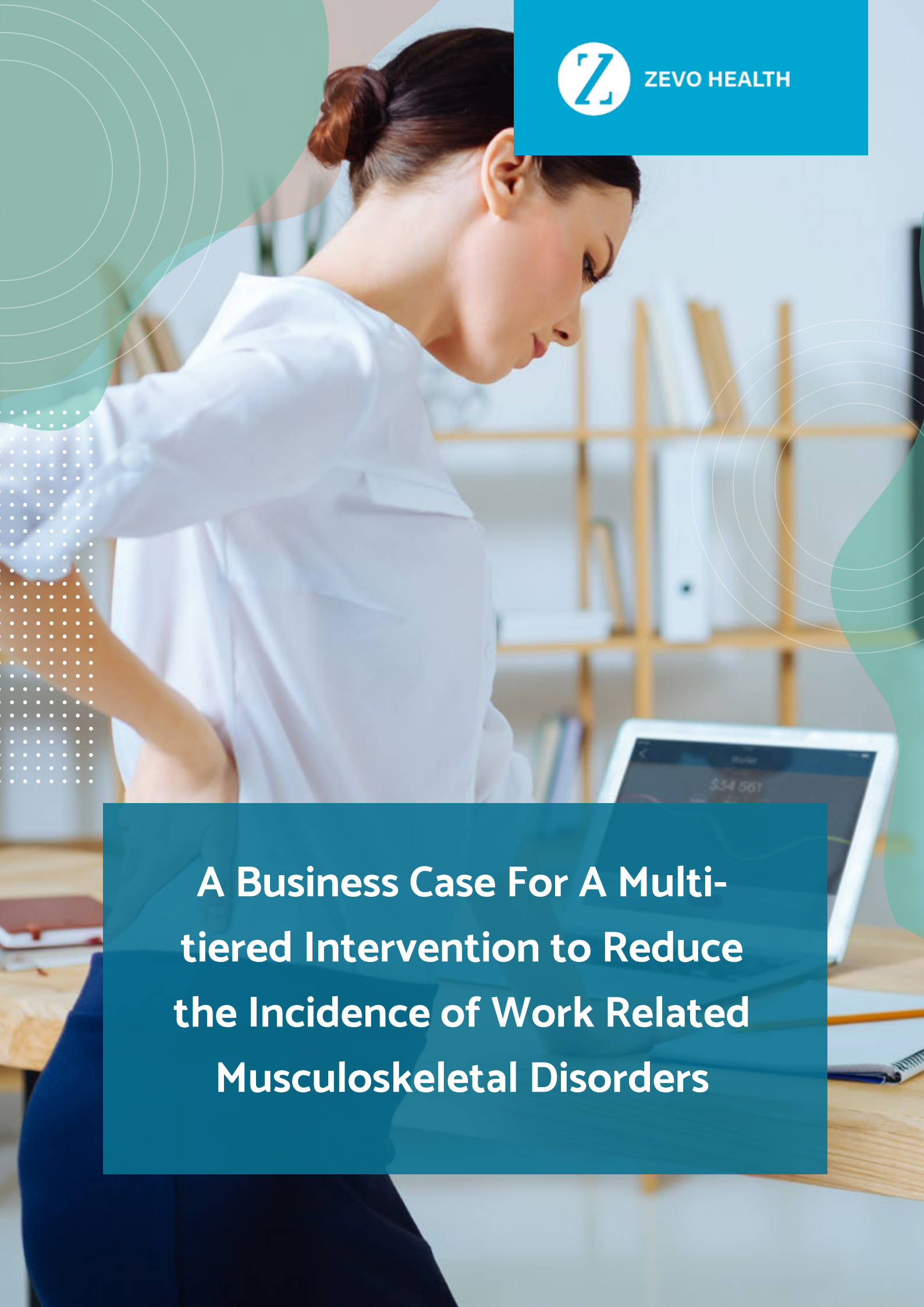
ZEVO HEALTH



A Business Case For A Multi-tiered Intervention to Reduce the Incidence of Work Related Musculoskeletal Disorders

ABOUT

The purpose of this report is to provide employers with a concise overview of the most prevalent work-related musculoskeletal disorders (WRMSDs) that occur in an office-based setting, and to address the rationale behind implementing a multi-level prevention strategy to significantly reduce the rates of incidence.

The primary objective of the report is to explore ways in which the application of time, attention

and resources can be optimised most effectively to diminish the negative impact of this costly workplace issue.

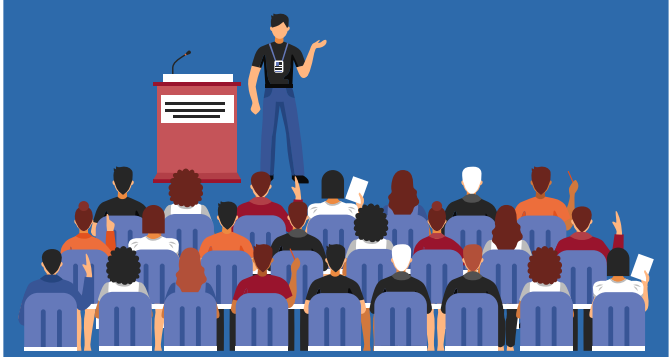
In a report on the prevalence of WRMSDs published by the European Agency for Health and Safety at Work (EU-OSHA, 2019) - MSDs were earmarked as the most prevalent work-related health problem across Europe, with three out of every five workers in the EU-28 reporting MSD complaints. Of all work-related health issues that were reported, 60 % of these identified MSDs as their most serious issue.

In addition to this, the International Business Council published a white paper in September 2020, to lobby companies globally to commit to recording new stakeholders metrics which includes WRMSDs in the 'Health and Wellbeing' section of the 'People' category. At the most recent World Economic Forum meeting in Davos (2021), over sixty major corporations signed-up to this new initiative as part of a plan to propel sustainable recovery for our global economy. This movement indicates that increased awareness around WRMSDs is fast becoming an inherent component of a socially responsible business - and it is for this reason that tackling the issue of WRMSDs is a pressing issue for employers.

Of all work-related health issues that were reported, 60% of these identified MSDs as their most serious issue.

WORLD ECONOMIC FORUM

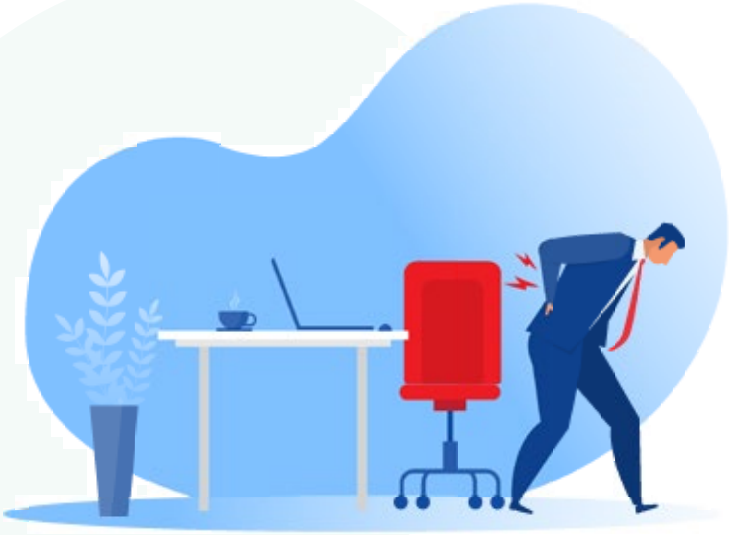
WRMSDs in the 'Health and Wellbeing' section of the 'People' category. At the most recent World Economic Forum meeting in Davos (2021)



EXECUTIVE SUMMARY

- WRMSDs are widespread in all industries across Ireland, UK, Europe and the US – including high rates in office settings among desk-based employees (Parry et al. 2017)
- Change in working conditions in 2020/ 2021 saw an increase in desk-based office workers based remotely, working from their home environment. This increases the risk of sedentary behaviour and poor ergonomics of home workstations - two significant factors implicated in the development of WRMSDs.
- WRMSDs can impose a substantial cost to employers in many ways, including working days lost, employee healthcare costs, re-training and litigation (EU-OSHA, 2019)
- This is not just a relevant issue for older employees, as individuals over the age of 35 are at significantly higher risk of experiencing a WRMSD (Russell et al. 2016)
- However, given the rapidly ageing working population in Ireland and across Europe, this poses a high risk of increased incidence of WRMSDs among the workforce in the future if optimal preventive strategies are not put in place (Privalko et al. 2019).
- There is mounting evidence to support the value of implementing a social-ecological model intervention which bridges health promotion and occupational health and safety to more effectively improve the health of a workforce and decrease the incidence of WRMSDs.
- Given the more widespread access to technologies such as teleconferencing and online class rooms – comprehensive multi-levelled programmes to tackle WRMSDs and other health and wellness issues in the workplace, can be rolled out economically, saving employers significant costs in the future (Pronk et al, 2021).

Over the age of 35 are at significantly higher risk of experiencing a WRMSD



INTRODUCTION

WHAT ARE WORK RELATED MUSCULOSKELETAL DISORDERS (WRMSDS)?

According to a report issued by the Canadian Centre for Occupational Health and Safety (CCOHS) on Musculoskeletal Disease Awareness (2019) - WRMSDs encompass a wide variety of conditions affecting muscles, joints, tendons and nerves, which are either caused or exasperated by the demands of the working environment.

Symptoms can span a broad spectrum - from mild discomfort and fatigue, to chronic pain and inability to function. The nature of WRSMDs is very rarely life threatening, if ever - nonetheless they can significantly impair the quality of life of an individual and they effect a large percentage of the working population. As such, they impose a significant cost to not only businesses, but the economy at large – this will be highlighted by some of the statistics detailed further in this document, which encompass reports from the Irish, British, European and American labour forces.

While most WRMSDs develop over time, some can also result from injury sustained in a work-related accident – however this specific report is concerned primarily with those that develop in an occupational setting due routine work activities, namely focussing on the prolonged use of display screen units and desk-based work among office workers.

Musculoskeletal Disease Awareness (2019) - WRMSDs encompass a wide variety of conditions affecting muscles, joints, tendons and nerves, which are either caused or exasperated by the demands of the working environment.

Pain **Numbness** **Tingling** **Swelling**

WHAT CAUSES WRMSDS?

The CCOHS report (2019) summarise the key elements that contribute to the incidence of WRMSDs within a business under three main categories - ergonomic, social and individual risk factors.

As an employer you are most likely already very familiar with the connection between ergonomics and WRMSDs. The term refers to the applied science of designing and arranging things in an environment for optimal work efficiency, comfort and safety. Poor ergonomics of an office workstation may include incorrect desk height / screen slant/ chair positioning – all of which can compromise posture and contribute to the development of WRMSDs over prolonged periods of time. The nature of the task in which employees engage is given central consideration in an ergonomic assessment – as any repetitive actions can lead to muscular strain and inflammation if not performed in an optimal way, for example typing, or speaking frequently on the phone.

In addition to these elements, the physical attributes of the working space setting also fall under the remit of an ergonomic assessment – such as the quality of lighting, air, temperature and spaciousness, as these factors can bare significant impact on physical functioning over time.

Dovetailing on the ergonomic risk factors of a work space, social considerations such as the culture and values of an organisation also play a pivotal role in the development of WRMSDs. Problems may be greatly exasperated in a workplace that gives employees minimal autonomy and control over how their work is completed, or forces them to engage in

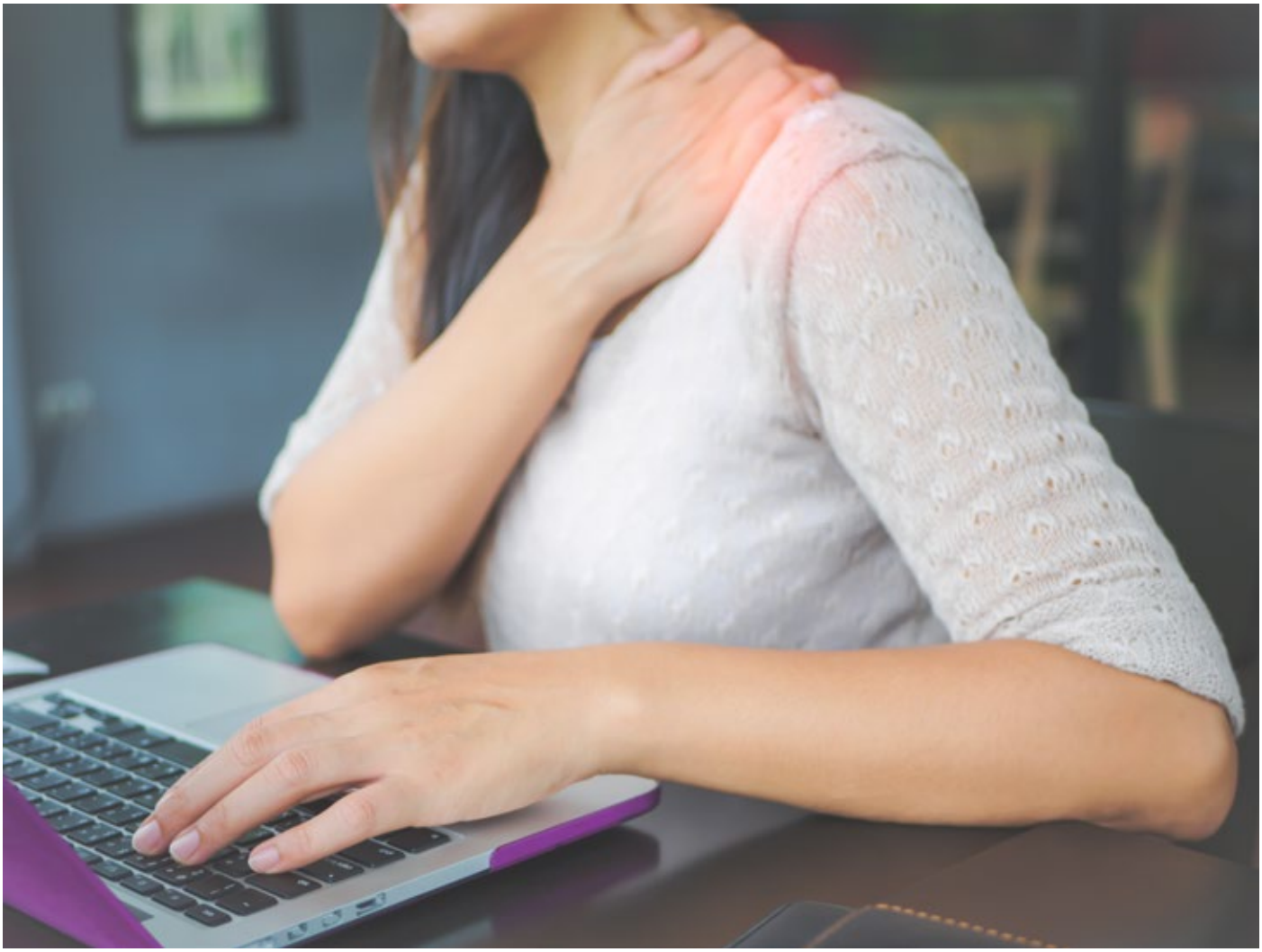
The incidence of WRMSDs within a business under three main categories - ergonomic, social and individual risk factors.

monotonous tasks for prolonged periods - or in contrast, demands high levels of concentration, asserting constant pressure to meet tight deadlines, while perhaps providing inadequate support from management. In such instances a fundamental organisational review may also be necessary to enhance the

health of the workforce.

Lastly, Individual risk factors play a significant part in the incidence of WRMSDs – because even if an employer does their utmost to optimise the ergonomics of a workstation, correct employee use of the equipment is not guaranteed. The overall personal health status of an employee bares a huge influence on the development of a WRMSD – for instance, according to the UK Labour Force Survey (2018) work may exacerbate a pre-existing condition which was originally caused in a non-occupational setting, such as playing sport – however the employer becomes responsible. In addition to this, an employee's work practices, self-care behaviours (nutrition, exercise, hydration) and level of self-awareness (for instance recognising early symptoms and making adjustments accordingly instead of ignoring warning signs) also contributes significantly to the development of a WRMSD.

This report presents a case for implementing a more holistic and integrative approach to tackling the issue of WRMSDs – a strategy that encompasses all of these dimensions, instead of over-relying solely on ergonomic assessments to offset the issue.



WHAT IS THE NATURE OF OFFICE-BASED WRMSDS?

The Centres for Disease Control and Prevention (CDC) have published a multitude of studies investigating WRMSDs under the umbrella of the National Institute for Occupational Safety and Health (NIOSH). The research spans the last two decades and provides strong evidence for the relationship between office working conditions and the incidence of MSDs of the neck, shoulder, elbow, wrist, hand and lower back.

The previously mentioned European Agency for Health and Safety at Work report (2019) concurs with this – citing that the most common types of MSDs reported by workers are backache and muscular pains in the upper limbs. One out of five people in the EU-28 suffered from a chronic back or neck disorder in the past year.

The Health and Occupation Research (THOR) network of physicians across Ireland and the UK publish annual reports on the incidence of work-related ill health. They estimate that approximately 19% of all WRMSDs in the UK affect lower limbs, 41% upper limbs/ neck, and 40% affect the back. While these figures encompass WRMSDs across all industries – they also cite that the majority of office-based workers primarily suffer with back pain and disorders of the hand, wrist or arm – again echoing the US and broader European findings.

These figures encompass WRMSDs across all industries

WRMSDs in UK

- **19 %** lower limbs
- **41 %** upper limbs / neck
- **40 %** back

The CCOHS (2019) identified that office-based WRMSDs commonly fall under three main categories - muscle, tendon or nerve injury.

Muscular issues tend to most commonly arise due to the slowed clearance of metabolites after prolonged contraction and physical stagnation, for instance a build-up of lactic acid can irritate the muscle tissue and lead to pain, as well as a host of other metabolic issues including weight gain. In office workers the most prevalent muscular issues tend to be tight hip flexors from prolonged sitting, weakened gluteal and abdominal musculature combine to contribute to the development of hip instability - which in turn puts pressure

on the lower back and can cause disc issues. Further up the spine, muscles of the back and shoulders can easily fatigue and become strained if the vertebral column is out of alignment due to awkward posture and slouching.

Tendons consist of numerous bundles of fibres that attach muscles to bones - tendon issues generally arise from repetitive motion, but awkward posture also plays a part – tendonitis refers to inflammation of the tendon and in office workers most commonly occurs in the hand and wrist. Tensynovitis, ganglion cysts, bursitis and tears span a spectrum of conditions which effect the tendons.

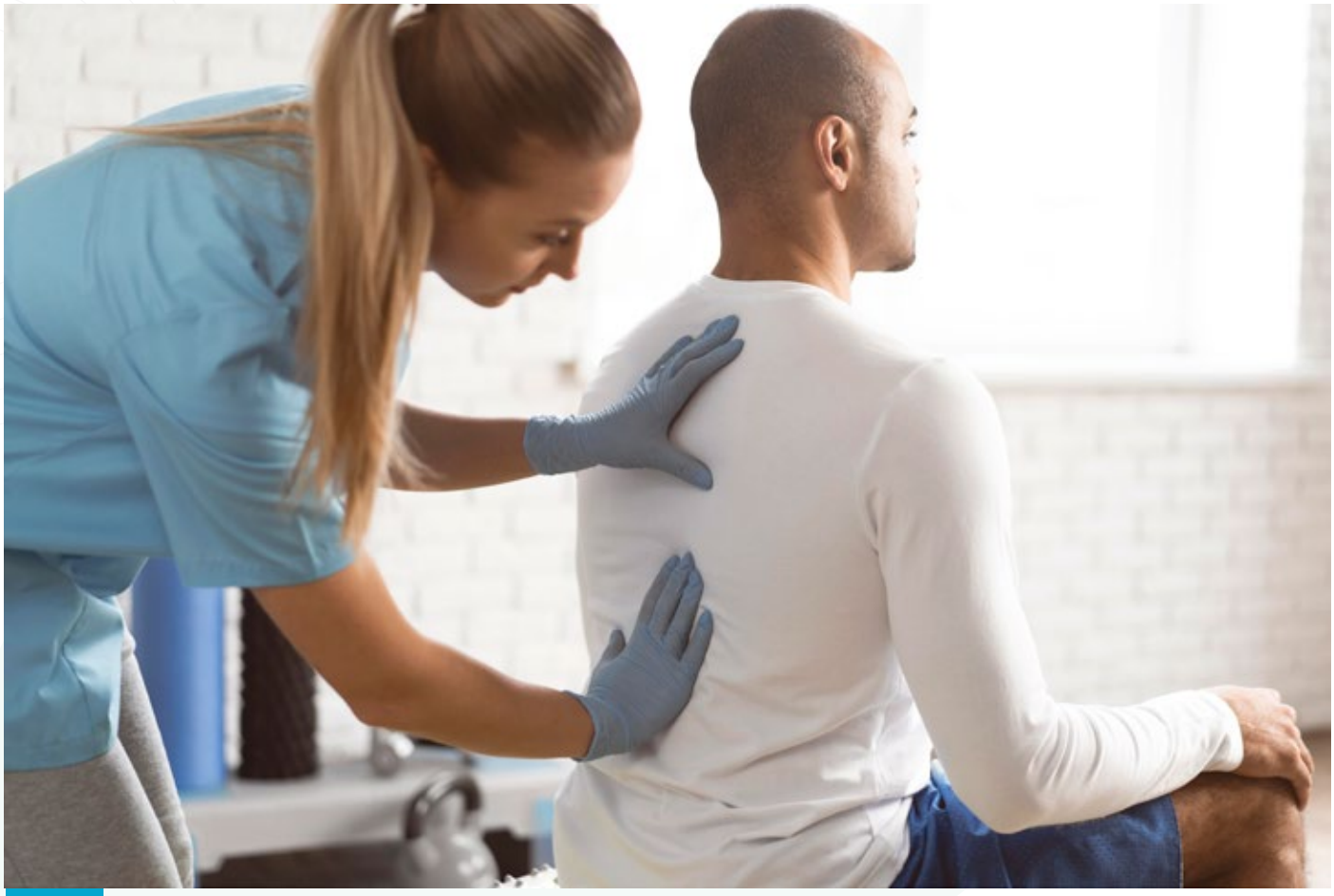
Finally nerve function can also be impinged or damaged by swollen muscles and ligaments causing compression – symptoms depend largely on the location of the nervous tissue involved, as our nerves both carry signals away from the brain to control muscle action (efferent) and back to the brain to give sensory feedback (afferent). Weakness, strange sensations like 'pins and needles', or numbness and pain are common among office workers – in particular thoracic outlet syndrome due to prolonged awkward posture, and can affect the nerves running down the arms.

DIAGNOSIS & TREATMENT

Diagnosis of a WRMSD can be medically confirmed by testing nerve or muscle damage via electromyography and nerve conduction velocity. Magnetic resonance imaging scans and X-rays can also be solicited to provide images that enhance the diagnostic process.

The treatment of WRMSDs can involve several approaches depending on the severity of the condition, these include – rest and restriction of movement, application of heat or cold packs, muscular rubs and massage, targeted exercises prescribed by a health professional – and in worse cases, medication and surgery.

The Health and Safety Authority (HSA) published a report on WRMSDs, Stress, Anxiety and Depression in Ireland (2018) – in which they stated that while there is no specific remit for the management of injured employees in terms of retention, rehabilitation and return to work after suffering a WRMSD. However the report advises that effective injury management has an important role to play in reducing lost time and employee absence from work. There are significant direct and indirect costs involved in losing staff, and they report that it makes good business sense for employers to actively support recovery.



WHO IS MOST AT RISK OF WRMSDS?

In a review entitled Workplace Interventions for Increasing Standing or Walking for Preventing Musculoskeletal Symptoms in Sedentary Workers (Parry et al. 2017) – the author cites a study in which 92% of office workers reported musculoskeletal symptoms of some sort. This figure is significantly higher than the statistics quoted above relating to the prevalence of WRMSDs across the US, UK and Ireland. The review concludes that there is no significant difference in rates of incidence between genders.

However there is one glaring correlation between certain populations and the incidence of WRMSDs which one might instinctively guess – and that is age demographics. According to the UK Labour Force Survey (2018) – both males and females over the age of 45 are most at risk of WRMSDs. This concurs with previous research published in a report by the Economic and Social Research Institute in Ireland (Russell et al., 2016), which found that rates of work-related musculoskeletal disorders are more common among older age groups. The European Agency for Safety and Health at Work (2016) also reported a significantly higher incidence of work-related MSDs among older workers.

In the Irish HSA report on WRMSDs (2013), the higher risk age group was even younger than 45 – in fact it found that workers aged 35–54 were cited to be 2.5 times as likely to experience WRMSDs compared to those aged under 25 years - and those aged over 55 years were 2.7 times as likely.
This is an extremely important statistic for

In the Irish HSA report on WRMSDs (2013), the higher risk age group was even younger than 45

employers to be aware of given the ageing work population worldwide.

In a report published by the ESRI entitled The Ageing Workforce in Ireland (Privalko et al. 2019), they forecasted that by 2031 approximately 32% of the labour force in Ireland will be aged over 50 years, up from 26% in 2016. These figures are supported by the Future Jobs Ireland initiative, which aim to actively increase the employment participation

rate among those aged over 55, to 38% by 2025.

According to a report published by the Organisation for Economic Co-operation and Development (OECD, 2016) - Ireland has a higher retention rate of older workers comparative to other constituent members, in 2015 the retention rate for employees aged 60-64 was 58%, compared to 49% in other member countries.

Given the correlation between age and the increased risk of WRMSD - this indicates that interventions to reduce WRMSDs should particularly be at the fore of Irish business owners agenda over the coming decade. Extending working lives is a central element of in Ireland, but also extends across Europe. Providing sustainable employment for older workers has been identified as a key issue for the economy and welfare state in the broader EU community.

In another report published by the European Agency for Safety and Health at Work on Promoting Active Ageing (2012) – they emphasised that working conditions are a critical factor in promoting the employment of older workers due to their impact on health. They also published a detailed review of the implications of ageing for the health and safety of the workforce and found that a number of key physiological functions that deteriorate with age – including measures of strength, dexterity and mobility - all of which are centrally implicated in the incidence of WRMSDs.

WHAT DO WRMSDS COST EMPLOYERS?

In a recent HSA report on WRMSDs, Stress, Anxiety and Depression in Ireland (2018) - about 55,000 workers in Ireland suffered from a work-related illness, and over 790,000 days of work were lost. In Ireland the average absence from work is MSD (16 days). It cites that one third of workplace illnesses in Ireland in 2017 were WRMSDs, and the most common illness reported by both male and female workers to the Central Statistics Office in the same year were bone, joint or muscle problems.

In Northern Ireland the figures are similar - 29% (34,654 days) of all absences in town councils (local authorities) were due to WRMSDs. The average duration of these absences was between thirteen and nineteen days, with a loss of productivity estimated at £4.7 million.

According to the Health Safety Executive (HSE) report on Musculoskeletal Disorders in Great Britain (2019) almost half a million workers suffer WRMSDs in the UK, which again accounts for over a third of all work-related illnesses. This equated to approximately 6.9 million working days lost in 2018/2019 based on figures from the most recent Labour Force Survey. These findings were confirmed in the THOR-GP report - that WRMSDs account for almost 30% of working days lost due to employee illness.

Meanwhile across the Atlantic, the U.S. Bureau of Labour statistics also cite comparative figures – reporting that WRMSDs made up 32% of all worker injury and illness cases (2016). They approximated 1,153,490 days-away-from-work cases in private industry, state government, and local government. The median days away from work to recuperate for each employee was 8 days.

The high incidence of WRMSDs are associated with significant costs to employers – not only in terms of absenteeism and lost productivity, but also litigation, compensation and added healthcare costs. Financially WRMSDs can have a more severe impact on business than the average nonfatal injury or illness.

According to the Irish HSA report (2013) no study had been undertaken in Ireland to find out how much this costs our economy, but studies in the UK found that WRMSDs could be costing their economy about £10 billion (€11.2 billion) every year.

WHAT ARE THE CURRENT LEGAL OBLIGATIONS OF AN EMPLOYER?

There are regulations in place which require employers to take a proactive approach to preventing the risk of WRMSDs in their workplace, both in relation to both manual handling of loads and the use of display screen equipment.

In the Republic of Ireland the parent legislation is the Safety, Health and Welfare at Work Act (2005) while in Northern Ireland the parent legislation is the Health and Safety at Work Order (1978). In the UK the Display Screen Equipment Regulations (1992) require employers to undertake an analysis of the workstation to assess and reduce risks for office-based workers who must sit at a desk for periods extending beyond an hour.

These laws places duty on the employer to conduct risk assessment of work activities and to provide safe systems of work. The employer is liable in the following instances:

- No risk assessment of work activities
- Lack of safe systems of work
- Adequate training not provided
- No evidence of work supervision

The main provisions of these regulations is primarily focused on ergonomic risk management, requiring the employer to take proactive steps to amend the workplace setting accordingly. However these provisions largely neglect the influence of both individual and social risk factors which, as highlighted earlier - also play a significant role in the development of WRMSDs.

Apart from legal responsibilities, there are many good business reasons for an organisation to address WRMSDs as they are a drain on the resources of an employer, including aforementioned costs such as sick pay, lost productivity, retraining, legal and injury benefit. However, they also represent a significant opportunity for cost reduction, since they are manageable and can be preventable.

WHAT IS THE BEST WAY TO TACKLE THIS ISSUE?

The WHO Global Plan of Action on Workers' Health 2008-2017 – acknowledges the workplace as a setting that provides ideal opportunity for primary prevention of disease, injury, disability, and premature death. Given that such a large percentage of an employee's waking life revolves around the workplace – it is estimated that up to 70% of health determinants can be addressed in the working environment. The WHO action plan states the improvement of the health of workers requires a holistic approach - combining

occupational health and safety with disease prevention, health promotion and tackling social determinants of health.
In response the National Institute of Occupational Health and Safety (NIOSH) in the US have been advocating for the last decade to bridge the divide between Occupational Health and Safety with Health Promotion Strategies – pioneered by their WorkLife initiative in (2009).

NIOSH have advocated that integrative approaches which address both health risks specific to the work-setting and individual risk factors are far more effective.
This has given rise to employee health interventions that are based on a more holistic Social-ecological Model – encompassing ergonomics, organisational culture and individual risk factors for the most effective outcomes in terms of risk reduction and injury prevention.

PROPOSED INTERVENTION STRATEGY

It begins with policy. A prime example is illustrated in the Helping Great Britain Work Well Strategy and Work Programme on MSDs – which is actively promoting companies, big and small, to overhaul organisational policy to optimise the health of their workforce.

A policy on the prevention and management of WRMSDs sets out how an organisation is going to implement measures to reduce or eliminate the prevalence of this issue. The development of a policy is of course specific to the special requirements and considerations of each individual organisation – however a comprehensive policy will encompass elements from organisational operations, work-setting ergonomics, employee training and education, ongoing support and inspection.

In addition to the standard ergonomic assessments a multi-tiered strategy to tackle WRMSDs may include some or all of the following:

DESKERCISE

In recent years the term 'sitting disease' was coined after the association between sedentary behaviour and the incidence of metabolic diseases and WRMSDs was scientifically proven. There are many studies proving the beneficial association between regular movement and increased breaks in sedentary time and reduction in rates of disease among office workers (Healy, 2019)

There is increasing evidence the many health benefits of frequent movement and light stretching among office workers can offset the risks of prolonged sitting and sedentary behaviour. As such, Deskercise tutorials can greatly benefit employees by teaching them the importance of regular breaks in sitting, the value of frequent light stretching to minimise tension in common problem areas previously discussed - as well as introducing them to many ways in which more physical activity can naturally be incorporated into the workplace setting.

Deskercise tutorials can either facilitated on the worksite or accessed digitally via online classroom.

HEALTH SCREENING

Providing employees with the option of postural and functional movement assessments can allow for the early detection of any structural health imbalances – allowing for appropriate treatment, preventing further exasperation of the issue that may lead to a WRMSD. This does not have to be a thorough medical exam/ clinical grade evaluation, but rather an observational procedure to provide the employee with more awareness of any potential underlying structural issues that may require the

attention of an appropriate healthcare professional.

'Body Mapping' is an example of a screening tool implemented by some employers in the UK. This helps to identify problems that may require to be investigated further, as well as encouraging workers to think about solutions to the problems they report. The Health and Safety Executive in the UK have used this body map questionnaire to survey the prevalence of musculoskeletal issues in a variety of sectors. It's design is based on the Nordic Musculoskeletal Questionnaire.

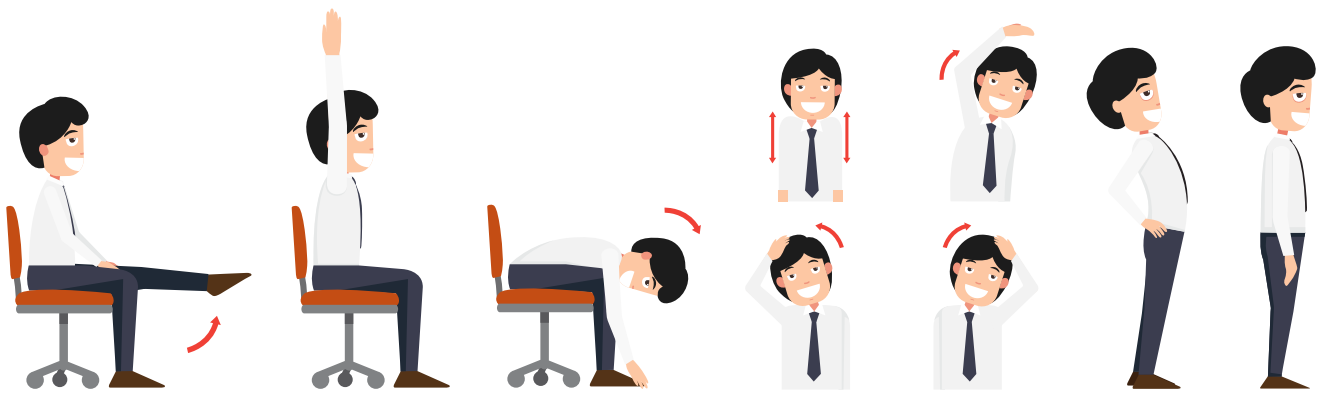
Existing tools such as this one can be applied, or a health screen can be adapted and designed to meet the specific needs of any given organisation.

MOBILITY CLASSES.

Mobility training combines several training strategies to comprehensively tackle musculoskeletal limitation and imbalances. Based on the American College of Sports Medicine recommendations to promote structural health (2019) – effective mobility training includes 'softening' muscle tissue with some form of massage (foam rolling, self-massage) followed by basic stretch sequences, and finally strengthening moves with resistance training.

This sequence of activity can pro-actively counter the degeneration of dexterity, strength and mobility – which was previously cited as significantly contributing to the development of a WRMSD.

Mobility training for office-based workers can focus primarily on hips and shoulders, in addition to developing core strength – and can be delivered onsite or through digital educational portals for employees or training staff.

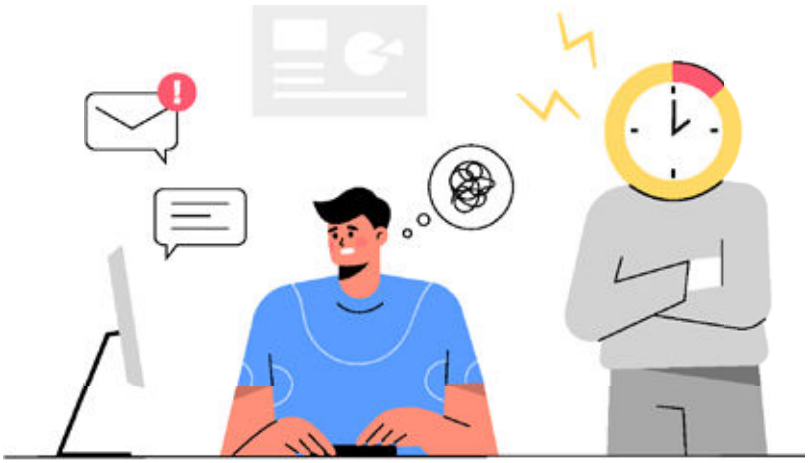


NUTRITIONAL EDUCATION

As we all know, diet plays a central role in physical health – and a wide range of dietary interventions can be implemented in the workplace setting to promote greater nutritional intake by employees. These strategies can be educational, or practical in terms of increasing accessibility to health foods - or indeed, preferably both, as advocated by the Food Choice At Work study implemented by researchers in University College Cork (2016).

Key nutrition elements regarding the development of WRMSDs include all those that apply in regard to general health – however a diet that contains adequate amounts of essential fats (omega 3's), high biological value proteins, anti-oxidants and anti-inflammatory foods is especially important for our structural wellbeing. Also ensuring sufficient energy intake that supports overall body functions to offset fatigue is highly relevant to the development of WRMSDs.

STRESS MANAGEMENT TOOLS



Another avenue worth exploring to help employees reduce tension and fatigue - is to educate them about stress management and equip them with tools and resources to relieve emotional pressure and optimise stress management. This can span anything from mindfulness tuition, guided meditations to providing resilience spaces in the workplace. Again the appropriate intervention will be specific to the needs of the workforce and the work environment.

EMPLOYEE INPUT.

According to the NIOSH LifeCycle initiative, there is evidence to suggest that workplace health promotion strategies are more successful and yield greater employee engagement if the workers are consulted, and actively involved in the implementation of the intervention.

These findings are echoed in the much more recent HSE report on Helping Britain Work Well – promoting employee participation in the implementation of strategies boosts morale, interest and

employee investment in the outcome.

ORGANISATIONAL REVIEWS.

According to the WHO Global Plan of Action on Workers' Health previously referenced – employers are encouraged to increase communication and support, and design work flow to enable the employee to control as many elements of his tasks as possible. Healthier organisational practices can greatly improve worker's satisfaction and have a positive impact on reducing the risk of WRMSDs.

The same report advises that communications tools such as workshops and publications for both employers and employees – could also serve to promote awareness and diminish risk factors. A soft paternalistic 'nudge' approach can be highly effective when implementing new health strategies in the workplace, rather than imposing rules and regulations on workers – such as that used in the Food At Work study (2016).

ONGOING INSPECTION.

According to the same Health and Safety Executive initiative Helping Britain Work Well, higher workplace inspection rates have been linked to lower levels of WRMSDs - thereby increased inspections and ongoing training reviews, could be a very important element of WRMSD prevention and something to be considered in the planning of any intervention.

CONCLUSION

These proposed strategies are only some of the potential facets that could be considered when weaving together a workplace intervention to tackle the incidence of WRMSDs.

Positive well-being and fitness can make a substantial difference to the cost of staff to businesses and the economy as a whole – and so putting an effective holistic strategy in place can greatly improve the health of a workforce and ultimately reduce future costs to employers.

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