

QLINE STRESS ASSESSMENT AT WORKPLACE

QLINE DANTEST STRESS ASSESSMENT

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INTRODUCTION TO WORK STRESS

- *Occupational Stress and Implications for Health*
- *Impact of Stress on the Workforce and cost*
- *Implications for Business, Productivity and Absenteeism*

Occupational Stress Statistics - Prevalence

The Stress and Health at Work survey indicated that almost 20% of working individuals, when asked to consider how stressful their job was on a 5-point scale, rated their work in the top two work-stress categories of very and extremely stressful. The authors of the study estimated that, on this basis, 5 million British workers believe that they are exposed to work stress.

Incidence

Other HSE commissioned surveys, SOSMI (Surveillance of Occupational Stress and Mental Illness) surveillance schemes together indicated an estimated 7,419 new cases of work-related mental ill health reported by psychiatrists and occupational physicians in Britain in 2001. Over 85% of these cases were categorised as work-related anxiety and depression, or other work-related stress. Together they probably represent cases of work-stress-related psychological ill health. Incidence estimates from these surveillance schemes represent the more severe cases and almost certainly underestimate the overall incidence of work-related stress in Britain.

Trends

Approximate comparisons, limiting analyses to England and Wales and attempting to align stress figures on a similar basis, suggest an approximate doubling of the prevalence rate of self-reported stress from 1990 to 1999 and no significant change between 1999 and 2001. Assessing the data from several surveillance schemes would suggest an increase of approximately 13% in the annual incidence of work-related mental ill health for the years 1999 to 2001. Furthermore, factors such as awareness and knowledge of stress, and the social stigma attached to stress or mental illness, can change markedly with time and may strongly influence the reporting of work stress.

Age and Sex distribution

STRESS AND HEALTH AT WORK SURVEY and SWI95 (Self-reported work-related illness in 1995) survey data suggests that a similar number of males and females report work-related stress. SWI95 analysis by broad age groups indicated that the rates for work-related stress were highest in the age grouping 45 to retirement age, compared to a younger worker age group. Furthermore, this survey indicated very few cases occurred in the retirement age groups, implying a reversible and generally non-persistent effect. This age distribution is broadly supported by STRESS AND HEALTH AT WORK SURVEY data, which indicated that a higher proportion of those reporting that their work was very or extremely stressful occurred in the two age groupings 33-40 and 41-50 years. data indicates that the 35-44 and 45-54 age groups are affected by work-related mental ill health to a greater extent than older and younger groups.

Occupational Distribution

SWI95 reported that occupations with the highest rates of stress depression or anxiety were nurses and teachers. Over 2% of those currently or recently working were suffering from work-related stress, depression or anxiety. Care workers, managers and professional occupations have the second highest rate of stress, depression or anxiety, with over 1% of those currently or recently working affected. This occupational distribution is broadly similar to that suggested by SWI90, SWI98/99, STRESS AND HEALTH AT WORK SURVEY and surveillance scheme data. Generally these data suggest that the highest work-stress is found among social class group II, representing managerial and technical occupations. Also notable is that those occupations with high work-stress, as measured by these sources, tend to be public sector workers.

Cost

Based on HSE reporting that used data from SWI95, it is estimated that the cost to employers of work-related stress was about £353 million to £381 million (1995/96 prices) and to society about £3.7 to £3.8 billion. These estimates are based on a number of assumptions and are intended only to be broadly indicative of the cost. It should be noted that since these

calculations were made, the estimated number of days lost due to stress has more than doubled. The Confederation of British Industry estimates that businesses lost £10.2 billion in 1998 through lost productivity caused by stress (see below).

Statistics and Statements on Work Stress and Burnout

On the basis of the results of a survey drawn from separate studies conducted in five industrialised countries, the International Labour Organisation (ILO) predicts a dramatic worldwide increase in depression and stress as new technologies grow and globalisation accelerates. In some European countries job insecurity and rising unemployment have contributed to high stress rates, with more than 50% of workers suffering from burnout and 7% severe burnout in one particular country. In Britain and the US the problem is attributed to the pressures of mastering the information technology revolution and increased productivity demands. "These trends represent a wake-up call for business", according to the ILO report.

UK Stress at work costing billions

According to HSE estimates, stress-related illness is costing the U.K £3.75 billion a year. The Confederation of British Industry (CBI) estimates that businesses lost £10.2 billion in 1998 through reduced productivity caused by stress. Each year, 150,000 people take at least a month off for ailments caused by job pressure. More than 6.5 million working days are lost and, at any one time, an estimated 50,000 people are off sick with anxiety or depression. One in five people told the HSE that their work was 'very' or 'extremely' stressful. A new HSE stress-busting guide advises that managers must encourage staff to take their annual leave entitlement and proper meal breaks.

Research shows that many British people are also working more intensively now than they did before 1986, mainly owing to peer pressure rather than hard-driving supervision. In 1986, 29 per cent of employees cited colleagues as affecting how hard they work; by 1997 the figure had risen to 57 per cent. In addition, there have been rises in both productivity and stress levels. (F.Green, British Journal of Industrial Relations, March 2001).

In the Netherlands, the percentage of workers who received a disability pension because of stress-related disorders increased between 1981 and 1999 by 21%, and is now higher than disability rates for any other physical disease. This is mainly due to an increase in the occurrence of burnout syndrome, the direct consequence of prolonged, uninterrupted stress. The cost to the community caused by psychological problems at work in Holland has led to insurance companies increasing their rates by 20-30% (de Valk & Werner, 2002).

Huge stress payouts and rising claims

Are the high profile stress awards of £250,000 for schoolteacher Janice Howell (2000); £203,000 for site manager Randy Ingram, and £100,000 for bank manager Leslie North just the tip of the iceberg? The unions think so, with the latest TUC report showing that 516 new stress cases are now in the system (2001), up a quarter on the figure for 2000. Union-backed awards last year for ill health totalled £320m, up on £308m the year before.

Is new technology to blame for rising stress figures?

A survey commissioned by the International Stress Management Association (ISMA) has shown that the nightmare vision of electronic overload pushing stress levels to the limits has failed to materialise. More than half of those interviewed "disagreed strongly" that new technology was the cause of workplace stress. In fact, a third of workers believe that their quality of life has been improved by e-technology. ISMA's Carole Spiers, ex-chair of the National Stress Awareness Day Committee, said: "Technology may not be the culprit, but there are plenty of other factors that contribute to stress in the workplace. These can be work overload caused by downsizing, longer hours, bullying, pressure to perform and lack of job security."

Exhaustion epidemic takes its toll

Within the survey published by pharmaceutical company Roche, GPs have revealed that 10 per cent of their patients are suffering from the signs of anxiety brought on by everyday living. About a third of family doctors questioned have seen a 50 per cent increase in 26 to 35-year-olds with symptoms of exhaustion.

Professor Cary Cooper from UMIST cites "the shift away from the nine-to-five culture" as another source of stress. "Ten years ago the average career consisted of two to three jobs - now it is 12 to 15 jobs," he says. "The two-earner family also puts great pressure on the home and you get a bad work-life balance," he adds. According to Professor Cooper, "work-related stress partly explains the increased divorce rate in the UK." Less obvious "stressors" include emails and faxes, which create "e-stress".

The most common response to stress is the "sickie". The taking of sick leave has increased 500 per cent since the 1950s. The average holiday time in Britain is 28 days a year, compared with 37 days in Germany and 43 days in Austria. And neither the German nor Austrian economies have collapsed while their workforce is relaxing in Tenerife! "The likelihood is that British workers would be less stressed and more productive if they had more holidays," says Professor Cooper.

Workers off with stress

Stress is now the Number One reason for absence from work - overtaking the common cold. Every day, more than a quarter of a million people are off sick with stress, with headaches, depression and panic attacks being the most common symptoms.

A survey for National Stress Awareness Day reveals that employees have an average of eight days sick leave per year due to stress. If ignored it can cause anxiety and depression. Tips for preventing office stress include: avoid nicotine, caffeine and too much alcohol; exercise; get enough sleep; take breaks; avoid conflict; accept what you can't change, and manage your time better. As well as costing £7 billion in sick pay, lost production and NHS bills, stress wreaks havoc with our general health.

Dr Tim Cantopher, a psychiatrist from the Priory group of hospitals, emphasises that it is often the apparently emotionally strong, goal-oriented, competitive type of person who becomes a victim of mental illness. "Many people believe that people who suffer from stress are weak. But in fact it is often the strong, reliable, diligent person with a firm conscience and a sense of responsibility who is more likely to be affected," he says. He goes on to explain that stress is the most common cause of depression in those who are strong and successful. When stressed, the weak capitulate - but the strong react by doubling their efforts, increasing the burden until they push themselves beyond their limits.

People affected by stress to the point where their mood is also affected show all the classic signs of depression. They lose pleasure in what they are doing and are unable to look forward to the future with confidence. These overstretched workers lose sleep, libido, weight, appetite, energy and enthusiasm, though their low mood frequently improves as the day progresses and sometimes they may display even a hint of optimism by the evening.

Recent surveys have indicated that stress counselling at work has trebled in nine years, with more than half of all companies now providing it. More firms are also offering benefits such as child-care facilities, sabbatical leave and working from home to help staff cope better with the strain of modern living. With fewer 'jobs for life' around, counselling to employees losing their posts has more than doubled from 36 per cent in 1990 to 77 per cent in 2000.

A spokesperson for the consultants who carried out the survey of 136 firms said, "Technological advances such as the Internet and email have placed employees under far greater pressure. Stress levels are building and the balance between work and home life must be actively managed. Employers are now taking positive action to make it easier for staff to do their jobs."

Companies get grants to improve staff life balance

A £5.5m Challenge Fund has recently been awarded by the government to help companies improve the work/life balance of their staff (Financial Times, October, 2000). Under the scheme, management consultants such as PwC will come on site to examine working practices and draw up plans for change. Standard Life Group and Glaxo SmithKline are among companies to receive government grants to help them introduce family-friendly working practices. Other recipients include Railcare, Unijet, Airtours, Plymouth City Bus Company, Cumberland Constabulary, Bedford Police and Freeman. Great Ormond Street Hospital for Sick Children and Imperial Cancer are among groups outside the private sector to win cash, along with Norfolk County Council. Ministers believe that establishing and spreading best practice will encourage more businesses to adopt flexible shift patterns and offer more part time jobs.

Workplace stress 'as bad as smoking'

A study of the effect of strain on 21,290 women nurses in America by the Harvard Centre for Society and Health has found that women in stressful jobs are about a fifth more likely to suffer from bad health than those in an undemanding job. Previous studies have shown that stress increases the chances of a heart attack, but the new research found that women with stressful jobs were as likely to suffer illnesses as those who smoked or did no exercise (The Times, May 2000).

Police to get mental health tests

In a report released in August 2003, the Home Office is to agree to psychological testing for police officers to make sure that they can cope with the stress of their jobs. It is part of a £15 million Government strategy, agreed with the police service, to try to reduce sickness, absenteeism and early retirement among officers. The testing is aimed at recognising officers who are suffering from stress and would probably involve officers in the more stressful jobs (e.g. paedophile specialist units) being asked to complete a health questionnaire on a regular basis to monitor the pressure they feel they are under.

QLINE APPLICATION QLINE will help to identify individuals who are more likely to be harmed by stress. The use of QLINE in the workplace demonstrates proactiveness in the monitoring of employee stress and well-being. QLINE will assist in identifying individuals running into trouble well before signs and symptoms of stress appear, enabling early preventative strategies to be implemented. This can, of course, lead to preservation of health, reduce stress and reduce the incidence of individuals reaching the point where they may need time off work due to stress and sickness. This can reduce costs, including potential legal costs, associated with the latter.

CURRENT LEGAL OBLIGATIONS ON EMPLOYERS IN UK (SEPTEMBER 2003)

Under UK Law it is the employer's duty to make sure that employees are not made ill by their work. The onus is on the employer to look for pressures at work that could cause high and long-lasting levels of stress; to decide who may be harmed by these; to examine whether they are doing enough to prevent that harm, and to take reasonable steps to deal with unreasonable pressures that could lead to stress and ill-health. The outward signs of stress in individuals are a change in mood or behaviour; deteriorating relationships with colleagues; irritability; indecisiveness; absenteeism or reduced performance, increased smoking or drinking alcohol; turning to drugs, or complaining about their health. These signs may be either subtle or present late.

In order to help employers to achieve these objectives the HSE offers guidance and training materials on the subject. HSE's work on stress was also found to link with other issues of concern such as bullying and harassment and musculoskeletal disorders.

A **five-point program** was put forward by the HSE:

1. Securing compliance through improvements in the law related to occupational health.
2. Striving for excellence through continuous improvement in occupational health.
3. Obtaining essential knowledge on occupational health through research.
4. Ensuring that all interested parties have the necessary competences and skills.
5. Ensuring that the appropriate support mechanisms are in place to deliver information, advice and other support (not defined) regarding occupational health.

QLINE APPLICATION We advise that points 2 and 3 and also 4 are particularly addressed by the QLINE technology, which can play a significant role in identifying and therefore reducing the impact of occupational stress by offering an early warning physiological indicator of stress and illness vulnerability.

HEALTH & SAFETY EXECUTIVE (HSE) RECOMMENDATIONS AND LEGAL OBLIGATIONS IN UK (2003 UPDATE)

The HSE document entitled "Work related Stress" (Updated January 2003) states "There is a clear link between poor work organisation and subsequent ill health." Stress is defined as "The adverse reaction people have to excessive pressure or other types of demands placed on them."

Although stress can be experienced in all areas of life, figures from a 1995 survey indicated that ill health stemming from work-related stress is the second biggest cause of occupational ill health in Great Britain.

Research commissioned by the HSE indicated that:

- About half a million people experienced work-related stress at a level they believed was making them ill
- Up to 5 million people in the UK feel “very” or “extremely” stressed by their work
- Work-related stress costs society £3.7 billion every year (1995/96 prices).

The key messages put forward by the HSE are:

- Work-related stress is a serious problem for organisations.
- There are things organisations can do to prevent and control it.
- The law requires organisations to take action.

There are essentially 2 pieces of Law on which Work-related stress hinges:

- 1 The Health & Safety at Work Act, 1974 states that employers have a general duty to ensure the health of their employees at work. This includes steps to make sure that employees do not suffer stress-related illness as a result of their work.
- 2 The Management of Health and Safety at Work Regulations, 1999. This states employers’ obligations regarding work-related stress, which includes assessing stressors, preventing stress factors and not imposing unreasonable demands on employees.

STRESS IN THE WORKPLACE

Evidence is accumulating linking psychosocial stress at work to an increasing proportion of occupationally related illness with the majority of the problem stemming from poor work organisation. The problem is predominant in civilised countries where the free market economy has led to scientific management styles and more recently with an emphasis on lean production. More specifically, substantial research exists relating adverse psychosocial work environments with cardiovascular disease (Belkic, 2000; Schnall, 1994).

WHAT IS WORK-RELATED STRESS?

Stress is the adverse reaction people have to excessive pressure or other types of demand placed on them. It can be caused by things at work or by things outside of work, or both. This text is concerned with work-related stress: that is, stress that arises from, or is made worse by, work. Work-related stress is not an illness, but it can lead to increased problems with ill health, if it is prolonged or particularly intense. For example:

- Physical effects
- Heart disease
- Back pain, gastrointestinal disturbances and various minor illnesses
- Psychological effects
- Anxiety and depression.

You are not alone if you feel very or extremely stressed. In the country (UK) as a whole, as many as one in five people could be feeling the same way. In the workplace, the Management of Health and Safety at Work Regulations 1999 require you, as an employee, to tell your employer about any shortcomings in their health and safety arrangements. This is particularly important when tackling work-related stress – it requires a partnership between you, your manager, and your employer: a partnership based on

honesty and trust, where you all say what you feel.

EMPLOYER'S GUIDE TO WORK-RELATED STRESS

The number of legal claims over work-related stress has increased 12-fold in the past twelve months, according to a TUC survey published in 2002.

Not surprisingly, employers are concerned about becoming involved in litigation but work-related stress can have other serious business and financial implications. The Health & Safety Executive estimates that about 6.5 million working days are lost each year because of stress-related illnesses, at a cost to employers of £570m.

What is Stress?

Stress is the adverse reaction people have to excessive pressure, which may be caused by work or financial and domestic worries. On its own, stress is not an illness, but it can cause ill health if it is prolonged or intense. It can result in minor physical illnesses such as stomach upsets and can cause psychological problems such as anxiety. In more serious cases it can result in clinically recognised conditions such as depression.

Who is at Risk?

Everybody is vulnerable to stress and although some people work well under pressure this does not mean that excessive pressure is a good thing.

There are a number of work-related stressors including:

- Excessive workload
- Boring or repetitive work
- Unrealistic expectations of the employee
- Poor communication
- Culture of blame in the organisation.

Taking action to alleviate these problems should benefit both employers and employees.

Why may Employers be Liable for Work-related Stress?

Employers have a duty of care to keep their employees safe from harm and also have specific statutory duties to ensure the health and safety at work of their employees as provided for by legislation.

Accordingly, employers must provide a safe place of work, proper machinery and equipment, a safe system of work and competent staff to discharge these duties. The employer must act with "reasonable care", which includes assessing the possibility of injury or risk and taking preventative measures to avoid such risks.

In order to pursue a successful claim for stress the employee must establish not only a breach of the duty of care by the employer, but must also show that the breach resulted in a psychological or psychiatric injury and that there is a link between the breach of duty and the injury. Finally, the employee must show that the injury was reasonably foreseeable.

What can Employers do to Prevent Work-related Stress?

There are many steps an employer can take:

- Ensure employees are well suited to the job they carry out
- Where necessary provide appropriate training
- Change the way jobs are carried out

- Increase the variety of tasks
- Prioritise tasks and cut out unnecessary work
- Improve communication
- Create a positive and supportive atmosphere where people feel comfortable about disclosing any work problems they may have
- Ensure employees avoid working excessively long hours

Have there been any recent developments?

In February 2002, the Court of Appeal gave its decision in four related appeals. The appeals were brought by four employers following successful county court claims brought by employees over work-related stress.

Two teachers had been awarded £90,765 and £101,141 damages respectively. An administrative assistant in a local authority training centre had been awarded £157,541 damages and a factory worker £7,000.

Three of the employers' appeals were successful. The Court of Appeal held that they could not have reasonably foreseen that the employees would suffer psychiatric injury from work-related stress.

What does this mean in practice?

The significance of the decision is that the Court of Appeal makes it clear that no occupations are inherently risky and likely to cause mental illness. Employers are entitled to assume that an employee can withstand the normal pressures of the job. Workplace-related stress claims will only succeed when mental injury was reasonably foreseeable.

Foreseeability depends upon what the employer knows or ought reasonably to know about the individual employee. However, the employer is generally entitled to take what he is told by his employee at face value.

Employers should still ask themselves:

- Is an individual's workload much higher than is normal for the job?
- Is the job particularly intellectually or emotionally demanding for the employee in question?
- Are unreasonable demands being made of a particular employee?

Any employer who offers a confidential advice or counselling service is unlikely to be found in breach of his duty of care unless the employee has an excessive workload and the risk of psychiatric injury is clear.

So should employers be concerned about work-related stress?

Yes. In April 2000 the same court upheld a finding of liability against the Post Office for the stress-related illness suffered by an employee, and his award of approximately £94,000 was allowed to stand.

This was because the Post Office had failed to ensure that they properly managed the employee's return to work after a period of stress absence.

Preventative measures include:

- Being aware of the signs of stress in the workplace
- Offering employees access to a confidential advice or counselling service
- Conducting a workplace stress risk assessment (to include a review of physical working conditions and training and support systems, identifying more susceptible employees, assessing the likelihood of stress, setting up a monitoring system to alert the employer to potential stress triggers and problems)
- Training managers in stress awareness and management.

The Health & Safety Executive (HSE) has published some extremely comprehensive guidance for both small and large employers. Up to 13.4 million days a year are lost due to stress at work. HSE's Stress Priority Programme exists to tackle this important issue. A new and innovative approach is needed that offers a helping hand to management and workers.

The Health & Safety Executive (HSE) has been working with partners to develop standards of good management practice, which will provide a yardstick against which employers can gauge their performance in tackling a range of key stressors. Following publication of an evaluation of scientific evidence to support standards for control, demand and support last summer, a first draft of a possible standard was prepared for discussion with partners. The outcome of this discussion was agreement that a standard was needed, which is much simpler to understand and apply.

A radically revised approach has been taken by HSE in developing a second draft for the Management Standards. For each of the stressors identified in HSE's guidance publication to tackle work-related stress, we have sought to establish as a standard the percentage of workers exposed to conditions which reflect those stressors at the workplace. This is the current condition of stress management.

Given the prevalence of occupational stress and resulting time off from work, the Health and Safety Commission's Priority Programme to reduce prevalence and incidence require this current condition to be improved. An increase in the percentile for the standard would set the target to bring about widespread organisational change to meet the standard and improve stress management at work.

RESEARCH COMMISSIONED BY HSE -SCALE OF OCCUPATIONAL STRESS

The Bristol Stress and Health at Work Study CRR 265 showed as many as one in five employees reported that they were either 'very' or 'extremely' stressed by their work. The Whitehall II studies provided powerful evidence that the demands placed upon employees, the control employees have over their work, and the amount of support employees receive are associated with health outcomes.

For the purposes of the pilot exercise we have made an assumption (based on the Bristol study) that 20% of employees within an organization may be either very or extremely stressed by their work.

To impact upon this, we have set the cut-off points for the stressors on Demands, Control, and Support at 85%. That is to say that the organization will only achieve the standard if at least 85% of employees indicate they are satisfied with the way these elements of work activity are managed.

At the time of writing, the evidence linking the stressors Relationships, Role and Change to health outcomes is not as robust. We have therefore set the cut-off points for these stressors at 65%. That is to say that the organization will only achieve the standard if at least 65% of employees indicate that they are satisfied with the way these elements of work activity are managed.

Further work is being done to refine the estimates of numbers and proportions exposed to risk from low job control, high job demands and social support.

Draft Standard -Demands

The organization has achieved the standard if:

- At least 85% of employees indicate that they are able to cope with the demands of their jobs; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization provides employees (including managers) with adequate and achievable demands at work.
- Job demands are assessed in terms of quantity, complexity, and intensity and are matched to people's skills and abilities.

- Employees have the necessary competencies to be able to carry out the core functions of their job.
- Employees who are given high demands are able to have a say over the way the work is undertaken (see standard on Control).
- Employees who are given high demands receive adequate support from their managers and colleagues (see standard on support).
- Repetitive and boring jobs are limited, so far as is reasonably practicable.
- Employees are not exposed to a poor physical working environment (the organisation has undertaken a risk assessment to ensure that physical hazards are under appropriate controls).
- Employees are not exposed to physical violence or verbal abuse.
- Employees are provided with mechanisms, which enable them to raise concerns about health and safety issues (e.g. dangers -real or perceived, working conditions) and working patterns (e.g. shift work systems, uncertain hours, etc) and, where necessary, appropriate action is taken.

Draft Standard -Control

The organization has achieved the standard if:

- At least 85% of employees indicate that they are able to have a say about the way they do their work; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization provides employees with the opportunity to have a say about the way their work is undertaken.
- Where possible, the organization designs work activity so that the pace of the work is rarely driven by an external source (e.g. a machine).
- Where possible, employees are encouraged to use their skills and initiative to complete tasks.
- Where possible employees are encouraged to develop new skills to help them undertake new and challenging pieces of work.
- Employees receive adequate support when asked to undertake new tasks -employees are supported, even if things go wrong.
- Employees are able to exert a degree of control over times when breaks can be taken.
- Employees are able to make suggestions to improve their work environment and these suggestions are given due consideration.

Draft Standard -Support

The organization has achieved the standard if:

- At least 85% of employees indicate that they receive adequate information and support from their colleagues and superiors; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization provides employees (including managers) with adequate support at work.
- There are systems in place to help employees (including managers) provide adequate support to their staff or colleagues.
- Employees know how to call upon support from their managers and colleagues.
- Employees are encouraged to seek support at an early stage if they feel as though they are unable to cope.
- The organization has systems to help employees with work-related or home-related issues (e.g. EAPs) and employees

are aware of these.

Draft Standard -Relationships

The organization has achieved the standard if:

- At least 65% of employees indicate that they are not subjected to unacceptable behaviours (e.g. bullying) at work; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization has in place agreed procedures to effectively prevent, or quickly resolve, conflict at work.
- These procedures are agreed with employees and their representatives and enable employees to confidentially report any concerns they might have.
- The organization has a policy for dealing with unacceptable behavior at work. This has been agreed with employees and their representatives.
- The policy for dealing with unacceptable behavior at work has been widely communicated in the organization.
- Consideration is given to the way teams are organized to ensure that they are cohesive, have a sound structure, clear leadership and objectives.
- Employees are encouraged to talk to their line manager, employee representative, or external provider about any behaviors that are causing them concern at work.
- Individuals in teams are encouraged to be open and honest with each other and are aware of the penalties associated with unacceptable behavior.

Draft Standard -Role

The organisation has achieved the standard if:

- At least 65% of employees indicate that they understand their role and responsibilities; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization ensures that, so far as possible, the demands it places upon employees (including managers) do not conflict.
- The organization provides inductions for employees to ensure they understand their role within the organization.
- The organization ensures that employees (including managers) have a clear understanding of their roles and responsibilities in their specific job (this can be achieved through a plan of work).
- The organization ensures that employees understand how their job fits into the overall aims and objectives of the organization/department/unit.
- Systems are in place to enable employees to raise concerns about any uncertainties or conflicts they have in their role.
- Systems are in place to enable employees to raise concerns about any uncertainties or conflicts they have about their responsibilities.

Note:

Role conflict exists when an individual is confronted by conflicting job demands or by doing things he or she does not really want to do, or by tasks which the individual does not believe are part of their job. Workers may often feel themselves torn between two groups of people who demand different types of behaviour, or who believe the job entails different functions.

Role ambiguity arises when individuals do not have a clear picture about their work objectives, their co-workers' expectations of them, and the scope and responsibilities of their job. Often this ambiguity results simply because a manager or supervisor has never adequately explained what is required of them or because the job has changed without this being acknowledged in the job description.

Draft Standard – Change

The organization has achieved the standard if:

- At least 65% of employees indicate that the organization engages them frequently when undergoing an organizational change; and
- Systems are in place locally to respond to any individual concerns.

State to be achieved:

- The organization ensures that employees (including managers) understand the reason for proposed changes.
- Employees receive adequate communication during the change process.
- The organization builds adequate employee consultation into its change programme and provides opportunities for employees to comment on the proposals.
- Employees are made aware of the impact of the change on their jobs.
- Employees are made aware of the timetable for action, and the proposed first steps of the change process.
- Employees receive support during the change process.

Organizations will be expected to conduct workplace pressures/stress audits as part of a psychological risks assessment to establish the levels of pressures/stress generated by the following workplace stressors (psychological risk factors):

- Control
- Support
- Relationships
- Role
- Change

From its research into work-related stress and workplace stressors (psychological risks) the HSE has concluded that at least 20% of an organizations workforce are likely to be very stressed, which could lead to a stress-related illness, or extremely stressed which potentially could result in psychological injury or damage.

To achieve the pressures /stress management standards the workplace pressures/stress audit (and subsequent psychological risk assessment) will need to prove 85% of employees are satisfied that:

- DEMANDS placed upon them do not pose a stress risk
- CONTROL is not so low as to create stress risks
- SUPPORT they receive minimizes stress risks 65% of employees will need to be satisfied that:

- RELATIONSHIPS (bullying) is not a stress risk
- ROLE clarity is such not to be a stress risk
- CHANGE is managed to prevent stress risks

Within each standard the HSE has outlined a range of measures which organizations will need to achieve to minimize psychological risk factors such as:

- Ensuring adequate communication and consultation to reduce stress risks.
- With regard to individuals, the HSE states that it is essential that organizations develop ways for employees to raise their concerns over issues that they perceive may pose a psychological risk factor to them including:
 - Creating an environment to encourage employees to consult their line manager
 - Encouraging communication with unions and Health & Safety representatives. HR personnel or occupational health teams
 - Provide an employee pressures/stress coaching or counselling service

SICKNESS ABSENCE

The Confederation of British Industry (C.B.I.) puts the cost one week's absence at:

- £1,000 (direct and indirect costs) In an exercise for a client, we discovered stress related absence cost them:
- £204,000 in 2001
- £291,000 in 2002

Put another way, the levels of sales they would have to make to replace that loss at a 10% profit margin would be:

Nearly £3,000,000 in 2002 Lost Revenue

How much revenue could you lose by having a high performing sales person absent due to stress?

A total loss including sickness absence costs of:

£54,000 at a 10% profit margin extra sales to cover that loss would amount to £540,000

Labour Turnover

Another sign of an unhappy or stressed workforce can be a high labour turnover. The Chartered Institute of Personnel has worked out the cost of recruiting and training a worker earning £13,000 per year at £8,000.

This does not include the disruption to the smooth operation of a department between losing a staff member and their replacement (if you can find one) coming up to operational speed.

Health and Safety law

Under Health and Safety Law organizations have a clear responsibility to have in place a Stress Management Policy. Stress management procedures (control measures) need to be in place under the management regulations to conduct a satisfactory assessment of the workplace stressor risks, which could lead to harm (psychological injury).

After the publishing of these standards, organizations that fail to embrace these standards will be committing a clear breach of Health and Safety Law and will be liable to prosecution.

Duty of Care

Organizations have a Common Law duty of care to provide a safe place and system of work. Failure to do so may result in a case of negligence, which may result in litigation. A clear breach would lead to large claims for damages.

Awards of this nature and out of court settlements have been made to the level of: £175,000

The Health and Safety Executive have made their intentions very clear. Failures to adhere to the Stress Management Competencies Framework make prosecution and litigation all the more likely.

STRESS AT WORK

Many employers are now increasingly aware of the costs and risks associated with workplace stress. Employers now face the threat of legal action on two fronts -from the HSE and from their own employees. This may or may not be covered under the terms and conditions of their insurance policy.

In early 2003 the Health & Safety Executive (HSE) published its new draft "Stress Management Standards" that identify and define workplace stress, set out employers' responsibilities and suggest solutions and best practice policies.

In July 2003 a NHS Trust was the first large UK employer to face legal enforcement action from the HSE over workplace stress. The Trust was given 6 months to improve its stress management policies, or face unlimited fines under the Health & Safety at Work Act.

The threat of litigation from employees who claim they have not received sufficient support from their employer is also a steadily increasing risk.

In 2001, 6,248 UK employers paid out an average of £51,000 in damages for workplace stress. This figure of 6,248 cases represents a staggering 12-fold increase in the number of employees who successfully sued their employer the year before.

In addition to the legal risks facing employers, there is the human and financial cost of workplace stress, as measured in absenteeism and lost productivity. A recent Health and Safety Executive survey in 2001/02 found that one in five respondents were very or extremely stressed at work and over half a million individuals in Britain believed that they were experiencing work-related stress at a level that was making them ill.

Self-reported work-related stress, depression or anxiety accounted for an estimated 13.5 million lost working days, making this the largest contributor to overall days lost from work-related ill health in 2001/02.

TUC poll of more than 500 trade union safety representatives published in January 2003 revealed that stress was the biggest single health and safety concern in almost 60% of organisations, well ahead of back pain and repetitive strain injury.

NEW LEGAL GUIDELINES

Could you be sued for causing workplace stress, or be accused of harassment, bullying or discrimination?

In 2001, 6,248 UK companies paid out an average of £51,000 in damages for workplace stress.

This figure represents a staggering twelve-fold increase in the number of employees who successfully sued their employer the year before. Experts predict that the numbers of workplace stress related lawsuits will continue to rise.

The Health & Safety Executive (HSE) has launched its new Stress Management Standards. These will be legally binding on employers and will be enforced under existing health and safety legislation. Of course, companies with bad employment practices will always, and justifiably, remain vulnerable to being sued. However, the majority of firms – who genuinely strive to be good employers – are also frequently caught up in stress related legal actions. Long hours, tight deadlines and heavy workloads can all cause workplace stress.

Even organizations that are proud of having a good relationship with staff may suffer from external factors that will inevitably increase the risk of being sued in the future.

Until recently the scales were tipped firmly in the employees' favour. In February 2002, in a landmark ruling made by the Court of Appeal, employers were for the first time offered some practical protection against being sued for workplace stress. The Court of Appeal said:

"An employer who offers a confidential advice service, with referral to appropriate counselling or treatment services, is unlikely to be found in breach of duty (Extract from Court of Appeal new guidance, issued by Lady Justice Hale, 5th February 2002)."

These new legal guidelines provide significant protection for employers who offer their staff a confidential counselling helpline.

Compliance with HSE requirements does not necessarily cover an individual case since the employee may not have been part of the statistical sample selected. Even if selected, and the overall sample met the criteria, it would not lead automatically to that individual being the subject of counselling due to confidentiality restrictions on the stress check. The employer can therefore offer the stress check to all individuals, not just those required statistically for the sample, in order to demonstrate their duty of care.

STRESS FACTORS

JOB STRAIN AND HEALTH

Karasek's "job strain" model (1979, Fig.1) states that the greatest risk to physical and mental health from work stress occurs to workers facing high psychological workload demands or pressures, combined with low control or decision latitude in meeting those demands. More recently this model was expanded to include a third factor – the beneficial effects of workplace social support.

There is strong evidence for an association between job strain and the risk of heart disease and of high blood pressure (Schnall et al, 1994). Karasek & Theorell (1990) calculate that up to 23% of heart disease could potentially be prevented if we reduced the level of job strain in jobs with the worst strain levels to the average of other occupations. Chronic adaptation to low control – low demand situations (passive jobs in Fig.1) can result in reduced ability to solve problems or tackle challenges, and feelings of depression, or "learned helplessness". Conversely, when high job demands are matched with greater authority and skill use (controllable stressors, or active jobs), more active learning and greater internal locus of control develop.

QLINE APPLICATION The difficulty in assessing job strain is related to the multiplicity of factors that can affect it, e.g. both perceived and objective stressors, the potential moderating effects of social support, personality factors, non-work factors, level of physical health and demographic measures. Whilst all of these factors are important, trying to quantify any of them or their level of impact on the individual is very difficult, if not impossible. The measurement of HRV by QLINE now makes this possible. QLINE, because it is based on a physiological assessment of the body's key regulatory systems, is able to provide an index of physiological strain and more importantly identify individuals who are vulnerable to work stress due to lack of reserves to cope efficiently, i.e. the individuals in the high strain category of Karasek's model.

STRESS, BURNOUT AND HEALTH

Burnout has been defined as a syndrome of emotional exhaustion (feelings of being emotionally overextended and drained by one's contact with other people), depersonalisation, and reduced personal accomplishment that occurs among individuals who work with people in some capacity.

Stress and burnout are closely related. It has been suggested by some that it is caused by a relentless pursuit of success and seems to be a unique type of stress syndrome that can be distinguished from other forms of stress (Cordes & Dougherty, 1993). Because there is little agreement on what burnout actually is, our understanding of the concept and what produces it is far from complete. Well-designed individual and organisational-based interventions to prevent prolonged job stress are necessary, as well as monitoring tools for assessing the effectiveness of these interventions. Seyle described stages of stress moving from alarm and resistance through to exhaustion, the latter representing a state in which the system is no longer able to effectively compensate for, or cope with, stress. It is this latter stage that represents burnout and this is identified reliably by a red zone reading on QLINE (see later).

Recent studies suggest that the primary sources of burnout are related to organisational conditions, as well as the personal characteristics of the professional individual suffering from burnout (Burke et al, 1984; Dolan & Renaud, 1992; Richardson et al, 1992; Schwab et al, 1986). The more stressful that the interaction with clients becomes, the higher the likelihood of a high rate of burnout. Work overload appears to be significantly related to emotional exhaustion. Workload related to large caseload, and high demand with low decision latitude is particularly linked to higher burnout and more job strain. Burnout scores are always higher in work settings characterised by overload. Role ambiguity (lack of clear, consistent information regarding rights, duties, and responsibilities) or role conflict (2 or more inconsistent but expected role behaviours) have also been associated with burnout. High levels of role conflict are associated with high levels of emotional exhaustion and fatigue.

Lack of social support may also lead to burnout (Pines et al, 1981; Leiter & Maslach, 1988). Support may come from inside or outside the workplace. A number of studies have shown that lack of peer support is correlated with burnout (Burke et al, 1984; Dignam & West, 1988; Leiter, 1988,

1991; Ross et al, 1989). It is thought that lack of supportive relationships contributes directly to burnout and is not just a buffer between job stressors and work. Support in the work place from colleagues may impact on burnout by way of a feeling of job satisfaction. There are conflicting reports with regard to the effects of family and friend or relative support and burnout.

Burnout-prone individuals are empathic, sensitive, dedicated, idealistic and people-oriented; but also anxious, obsessional and over-enthusiastic, with a tendency to perfectionism. Significant relationships have been found between all the burnout scales and reports of anxiety (Gold & Michael, 1985; Morgan & Krehbiel, 1985).

Some studies indicate that a high anxiety trait may make a person more susceptible to burnout (Cherniss, 1980; Goodman, 1991; Richardsen et al, 1992). ***QLINE helps to identify anxiety levels through its questionnaire and also by the measured autonomic nervous system profile.***

Burnout has been linked to absenteeism, job turnover, reduced effort and reduced job satisfaction (Pierce & Molloy, 1990; Schwab et al, 1986; Wolpin et al, 1991), as well as to psychosomatic symptoms and lower quality of personal life (Burke et al, 1984; Greller & Parsons, 1988, Schwab et al, 1986). Evidence indicates that burnout is related to poor health including fatigue, sleep disturbance, headaches, muscle and joint pains, back pain, gastrointestinal problems, colds and flu (Kahill, 1988). High burnout scores are also related to lifestyle practices associated with poorer health, e.g. consuming excess alcohol and smoking.

Lifestyle practices including smoking and alcohol intake are logged and tracked by QLINE, so that any unfavourable trends can be noted. In addition, burnout has been linked to hypertension, depression (Firth et al, 1987; Schonfield, 1989) and anxiety (Fimian & Cross, 1986; Gold & Michael, 1985; Morgan & Krehbiel, 1985). Burnout also has a significant effect on the quality of home life and is linked to marital disharmony (Burke & Greenglass, 1989; Jackson & Maslach, 1982) (Burke, 1987; Zedeck et al, 1988).

Burnout has been conceptualised to consist of 3 stages. The first stage involves an imbalance between work demands and an individual's resources to deal with them (stress).

The second stage is an immediate and short-term response to this imbalance and is characterised by feelings of anxiety, tension, fatigue and exhaustion (strain).

The third stage is marked by changes in attitude and behaviour. These include a tendency to treat clients in a detached or

mechanical fashion, or a cynical preoccupation with the gratification of one's own needs (defensive coping).

Burnout is therefore a process in which workers disengage from their work in response to stress and strain experienced on the job. Burnout occurs over time and is a process. It begins when a worker cannot actively problem-solve around a stress or strain. Antecedents to burnout are therefore stress and work setting. Principle stressors are work overload and conflict with people in the work setting. The impact of these may be mediated by way of emotional exhaustion.

INTERVENTIONS THAT REDUCE BURNOUT

Factors that help people recover from burnout also seem to prevent the condition occurring in the first place (Cherniss, 1992). These are: new work situations; more autonomy in these situations; organisational support, and interesting work. Historically, interventions have focused on changing the work environment through staff development and counselling; increasing worker involvement in decision-making; improving supervision, and social support. Others have focused on individual coping efforts and styles, with a view to reducing stress reactions.

Several studies support the effectiveness of individual interventions in reducing stress and burnout based around cognitive skills training, relaxation and meditation training, and exercise training (Bruning & Frew, 1986; Higgins, 1986). There is some evidence that in the work setting higher-level strategies involving teams or groups of workers may be more efficient in relieving job strain than individual coping strategies (Shinn et al, 1984). Few well-designed evaluations of interventions aimed at reducing stress and burnout in the workplace have been implemented (Murphy, 1988).

Several published studies on intervention programmes show that, if recognised at an early stage and treated adequately, 70 to 80% of people suffering from burnout syndrome recover within 7 months (de Vaik & Werner, 2002).

The research of de Vaik & Werner (2002) in the Netherlands appears to be the first to determine the cost effectiveness of burnout intervention programmes. They studied a total of 123 patients, all of whom were diagnosed with burnout and all from the medical profession. These were people who were receiving sickness benefit for burnout, but who received no counselling or therapy. 44 were allocated to an intervention group and 79 to a control group. The average duration of sickness absenteeism in the group following intervention was 5.95 months compared to 10.9 months in the control group. The patients in the intervention group had counselling sessions with an average frequency of 1.15 per month of one-hour duration and assignments for self-management at home. The estimated cost of treatment per individual was approximately £1500. With an average reduction of sickness absenteeism of 4.95 months the potential cost savings are obvious. It is uncertain from this study whether the type of intervention is important, or whether any interaction with an interested party is of benefit, but clearly there are merits to some form of intervention program.

QLINE APPLICATION An accurate and evaluative tool for the physiological assessment of stress and burnout vulnerability has not been available until now. QLINE provides a quick and non-invasive evaluative tool to identify individual vulnerability. It provides an early warning measurement that can help to identify burnout-prone individuals at an early stage. QLINE is able to display on its readout an individual's stress reserves and ability to cope. Those in the low yellow or red zones (1 to 4) are vulnerable to burnout and ill health and can be targeted for stress support.

SHIFT WORK AND ILL HEALTH

A recent report in the British Medical Journal (by Wilkinson 2002) suggested that shift work increases the risk of abnormal heart rhythms. The results held true even taking into account other likely contributing factors, such as smoking, coffee and alcohol consumption, weight changes and job stress.

There are several ways in which shift work can have a detrimental affect on health. Shift workers have little opportunity to interact in social or family gatherings, and are under emotional stress and strain in coping with everyday issues, both on and

off the job. Other contributing factors are disturbed sleep, poor eating habits, excess coffee drinking, smoking (higher levels in shift workers) and psychological stress.

Research has shown that shift workers, especially those who work nights, can suffer a number of health problems. These include sleep disorders, fatigue, heart disease (at least in part attributable to fast food and high fat diets with raised cholesterol levels), high blood pressure and gastrointestinal upsets (2 or 3 times more common in shift workers), as well as an earlier onset of stomach ulceration.

In one study of Italian workers, the time between the start of work and diagnosis of an ulcer was 12 years for day workers, 5.6 years for permanent night workers, and 5 years for workers on a rotating 8-hour schedule. Shift workers are also likely to increase body weight because of abnormal eating habits and lack of exercise. The Helsinki Heart Study of the Finnish population found that, over a 5-year period, rotating shift workers had a 40 to 50% increased risk of heart disease compared to day workers. In another study of American nurses, rotating shifts for 6 years or more was associated with a 51% higher coronary heart disease risk. The nurses also have a higher divorce rate; worse rates of substance abuse and depression, and were more likely to view their jobs as stressful. Apart from these increased health risks, they are more prone to danger from accidents and mistakes due largely to the effects of fatigue.

The effects of fatigue on performance are well defined: concentration, data processing and short-term memory are impaired. Performance declines sharply as the duration of the task increases, and fatigued workers sacrifice accuracy for speed. Fatigue mistakes characteristically involve failure to recognise the existence of a serious problem. Night shift workers seldom sleep more than 5 or 6 hours in each 24-hour period, so that after 7 nights the accumulated sleep deficit is 15 to 20 hours. At least 48 hours off duty are usually needed to recover this deficit, and rosters that require workers to go from night shifts to day shifts with no break are dangerous.

The problem seems to have its root in the disruption of the body's 24-hour cycles or circadian rhythms. The latter are important to optimal functioning of physiological processes that are vital to health. When normal circadian rhythms are disrupted by lack of sleep, or by crossing time zones, it may take days or weeks for the body to readjust. Physiological adaptation to night work does not seem to occur and there is little evidence to support the notion that extending periods of night work encourage the body to adapt. For intellectually demanding tasks, short periods of night work (one or two shifts) are better tolerated than longer periods, because the accumulated sleep deficit is less.

The exact mechanisms behind the increased risk of heart disease in shift workers are not well understood, but it is possible that the unphysiological timing of physical activity and food intake in relation to circadian rhythms may be important (Knutsson & Boggild, 2000).

The following are references to studies that have looked at heart rate variability (HRV) in relation to shift work. A full explanation of HRV is found in the next section of this dossier. Furlan et al (2000) showed that lower values of low frequency (LF) and low frequency (an index of sympathetic nervous system activity) to high frequency (an index of parasympathetic nervous system activity) ratios, LF/HF, were present when a job task was performed at night, compared with values obtained when the work was performed in the morning and evening. They suggested that the continuous weekly changes of time of maximum and minimum in the cardiac sympathetic and parasympathetic autonomic control may play a role in the excessive rate of cardiovascular disease that has been described. Shift workers were also found to display significantly reduced standard deviations of HRV during sleep, compared with those of daytime workers (Van Amelsvoort et al, 2000).

Decreased parasympathetic (vagal) activity was found in workers who had long commuting time and who worked excess overtime. They also had increased sympathetic activity leading to an overall sympathodominant ANS (Kageyama et al 1998). Poor sleep quality associated with job difficulty, less achievement, less support by colleagues and high amounts of personal distress were associated with a sympathetic predominance. Job stressors were not directly associated with HRV (Kajeyama et al 1998). Hence, the stressors per se may not influence HRV, but the consequent ruminations and lifestyle disruption may result in autonomic imbalance.

QLINE APPLICATION Because QLINE measures HRV, and more specifically the balance between the sympathetic and parasympathetic components of the autonomic nervous system, it is a useful tool to monitor health and illness vulnerability in shift workers. A reduction in HRV gives a warning sign of a system under stress, and certainly a trend to increasing reduction in HRV is a warning of illness vulnerability, reduced work performance and efficiency.

DEPRESSION AND STRESS

Since 2000 there are many more reports in the literature on depression and HRV. This reflects the potential interest in this tool as a measure of the mind-body interaction and as a possible way of defining how mood state manifests its well-established effect on cardiovascular health (in particular stress, depression and anxiety). Nearly all the recent studies on depression and heart disease document increased cardiovascular morbidity and mortality in patients with depressive symptoms or major depression. This implicates depression as an independent risk factor in the pathophysiologic progression of cardiovascular disease, rather than merely a secondary emotional response to cardiovascular illness (Musselman & Nemeroff, 2000).

Studies have suggested that the relative risk of major depression with cardiovascular disease varies from 1.5 to 4.5. This seems to apply both to the development of cardiovascular disease and death after an index myocardial infarction (Musselman et al, 1998). In patients with angiographic evidence of coronary artery disease, the presence of a major depressive disorder was the best single predictor of cardiac events during the 12 months following diagnosis. A decrease in HRV may mediate this effect (Sheps et al, 2001).

Forty-one subjects (34 men, 7 women) with coronary heart disease were assessed for depression scores. HRV analysis was performed during a public speaking task. During mental stress, patients with higher depression scores had greater changes in peak heart rate ($p < 0.05$) and low to high frequency power ratios than patients with low depression scores, suggesting a shift towards more sympathetic activity during mental stress (Sheffield et al, 1998).

Depression scores were established in 53 healthy students by using the Beck Depression Inventory. On the basis of their scores, students were categorised as being in a high or low depression group. Parasympathetic nervous system responses were measured by measuring high frequency HRV in response to an acute stress (a challenging speech task) and a forehead cold pressor test. Those in the high depression group had significantly greater reductions in HF during the speech task and smaller increases in HF during the forehead cold pressor task than those in the low depression mood group. Women were found to have significantly greater reductions in HF during the speech task and smaller increases in HF during the forehead cold pressor test than men (Hughes & Stoney, 2000). Differences in the male and female HRV response to a mental stressor were also described by Sharpley et al, 2000).

Sixty healthy women (aged 18-49) were asked to complete the Beck Depression Inventory (BDI). Fifteen with the highest scores and fifteen with the lowest scores (control group) underwent stress testing, including baseline, postural challenge, a speech task describing responses to a recent anger-arousing experience. Recovery from challenge was also recorded. The depressive group not only had higher systolic and diastolic blood pressure at baseline, challenge and recovery, but also had less HRV across all tests. During the speech task only, the depressive group exhibited greater increases in noradrenaline and higher cardiac output responses associated with faster heart rate. These results suggest it enhances sympathetic and cardiovascular activity in the depressive group. Moreover, the BDI scores correlated very highly with lack of perceived emotional support (Light et al, 1998).

QLINE APPLICATION Part of the QLINE evaluation process is a questionnaire-based scoring of the level of depression. When this is of a significant level, in conjunction with a low yellow zone or red zone score on the QLINE HRV measurement, these individuals are deemed as vulnerable and should be encouraged to seek help from their healthcare professional and/or be targeted with occupational support resources.

MOOD, PERSONALITY AND HRV

Levels of hostility have been shown to affect HRV. Women with high hostility scores demonstrated less blood pressure and heart rate rises during confrontational discussions than women of low hostility scores. Greater blood pressure response was observed with positive than with negative feedback (as estimated on the hostility rating). Analysis of coping styles suggested that high hostility subjects may be less reactive due to withdrawal and lack of engagement during the task, while low hostility subjects may show greater engagement, especially when encouraged by positive feedback (Piferi & Lawler, 2000). Individuals with high hostility scores and patients with anxiety and depression have low HRV and may be at increased risk of death from coronary heart disease and arrhythmias (Gorman & Sloan, 2000).

HRV was investigated in eight Type A and eight Type B women during a 30-minute psychomotor task. The results suggested that the sympathetic nervous system in Type A individuals was more stimulated during the task, and although there was no difference in task performance between the 2 groups, Type A subjects felt a greater subjective mental workload than did Type B individuals (Sato et al, 1998).

Both in laboratory conditions and in the workplace, techniques to engender positive thought processes in individuals have been demonstrated to produce a significant improvement in HRV (Tiller et al, 1996). Emotions such as hostility and anger produce a sympathetically dominated HRV, whereas feelings of appreciation shift the HRV power spectrum in the opposite direction (Sloan et al, 1994; McCraty et al, 1995). It has been shown that people who express positive emotions show less life stress and are less likely to become ill (Jemmott, 1987; McClelland & Jemmott, 1980).

QLINE APPLICATION An inefficient coping strategy and poor management of anger can contribute to a significant sympathetic dominance profile on QLINE. Hence, those with reduced HRV scores (in the low yellow or red zones) would benefit from anger and hostility management, if this were relevant (see section on interventions shown to improve HRV).

STRESS TRENDS IN PHYSICAL ILLNESS

Loss of normal autonomic nervous system control of heart rate and rhythm is now recognised to be an important risk factor for adverse cardiovascular events.

HEART DISEASE

Significant high frequency decreases in HRV occurred from 60 minutes before ischaemic events in male patients with stable coronary heart disease who had ambulatory ECG recording. Low frequency decreases began at 4 minutes before the ischaemic event. It was also observed that ischaemic events occurring at high mental activities were preceded by depressed high frequency HRV levels, compared with events at low mental activity. It was concluded that autonomic changes consistent with vagal withdrawal can act as a precipitating factor for daily life ischaemia and particularly in episodes triggered by mental activities (Kop et al, 2001).

In patients with ischaemic heart disease, high and low volume aerobic exercise and the effect of the Stroop Colour word conflict test were examined for their effects on HRV. Total spectral power and HF were greater in the high, compared to the low volume, exercise group. The mental challenge was observed to reduce total power and HF power (Wood et al, 1998). An exaggerated cardiovascular response to mental stress was also found to be associated with exercise-induced myocardial ischaemia in persons with pre-clinical coronary heart disease (Kral et al, 1997).

CARDIAC ARRHYTHMIA

On the basis of HRV studies it has been suggested that atrial fibrillation can be preceded by autonomic imbalances affecting either the sympathetic or parasympathetic divisions of the autonomic nervous system (Wiegand & Bonnemeier, 2001). Increased sympathetic activity is associated with lower ventricular fibrillation threshold and an increased risk of ventricular fibrillation (Lown et al, 1978), in contrast to increased parasympathetic activity, which protects the heart (Lown & Verrier, 1976).

MIGRAINE HEADACHE

Eighty migraine sufferers were compared with eighty-five controls. Migraine sufferers were divided into those with (n=28)

and those without (n=52) disabling headaches. Disabled migraine cases had significantly reduced HRV, compared with non-disabled migraine cases and controls ($p<0.01$). Whilst this apparent autonomic dysfunction may play a causal role, the authors rightly concluded that this dysfunction could also be a consequence of frequent disabling headaches (Schechter et al, 2002).

FIBROMYALGIA

Heart rate was significantly higher in twenty-two patients with fibromyalgia compared to the same number of age-matched controls. Fibromyalgic patients also had significantly lower HRV ($p<0.001$) and greater lower frequency, as well as reduced high frequency, components of HRV. The same authors also demonstrated abnormal sympathovagal response to posture changes in male patients with fibromyalgia (Cohen et al, 2001). No association was observed between HRV parameters and measures of tenderness and fibromyalgia symptoms, suggesting that autonomic dysregulation may be a primary and not a secondary phenomenon (Cohen et al, 2000). The same sympathetic dominance in fibromyalgia patients has also been described (by Martinez, 2002), who suggested that the disruption in autonomic balance could be explained by relentless sympathetic activity, which maintains pain with an associated hyporeactivity to stress.

IRRITABLE BOWEL SYNDROME (IBS)

HRV was studied in 35 patients with irritable bowel syndrome (IBS) and eighteen healthy controls were studied with HRV. In the supine position, the VLF (very low frequency) component of HRV was significantly higher. On changing to standing, normal subjects showed a raised VLF and LF, indicating raised sympathetic tone, whereas HF remained unchanged. Similarly IBS patients showed an increase in VLF and LF on standing up, but the HF was also raised. On deep breathing, normal subjects had a significant increase in HF, with significant reduction in VLF and insignificant reductions in LF. In IBS subjects, HF remained constant, while LF and VLF were reduced. In IBS the median sympatho-vagal outflow ratio was significantly lower in the standing position and higher in the deep breathing mode. In summary, it would appear that IBS patients have reduced sympathetic influence on HRV in response to orthostatic stress and reduced parasympathetic modulation during deep breathing (Adeyemi et al, 1999).

PEPTIC ULCERATION

A study of eleven patients with chronic peptic ulceration and twenty age-matched controls suggested, in the absence of any difference in *Helicobacter pylori* infection rates between the two groups, that an autonomic dysfunction as well as *H.pylori* infection may need to co-exist for chronic peptic ulcer formation (Nomura et al, 2000).

RENAL FAILURE

HRV was examined as a mortality predictor in 278 patients with end-stage renal failure, compared with a control group of healthy volunteers. The results showed that end-stage renal failure patients, particularly diabetics, had compromised autonomic function. Sixty per cent of deceased patients had been noted to have diminished standard deviation (SDNN) of HRV to less than 50ms on 24-hour HRV measurements. Exercise was identified as a factor associated with better autonomic function (Cashion et al, 2000).

OTHER OBSERVATIONS

In patients with Cardiac syndrome X, characterised by angina, positive exercise stress test and negative coronary angiography, it has been suggested that, in at least two thirds of patients, the pathophysiological mechanism causing the symptoms could

be related to the reduced parasympathetic tone, rather than augmented sympathetic activity (Gulli et al, 2001).

Patients undergoing endoscopic retrograde cholangiopancreatography (ERCP) are at risk of developing cardiorespiratory complications. Vagal withdrawal has been described during ERCP and it is unknown as yet whether this phenomenon contributes to risk (Christensen et al, 2000).

QLINE APPLICATION An increasing number of physical ailments appear to be associated with autonomic nervous system imbalance. It would seem that progression to more severe forms of an illness is associated with a reduction in HRV. The potential application of HRV measurement by QLINE to monitor this balance is enormous. It enables the identification of vulnerability to physical ill health. This can provide a “window of opportunity” to prevent further progression into illness that might necessitate time off work, by appropriate interventions and advice at an earlier point in time.

STRESS, WORK PERFORMANCE AND PRODUCTIVITY

Stress results primarily from unmanaged emotions. Factors such as anxiety, worry or fear are disablers of performance.

States of peak performance have a measurable physiological correlate. A physiological state characterised by improved and coherent heart rhythm leads to measurable improvement in organisational performance, including heightened decision-making ability, quality of work, management and time efficiency. A physiological state of entrainment, where HRV patterns, brain activity and respiration synchronise with each other, correlates with a state of peak performance (Grove, 2000). This same state is also associated with a reduction in stress-related symptoms, including tachycardia, tension and various aches and pains. These positive effects are best achieved during conditions of positive emotional management.

Various corporate-based studies have demonstrated that coherent heart rhythm with improved HRV profiles is associated with overall improvement in health and well-being (82%), reduced anger (62%), less worry (70%), less fatigue (87%) and feeling happier (68%). There was a 44% reduction in desire to leave the company and a 52% decrease in desire to quit the job. Listening skills improved 65%, decision-making ability increased 100%, efficiency increased 86% and creativity by 119% (Grove, 2000). These HRV-based studies report an increased capacity to recognise and manage stress and negative emotions, both in the workplace and outside it. Substantial reductions in items reflecting burnout and physical stress symptoms were also noted.

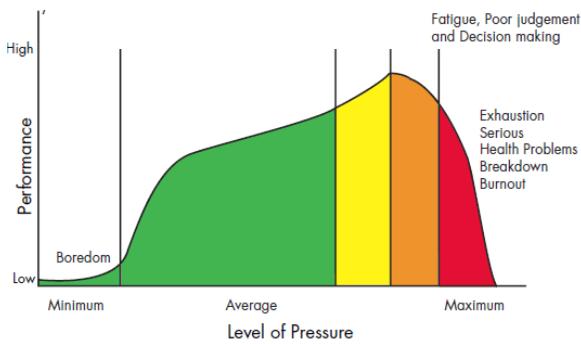
Recent scientific, medical and organisational research suggests that the turbulence of change and transformation and subsequent feelings of being overwhelmed, under-resourced, time pressured and stressed, substantially prevent individuals, teams and organisations from optimum performance. Research has also shown that a rise in physical symptoms is a leading indicator of productivity losses. For example, hypertension (high blood pressure) has been strongly linked with decreases in cognitive performance and memory loss (Grove, 2000).

There is now increasing evidence that the physical symptoms of stress are linked negatively to workplace effectiveness. Techniques that improve HRV in individuals have been shown to benefit organisations by increasing productivity, reducing health care costs, lowering absenteeism and improving retention. Pilot studies have shown that executives with stage 1 and 2 hypertension have been able to restore their blood pressure to normal without medication by learning techniques that regulate their HRV (Watkins, 1999).

It would seem that the heart is more powerful in improving one's ability to succeed than the mind. The heart as a source of electromagnetic energy is 40 to 60 times greater than the brain and carries intricate messages that affect people's emotions, physical health and quality of life. These can be measured up to 18 inches away from the body. Furthermore, the heart is an intelligent system that profoundly affects brain processing (Cryer, 2002). This two-way communication between the heart and the brain directly affects perception, reaction speeds and decision-making ability.

We know that when people are off balance emotionally they often have impaired brain functions. Engendering appreciative thoughts and positive emotions not only has a beneficial impact on the sympathetic and parasympathetic nervous system balance, measured by QLINE as HRV, but also provides the foundation to dramatically boost performance, without burning out in the process. Positive feelings, such as appreciation, progressively increase heart-brain synchronisation and therefore create a healthier HRV profile. Workplaces known for caring, appreciative climates are more productive, encouraging greater

retention and innovation. Whilst an attitude of frustration and anger is known to inhibit cortical function, and to produce incoherent heart rhythm signals, appreciative or caring attitudes are proved to enhance cortical function and produce ordered and coherent signals from the heart (Cryer, 2002: McCraty et al, 1995). There is an associated shift away from stress patterns to those that are more calm and balanced.



QLINE APPLICATION We conclude that HRV measurement, as performed by QLINE, is a sophisticated measure of overall health. Increasing scientific data is showing that it is an important measure of human performance and vitality. Interventions that lead to an improved HRV profile lead to more efficient physiological function, better work performance and productivity and reduced work-related stress, with its associated symptoms.

INTERVENTIONS SHOWN TO IMPROVE STRESS

LIFESTYLE CHANGE

Lifestyle rehabilitation (particularly stopping smoking and taking regular exercise) for 3 months after myocardial infarction has been shown to improve sympatho-vagal balance, with a shift towards higher parasympathetic tone. Furthermore, this favourable effect persisted after one year (Malfatto et al, 2000).

PHYSICAL FITNESS

In older people, greater physical fitness is associated with significantly higher total power and HF component of HRV measured at rest (Ueno et al, 2002).

DIETARY ESSENTIAL FATTY ACIDS

Supplemental omega 3 fatty acids have been demonstrated to improve parasympathetic tone and HRV (Das, 2000).

POSITIVE EMOTIONS

Emotional self-management skills, and in particular emotional competence skills, are designed to intercept stressful responses during emotionally challenging situations. Behavioural outcomes were assessed using the Achievement Inventory Measure in a group of students. Following the programme, students exhibited significant improvements in stress and anger management, work management and focus, and relationships with family, peers and teachers. These improvements were sustained over the ensuing 6 months. As compared to the control group, trained students demonstrated significantly increased HRV and more rhythmic sine-wave heart rhythm patterns during recovery. On the basis of this and other work, the authors state that this physiological response pattern was due to increased parasympathetic activity and that this HEART RHYTHM COHERENCE

is associated with improved cognitive performance, emotional balance, mental clarity and several positive health outcomes (McCraty et al, 1999).

Sakuragi et al (2002) studied the effects of laughing and crying on HRV. They elicited emotional responses by getting ten healthy female subjects to watch a comedy and a tragedy video. Profiles of mood states, including an anger/hostility component were evaluated by questionnaire. All the subjects laughed and wept while watching the comedy and tragedy videos, respectively. Anger and hostility scores decreased and vigour score increased significantly after watching comedy videos, while depression-dejection scores increased significantly after watching the tragedies. Both contents led to an increase in LF/HF ratios of HRV, but the time courses of the responses were different. LF/HF ratios increased immediately after watching the comedy and returned to basal level quickly after they stopped watching, whereas the LF/HF ratio increased gradually and to a lesser extent whilst watching the tragedy videos. In contrast, HF gradually decreased while watching both videos, but did not return to the basal levels after watching the tragedy ones. The authors concluded that laughing has strong but transient effects on the autonomic nervous system, while crying or feeling sad has moderate but sustained effects on it.

RELAXATION AND MEDITATION

Relaxation states, as achieved by myofascial trigger point massage therapy to the head and neck, were able to significantly increase the parasympathetic component of HRV (Delaney et al, 2002). Whilst cardiac reflexes indicating strain of a mental nature caused the functioning of the ANS to deteriorate, regular deep relaxation normalised ANS function and improved the ability to cope (Toivanen et al, 1993). Meditation reduces sympathetic and increases parasympathetic components of HRV (Kappagoda et al, 2000).

BREATHING

Controlled breathing, particularly that associated with abdominal breathing, has been demonstrated to increase HF power of HRV.

MUSIC

Immediately and one hour after listening to relaxing music for 20 minutes, HF HRV was significantly increased and heart rate and respiratory rate were significantly decreased in patients who were hospitalised after acute myocardial infarction (White, 1999).

OTHER THERAPIES

Thought field therapy (TFT) has been reported to reduce subjective distress, which in most cases related to an improvement in HRV (Pignotti & Steinberg, 2001; Callahan & Callahan, 2000).

In summary, it is likely that an ability to control HRV could well alleviate negative mood states in people seeking assistance for inadequate stress responses, anxiety or depression. Since there is a clear association between negative mood states and heart disease, the efficacy of any psychological intervention to reduce the risk of heart disease would be improved if it focused directly on improving autonomic nervous system imbalance, characterised by SNS dominance and low HRV. Furthermore, since an increasing number of physical ailments appear to be associated with autonomic nervous system imbalance, the potential application of HRV to monitor this balance is enormous.

QLINE APPLICATION QLINE is a monitoring tool for assessing HRV and therefore a means of quickly and noninvasively assessing and monitoring illness and stress vulnerability trends. It therefore acts as an early warning system. The employment of such a tool in the workplace will allow targeting of resources to those departments or individuals that most need

intervention. QLINE has the potential to benefit the employer and employee by providing:

- Ongoing assessment of health and identification of problem departments
- Enabling targeting of resources for support and motivation
- Encouraging change for the better
- Encouraging increased productivity
- Promotion of better and stress-free working environment
- Promotion of long-term behavioural change
- Lowering costs due to sickness and absenteeism and reduced productivity
- Improved employer compliance.

QLINE - INDIVIDUAL & CORPORATE STRESS RELATED HEALTH RISK ASSESSMENT

QLINE utilises a well-recognized and researched clinical process, Heart Rate Variability (HRV), to assess the stress related health risk within your organization. The QLINE lifestyle and physiological analyses are designed to assess and quantify objectively the levels of performance, stress and health in an organization. The QLINE risk assessment programme produces a baseline measurement of employees' physical, mental and emotional well-being.

QLINE is a low cost, quick and simple method to manage corporate wellness. It identifies areas of risk in an organization, and provides the aggregate data to promote wellbeing, reduce the cost of stress and ill health, reduce absenteeism and improve productivity.

Employee tests take 10 minutes to complete. On completion, QLINE generates a personalized and graphical Stress Score that enables individuals to monitor their lifestyle, stress, stress coping and general health. This score is recorded for future reference and is incorporated into a Progress Profile that identifies the areas of health risk. For each risk area, the system provides in-depth explanations of how the level of risk is compared with recommended ideals and what steps should be taken for improvement.

The QLINE personalised report is based on each employee's Health Risk Assessment and is designed to encourage self-improvement in areas such as:

- General well-being
- Stress and stress coping
- Reduce the risk of burnout
- Anxiety and depression
- Nutrition and Body Mass Index (BMI)
- Exercise and fitness
- Smoking, caffeine and alcohol
- Rest and relaxation

QLINE delivers fully integrated printable online health reports customized to users' needs. The reports, recommendations, graphs and tables contain the vital data that will help users to improve and/or maintain their well being.

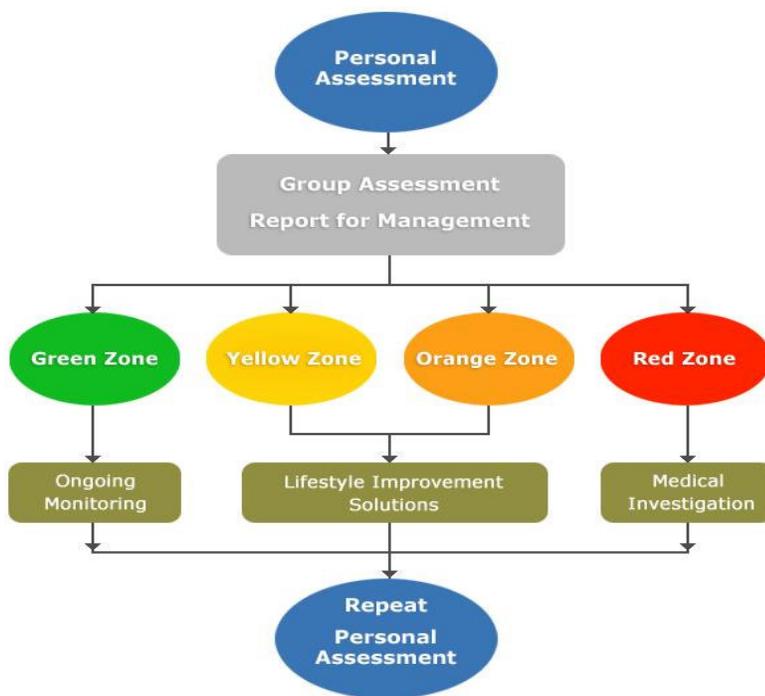
All user data is transferred to state-of-the-art and on-line QLINE databases with multiple levels of security. The individual on-line data is restricted both physically and technologically to resist any tampering. To prevent any unauthorized access to confidential data, each user accesses their QLINE report using an individual PIN number, which makes the raw data un-identifiable. The QLINE P3 system is designed as a monitoring service to give an indication of the body's stress levels, stress reserves and vulnerability to illness, including a measurement of Heart Rate Variability, which is an indicator of the activity of the Autonomic Nervous system. **This is an indication of how well the body is coping with physical and mental challenges.**

The QLINE risk assessment programme starts by each individual taking 2 initial QLINE readings, one or two weeks apart, to establish average baseline stress reserves.

Following this, a personalized report gives significant information on these important health indicators and the QLINE website gives the facility to monitor progress and improve health levels. Personal Reports are protected under the Data Protection Act 1998 and are subject to the QLINE terms and conditions and privacy policy, all of which are viewable on the website.

QLINE individual Score & Comment

The QLINE score is an indicator of the body's ability to cope with stress. Not only do we quantify stress levels, but also more importantly stress reserves, i.e. vulnerability to the effects of stress. By measuring Heart Rate Variability (HRV), QLINE is able to assess the balance of the autonomic nervous system (ANS). The QLINE score above is a composite of mathematical analyses of HRV from scattergram and histogram. Medical Research has shown that HRV is a useful indicator of general health and that a reduced HRV can be indicative of susceptibility to physical and psychological ill health.



PROTOCOLS FOR QLINE TESTING IN THE WORKPLACE

QLINE can be brought to you on a day-to-day contract basis, operated by Qline personnel, or can be installed permanently in your office and operated by your designated staff. Arrangements can also be made for offsite screening in recommended clinics or doctors' surgeries where QLINE is installed.

Test location

Somewhere quiet, where employees will not be disturbed and where they can sit down and relax for at least 10 minutes. There should be no telephones in this area and mobile phones must be switched off.

Special requirements for the test.

Subjects should be as relaxed as possible and should not be rushed in taking the test.

The following prerequisites should be met prior to the test being performed:

- Any consent form should be signed
- Short QLINE information paper explaining the test should be read
- No food or caffeine should be consumed for 2 hours prior to the test
- No alcohol should be consumed for 2 hours prior to the test
- No vigorous exercise should be performed for 1 hour prior to the test
- The test should always be performed in the same comfortable chair and if this is adjustable the back should be maintained at the same angle
- The environment in which the test is conducted should be relaxed and clutter-free
- If it is not possible to screen out ambient noise then earphones should be used
- Employees should avoid talking and moving during the 5 minute test period.

Frequency of tests

The QLINE risk assessment programme starts by each individual taking 2 initial QLINE readings within two weeks of each other, to establish their average baseline stress reserves. Frequency of any further tests is determined by the QLINE scores achieved.

Supervision of tests

Organisations that employ the services of a Doctor, Nurse or Occupational Health Professional should make them responsible for overseeing the tests. If not, an Qine trained representative from HR should be appointed to conduct the test, whilst maintaining client confidentiality. H&S employees are not always the appropriate people in the organisation to conduct tests, as they are usually more concerned with "safety" issues rather than "Health", but they can be trained accordingly.

The Test

Fill out the on screen questionnaire including the email address (7 minutes). Connection to three arm sensors (for 5-8 minutes) View automatic on-screen results Conclusion and QLINE comments as necessary Employee receives e-mail within 24 hours, containing PIN number for access to members' section of QLINE web site www.QLINE.com to review, download and print 10 to 14 page personal report. Modifications can be made to the system which enable all data to be anonymous, but the employees will be responsible for ensuring retention of the PIN number issued by QLINE at the end of the test.

Viewing the Results

Each employee can view their own results at their leisure on the members' section of the QLINE web site www.QLINE.com. The report explains to each individual what their physiological stress and stress coping levels are, and if necessary how these can be improved by lifestyle changes.

QLINE also computes a depression and anxiety, as well as a lifestyle stress score. This is converted into an ongoing progress chart after the second QLINE test, for comparison and self-monitoring purposes.

Web Access

Internet access is necessary for employees to be able to view, download and print the 10 to 14 page personal report. Alternatively, if the employee has a PC with Internet access at home, they may wish to access their full report from there. It should be borne in mind that a colour printer is recommended if reports are to be printed.

Feedback to QLINE

Comments and feedback from your HR Department and/or Occupational Health and/or Health and Safety Department and from employees can be emailed to the QLINE website info@QLINE.com.