

Age-Related Capacity Decline: A Review of some Workplace Implications

Sarah Harper and Sue Marcus, Oxford Institute of Ageing

Abstract

Global ageing will intensify the world skills shortage and potentially create severe competition in the global labour market. OECD countries will increasingly need to look to the large skills base they have already within their own economies, and retain experienced older workers in their 50s and 60s. This raises a variety of concerns, particularly, in the area of the health and safety of older workers, given potential change in work capacity with age. This review will consider what is known about age-related changes in physical and psychological functioning, the way in which they may be modified, and how they interact with environmental factors. Not only is the degree to which any of these changes impact on performance and function highly variable, but most of them are also highly dependent on environmental factors. We consider the work place implications for these factors. We end with an overview of current capacity testing, drawing on international examples of good practice.

Introduction

As the Global Commission on International Migration (2005) highlights, global ageing will intensify the world skills shortage and potentially create severe competition in the global labour market. European countries in particular have heavily relied on immigrant labour to compensate as their own labour markets contract across a spectrum of occupations: health care, manufacturing, services and retail, and even in terms of skilled labour, IT. However, given the dramatic ageing forecast for transitional and developing economies, it is clear that OECD countries will need to look to the large skills base they have already within their own economies, and retain experienced older workers in their 50s and 60s.

This raises a variety of concerns, particularly in the area of the health and safety of older workers given potential change in work capacity with age. Whilst this is by no means universal, physical, mental and social capabilities may undergo some degree of change. However, it is now widely recognised that very few capacity changes are directly related to decline due to chronological age alone. With the exception of sensory change, which does seem to deteriorate along a more or less fixed chronological continuum, albeit one that is also subject to some environmental modification, the majority of so-called age-related decline

is in fact closely linked to environment and behaviour. Most thus have a strong environmental component, and can be modified or reduced. In addition, considerable adaptations can be made to the work place to compensate for any decline in capacity. Furthermore societal attitudes can also be changed to encourage the retention and retraining of older workers. In what follows, we look at the known age-related changes in physical (aerobic/respiratory, cardiovascular, sensory, musculoskeletal) and psychological functioning. We then briefly identify their work place implications. We end with an overview of current capacity testing, drawing on international examples of good practice.

Perhaps the most significant implication for older workers and their employers is the change in work capacity with age, whether as a result of age per se or environmental factors over the life course and, in particular, individual life style. As noted above, many of these factors may be modified by environmental change. The extent to which this impacts on health and safety will depend very much on the nature of the work. For example, those involved in sedentary clerical work may be less affected than those who are involved in work of a very physical nature, e.g. lifting/handling equipment and/or patients. Notwithstanding that general health promotion is important (Naumanen, 2006), in light of evidence that lifestyle is a major contributor to all risk mortality, chronological age is no longer a reason to exclude older workers from the workforce. Impairments can be mitigated by good ergonomic design (Benjamin and Wilson, 2005).

For example, a study by Reynolds *et al.* (1998) points out significant cohort and time effects. According to the study, adults born in the late 1940s and 1950s will probably be in better cardiovascular condition but musculoskeletal health would be worse in comparison to current cohorts of older people. Increasing shortages of the workforce will make it necessary to revisit the status of those who became unemployed because of disability. Psychosocial factors have been found to be crucial in terms of return-to-work, as the period of work disability has been found to be less dependent on physical workload and injury severity, and rather more on psychological job factors (Krause *et al.*, 2001). Therefore, greatest results are achieved when both the psychosocial and the physical factors at work are properly addressed (Devereux *et al.*, 1999).

Much research has been undertaken by the Finnish Institute of Occupational Health. The main principle is that work demands should change as workers change with age – known as productive ageing (Ilmarinen, 2001). The work ability index (Tuomi *et al.*, 1998) was devised to show how well a worker can perform their tasks and restoring work ability may be done through modifications to the work environment (the employer's responsibility) and lifestyle (the employee's responsibility). Three main risk factor groups are defined – 'physical demands that were too high', 'stressful and dangerous work conditions' and 'poorly organised work' (Ilmarinen, 1995). The concept of work ability is not therefore just about functional ability, but includes workload effects (subjective and objective), the nature of tasks (i.e. demands) and the amount of control/autonomy a worker has over their work and environment. Griffiths (2000) defines this in terms of the demands of the job needing to meet the functional capacity of the worker. Let us consider the factors and appropriate work place modifications.

1. Aerobic/respiratory and cardiovascular function

There are significant individual differences with respect to aerobic and cardiovascular function arising from highly variable lifestyle habits and previous working habits. As Ilmarinen (2001) showed, an unfit 45 year old can have lower aerobic and cardiovascular function than a fit work colleague of 65 years old. However, it is possible to single out some general age-related changes in aerobic and cardiovascular function.

i) Aerobic/respiratory changes

- Decreased lung function. Lungs become stiffer, muscle strength and endurance diminish, and the chest wall becomes more rigid. Total lung capacity remains constant but vital capacity decreases and residual volume increases.
- Alveolar surface area decreases by up to 20% and alveoli tend to collapse sooner on expiration leading to breathlessness.
- Decreased maximum breathing capacity.
- Decreased elasticity of tissues.
- Reduced thermoregulation impacts on ability to do aerobically demanding tasks.

ii) Cardiovascular changes

- Reduced cardiac output: heart may increase in size but heart walls thicken, offsetting any benefit.
- Heart rate and blood pressure take longer to return to normal after exercise.
- Stiffening and thickening of aorta/other arteries can lead to raised blood pressure.
- Heart valves thicken resulting in possible heart murmurs.
- Odd heart rhythms/extra heart beats more common.
- Decreased function/number of pacemaker cells can

cause slower heart rate or may block heart.

- Decrease sensitivity of baroreceptors that monitor blood pressure.
- Heart size decreases, decreased elasticity and increased stiffness of arterial system.
- Decrease in intrinsic heart rate because peripheral vascular resistance increases with age and resting blood pressure tends to rise.
- Resting heart rate and the resting cardiac output (amount of blood pumped over a period of time) do not change.

Notwithstanding individual differences, the deterioration of aerobic and cardiovascular function may lead to a decreased ability to do heavy work and to work in certain environments such as intense heat/cold; a reduced capacity for shift work; and a need for greater recovery time from exertion. Appropriate workplace modifications include, for example, a) changes in work design or use of equipment for lifting, b) restrictions on amount of lifting/heavy physical tasks, and c) an increased number of breaks. In addition, aerobically demanding tasks are not only more hazardous to some older workers due to decreased aerobic capacity but also because this impacts on thermoregulation (Aittomaki *et al.*, 2005; Benjamin and Wilson, 2005; Kowalski-Trakofler *et al.*, 2005).

2. Sensory functions

Age-related changes in hearing may occur as soon as in mid 40s, in vision and touch – in mid 50s, in taste – in mid 60s, and in smell – in mid 70s. In general, loss of sensory abilities can be compensated for. However, allowances must be made for the possibility of a slower reaction time.

i) Hearing

Usually, hearing remains normal until about age 60 but then it deteriorates. According to the Royal National Institute for the Deaf (RNID), more than 50% of people over 60 have some hearing loss (RNID, n.d.). The following changes in hearing are associated with age.

- Delicate hair cells in the inner ear that translate sound waves into nerve impulses are damaged.
- Higher frequency consonants, such as *t*, *p*, *k*, *f*, *s*, and *ch*, are no longer heard due to the sensitivity loss in the high frequencies.
- Children and women's voices are more difficult to understand.

Workplace implications arising from diminished hearing ability in later life may be inability to hear alarms/announcements (of particular importance in the case of any emergency); inability to hear instructions/requests; inability to hear and converse with colleagues (Benjamin and Wilson, 2005; Daniell *et al.*, 2006; Irwin, 2000). Modifications to the workplace could include a) offering protection to workers in noisy environments, b) reducing

general noise levels, c) employing quieter machines, d) shortening exposure time, and e) increasing hearing protection. Damaging effects of noise occur both in terms of 'dose' and exposure – so prolonged exposure to low levels of noise can be just as problematic/damaging as short exposure to higher noise levels. Daniell *et al.* (2006) showed that in the US, despite 20 years of hearing regulation, most companies did not do much to reduce noise levels. However, neither did employees use the protection they were offered. In the US, the NIOSH (2004) recommends hearing loss prevention programmes for all workplaces with hazardous noise levels. In the UK, a MORI poll for the RNID (2005) suggested that embarrassment prevents employees from reporting workplace hearing problems and a telephone based hearing test has been made available (2006) in the hope that more people will be willing to take a hearing test. The HSE (2005) recommend employers start screening before exposure, i.e. at entry or change of job annually for the first two years, thereafter every two or three years.

ii) Balance

Age-related changes in the ability to maintain balance are as follows.

- More difficult to maintain balance.
- Greater propensity for falls.
- Loss of sensory cells and changes to receptors affectability to maintain balance.

Age related changes to balance require some modifications to the work environment, although most of these should be in place for all workers, regardless of age (Benjamin and Wilson, 2005; Gauchard *et al.*, 2001; Ohio BWC, 2003). There may be an increase in the number of falls, for example, and difficulties due to increasingly poor posture. Eliminating slips, trips, and falls that occur as a result of impaired balance through either sensory impairment, and in some cases coupled with musculoskeletal decline, should be a primary workplace objective. Ways to achieve this include improved lighting, even surfaces, clean non-slip surfaces and the removal of objects from floors and in path/walkways. Untidy workplaces, slippery surfaces and poor lighting can contribute to the risk of falls (PPHSA, 1998). In addition, uneven floor surfaces, inappropriate footwear and poor carrying techniques can contribute to falls as can temporal constraints related to urgency (Guachard *et al.*, 2001). Established Health and Safety workplace housekeeping practices will enable removal of objects from floors and in path/walkways. Floor surfaces therefore need to be kept clean/non slip with adequate lighting.

iii) Vision

Age-related changes in vision are as follows.

- Decreased ability to see objects clearly.
- Decreased ability to focus on objects at different distances.

- Decreased ability to function in low light levels.
- Decreased ability to distinguish certain colour intensities.
- Decreased ability to correctly judge distances.
- Decreased ability to perceive speed of moving objects.
- Dry eye.
- Cataracts.
- Glaucoma.

Once changes in eyesight occur, the ability to distinguish light and dark may be affected which can have implications for a variety of tasks such as operating/driving machinery/vehicles (Schneck and Haegerstrom-Portnoy, 2003; Ball, 2003; Benjamin and Wilson, 2005). Also, there may be an increase in recognised vision defects such as long and short sightedness, astigmatism, and eye tiredness. Lighting and regular vision testing, sufficient rest periods, larger text/font size on computers and in documents/signage, monitoring of corrections to existing eyesight problems, and anti-glare computer screens together with other relevant technology are all ways in which the work environment can be altered to compensate. For computer users, UK employers are already required to pay for an eye test every two years; this may need to be extended to other workplace tasks. Ball (2003) suggests that testing be done in a real world situation rather than in the laboratory. Clinical settings may be appropriate for determining the presence/absence of disease but do not necessarily explain everyday functional ability.

iv) Touch/Skin/Thermoregulation

The following are age-related changes in touch, skin, and thermoregulatory functions.

- Reduced response to thermal stress.
- Reduced sensation to pain, vibration, heat, cold, pressure. May be associated with disease (e.g. diabetes) rather than ageing process *per se*.
- Skin thins and wrinkles.
- Reduced skin elasticity.
- Subcutaneous fat thins and reduces its ability to maintain body temperature, increasing the likelihood of hypothermia.
- Sweat glands become less efficient in keeping cool in heat, increasing the likelihood of heat stroke.
- Skin takes up to four times longer to heal if cut/wounded.

There may be a risk of greater susceptibility to dermatitis which could impact on an employee's ability to perform certain tasks if contact time has to be reduced to prevent dermatitis. Protective gloves should be provided if and where necessary, thus reducing the contact with irritants that may be the cause. If working out of doors older and younger workers alike should be protected from harmful UVA and UVB light.

3. Musculoskeletal function

According to the most recent Health and Safety Executive (HSE) Statistics, of the 2 million people who reported work related illness in 2005 – 2006, 75% of this was due to musculoskeletal disorders. Age-related changes in the musculoskeletal function may occur as soon as the mid 40s when bone density begins to decrease in both sexes. Other common age-related changes are as follows.

- Decrease of bone mass leading to fractures at the proximal ends of long bones and the spine.
- Decrease of muscle mass (*sarcopenia*) and subsequent decrease in maximal muscle strength and increase of adiposity.
- Loss of elasticity, tensile strength and capacity for regeneration of the connective tissue in the ligaments and tendons.
- Increase of fracture incidence, particularly of the long bones and the spine.
- Increased brittleness and reduced growth capacity of articular cartilage.

Age-related changes in the musculoskeletal function usually result in the deterioration of physical health, in particular, alteration/loss of balance, change of posture, and a decrease in mobility/movement. Back pain and neck pain are common, intermittent symptoms in old age and are associated with general poor physical health (Hartvigsen *et al.*, 2004). Absence from work due to back pain has been found to be strongly inversely related to employment grade, and the effects of psychosocial work characteristics, such as control, have been found to differ by grade and gender in both magnitude and direction, thus pointing out that the psychosocial work environment represents a potentially reversible cause of ill health (Hemingway *et al.*, 1997).

Flexion and rotation of the trunk, lifting, and low job satisfaction, as well as low social support, either from supervisors or co-workers, have also been cited as risk factors for sickness absence due to low back pain (Hoogendoorn *et al.*, 2002; 2000). A review of existing studies, exploring the relation between back pain and psychosocial factors in work and in private life, additionally confirmed that low workplace social support and low job satisfaction are risk factors for back pain. However, as the results turned out to be sensitive to changes in the rating system, the overall conclusion is “for an effect of work-related psychosocial factors, but the evidence for the role of specific factors has not been established yet” (Hoogendoorn *et al.*, 2000, p.2114).

According to the Ontario University’s Back Pain Study, low back pain seems to be a function of both the physical demands of the job and a number of worker’s perceptions. Both physical and psychosocial factors were associated with the reporting of low back pain and therefore both of these factors should be addressed in the design and modification of work. Physical risk factors included peak lumbar shear force, peak

load handled, and cumulative lumbar disc compression. Significant psychosocial factors were high perceived physical load, low opinion of the workplace social environment, perception of lack of control of the job, high co-worker support; high job satisfaction, perceived over-education and a prior low back compensation claim (Kerr *et al.*, 2001).

Current general psychological and medical literature suggests there is sufficient evidence for the association between psychological factors and back pain, but “there is still a lack of knowledge concerning the mechanisms by which these operate” (Linton, 2001, p.53). Fuller exploration and better understanding of the psychological factors will be of huge benefit in targeting MSDs, as ergonomic interventions alone have already proved to be suboptimal in dealing with MSD problems: “[t]he attributable fraction indicated that substantial reductions in the number of cases of back pain could be achieved if the exposure to the psychological risk factor was eliminated” (*ibid.*).

Despite the widely accepted understanding that a variety of factors contribute to Low Back Disorders (LBD) “the relative contributions of personal, workplace, organisational, and environmental variables to the development and severity of LBDs are not completely understood”, in particular “age, gender, injury history, relative strength, smoking, and psychological variables (should) be studied further” (Dempsey *et al.*, 1997, p.748). According to Lebouef-Yde (2004), there is enough evidence confirming a relatively strong genetic component to Low Back Pain, but there is no evidence for a connection between that kind of MSD and a sedentary life style.

In light of the above it is clear that any attempts to modify the workplace will need to be specifically tailored to the type of musculoskeletal change experienced by the worker and its impact on their physical capacity and ability to do the job. This may extend to include changes in the way the work is organised, such as rotors and shifts.

4. Psychological function

i) Depression

Depression is a disabling illness to which older workers are more susceptible than those from other age groups. Common manifestations of depression in old age are as follows.

- An increase in depressed or irritable mood, feelings of overwhelming sadness, or seeming inability to feel emotions.
- Marked decrease of interest in activities and hobbies that are normally enjoyed, friends, socialising, and a loss of libido.
- Change in appetite, usually a loss of appetite.
- Change in weight (unintentional weight loss (most frequently) or weight gain).
- Disturbed sleep patterns (daytime sleepiness and insomnia).

- Decreased level of energy and changes in activity levels, temper and agitation.
- Mental and physical fatigue.
- Lowered self-esteem, feelings of worthlessness.
- Abnormal thoughts, excessive or inappropriate feelings of guilt, self-blame helplessness, anxiety, and/or fear.
- Decreased ability to focus, concentrate or make decisions, memory loss.
- Abnormal thoughts about death, thoughts about suicide, plans to commit suicide or actual suicide attempts.
- Marked pessimism about the future.

For older workers, especially those of low socio-economic standing who are nearing retirement, involuntary exclusion from the workforce may be a contributor to ongoing mental health issues. A number of studies have shown elevated risk factors for adverse psychosocial health outcomes from workplace stress/conditions (Pikhart *et al.*, 2004; Godin *et al.*, 2005; Weyers *et al.*, 2006). In a study of nursing home nurses in the US, Muntaner *et al.* (2006) found that workplace emotional strain and age were associated with increased odds of depression.

ii) Cognitive function

Age-Related Cognitive Decline (ARCD) is manifested through *gradual* deterioration in such mental and cognitive functions as thinking, memory, learning, attention, focus, concentration, and use of language. More specifically, under the presence of ARCD problems occur in terms of:

- encoding (putting information into memory) and retrieval (finding information in memory);
- understanding text;
- processes involving attention, concentration, and resistance to distractions;
- working memory capabilities (the amount of information you can work with without losing track of any);
- making inferences.

The clinical manifestations for Mild Cognitive Impairment involve the same characteristics, only more intensified. The difference between the two is quantitative, not qualitative.

Given that the decline is gradual, the impact on those of working age – up to 65 or 70 – may be limited. However, studies have found shift work to have a significant effect on cognitive function and this appears to be increased in later life. Short-term effects – changes in alertness and efficiency – have been noted in workers whose circadian rhythms are disturbed. Using a variety of neurological tests, Rouch *et al.* (2005) found that shift work had negative effects on memory.

Current male shift-workers had lower cognitive performance than never exposed workers. In the same population, memory performance tended to decrease with increasing

shift-work duration. Among former shift-workers, the cognitive performance of the participant having stopped shift work more than 4 years ago seemed to be increased, suggesting a possible reversibility of effects.

Rouch *et al.*, 2005

However, another study by Petru *et al.* (2005) documented no negative effects on either cognitive or psychomotor performance, neither was there an increased risk of accidents. The recent study by Harma *et al.* (2006), unique in that it was an intervention study specifically designed for older workers, showed that a fast forward rotating shift system improved psychomotor performance and alertness on the night shift and general wellbeing,

Of particular concern with respect to cognitive function is the potential change in reaction times (RT). Reaction times are not purely a psychomotor function but depend on other cognitive factors. Crystallised intelligence depends on experience, education and learning and increases with age. Fluid intelligence is more about the ability to solve new problems based on current information. It is therefore about more immediate reactions. Bugg *et al.* (2006) suggest that declines in fluid intelligence are associated with a general slowing of function of the frontal lobes of the brain, one of the first areas of the brain to be affected by ageing. Zimprich and Martin (2002) found changes in processing speed strongly correlated with changes in fluid intelligence.

Reaction times tend to increase with age, but there is much variability, depending on the type of task. Many studies use small samples and lack power and consist only of older people or a group of older people compared with a younger group, rather than across the whole age range. This can cause population level confounding (Hofer and Sliwinski, 2001). Salthouse (2004) challenges the assumption that although there are declines in speed, reasoning and memory, there is significant variation between persons. He found age-related cognitive decline to be cumulative across the lifespan, but adds that cognitive ability is not the only contributor to successful cognitive functioning, others being motivation and persistence. Der and Deary (2006) found that there was little change in simple RT up to age 50 but choice RT shows signs of slowing. Gender differences exist especially with respect to choice variability. Sight and light recognition can be impaired as visual reaction times decline with age. This is important with respect to driving/operating machinery (3M, 2006). Dynamic Visual Acuity (DVA) – the ability to resolve details of a moving target – decreases with age, starting around 45 (Shinar and Schieber, 1991).

Time dependent decision-making may compromise older workers' performance (Haight, 2003). If time is sufficient and task is familiar, performance should not be compromised. Greater complexity needs more time. Ability to co-ordinate multiple tasks declines with age (Sit and Fisk, 1999), although age-related differences in multiple task

performance decreased with practice. Adjustments need therefore to be made in task design. However, decision quality seems not to be affected by age. In their study of younger and older drivers, Walker *et al.* (1997) found that decision speed was slower for older participants, but age did not affect the quality of decision.

iii) Dementia

Dementia is a syndrome caused by a chronic or progressive brain disturbance, under which deterioration of variety of primary and cerebral functions occurs. More specifically, deterioration takes place in memory, thinking, orientation, comprehension, calculation, language, learning abilities, and decrease in other intellectual functions. These cognitive deteriorations are usually accompanied, or preceded by:

- decrease in motivation;
- decrease in control over the emotions;
- degradation in social behaviour (this pattern of development is especially common in Alzheimer's disease);
- disturbance in daily activities.

Note should be made that until this day we still lack conclusive diagnostics for the majority of the existing dementias, other than autopsy. Therefore, the above-mentioned manifestations are the symptoms currently used as sufficient clinical evidence for the diagnosing of a "probable dementia". Diagnosing dementia is even further complicated as in elderly depression can mimic the effects of dementia. Depression in elderly can also lead to over-reporting and exaggerating the existing level of cognitive disturbances, which, therefore, can affect the diagnosing with probable dementia.

The relationship between the workplace and dementia is a highly important and still largely unexplored area of research. Studies have found an association between dementia and the psychosocial features of the workplace. Additionally, the risk for dementia may decrease with more cognitive and socially challenging working conditions (Seidler *et al.*, 2004; Evans *et al.*, 1997). This raises the question as to whether people with different labour patterns and occupations have an increased risk of dementia.

Health and Safety

Given the introduction of recent age discrimination legislation throughout the EU, and its implementation in several countries, the importance of health and safety issues will rise as the numbers of older workers in the labour market increases. However there is surprisingly little research or information appertaining to the needs of older workers in the extant literature. Unions, public bodies and professional organisations differ in the way they address – or not – such needs, and examination of literature from other countries

reveals similar disparities in approach. Whilst there will of necessity be the need for a varied approach to health and safety amongst differing professions/occupations, the concept of an older work force having specific needs is not yet evident.

This may be because of the need to avoid discrimination on the grounds of age. To use age as a trigger for any kind of capacity testing would clearly be unacceptable under age discrimination legislation. In the UK, there is a legal duty of all employers to ensure the health, safety and welfare at work of all their employees, regardless of age. The Health and Safety Executive (HSE) requires that a "suitable and sufficient" risk assessment be done on the work their employees do. Under the regulations defined in the Health and Safety at Work Act 1974 and the Management of Health and Safety at Work Regulations (Management Regulations) there are several risk assessment duties that need to be carried out, aimed at identifying and implementing preventative and protective measures to improve the workplace, updating these at regular intervals and identifying particular groups (group means here more than 5 people) that are at risk (UNISON, 2000, p.15). This includes young workers, experienced workers, lone workers, workers with disabilities, and pregnant workers. Currently this does *not* include older workers as a group.

The risk assessment is supposed to take in all relevant actors such as ergonomics, design of workplaces/tools/equipment/workstations and organisation of work. However, defining whether the job is suitable both physically and psychologically for the worker, although included in this assessment, does not require that the worker submit to any kind of capacity testing. Any assessment is carried out from the perspective of the work rather than the worker. This is in contrast to the idea of workability which has a more holistic approach. This lack of a holistic approach reveals itself in the differing ways in which Trade Unions, Government and Public bodies and Practitioner organisations express their position.

Trade Unions

There is no set way to perform a risk assessment and this lack of uniformity has inherent problems. From the perspective of the unions, the biggest problem is that risk assessments may be badly done, and problems are "underestimated, missed or just plain ignored". Their argument is that input of the workers themselves is crucial since they are the ones who know the job best. Although a union safety representative (i.e. an employee) may know more about Health and Safety than the management, currently the responsibility of the risk assessment lies with the employer. UNISON recognises that too often management will exclude workers from jobs rather than alter the job to fit the worker. People with disabilities can be seen/treated as a hazard and screened out rather than viewed as workers for whom a different kind of protection is needed. UNISON has its own workplace health survey for its members, which provides

a means of gathering information on both physical and mental health status from the employee's perspective.

Both the British Safety Council and Trades Union Congress (TUC) have health and safety information regarding special groups such as younger workers and women, but information on health and safety issues regarding older workers is absent. On the TUC's website under the Health and Safety section of their 'Equality' page, there is a section for younger but not older workers (TUC, 2006).

The TUC also regard capacity testing on the grounds of age is unacceptable (personal communication). Speaking in 2003 (BUPA, 2003), Owen Tudor of the TUC stated that perfect health and safety practices where risk assessments were tailored to the individual employee's needs would provide a safe working environment for all, not just older workers. He added that issues specific to older people are often overlooked. (e.g. menopause in women is not talked about in the same way that pregnancy is. There is a limited awareness of needs at this time – for example and increased need for access to fresh air and/or cold water.) Another Union, the Graphical, Paper and Media Union, in their 'key issues' section on their website has a section on younger workers but nothing relating to older ones (GPMU, accessed 2006).

Government and Public Bodies

The HSE's paper 'Facts and misconceptions about age, health status and employability' (Benjamin and Wilson, 2005) concerns itself with exploding the myths of an ageing workforce. They recommend health promotion activities in the work place, frequent risk assessments and continuous opportunities (equal with those of younger colleagues) for learning/training, promotion of functional capabilities and matching work to workers abilities so functional capacity, both physical and mental, are optimised (Benjamin and Wilson, 2005). The HSE newsletter of Mainstream Research News on July 13, 2000, states:

Provided that job demands are well matched to individual capabilities, there are no grounds for excluding older workers from the workplace, but achievement of this goal requires identification of best practice in job design and work organisation.

Another very clear statement comes from Scotland in the government paper 'Healthy Working Lives – A Plan for Action'. They categorically state the need for individuals to maximise functional capacity, including physical, mental and social capacity and that skills, abilities, fitness and knowledge should be matched to the job from the workers perspective, if necessary making adjustments to changes with age including training and development (Scottish Executive, 2005).

The Department of Trade and Industry's 'Success at Work' paper (2006), whilst it recognises the need to facilitate older workers, does not include age in its section 'Measures to

promote fairness in the workplace', stating that there is 'a right to no discrimination on grounds of religion or belief, disability or sexual orientation.' But ageing is not mentioned here

In the Cabinet Office paper 'Winning the Generation Game' (2000) more training and skill development, more flexible working arrangements and more measures to improve occupational health are defined as ways to improve work arrangements. If capacity decreases and there is a need to 'downshift' in later life, this should be accommodated by good practice.

The Advisory, Conciliation and Arbitration Service (ACAS) advocate a fair appraisal of performance system. Comments based on (negative) preconceptions about age can often undermine a fair appraisal system and lead to further discrimination (this is true for younger workers too). Shortfalls in performance should be noted even if the worker is nearing retirement (ACAS, 2006).

A somewhat clearer stance emerges from the Chartered Institute of Personnel and Development (CIPD) who in their 2006 document 'Age and Employment' recommend the following: "An individual's age should not be used to make judgements about their abilities or fitness. Where such a judgement is required, an occupational health or medical practitioner should be consulted." They also state that age is a poor predictor of performance and that it is misleading to equate physical and mental ability with age. Job suitability should be based on competency qualifications, skills potential and objective job-related criteria by means of analysis of both requirements and performance (CIPD, 2006).

A survey of employers by CROW found that the application of appraisal and performance management systems was very varied. Those nearing retirement were perceived as needing less attention and poor performance was ignored. Although some Human Resources directors thought this was in effect being kind, it is in fact discriminatory (CROW, 2005). Withholding training, development or promotion on the grounds of not identifying the need through some kind of appraisal because of age, is unlawful post October 2006.

BUPA offer remote occupational health assessments, where BUPA physicians assess health status and work environment details (BUPA, 2003). It is unclear from their document if and/or to what extent companies are 'screening' by the back door.

Practitioners

The Institution of Occupational Safety and Health (IOSH), "Europe's leading body for health and safety professionals" (IOSH, 2007), has no position statement or recommendations regarding older workers and capacity testing. IOSH has a publication for educating younger workers into better health and safety at work (IOSH, 2006)

but nothing equivalent that addresses the needs of older workers.

According to the multinational study/survey by the European Network of Safety and Health Practitioner Organisations (ENSHPO) into the role of occupational health practitioners, the average age of the UK respondents was 49 with 19% under 40 but almost 50% over 50, and 89% of them were male (ENSHPO, 2005, p.5). This study also notes that most Occupational Health and Safety issues are Health rather than Safety related: 33 million out of 40 million working days lost in the UK in 2001–2002 were due to ill health (ENSHPO, 2005).

The paper ‘Creating a Healthy Workplace’ written by the Faculty of Occupational Medicine together with the Faculty of Public Health (FOM and FPH, 2006) makes no mention of older workers. However, their Position Paper on Age and Employment (FOM, 2004) supports the ideas of workability and employability, citing the benefits of older workers and that any capacity declines that may be age-related are in fact compensated for. They recommend pre-placement assessments especially for critical safety tasks, and accessible advice for any health and safety concerns that may arise for them.

From the above examples, overall, where the issue of older workers *is* addressed – and this is not consistent – the main unions, government and public bodies and practitioners are in agreement, as the FOM states, work should be matched to the worker’s needs/capability. However, there seems to be a lack of agreement regarding prioritisation of older workers as a group with particular health and safety needs. With regard to initiation and frequency of capacity testing, there is no clear directive at all. Any such testing is seen to be a function of the risk assessment process. In an ideal workplace this is carried out regularly and thoroughly and would reveal any mismatch of worker capacity and job requirement in a timely way.

International Perspectives

Other countries are tackling the health and safety of older workers in various ways. This section covers some of the initiatives and programmes.

Australia

The Australian Government brought in Job Capacity Assessment in July 2006. This is not aimed at one particular section of the population but is part of its broader Welfare to Work package and its remit is to help people find and keep paid employment. Apart from including jobseekers currently on benefit or those on disability support pension, “voluntary job seekers such as mature age people wanting to get a job” are specified. Assessments are done by professionals face to face, and the individual has the right of redress if they are not happy with the outcome. The ideal

outcome is to refer the individual to an employment or support service that meets their particular need.

The Australian government’s paper ‘Productive and safe workplaces for an ageing workforce’ (APSC, 2003) highlights the inappropriateness of equating capacity with chronological age. The main points are that chronological age is only a crude indicator of health and/or performance capacity and that there is great individual variability of both age related and non age-related factors. Additionally their view is that age related problems can be minimised by implementing strategies at a young age. Such strategies across the life course could be adjustment to both physical and work environment, healthy lifestyle promotion and updating professional skills.

The Surveillance Alert “OHS and the Ageing Workforce” from the Australian Office of Safety and Compensation (2005) gives a comprehensive range of suggestions for keeping older workers in the workforce based on matching the work to an individual’s capacity. This may be accomplished by modifications to the environment – e.g. improving lighting, reducing noise and appropriate heating; avoiding excessive work rates and production workload targets; flexible working patterns; appropriate training to update skills.

USA

The USA has a well-developed system of Health and Safety, yet this appears to be related more to minimising compensation claims than to work capacity testing for the sake of the worker. Although there is a national body, the National Institute for Occupational Safety and Health (NIOSH), there seems to be a mixture of Federal and Government criteria. In their publication Worker Health Chart Book (2004), chapter 5 has a section on older workers, but this is mainly factual information on the distribution of occupational injuries and illnesses. On their website, there is information dedicated to older workers in the mining industry and to older drivers, but there is no overall directive (NIOSH, 2007).

A Functional Capacity Evaluation (FCE) is a systematic process of assessing an individual’s physical capacities and functional abilities. However, this is mainly used for those returning to work after an injury-related absence or because of some disability or impairment (Owens, 1999). The FCE matches human performance levels to the demands of a specific job, work activity, or occupation. The FCE establishes the physical level of work an individual can perform and is useful in determining job placement, job accommodation, and return to work after injury or illness. FCEs can also provide objective information regarding functional work ability in the determination of occupational disability status. For example, the FCE test developed by the Center for Occupational Rehabilitation and Ergonomics of John Hopkins Medicine (CORE, n.d.) includes the following components:

- repetitive lifting capacity at various levels;
- repetitive push, pull, and carrying capacities;
- hand grip strength;
- tolerance for elevated work;
- prolonged trunk flexion in sitting and standing;
- prolonged trunk rotation in sitting and standing;
- prolonged crawl, knee and sustained crouch positions;
- repetitive squat;
- tolerance for prolonged sitting and standing;
- maximum walking, stairs and stepladder capacity;
- balance;
- hand coordination.

Some professions need work capacity testing to be carried out to make sure workers are fit to carry out the job. The Fire and Aviation Management department of the USDA forest service define work capacity with respect to fire fighters as “a composite of fitness, acclimatization, nutrition, skill experience, motivation and intelligence.” The purpose of capacity testing is to ascertain that workers can perform without undue fatigue and strain and are not and will not become a safety hazard to themselves or others.

A miscellaneous variety of other bodies have produced guidelines on this topic. For example, the National Academy of Sciences publication “Health and Safety Needs of Older Workers” (Wegman and McGee, 2004) recommends to NIOSH quite clearly that it is preferable to change the working environment to accommodate the needs of the worker rather than expecting the worker alone to adapt. The Ohio Bureau of Workers’ Compensation are slightly more specific, stating that general health and safety and ergonomic measures should be enough to deal with any capacity changes needed to suit an older worker. This is in their paper “Employing older workers and controlling workers’ compensation costs” where the latter part of the title seems to have more import. They do however have a website dedicated to older workers. In their pamphlet “Protecting Older Workers” they state: “Employers must get specific by performing individual job analyses”, analysing the needs of the worker assigned to the job (Sargeant-Matthews, 2005, p.4). The New Jersey Occupational Health Service directive for older workers suggests matching worker ability to the job, frequent monitoring, and promoting general good health. Certain industries/professions have their own capacity testing in place, e.g. Wildland firefighters (USDA, 2002). However, this is not age-related.

Interestingly, a paper by Smethurst (2006) notes that a report in Aviation, Space and Environmental Medicine

regarding the current compulsory retirement age of 60 for US pilots concluded: “There appears to be no medical, scientific or safety justification for the age 60 rule. It represents age discrimination.”

There are also other not for profit health and safety organisations that run in parallel with the national body NIOSH, part of whose remit is to advise unions and enable workers to address health and safety issues in the workplace without out fear of losing their jobs. NYCOSH, the New York Committee for Occupational Safety and Health is one such organisation. Older workers as yet do not appear as a recognised group.

Canada

The CCOHS, Canada’s national occupational health and safety resource, say the work environment needs to be adapted to suit the worker to compensate for any declines in physical capability. This also concurs with the government’s position (CCOHS, 2002; HRSDC, 2005). OSSA, the Ontario Service Safety Alliance, in their publication “An Aging Workforce” conclude that flexible work arrangements, job redesign and training opportunities will also enhance the work capacity of the older individual (OSSA, 2002). With regard to capacity testing, however, there is nothing specific.

Comparing the countries listed above, it emerges that there is a contrast between Australia and Canada’s attitude to health and safety and that of the USA. In Australia and Canada there is a more holistic approach, with the emphasis on matching the needs and capacity of the worker with the job. In the USA there is more emphasis on limiting the need for compensation claims and for worker’s rights regarding health and safety

Conclusion

It is clear that, in response to ageing workforces, the necessity to adapt and modify behaviour will lie with both employers and workers. Employers can modify tasks/environment/demands, provide training, monitor/assess functional capacity (physical, mental, social), whilst employees will be required to accept the need to adapt/train. In addition, making the workplace more flexible may help older workers feel safer and therefore stay longer. The new working mantra will surely be *Recruit Retain Retrain* older workers. Understanding age-related capacity changes, their relationship with environmental factors, and the necessity for work place adaptations will be crucial here.

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Correspondence

Professor Sarah Harper
 Oxford Institute of Ageing
 Manor Road Building
 Manor Road
 Oxford OX1 3UQ
 Email: sarah.harper@ageing.ox.ac.uk