Safety + Savings Through Ergonomics

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Complete Occupational Health + Wellness

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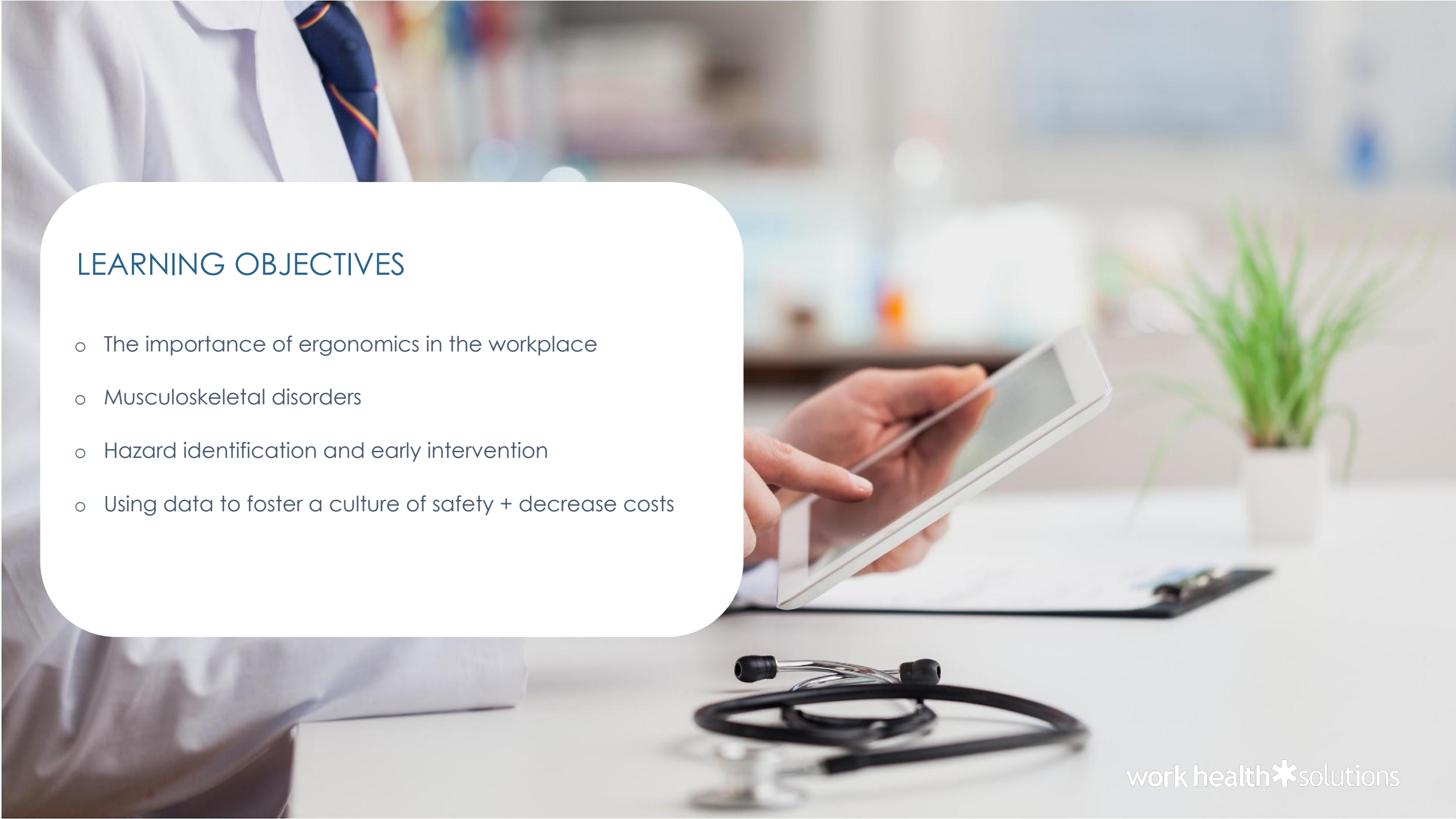

LEARNING OBJECTIVES

- The importance of ergonomics in the workplace
- Musculoskeletal disorders
- Hazard identification and early intervention
- Using data to foster a culture of safety + decrease costs

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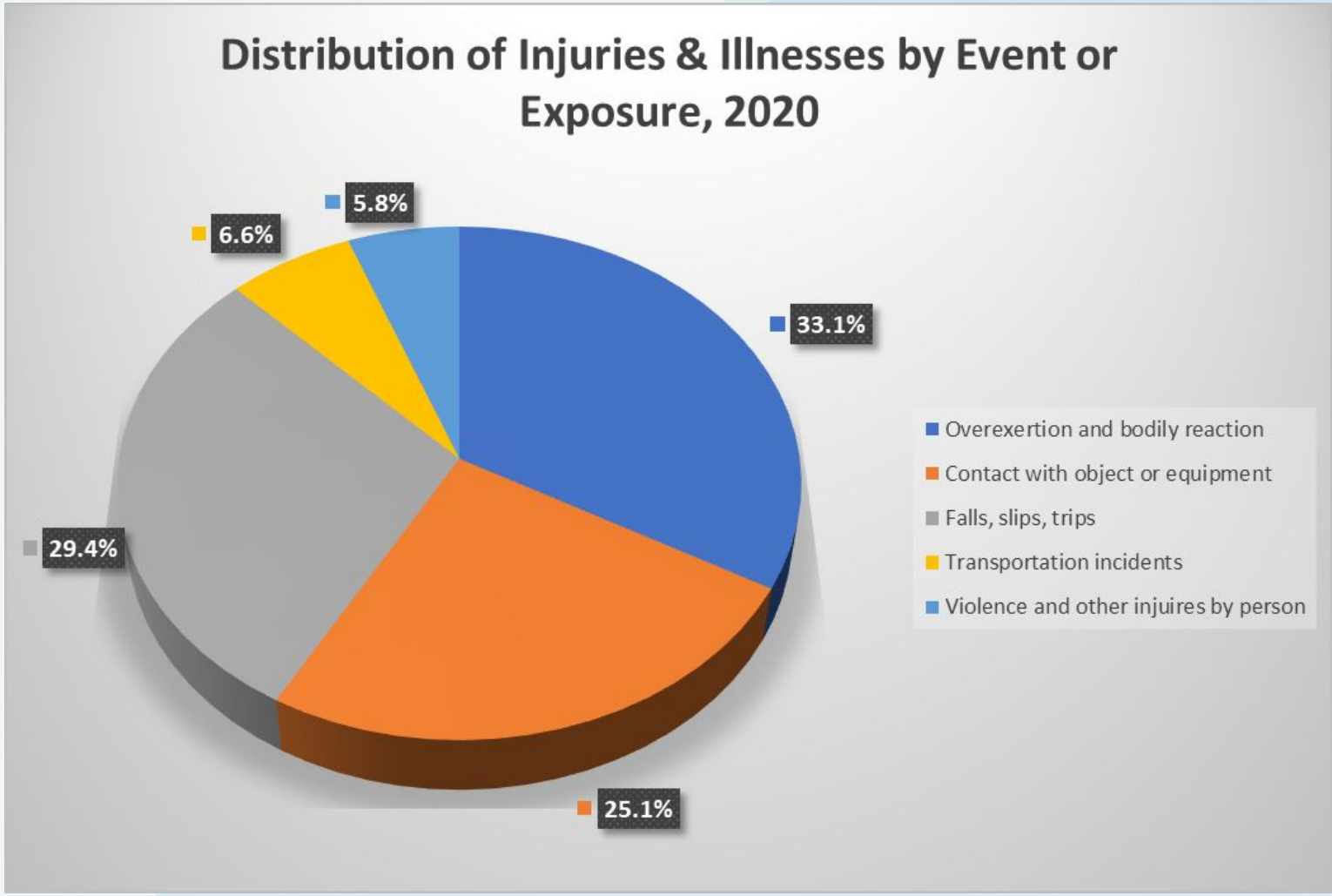
ERGONOMICS CREATE A SAFE WORK ENVIRONMENT

WHY ARE ERGONOMICS IMPORTANT?

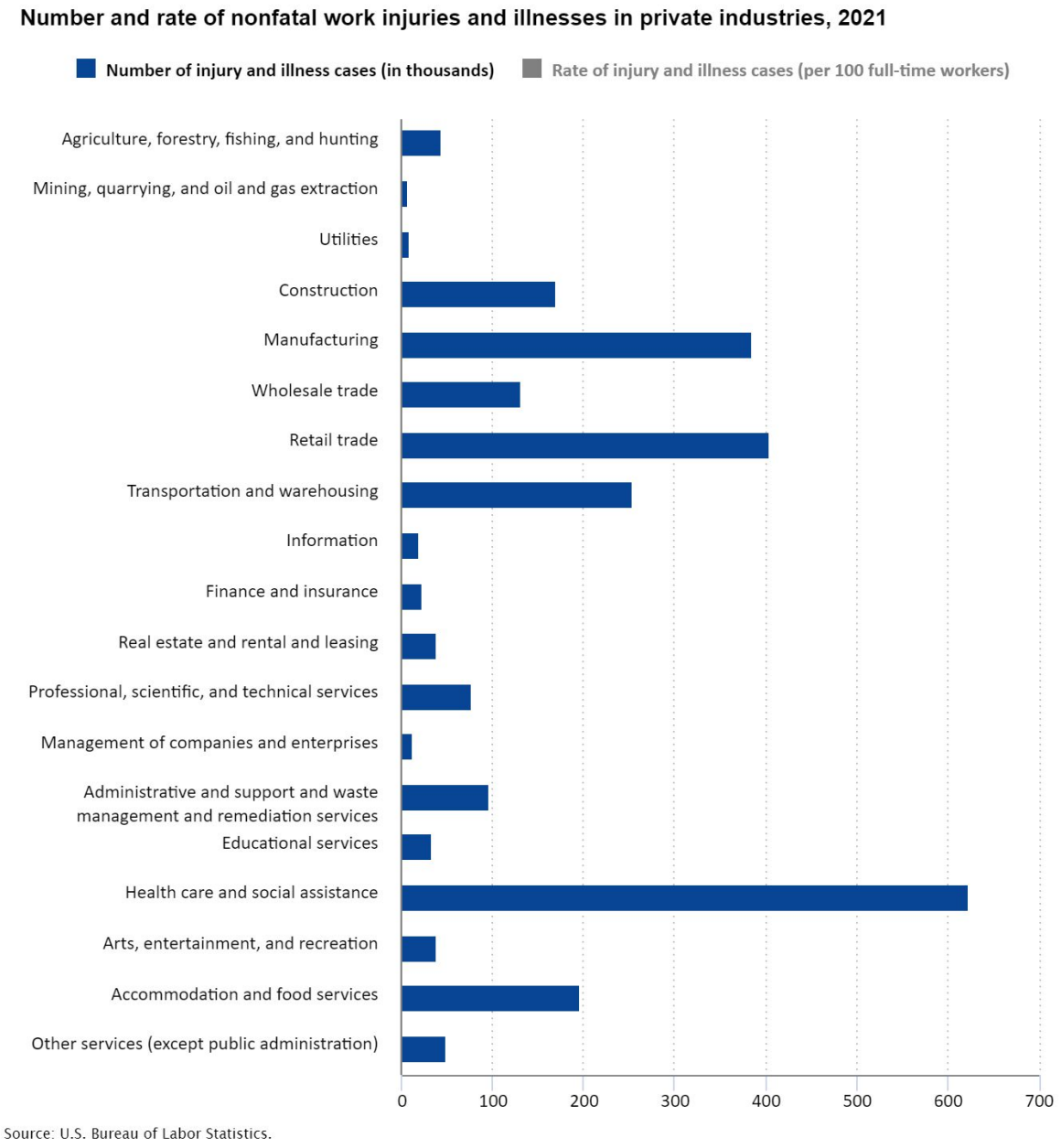
Musculoskeletal Disorders (MSDs) are the largest category of workplace injuries and **account for almost 30%** of all workers compensation costs.

(source: BLS)



INJURIES ARE COMMON

- Each year, millions of employees have non-fatal injuries on the job
- The top three fields accounting for injuries are:
  - Health care and social assistance
  - Retail trade
  - Manufacturing



Source: U.S. Bureau of Labor Statistics.

WHAT ARE MUSCULOSKELETAL DISORDERS (MSDS)?

Musculoskeletal Disorders or MSDs are injuries and disorders that affect the human body's movement or musculoskeletal system (i.e., muscles, bones, tendons, ligaments, nerves, discs, blood vessels, etc.)

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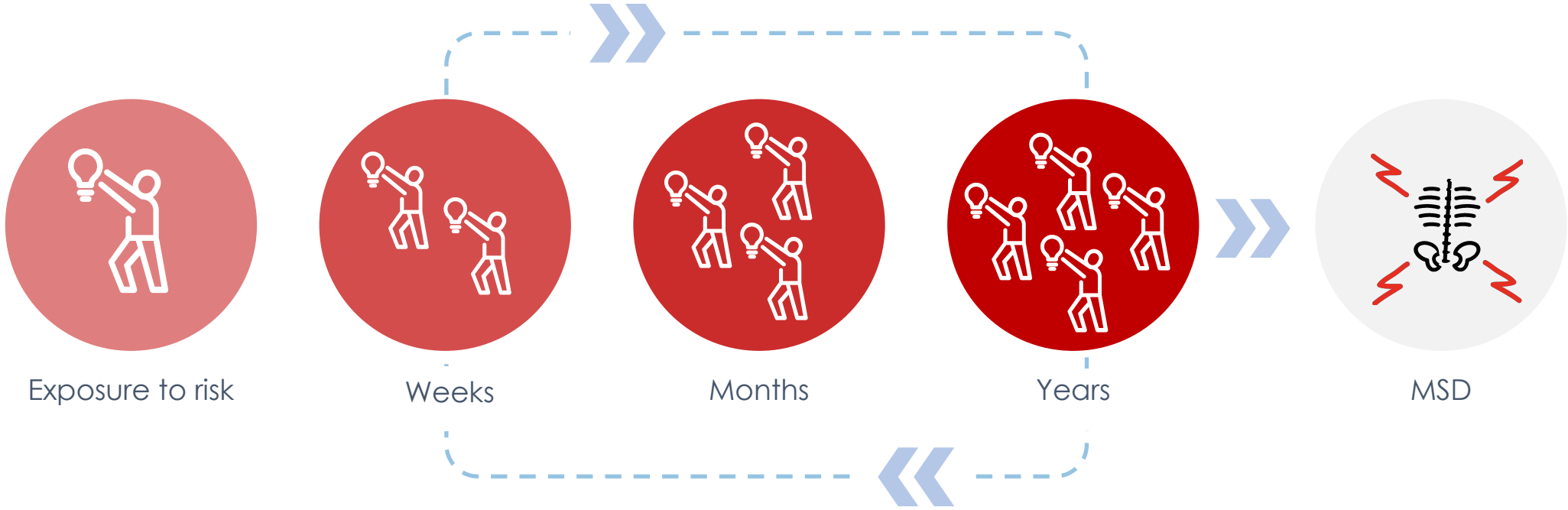
ERGONOMIC EPIDEMIOLOGY



PERSONAL RISK FACTORS FOR MUSCULOSKELETAL DISORDERS

- Age
- Underlying medical conditions
- Body habitus
- Sex
- Base level of physical conditioning
- Social habits (smoking)

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ENVIRONMENTAL RISK FACTORS FOR MUSCULOSKELETAL DISORDERS

- Lifting, pushing, pulling heavy loads
- Overhead reaching
- Repetitive movements
- Forceful movements
- Sustained awkward postures
- Exposure to vibration
- Exposure to extreme temperatures

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HUMAN PERFORMANCE RISK FACTORS

Work Practices

Posture

Health Habits

Nutrition + Fitness

IMPLEMENTING AN ERGONOMICS PROGRAM TO REDUCE MSDS

Key elements:

- Training and education
- Identification of problems
- Fostering early reporting of MSD symptoms
- Implementation of solutions to control hazards
- Evaluation of progress

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TRAINING + EDUCATION

Principles of ergonomics and applications

Proper use of equipment, tools, and machine controls

Proper work practices

Risk factors that lead to MSDs

Early symptoms of MSDs

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OFFICE HAZARD IDENIFICATION

Common risk factors

- Sustained awkward positions
- Repetitive movements and reaching
- Extreme temperatures

Self-assessment to identify risk factors

CHECKLIST

Instructions:
Answer the questions below to determine problems that might cause MSDs. If you answer "NO," turn to the page indicated for improvement options. If you run out of improvement options and you still have problems, contact your immediate supervisor.

GOAL pp. 9-33		YES	NO	If NO, see page:
WHEN SITTING				
1a-b	Is the chair height adjusted so that your feet rest comfortably flat on the floor or footrest, with your knees just slightly lower than the hips?	◯	◯	9
2	Look at the depth of the seat pan. Is there a small gap (2 to 4 inches) between the back of your legs and the front edge of the seat pan?	◯	◯	10
3	Does the curve of the back of the chair fit into your low back?	◯	◯	11
4	Does the back of the chair tilt back?	◯	◯	12
5	With your shoulders relaxed, are the armrests slightly below your elbows, and do your arms hang comfortably at your sides?	◯	◯	13
6	Can you get your chair close enough to your keying, mousing, or writing surfaces without reaching?	◯	◯	15

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INDUSTRIAL HAZARD IDENTIFICATION

Basic

Job Location: Metal Shop	***Analyst:*** Joe Safety	***Date:***
Task Description: Worker reaches into metal box to the right of the machine, grasps a 15-pound casting and carries it to grinding wheel. Worker grinds 20 to 30 castings per hour.		
Hazard Description: Picking up a casting, the employee could drop it onto his foot. The casting's weight and height could seriously injure the worker's foot or toes.		
Hazard Controls: 1. Remove castings from the box and place them on a table next to the grinder. 2. Wear steel-toe shoes with arch protection. 3. Change protective gloves that allow a better grip. 4. Use a device to pick up castings.		

Complex

JOB ANALYSIS WORKSHEET

DEPARTMENT _____ JOB DESCRIPTION _____

JOB TITLE _____ _____

ANALYST'S NAME _____ _____

DATE _____ _____

STEP 1. Measure and record task variables

Object Weight (lbs)		Hand Location (in)				Vertical Distance (in)	Asymmetric Angle (degrees)		Frequency Rate	Duration	Object Coupling
		Origin		Dest.			Origin	Destination			
L (AVG.)	L (Max.)	H	V	H	V	D	A	A	F	(HRS)	C

STEP 2. Determine the multipliers and compute the RWL's

RWL = LC x HM x VM x DM x AM x FM x CM

ORIGIN RWL = 51 x ☐ x ☐ x ☐ x ☐ x ☐ x ☐ = ☐ Lbs

DESTINATION RWL = 51 x ☐ x ☐ x ☐ x ☐ x ☐ x ☐ = ☐ Lbs

EARLY REPORTING

Benefits

- ✔ Identifying and removing risks
- ✔ Prompt medical intervention
- ✔ Reduce the progression of symptoms
- ✔ Track and trend MSDs
- ✔ Build positive workplace culture

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IMPLEMENT SOLUTIONS

Engineering Controls:

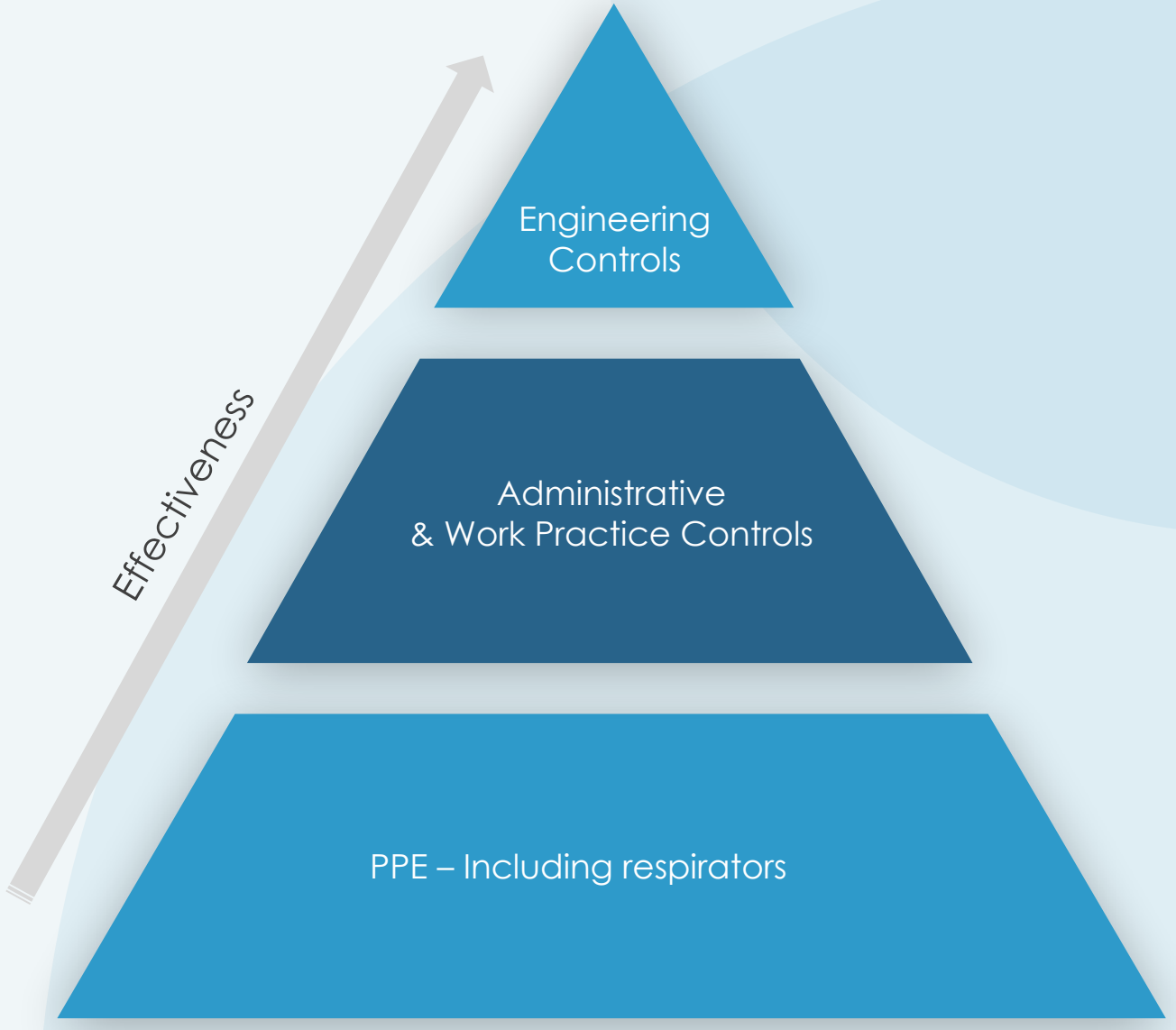
Physical changes to the workplace, eliminating/reducing the hazard

Administrative & Work Practice Controls:

Established processes and procedures of safe work performance

Personal Protective Equipment:

Protection used to reduce exposure to risk factors.



MULTIGENERATIONAL CONSIDERATIONS FOR PROGRAM IMPLEMENTATION

Baby Boomers – 25%

- ✔ Adjustable workstations, improved lighting, & ergonomic equipment
- ✔ Flexible hours to manage physical strain & fatigue
- ✔ Safety programs that promote healthy aging & encourage regular checkups

Gen X – 33%

- ✔ Wellness programs, stress management workshops, & access to mental support
- ✔ Encourage work-life balance
- ✔ Promote regular breaks, exercise, and health eating habits for overall well-being

Millennials – 35%

- ✔ Focus on mental health support through EAPs
- ✔ Implement ergonomic practices and promote physical activity during work hours
- ✔ Flexible work schedules to support work-life integration

Gen Z – 5%

- ✔ Thorough safety training to increase awareness of workplace hazards
- ✔ Emphasize the importance of ergonomics and proper posture with digital device use
- ✔ Training on healthy technology usage habits and practicing eye care

EVALUATING ERGONOMICS PROGRAM SUCCESS

EVALUATE PROGRESS

01

Establish and implement a process

02

Periodically review job hazard analysis

03

Keep employees engaged with the process

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WHAT DATA SHOULD YOU ANALYZE?

DATA ANALYSIS FOR PROGRAM EVALUATION

- Job analyses
- Checklists
- Symptom surveys
- OSHA form 300 logs
- Employee absentee rates
- Turnover rates
- Workers' compensation costs
- Productivity indicators
- Quality of products and services
- Savings

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RESEARCH SHOWS ERGONOMICS PROGRAMS ARE COST-EFFECTIVE

A multisite survey of employers that implemented ergonomics programs found they had a return on investment (ROI) of 77% to 1,513%, with the average respondent reporting an ROI of 378%

Ergonomics programs:

- Reduced the rate of recordable injuries and illnesses by 5%-9%, depending on the employer
- Improved productivity by up to 25%
- Enhanced quality and employee retention

Safety Management
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Ergonomics

Return on Investment

Show Me the Money

By Winnie Ip, Jennie Gober and Walt Rostykus

Musculoskeletal disorders (MSDs) continue to account for largest proportion of recordable workplace injuries (45% to 65%), and employers are focusing on establishing or improving their ergonomics programs to address this loss. Benchmarking studies (Humantech, 2011; 2014a, b) suggest that a common challenge with ergonomic programs is the lack of resources such as people, time and money. Why don't these alarming statistics justify the resources for improving workplace ergonomics? Part of the problem is demonstrating the value or financial return produced by ergonomic improvements and programs. OSH professional must be able to calculate and demonstrate this value to sell these programs to upper management.

This article aims to 1) share various models of cost justification and the elements of determining the return on investment (ROI) of an ergonomics program; and 2) provide guidance on the investment and results data needed to calculate the return.

IN BRIEF

•Ergonomic programs often lack resources: people, time and money. Part of the problem is demonstrating the financial return of ergonomic improvements and ergonomic programs.
•OSH professionals can measure the value of improved workplace ergonomics in more ways than the traditional reduction of injury costs. Improved productivity, quality and employee retention can provide greater returns.
•This article shares various models of cost justification and the elements of determining the return on investment, and provides guidance on the investment and results data needed to calculate the return.

Cost Justification

In today's business climate, any initiative that does not deliver measurable (short- to medium-term) value is considered an option, not a requirement. Ergonomic improvements and programs are more likely to be supported and accelerated if they fit into a cost justification process.

Cost justification is a normal business process that managers and executives use to weigh the costs and benefits of various improvement initiatives. Managers are challenged each day to do more with less and are often measured on how quickly they can improve productivity and quality.

Cost justification:

•enables communication between safety, engineering and management;
•takes the focus away from injuries (a reactive measure);
•focuses on taking action before an injury occurs (a proactive measure);
•enables a firm to prioritize countermeasures (e.g., compare payback periods);
•makes good business sense and affects the bottom line.

Management must often weigh the merits of ergonomic improvements against other potential projects. Ergonomic projects that produce an ROI are both effective and efficient in reducing hazard exposures.

Typical Cost Justification Models

Many business reasons support ergonomics initiatives. Primary drivers typically include factors such as regulatory compliance, OSH performance and production enhancement. Three common cost justification models are (Table 1):

1) Cost effectiveness: The improvement's effect on the number of injuries prevented.
2) Cost benefit: The improvement's effect on the costs saved.
3) Cost utility: The improvement's effect on worker satisfaction.

When using each model, one must understand that the ease of obtaining and analyzing data varies among each. Additionally, the type of management (proactive vs. reactive) also varies within each model.

While one might easily obtain past injury costs (cost effectiveness), the resulting focus on reactive

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Walt Rostykus, M.P.H., CSP, CIH, CPE, is a vice president with Humantech. He has more than 30 years' experience delivering and managing ergonomics, occupational safety, industrial hygiene and environmental programs. Rostykus holds a B.S. from Washington State University and an M.P.H. from the University of Washington. He is a professional member of ASSE's New Mexico Chapter and Assistant Administrator of ASSE's Ergonomics Practice Specialty.

A SAFE WORK ENVIRONMENT IS IMPERATIVE

REFERENCES

BLS (n.d.). *Injuries, Illnesses, and Fatalities*. U.S. Bureau of Labor Statistics. https://www.bls.gov/iif/home.htm

BLS (n.d.). *Number and rate of nonfatal work injuries and illnesses in private industries*. U.S. Bureau of Labor Statistics. https://www.bls.gov/charts/injuries-and-illnesses/number-and-rate-of-nonfatal-work-injuries-and-illnesses-by-industry.htm

BLS (n.d.). *Survey of Occupational Injuries and Illnesses Data*. U.S. Bureau of Labor Statistics. https://www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables.htm#dafw

Cal/OSHA (2022). *Easy Ergonomics for Desktop Computer Users*. Division of Occupational Safety and Health, California Department of Industrial Relations. https://www.dir.ca.gov/dosh/dosh_publications/computerergo.pdf

CPI Inflation Calculator. https://www.bls.gov/data/inflation_calculator.htm

Ip, W., Gober, J., & Rostykus, W. (2016). *Ergonomics Return on Investment: Show Me the Money*. Professional Safety, *61*(4), 48–52. https://www.jstor.org/stable/48690765

Leigh JP. (2011) *Economic burden of occupational injury and illness in the United States*. The Milbank Quarterly. 89(4):728-72.

NIOSH (2022, March 21). *Musculoskeletal Health Program*. Centers for Disease Control. https://www.cdc.gov/niosh/programs/msd/default.html#:~:text=Musculoskeletal%20disorders%20(MSDs)%20are%20soft,limbs%2C%20neck%20and%20lower%20back.

Occupational Safety and Health Administration, U.S. Department of Labor (2002-Revised). *Job Hazard Analysis*. https://www.osha.gov/sites/default/files/publications/osha3071.pdf

Occupational Safety and Health Administration (n.d.). *Solutions to Control Hazards*. U.S. Department of Labor- Ergonomics. https://www.osha.gov/ergonomics/control-hazards

Waters, T. R., Ph.D., Putz-Anderson, V., Ph.D., & Garg, A., Ph.D. (1994, January 1). *Applications Manual For the Revised NIOSH Lifting Equation*. CDC Prevention Guidelines Database. https://wonder.cdc.gov/wonder/prevguid/p0000427/p0000427.asp

Thank You

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