positive impact of preventive measures such as work station adjustments (technical), rest breaks (organisational), or ergonomic training (behavioural) on work-related MSDs. When these specific interventions are, on the other hand, included in a combined approach, they become more effective (Amick et al., 2009). The same holds true for office work, where ergonomic training and guidance in proper adjustments of the workstation and the adoption of good working postures have proven to be effective, especially when good quality and adjustable office equipment and furniture are available (Amick et al., 2009).

Preventive strategies to tackle MSDs at work need to be taken on three levels: (1) primary prevention with a combined focus on the risk assessment process and implementation of technical, organisational and behavioural measures; (2) secondary prevention targeting early identification and intervention; and (3) tertiary prevention aiming to stimulate and facilitate the (multi-disciplinary) return-to-work process of workers being absent due to a MSD problem. This integrated approach can be successful in a participatory environment and a prevention-oriented organisational culture. This is discussed in the 'comprehensive patient handling approach' (see solution 1 of part 3 healthcare), stating that the prevention of work-related low back pain due to lifting or transferring patients should be tackled by a multiple prevention strategy including a policy change, patient handling equipment and training, and physical exercise (see also Collins et al., 2010).

Only a limited number of preventive solutions for **psychosocial risks** were identified with in both the construction and HORECA sector. This highlights the relative importance of increased attention to the psychosocial working environment in these occupational settings, and how preventive solutions can be developed or tailored to the unique needs and challenges experienced in these sectors. Additionally, it can be observed that the quality of the evaluation of these programmes was limited.

¹² The main prevention strategies included keeping floors clean and dry, preventing entry into areas that are contaminated, using slip-resistant shoes, keeping walkways clear of objects and reduce clutter, providing adequate lighting in all work areas, securing loose cords, wires and tubing, and eliminating outdoor and indoor surface irregularities.

Many of the approaches identified and described had not included objective measures, organisational measures, assessment of economic benefits and a process evaluation. A pan-European survey of interventions for work-related stress found similar results; whereby a limited number of interventions were rigorously and comprehensively tested (Leka et al., 2008). Recently, Nielsen et al. (2010) identified five European methods that describe systematic approaches to improve workers' health and well-being through occupational health interventions at organisational level. It concerns the Risk Management approach and Management Standards from the UK, Work Positive from Ireland, Health Circles from Germany and the Spanish Prevenlab. These five methods all appear to consist of a five-phase process (preparation, screening, action planning, implementation, and evaluation) and certain core elements such as worker participation, the establishment of a steering group and senior management support.

Within the **hazardous substances** topic, the number of identified preventive solutions was limited. As the risks identified were the most significant in each sector they had largely been tackled successfully either by elimination or substitution. Where this was not the case administrative and/or workplace controls were in place to comply with domestic or European legislation. An example of this is with 'Waste Anaesthetic Gases' (WAG) where WAG scavengers are known and proven technologies and there is little need to improve beyond what exists. What may need to be achieved is to ensure that this solution, although not completely innovative, is applied as widely as possible so that everyone benefits from it. The majority of the solutions presented are therefore engineering controls or, where we are down to the last line of defence, personal protective equipment.

The quality of evidence for solutions to risks caused by dangerous substances was often low or medium. This was largely due to data and studies being provided by the companies that are behind the products. Only a minority of the solutions were supported by fully independent studies. The evidence provided by the manufacturers and/or distributors was also of variable quality, with some solutions backed up by large, if not totally independent, trials and others simply by claims made in brochures.

5.3. Checklists

The assembled preventive solutions were used for drafting three sector-specific checklists, in order to allow a user friendly search for solutions that can be applied for individual enterprises and organisations. Of course these checklists cannot replace a proper risk assessment, as risks and risk factors are linked to the specific context within a company's business processes and activities. Dynamic risk assessment processes are required to allow enterprises and organisations to put in place a proactive policy of managing workplace risks. The lists of preventive solutions included in this review can merely be seen as a source of inspiration and resource for certain innovative and evidence-based good practices in OSH, which could be used to select proper preventive and protective measures after having assessed and evaluated the risks.

As mentioned above (see section 1.4.3), effort-based premium systems (such as the Funding Programme in the German butchery sector) have proven to be effective in stimulating SMEs to increase their level of OSH. For many SMEs – in particular the micro and small enterprises – prevention of occupational accidents and work-related diseases is not at the centre of their attention. As SMEs are often too small to have 'in-house' expertise to run the risk assessment process in a proper and effective way, suitable preventive solutions are unlikely to be identified or put in place.¹³ Putting the proposed checklists in specific economic incentive schemes could encourage companies to adopt certain preventive measures which have at least being considered effective by experts in the field.

This review shows that OSH prevention measures have widely proved to be effective, when part of a multifaceted prevention programme (see among others Neuman et al., 2010).¹⁴ For example this is the case with the prevention of slips, trips and falls in the hospital sector (see e.g., Collins, 2010) and

¹³ See also EU-OSHA, <http://osha.europa.eu/en/topics/riskassessment>.

¹⁴ Neumann et al. (2010, p. 135) try to explain the fact that single factor interventions can rarely demonstrate a clear effect, by the fact that these single factor interventions are easier to undergo experimental evaluation, which may contribute to a body of 'null effect' experimental research. Multifactor interventions are on the other hand less suitable for evaluation by traditional experimental approaches, and require therefore new investigation/evaluation strategies.

the prevention of work-related MSDs in industrial, healthcare and office settings among others (see e.g., EU-OSHA, 2008; Amick et al., 2009; Michaelis, 2009; Tullar et al., 2010). A Cochrane¹⁵ review on OSH interventions for preventing fatal and non-fatal injuries in the construction industry (van der Molen et al., 2007; Lehtola et al., 2008) retained two multicomponent intervention studies that seemed to have had an effect in reducing injuries in the longer term. These were a targeted safety campaign (Spangenberg et al., 2002) and a drug-free workplace programme (Wickizer et al., 2004). Both programmes used multiple and continuing interventions targeted on employers and workers and implemented by various strategies. Information and facilitating strategies, combined with work site inspection or obliged drug testing appeared to be important activities in these comprehensive interventions.

Success of OSH prevention programmes depends on the social context and commitment by the company's management and workers. Collins et al. (2010) for example address the sustained commitment by hospital management and staff as a key component to both safe patient handling and slip, trip and fall prevention programmes. A recent Dutch study (Hale et al., 2010) aimed to determine which factors make the difference between successful and non-successful OSH intervention projects. Interventions that create constructive dialogue between shop-floor and line management, provide motivation to line managers and reinforce the monitoring and learning loops in the safety management system, appeared more successful. The amount of energy and creativity from top managers and, above all, by the coordinator (safety professional) appeared to be a distinguishing factor as well.

The effectiveness of an OSH intervention depends on its technical/tangible characteristics, but also on how the intervention is combined with other preventive measures and whether it is supported by OSH-related cultural aspects such as (senior) management commitment and workforce participation (see e.g., Neumann et al., 2010; Nielsen et al., 2010). Therefore it is important to raise awareness about these aspects, as EU-OSHA is doing in its 2012-13 campaign on 'working together for risk prevention'. Simple checklists cannot change the prevention culture of an enterprise overnight, but they can serve as a thought-provoking impulse. The first step to change an OSH culture always starts on the behavioural level, with specific actions for the improvement of working conditions. The experience with incentive schemes shows (Elsler et al., 2010), that through the incentivisation of specific action a sustainable behaviour change can be achieved, leading to significantly less accidents and sick leave.

The use of checklists for OSH-related economic incentives purposes is perhaps most suited for the prevention of equipment-related injuries and the promotion of innovative working techniques. Recent research by Shishlov et al. (2011) on tool and equipment-related injuries among workers in the USA construction industry, indicated that interventions are particularly needed to prevent injuries associated with use of ladders, nail guns and hand-held power saws. This requires the use of proper equipment (e.g. appropriate guarding) in addition to the training of workers on how to use the more safely and ergonomically designed tool or piece of equipment. Another recent example from research in the American construction sector (Hinze and Teizer, 2011) revealed that the likelihood of vision-related accidents (due to e.g. blind spots, obstructions and poor lighting conditions) is considerably reduced by reflective personal protective equipment worn by workers on the jobsite and the use of more jobsite illumination by means of spot lighting or warning signals.

5.4. Limitations and recommendations

The objective of this report is to be a thought-provoking impulse for the development of more sector specific economic incentive schemes. Being a first step in this direction, naturally it has to focus on certain sectors and certain risks. Nevertheless the three sectors involved cover more than 20% of the EU workforce and the report aimed to cover the most important risks, which can be mitigated by preventive measures.

Regarding the category of psychosocial risks, a certain degree of overlap was found between the sectors. Most preventive solutions to psychosocial risks were identified for the healthcare sector but could be tailored to the needs of the construction and HORECA sector.

¹⁵ The Cochrane Collaboration carries out systematic reviews in the field of occupational health, but also on OSH interventions. For more information, see <http://www.cochrane.org>.

By identifying and selecting preventive solutions for an entire sector, a very diverse set of innovative and evidence-based good practices in OSH was collected. For instance the solutions for the prevention of MSDs in the construction sector comprise interventions for bricklayers, plasterers, floor layers and road workers. The healthcare sector consists of a wide range of occupations and functions, ranging from nurses and doctors, to office workers, cleaning and kitchen staff. The HORECA sector is maybe even more diverse and therefore it is also difficult to define specific and applicable preventive measures. Narrowing the scope by taking a more occupation or function-oriented approach might in this regard lead to more practical and coherent information.

The sector-specific checklists, which were drafted for possible use in economic incentive schemes, were based on the solutions identified by reviewing the (scientific and grey) literature. It should however be noted that these solutions and checklists are not like recipes that can directly be applied for, for instance, economic incentive purposes. They should merely be considered as a useful resource of innovative and evidence-based preventive solutions. Instead of using a 'copy/paste approach', the development of such checklists or questionnaires should take the national/regional and cultural characteristics into account and involve OSH experts, social partners and other relevant stakeholders from the particular sector (Neumann et al., 2010; van Dijk et al., 2010, Elsler & Eeckelaert, 2010). This approach can result in the development of checklists with relevant and feasible solutions, stimulating enterprises to adopt effective preventive strategies. Such checklists or questionnaires need to be revised from time to time, adapting the content to new evidence and innovations and enabling a focus on particular topics for example national or sectoral prevention programmes (such as e.g. in the incentive scheme of FGB, EU-OSHA¹⁶).

Taking the latter into account, and considering the fact that the world of work as well as research evidence in the field of OSH is constantly evolving, this compilation of preventive solutions could be presented in a more flexible and user-friendly way. The use of a web-based format would allow employers to build a dynamic database of evidence-based preventive solutions. This would obviously require a coherent approach and methodology to extract best practices from both 'white' (scientific, published, peer-reviewed) and 'grey' literature, and the collaboration between and input from European and international OSH researchers.

¹⁶ See also EU-OSHA, E-fact 50 - Cost-benefit-analysis of economic incentives at national level. Available at: <http://osha.europa.eu/en/publications/e-facts/efact50/view>

6. References

- Amick, B.C., Brewer, S., Tullar, J.M., Van Eerd, D., Cole, D.C. and Tompa, E., 'Musculoskeletal Disorders: Examining Best Practices for Prevention', *Professional Safety*, March 2009, pp.24-28.
- Bell, J.L., Collins, J.W., Wolf, L., Grönqvist, R., Chiou, S., Chang, W.R., Sorock, G.S., Courtney, T.K., Lombardi, D.A., and Evanoff, B., 'Evaluation of a Comprehensive Slip, Trip, and Fall Prevention Program for Hospital Employees', *Ergonomics*, 2008, 51, 12, pp.1,906-1,925.
- Collins, J.W., Bell, J.L., Grönqvist, R., 'Developing evidence-based interventions to address the leading causes of workers' compensation among healthcare workers', *Rehabilitation Nursing*, 2010, 35, pp.225-235. Available in English at: <http://www.rehabnurse.org/uploads/files/pdf/RNJ328.pdf>.
- Cox, T. & Griffiths, A., 'The assessment of psychosocial hazards at work', in Shabracq M.J., Winnubst J.A.M. & Cooper C.L. (Eds.), *Handbook of Work and Health Psychology*, Chichester, Wiley & Sons, 1995.
- Elsler, D., Eeckelaert, L. (2010), 'Factors influencing the transferability of occupational safety and health economic incentive schemes between different countries', *Scandinavian Journal of Work, Environment & Health*, 36(4): 325–331. Available from <http://osha.europa.eu/en/topics/economic-incentives/transferability-econ-incentives.pdf>
- Elsler D., Treutlein D., Rydlewska I., Frusteri L., Krüger H., Veerman T., Eeckelaert L., Roskams N., Van Den Broek K., Taylor T. (2010). A review of case studies evaluating economic incentives to promote occupational safety and health. *Scandinavian Journal of Work, Environment & Health*. 36(4):289–298. Available from <http://osha.europa.eu/en/topics/economic-incentives/review-case-studies-econ-incentives.pdf>
- European Commission (COM), *Guidance on risk assessment at work*, Luxembourg: Office for Official Publications of the European Communities, 1996. Available at: <http://osha.europa.eu/en/topics/riskassessment/guidance.pdf>
- European Commission (COM), *Improving quality and productivity at work: Community strategy 2007-2012 on health and safety at work*, Brussels, 62 final, 2007. Available at: http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0062en01.pdf.
- European Union, *Council Directive of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (89/391/EEC)*, Official Journal of the European Communities, 29 June 1989, No. L 183.
- EU-OSHA – European Agency for Safety and Health and Work, *Research on work related stress*, Publications Office of the European Union, Luxembourg, 2000, 167 pp. Available at: <http://osha.europa.eu/en/publications/reports/203>.
- EU-OSHA – European Agency for Safety and Health and Work, *Factsheet 14 – Preventing Work-Related Slips Trips and Falls*, Publications Office of the European Union, Luxembourg, 2001. Available at: <http://osha.europa.eu/en/publications/factsheets/14/view>.
- EU-OSHA – European Agency for Safety and Health at Work, *Facts 33: An introduction to dangerous substances in the workplace*, 2003a. Available at: <http://osha.europa.eu/en/publications/factsheets/33>.
- EU-OSHA – European Agency for Safety and Health at Work, *Accident prevention in the construction sector*, 2003b. Available at: <http://osha.europa.eu/en/publications/factsheets/36/view>.
- EU-OSHA – European Agency for Safety and Health at Work, *E-fact 1 – Musculoskeletal disorders in construction*, 2004. Available at: <http://osha.europa.eu/en/publications/e-facts/efact01/view>.
- EU-OSHA – European Agency for Safety and Health at Work, *Forum 14 – Effectiveness of economic incentives to improve occupational safety and health*, 2005. Available at: <http://osha.europa.eu/en/publications/forum/14/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-Facts 18 – Risk assessment in healthcare*, 2007a. Available at: <http://osha.europa.eu/en/publications/e-facts/efact18/view>.

- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 19 – Prevention of vibration risks in the construction sector*, 2007b. Available at: <http://osha.europa.eu/en/publications/e-facts/efact19/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 17 – The prevention of work-related neck and upper limb disorders (WRULDs) in construction*, 2007c. Available at: <http://osha.europa.eu/en/publications/e-facts/efact17/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *Work-related musculoskeletal disorders: prevention report*, Publications Office of the European Union, Luxembourg, 2008a, 106 pp. Available at: http://osha.europa.eu/en/publications/reports/en_TE8107132ENC.pdf/view.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 37 – Slips, trips, falls and cleaners*, 2008b. Available at: <http://osha.europa.eu/en/publications/e-facts/efact18/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 28 – Patient handling techniques to prevent MSDs in health care*, 2008c. Available at: <http://osha.europa.eu/en/publications/e-facts/efact28/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *Factsheet 79 – Protecting workers in hotels, restaurants and catering*, 2008d. Available at: <http://osha.europa.eu/en/publications/factsheets/79/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 24 – Musculoskeletal disorders (MSDs) in HORECA*, 2008e. Available at: <http://osha.europa.eu/en/publications/e-facts/efact24/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 22 – Safety and health risks in HORECA*, 2008f. Available at: <http://osha.europa.eu/en/publications/e-facts/efact22/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *Good Practice Information Provided by EU-OSHA*, 2009a, 4 pp. Available at: http://osha.europa.eu/en/practical-solutions/en_good-practice_2009.pdf
- EU-OSHA – European Agency for Safety and Health and Work, *Preventing harm to cleaning workers*, 2009b, 225 pp. Available at: <http://osha.europa.eu/en/publications/reports/TEWE09006ENC>
- EU-OSHA – European Agency for Safety and Health and Work, *Expert forecast on emerging chemical risks related to occupational safety and health*, 2009c, 198 pp. Available at: http://osha.europa.eu/en/publications/reports/TE3008390ENC_chemical_risks
- EU-OSHA – European Agency for Safety and Health and Work, *Economic incentives to improve occupational safety and health: a review from the European perspective*, Publications Office of the European Union, Luxembourg, 2010a, 208 pp. Available at: http://osha.europa.eu/en/publications/reports/economic_incentives_TE3109255ENC/view.
- EU-OSHA – European Agency for Safety and Health and Work, *OSH in figures: Work-related musculoskeletal disorders in the EU – Facts and figures*, Publications Office of the European Union, Luxembourg, 2010b, 179 pp. Available at: <http://osha.europa.eu/en/publications/reports/TERO09009ENC/view>.
- EU-OSHA – European Agency for Safety and Health and Work, *E-fact 50 – Cost-benefit-analysis of economic incentives at national level*, 2010 c, Available at: <http://osha.europa.eu/en/publications/e-facts/efact50/view>
- FIOH – Finnish Institute of Occupational Health, CAREX database [Internet], Helsinki (Finland), 1998. Available at: http://www.ttl.fi/en/chemical_safety/carex.
- Greenhalgh, T., 'How to read a paper: getting your bearings (deciding what the paper is about)', *BMJ*, 1997, 315, pp.243-246.
- Hale, A.R., Guldenmund, F.W., van Loenhout, P.L.C.H., Oh, J.I.H., 'Evaluating safety management and culture interventions to improve safety: Effective intervention strategies', *Safety Science*, 2010, Vol. 48, No. 8, pp.1,026-1,035.
- Hathaway, G., and Proctor, N., *Proctor and Hughes' Chemical Hazards of the Workplace*, 5th Edition, Van Nostrand Reinhold, New York, 2004.

- Hinze, J.W. and Teizer, J., 'Visibility-related fatalities related to construction equipment', *Safety Science*, 2011, Vol. 49, No. 5, pp.709-718.
- HSE – Health and Safety Executive, *Slips and trips in the healthcare services*, Health Services Sheet, 2003, No. 2,. Available at: <http://www.hse.gov.uk/pubns/hsis2.pdf>
- HSE – Health and Safety Executive, *Workplace Newsletter: Slips and Trips*, 2004. Available at: <http://www.hse.gov.uk/slips/newsletters/healthservices.pdf>
- HSE – Health and Safety Executive, *Musculoskeletal disorders in health and social care*, undated. Available at: <http://www.hse.gov.uk/healthservices/msd/>.
- ILO – International Labour Office, *Encyclopaedia of Occupational Health and Safety*, 4th edition, Volumes 1-4, Geneva, Switzerland: International Labour Office, 1998.
- Jettinghoff, K., and Houtman, I., *A sector perspective on working conditions*, European Foundation for the Improvement of Living and Working Conditions, Dublin, 2009.
- LaDou, J., ed., *Current Occupational and Environmental Medicine*, 4th ed., New York: McGraw Hill, 2006.
- Lehtola, M.M., van der Molen, H.F., Lappalainen, J., Hoonakker, P.L.T., Hsiao, H., Haslam, R.A., 'The effectiveness of interventions for preventing injuries in the construction industry: a systematic review', *American Journal of Preventive Medicine*, 2008, 35, 1, pp.77–85.
- Leka, S., Griffiths, A.J., Cox, T., 'Guidelines on Work Organisation and Stress', *World Health Organization*, Geneva, 2003.
- Leka, S., Vartia, M., Hassard, J., Pakkin, K., Sutela, S., Cox, T., & Lindstrom, K. 'Best Practice in Interventions for the Prevention and Management of Work-Related Stress and Workplace Violence and Bullying', In: S. Leka & T. Cox, *The European Framework for Psychosocial Risk Management*. PRIMA-EF, I-WHO Publications, Nottingham, 2008.
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., 'The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration', *PLoS Medicine*, 2009, Vol. 6, No. 7, pp.28.
- Lipscomb, H.J., Pompeii, L.A., Myers, D.J., Schoenfisch, A.L., Dement, J.M., 'Systematic reviews of workplace injury interventions: what are we missing?', *Medicina del Lavoro*, 2009b, Vol. 100, No. 4, pp.247-257.
- McNeely, E., 'The consequences of job stress for nurses' health: time for a check-up', *Nursing outlook*, 2005, Vol. 53, pp.291-299.
- Michaelis, M., 'IPP-aMSE – Identification and prioritisation of relevant prevention issues for work-related musculoskeletal disorders (MSDs) – Work package 4 – Prevention approaches: evidence-based effects and prioritised national strategies in other countries', *Bergische Universität Wuppertal*, pp.72. Available at: www.dguv.de/content/prevention/campaigns/msd/review/ap_4_e.pdf.
- Ministerie van Sociale Zaken en Werkgelegenheid (Ministry of Social Affairs and Labour), *Arboportaal*, Available at: <http://www.arboportaal.nl>.
- Neumann, W.P., Eklund, J., Hansson, B., Lindbeck, L., 'Effect Assessment in Work Environment Interventions: A Methodological Reflection'. *Ergonomics*, 2010, Vol. 53, No. 1, pp.130-137.
- Nielsen, K., Randall, R., Holten, A.-L., Rial González, E., 'Conducting organisational-level occupational interventions. What works?', *Work & Stress*, 2010, Vol. 24, No. 3, pp.234-259.
- PEROSH - Partnership for European Research in Occupational Safety and Health, *PEROSH Clearinghouse Methods*, 28 p. Available in English at: [http://www.perosh.eu/per/per01.nsf/52b2da8b666e069080256aaa002ab228/94d78786e23bcb1ec12577b20032ed17/\\$FILE/PEROSH%20Clearinghouse%233AEAA80.pdf/PEROSH%20Clearinghouse%20Methods.pdf](http://www.perosh.eu/per/per01.nsf/52b2da8b666e069080256aaa002ab228/94d78786e23bcb1ec12577b20032ed17/$FILE/PEROSH%20Clearinghouse%233AEAA80.pdf/PEROSH%20Clearinghouse%20Methods.pdf).
- Robson, L.S., Clarke, J.A., Cullen, K., Bielecky, A., Severin, C., Bigelow, P.L., Irvin, E., Culyer, A., Mahood, Q., 'The effectiveness of occupational health and safety management system interventions: A systematic review', *Safety Science*, 2007, Vol. 45, No. 3, pp.329-353.

- Schulte, P.A., Lentz, T.J., Anderson, V.P., Lamborg, A.D., 'Knowledge management in occupational hygiene: the United States example'. *Annals of Occupational Hygiene*, 2004, No. 48, pp.583-594.
- Shishlov, K.S., Schoenfisch, A.L., Myers, D.J., Lipscomb, H.J., 'Non-fatal construction industry fall-related injuries treated in US emergency departments, 1998-2005', *American Journal of Industrial Medicine*, 2011, Vol. 54, No. 2, pp.128-135.
- Spangenberg, S., Mikkelsen, K.L., Kines, P., Dyreborg, J., Baarts, C., 'The construction of the Oresund link between Denmark and Sweden: the effect of a multifaceted safety campaign', *Safety Science*, 2002, No. 40, pp.457-465.
- Spangenberg, S., 'Large construction projects and injury prevention', Doctoral dissertation (Dr.Tech), *National Research Centre for the Working Environment*, Denmark & University of Aalborg, Denmark, 92 pp. & 17 articles, 2010.
- Tullar, J.M., Brewer, S., Amick, B.C., Irvin, E., Mahood, Q., Pompeii, L.A., Wang, A., Van Eerd, D., Gimeno, D., Evanoff, B., 'Occupational safety and health interventions to reduce musculoskeletal symptoms in the health care sector', *Journal of Occupational Rehabilitation*, 2010, Vol. 20, No. 2, pp.199-219.
- van der Molen, H., Lehtola, M.M., Lappalainen, J., Hoonakker, P.L.T., Hsiao, H., Haslam, R.A., Hale, A.R., Verbeek, J.H., 'Interventions for preventing injuries in the construction industry', *Cochrane Database of Systematic Reviews*, 2007, Issue 4. Art. No.: CD006251. DOI: 10.1002/14651858.CD006251.pub2. Available in English at: <http://www.cochrane.org/>.
- van Dijk, F.J.H., Verbeek, J.H., Hoving, J.L., Hulshof, C.T.J. 'A knowledge infrastructure for Occupational Safety and Health', *Journal of Occupational and Environmental Medicine*, 2010, Vol. 52, No. 12, pp.1,262-1,268.
- Verma, S.K., Chang, W.R., Courtney, T.K., Lombardi, D.A., Huang, Y.H., Brennan, M.J., Mittleman, M.A., Murray, A., Ware, J.H., Perry, M.J., 'A prospective study of floor surface, shoes, floor cleaning and slipping in US limited-service restaurant workers', *Occupational and Environmental Medicine*, 2011, Vol. 68, No. 4, pp.279-285.