HEFFERNAN CONSULTING

ASPEN
RISK MANAGEMENT GROUP
A TRISTAR COMPANY

STRONGER, SAFER, HEALTHIER

Strategies for Championing and Revitalizing Workplace Ergonomics

Steve Thompson, ARM, COSS, CCSHCO, CSHCO – Aspen Risk Management Group

STRONGER, SAFER, HEALTHIER

- Ergonomics defined
- Kickstarting and revitalizing
- Selling ergonomics
- Building a culture of ergonomic wellbeing

POLLING QUESTION

POLLING QUESTION

ERGONOMICS DEFINED

Fundamental ergonomics attempts to fit the task to the person

- adjusting the way work is done
- modifying equipment, job design, and layout
- adjusting for the physical capabilities of workers

LAWS OF WORK

Were the pyramids built by man or aliens from another planet, or…

HISTORY

- 1857 – Body relationship to productivity and efficiency
- 1900s – Time and motion studies
  - The Jungle
  - Interventions
- 1950s – Military applications
- 1980s – Office ergonomics
- Today – 24/7

ASSESSING ERGONOMICS

Review loss history

Identify patterns and trends

Access work practices

Access culture

Focus on areas needing attention

INDIVIDUAL HEALTH RISK AND INJURY FACTORS

- **Cigarette Smoking/Vaping** - smoking or vaping may be related to pain in the extremities, including the neck and back
- **Strength** - the risk for musculoskeletal injuries can be three times greater in weaker subjects
- **Anthropometry** - weight, height, body mass index, and obesity have all been identified as indicators for certain musculoskeletal disorders
- **Physical Activity** - a lack (or over-exertion) of physical activity may increase susceptibility to injury (sedentary lifestyles?)

POLLING QUESTION

ASSESSING ERGONOMICS

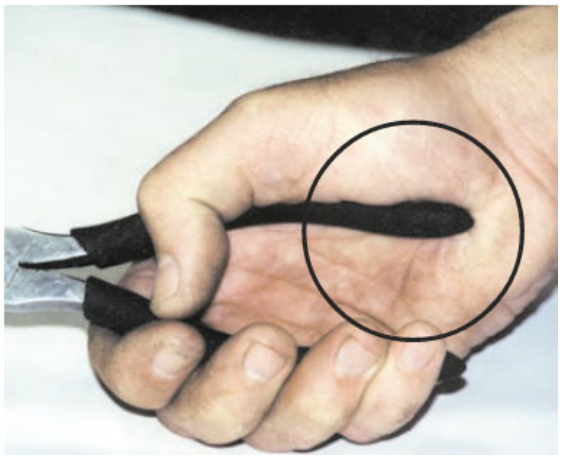
- Before, after, and…

BEFORE/AFTER

BEFORE/AFTER

?

BEFORE/AFTER



Short handled tools may put direct pressure

Using tools with longer handles may spread pressure over a larger area

LIFTING ALTERNATIVES

1. Get down on one knee.

2. Pull bag up leg.

3. Rest bag on knee.

4. Pull bag close to body and stand upright.

5. Pull bag up to waist height.

Lifting awkward loads (example of proper technique for a bag of cement)

- Use teamwork and mechanical aids such as a cart, wheelbarrow, or dolly
- Use 5-step lifting process

WIRE PULLING

Force and awkward posture while pulling wire by hand

- Use a tugger or a hand tool
- Communication between puller and feeder

SHEET MATERIAL


1 Squat


2 Tilt on end


3 Lift

- Use a 3-point lift when handling plank or sheet material

1) Squat 2) Tilt on end 3) Lift

SHOVELING

Twisting the body while lifting a shovel

- When lifting, put weight on front foot
- Before throwing, shift weight to rear foot
- When throwing, turn front foot in the direction of the throw.

REACHING

Working overhead and reaching for long periods of time

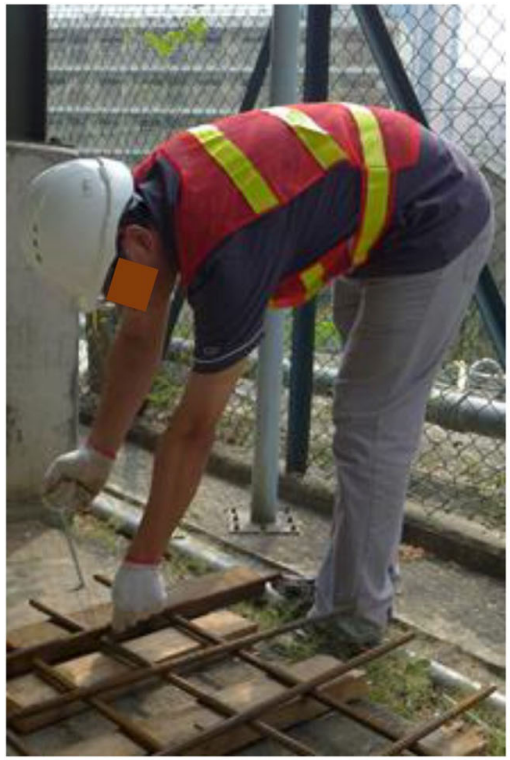
- Use a ladder, scaffold, or scissor lift
- Stay close to the work
- Use lighter-weight tools

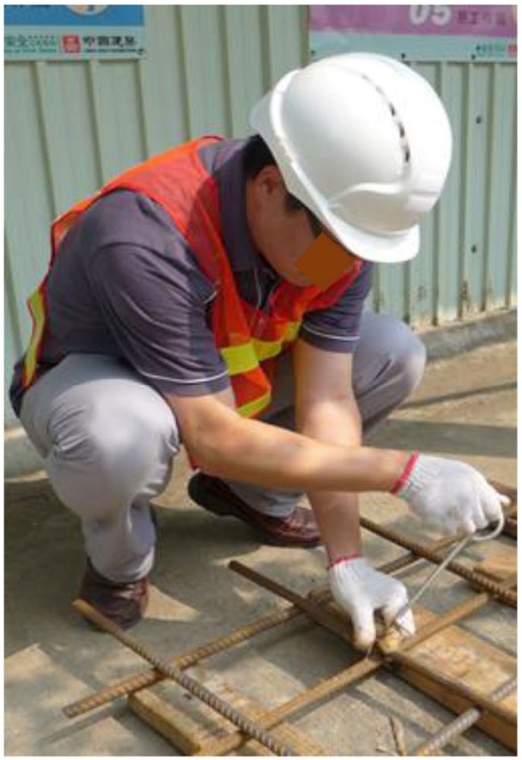
MODIFICATIONS

Solo lifting or carrying loads that are too heavy

- Teamwork with coordinated movements
- Carts and other moving devices

BENDING/STOOPING





?

ANALYSIS

(a) (b)

Notes: (a) Stoop posture; (b) squat posture. +ve and −ve represent flexion and extension trunk movements in the cartesian plane, respectively

MODIFICATIONS

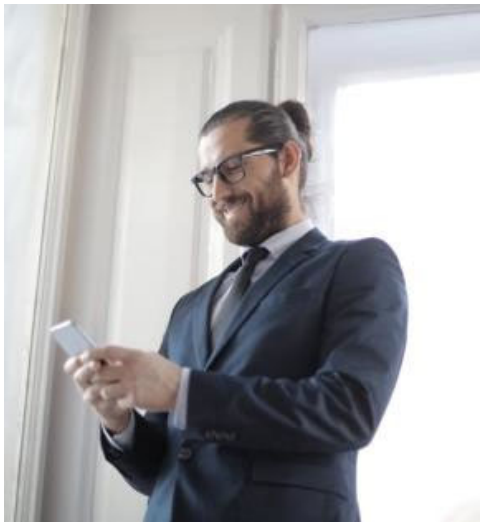
Bent or stooped posture for extended period

- Change positions (sit or kneel with knee pads)
- Alternate bending with non-bending tasks

SOME THINGS NOT TO DO

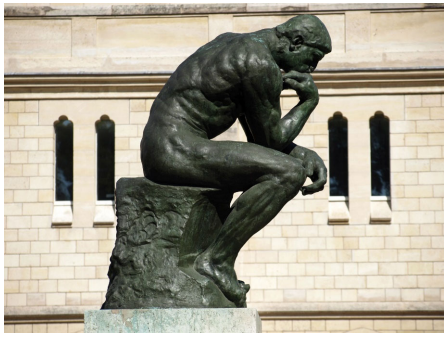
… other than for a few seconds to scan an email heading or image

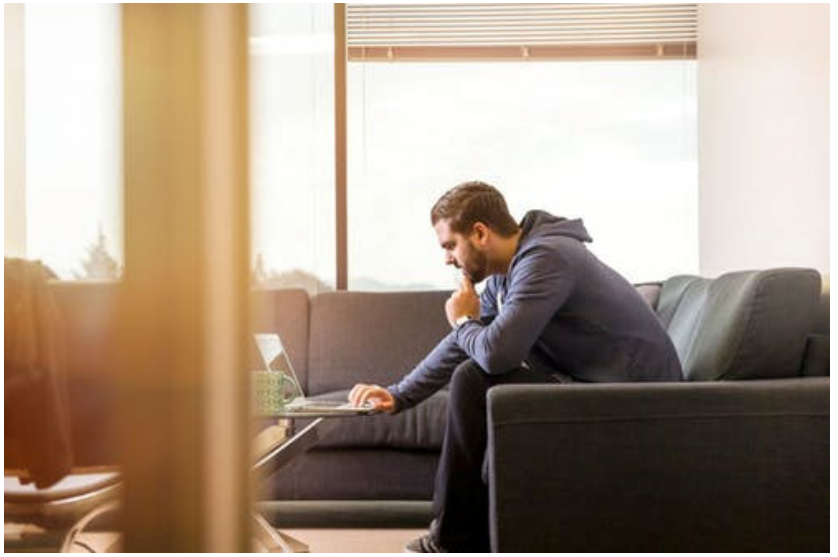
- Neck flexion / posture



MODERN THINKER

- Hunched over
- Outstretched arms
- Neck / back posture





… other than for a few seconds to read an email heading or look at an image

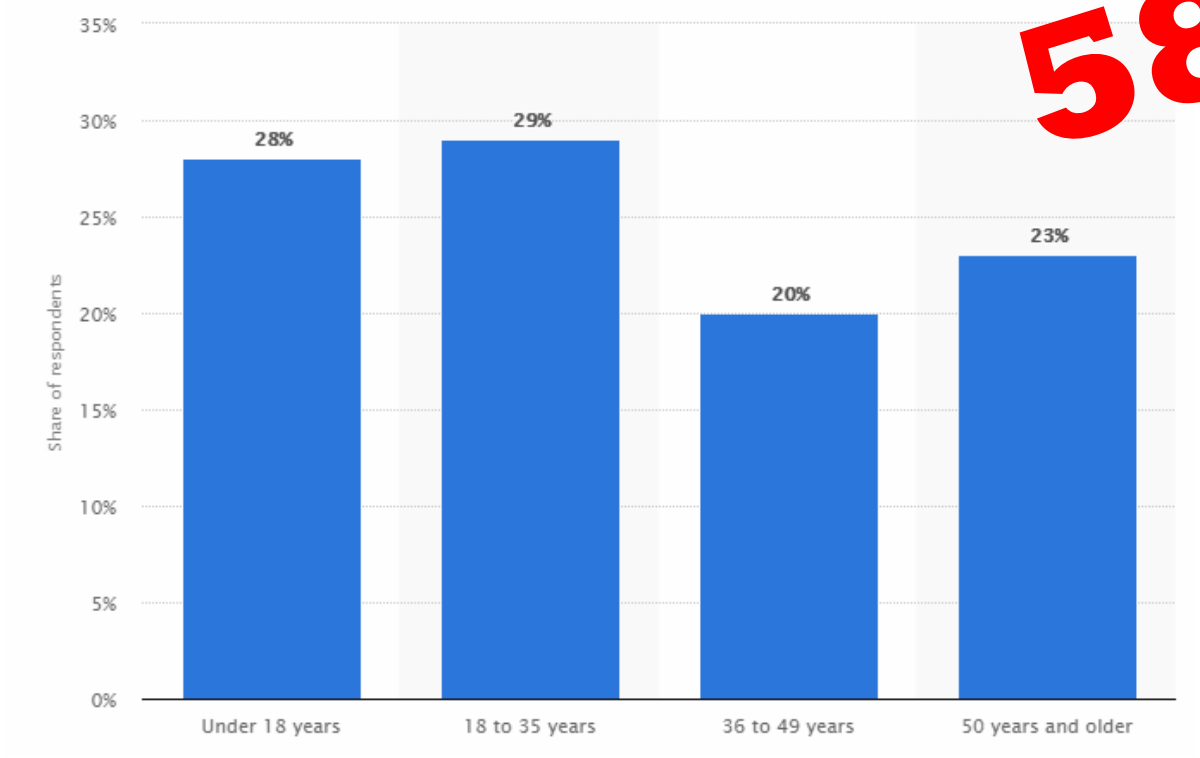
YOUR THOUGHTS

- Posture
- Interaction with electronic devices
- Sedentary lifestyle

IMPACT OF SEDENTARY EVENTS

- Sedentary workforce
- "Office work" is frequently ignored (versus "high hazard" work)
- "Remote work"
- "Explosion" of social networking/communication
- Gaming

AGE BREAKDOWN OF GAMERS IN US



58%

28

MELDING OF WORK, NON-WORK ACTIVITIES

- Employer is most likely liable for injuries that occur at home/remotely
- "Daily" oversight of teleworkers is difficult
- With mobile devices… houses, cars, subways, libraries, bars, airports, parks, beach, etc.
- Email when on vacation… home ill, or at kid's b-day party?
- 24/7 global economy

The lines between work and personal time are now permanently blurred

POLLING QUESTION

KICKSTARTING AND REVITALIZING

Do Ergonomic Interventions Work

Common Ergonomic Intervention Programs (EIP)

- Artisan – laborer to journeyman
- Landscaping
- Agriculture
- Factory/Warehouse
- Driving
- Industrial
- Construction
- Vehicle Design

DO ERGONOMIC INTERVENTIONS WORK

Yes, No, Not Sure - What does your gut tell you

What do the financials tell you

Is there any research that supports EIP

MOST STUDIES LACKING

INACCURACIES, MISCALCULATIONS, OR OUTRIGHT FRAUD

WATCH FOR

* CLINICAL STUDIES WITH SMALL NUMBERS OF PARTICIPANTS.

* BEWARE OF CLAIMS BASED ON SUBGROUP RESULTS (LARGE STUDIES)

* BE SKEPTICAL ABOUT HEALTH CLAIMS BASED ON ANIMAL/ LAB STUDIES

* BEWARE OF "CAUSE AND EFFECT" INTERPRETATIONS

* BEWARE OF HEALTH CLAIMS BASED ON EARLY-PHASE CLINICAL

RETURN TO WORK (TWO-YEAR STUDY)

WE DON'T KNOW IF WORKFORCE WAS STATIC/CONSISTENT

- Workers suffering low back pain (LBP) for 3-4 months
- Ergonomic interventions varied (assessments, training, workstation/tool changes)
- Workdays missed with workplace adaptation – 206 days
- Workdays missed without workplace adaptation – 311 days
- Results suggest that ergonomic interventions MAY BE effective on return to work due to LBP

The effectiveness of ergonomic interventions on return-to-work after low back pain; a prospective two-year cohort study in six countries on low back pain patients sicklisted for 3–4 months. https://oem.bmj.com/content/oemed/61/4/289.full.pdf

6 Months

Engaged Leadership/Management

Safety Committee Training (two-day workshops)

Ergonomic checklist development and action plan

18 Months

Implementation of corrective measures

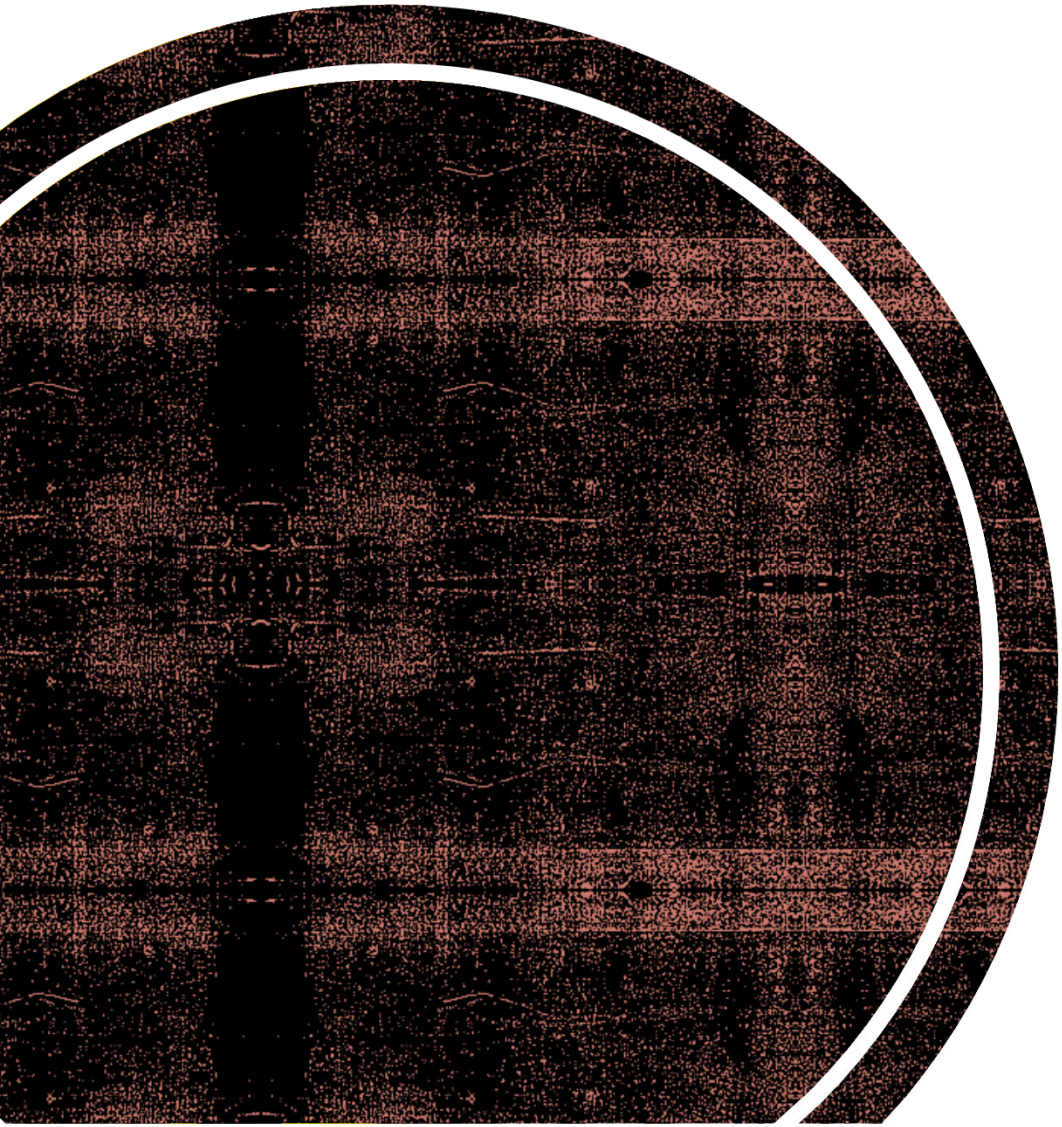
Assessing the effectiveness of an ergonomics intervention program with a participatory approach: ***https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8629733/***

INJURY REDUCTION (TWO-YEAR STUDY)

We don't know if workforce was static/consistent

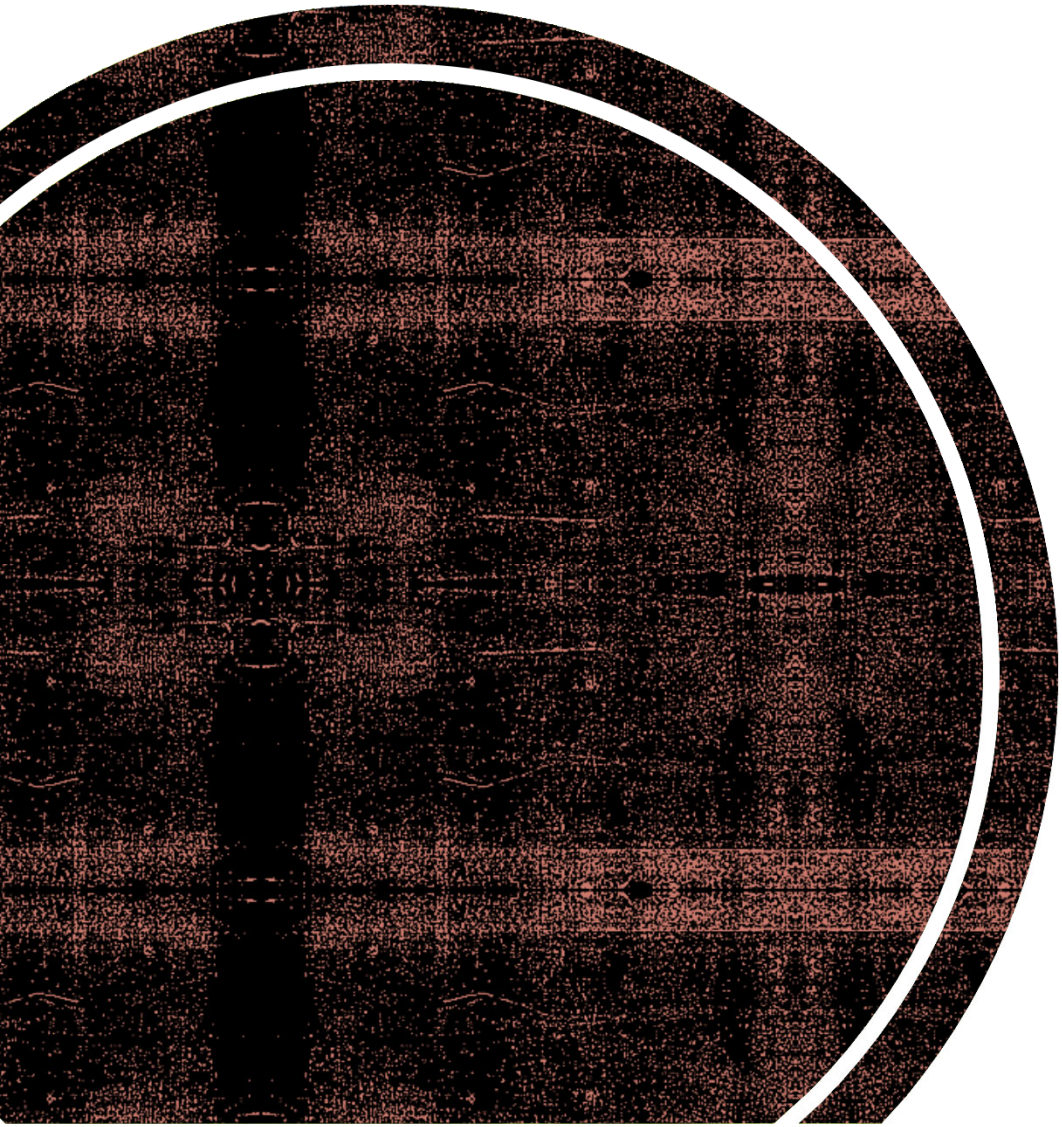
 # MSD before interventions = 430
 # MSD after interventions = 295

Body regions	Before intervention number (%)	After intervention number (%)	*p* value*
Neck	170 (39)	46 (18.6)	0.001
Shoulders	134 (30.7)	45 (18.2)	0.105
Elbows	77 (17.7)	15 (6.1)	0.002
wrist/hands	107 (24.5)	27 (10.9)	0.006
Upper back	137 (31.4)	27 (10.9)	< 0.001
Lower back	203 (46.6)	58 (23.5)	0.001
Thighs	58 (13.3)	23 (9.3)	0.001
Knees	142 (32.6)	46 (18.6)	0.008
ankle/foot	138 (31.7)	41 (16.6)	0.020



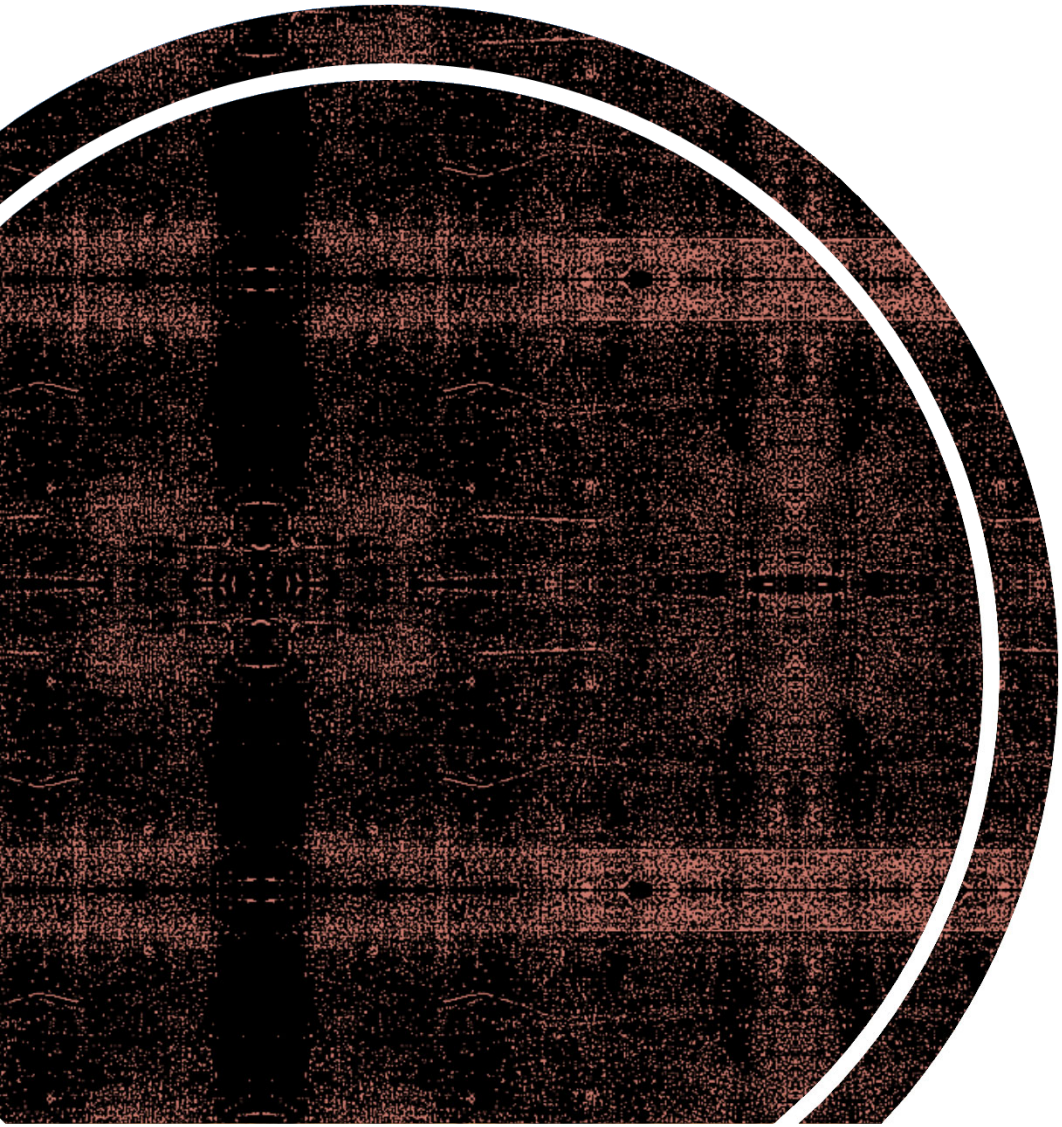
COMMON EIPS (ARTISAN – LABORER TO JOURNEYMAN)

1. Ergonomic Hand Tools
2. Adjustable Workbenches and Tool Stations
3. Mechanical Assistance for Heavy Lifting
4. Proper Lifting and Carrying Techniques Training
5. Ergonomic Seating for Precision Work
6. Task-Specific Lighting
7. Anti-Vibration Gloves
8. Ergonomic Power Tools
9. Climate-Appropriate Clothing
10. Task Rotation and Job Enrichment
11. Ergonomic Flooring
12. Noise Reduction Measures
13. Ergonomic Seating in Break Areas
14. Tool Organization Systems



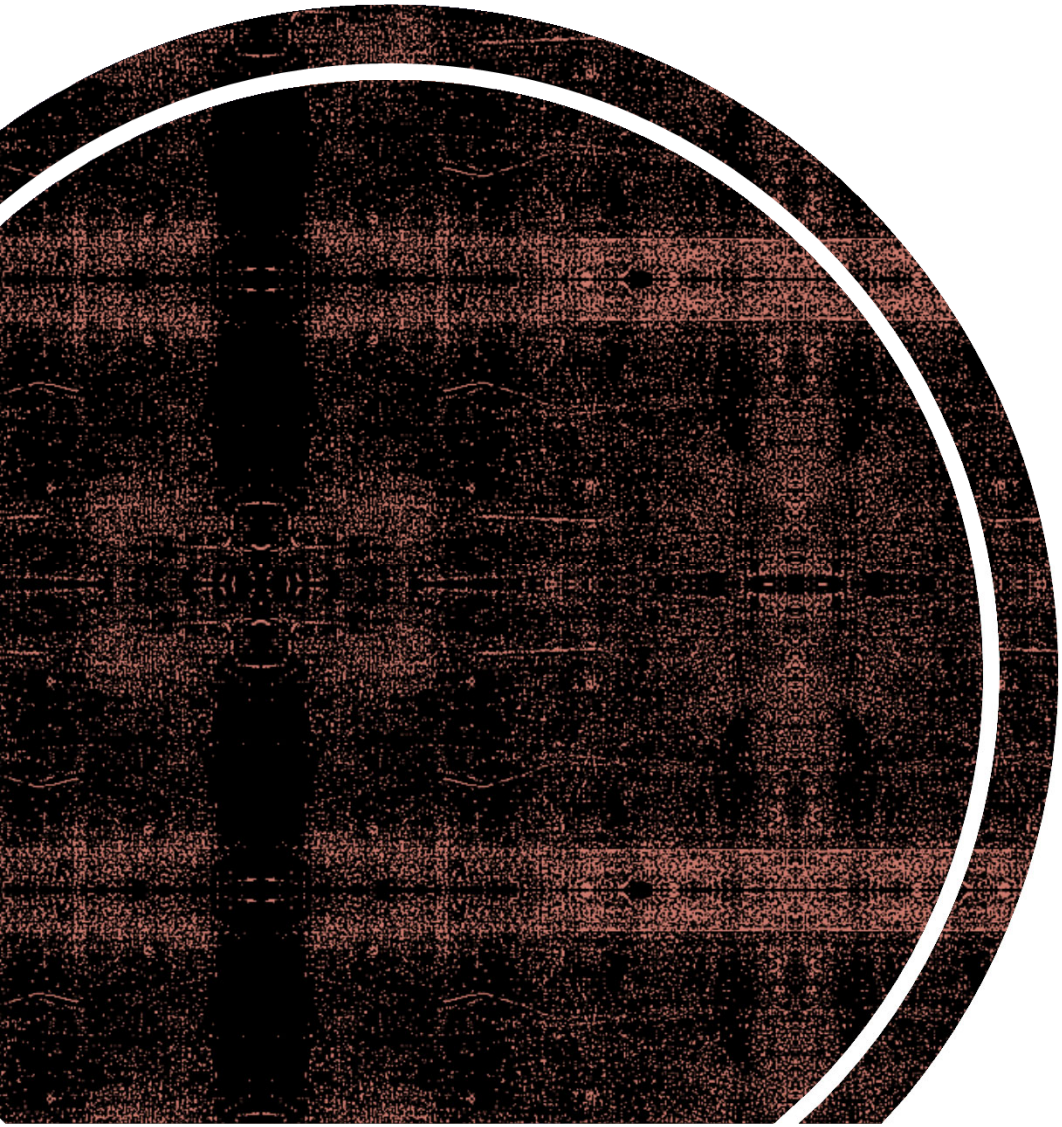
COMMON EIPS (LANDSCAPING)

1. Ergonomic Tools and Equipment
2. Mechanical Assistance for Heavy Tasks
3. Adjustable Workstations
4. Proper Lifting and Carrying Techniques Training
5. Ergonomic Seating in Break Areas
6. Anti-Vibration Gloves
7. Climate-Appropriate Clothing
8. Ergonomic Backpacks or Carriers
9. Ergonomic Seating for Vehicles
10. Ergonomic Posture Training
11. Task Rotation and Job Enrichment
12. Footwear with Arch Support
13. Noise Reduction Measures
14. Ergonomic Gardening Equipment



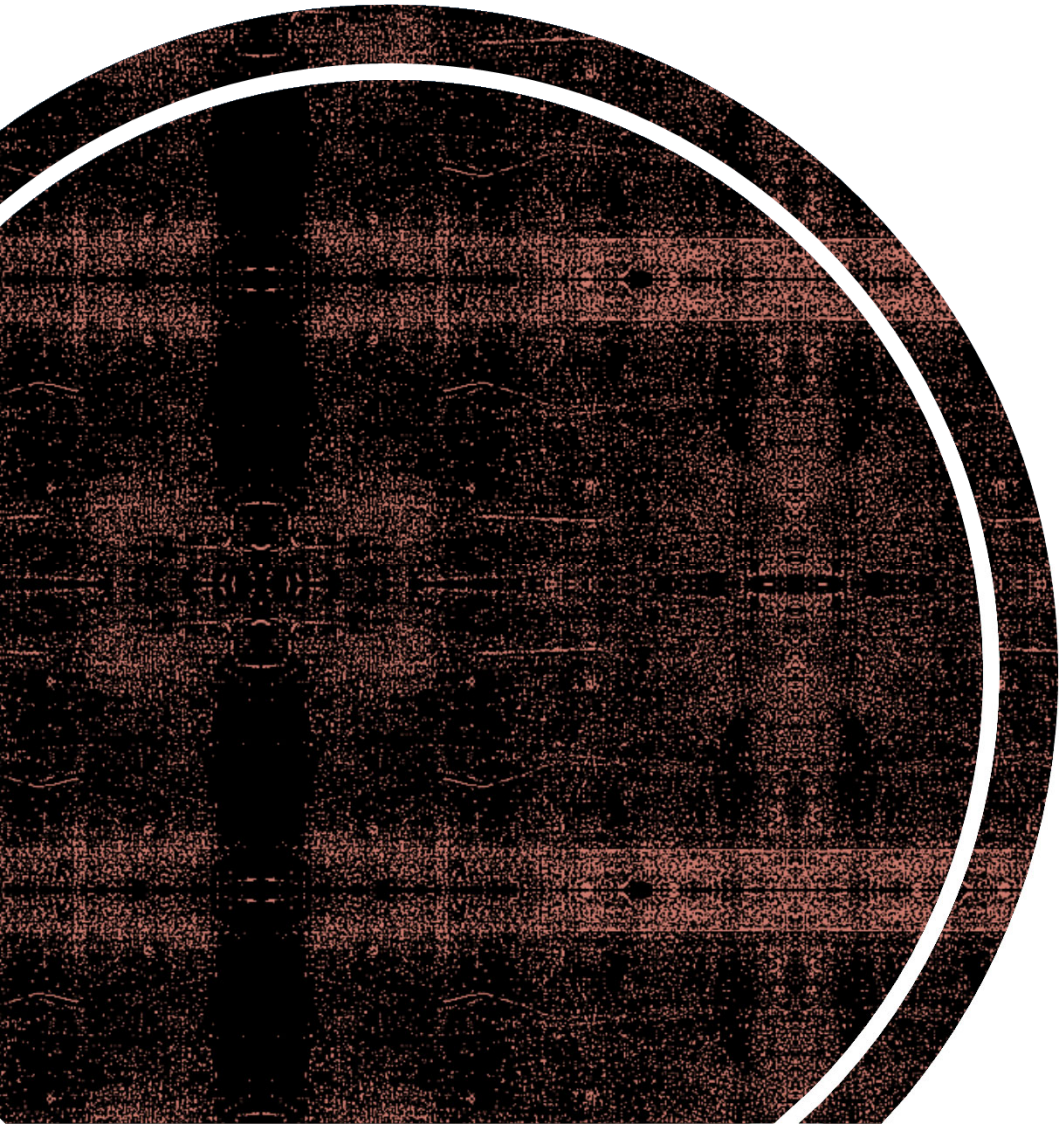
COMMON EIPS (AGRICULTURE)

1. Mechanical Harvesting Equipment
2. Ergonomic Hand Tools
3. Adjustable Seating for Tractors and Machinery
4. Mechanical Assistance for Heavy Lifting
5. Ergonomic Crop Planting and Harvesting Techniques Training
6. Ergonomic Containers and Bins
7. Climate Control Measures
8. Ergonomic Seating in Rest Areas
9. Personal Protective Equipment (PPE)
10. Task Rotation and Job Enrichment
11. Proper Tool Maintenance
12. Ergonomic Transportation Options
13. Ergonomic Posture Training
14. Safety Education Programs



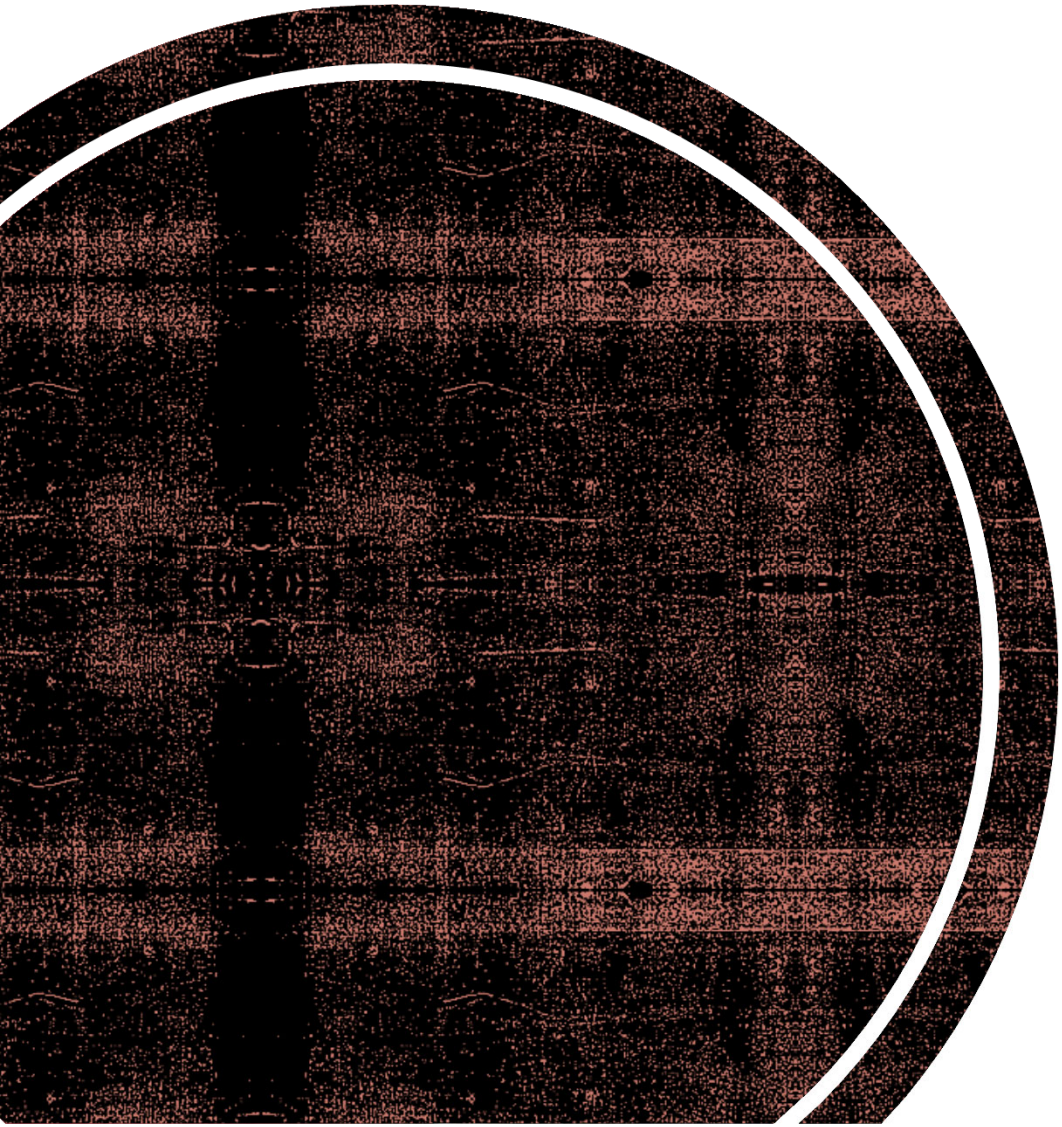
COMMON EIPS (FACTORY/WAREHOUSE)

1. Material Handling Equipment
2. Adjustable Workstations
3. Anti-Fatigue Mats
4. Ergonomic Lifting Techniques Training
5. Ergonomic Tools and Equipment
6. Task Rotation and Job Enrichment
7. Mechanical Assistance for Repetitive Tasks
8. Lighting and Visibility Improvements
9. Climate Control Measures
10. Ergonomic Seating in Break Areas
11. Personal Protective Equipment (PPE)
12. Noise Reduction Measures
13. Ergonomic Flooring
14. Ergonomic Feedback Systems



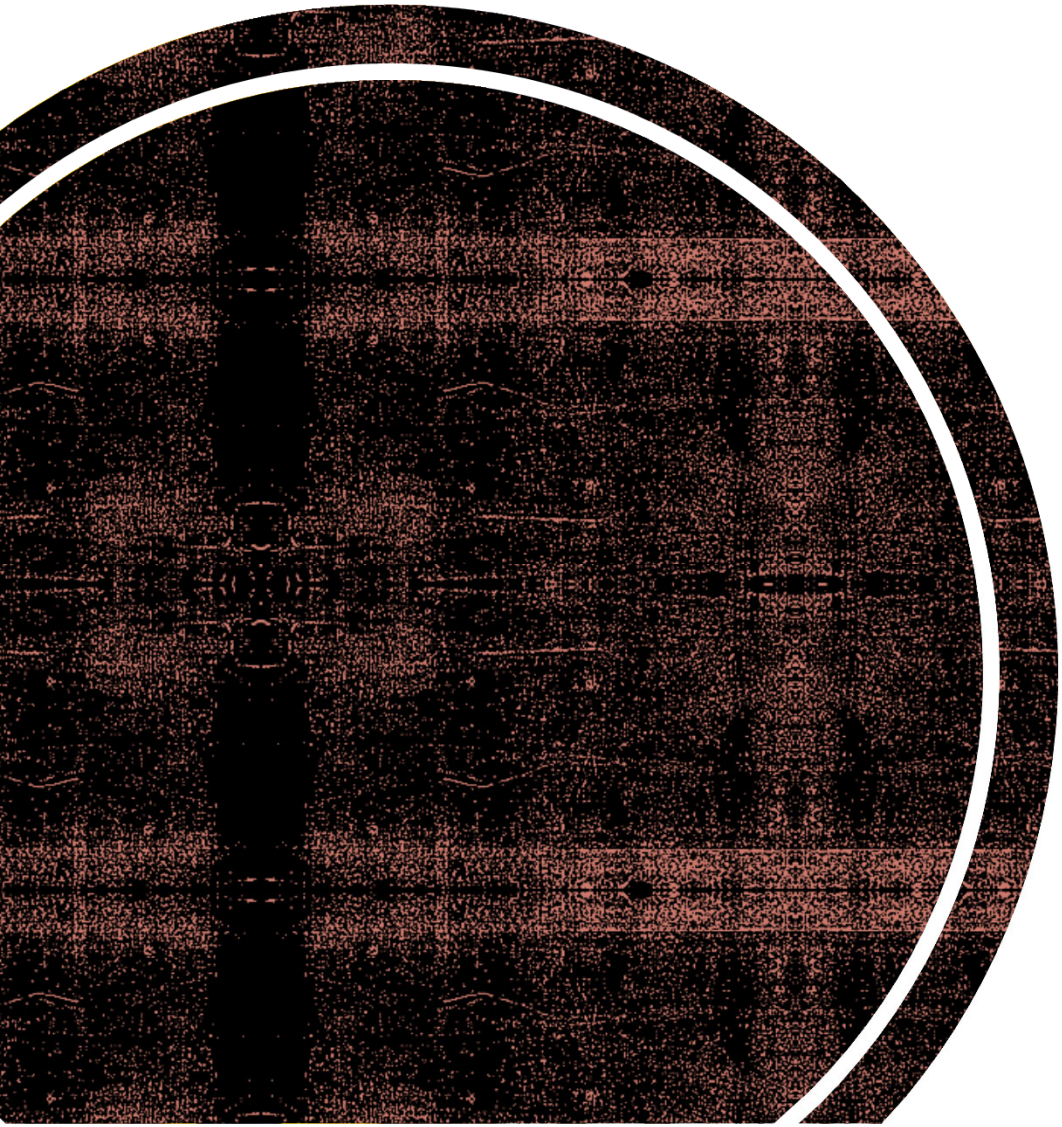
COMMON EIPS (DRIVING)

1. Ergonomic Seating
2. Adjustable Steering Wheel and Controls
3. Seat Cushions and Back Supports
4. Regular Breaks and Stretching Programs
5. Ergonomic Dashboard Design
6. Cabin Climate Control
7. Lumbar Roll or Pillow
8. In-Cabin Exercise Equipment
9. Ergonomic Steering Techniques Training
10. Noise Reduction Measures
11. Driver Wellness Programs
12. Fatigue Monitoring Systems
13. Accessible Storage Solutions
14. Ergonomic Sleep Environment



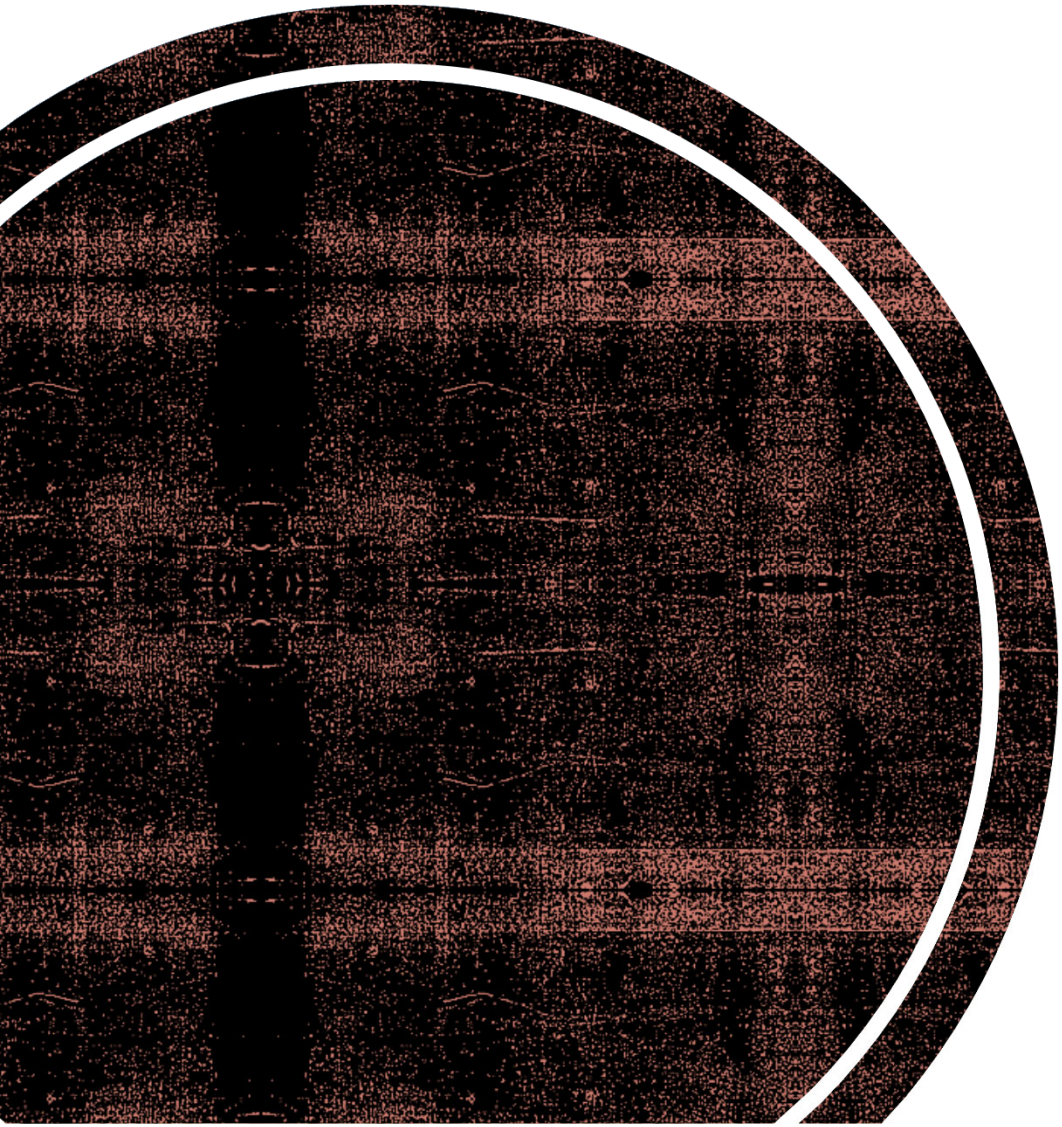
COMMON EIPS (INDUSTRIAL)

1. Adjustable Workstations
2. Proper Tool Design
3. Personal Protective Equipment (PPE)
4. Lifting Aids and Equipment
5. Anti-Fatigue Mats
6. Task Rotation and Job Enrichment
7. Training Programs
8. Stretching and Warm-Up Programs
9. Ergonomic Assessments
10. Workplace Design
11. Break and Rest Areas
12. Employee Involvement
13. Feedback Mechanisms
14. Continuous Improvement Initiatives



COMMON EIPS (CONSTRUCTION)

1. Vibration-Dampening Tools
2. Knee Pads and Cushioned Flooring
3. Body Harnesses and Fall Protection
4. Tool Belts and Weight Distribution
5. Portable Shade and Rest Areas
6. Adjustable Scaffolding and Platforms
7. Ergonomic Handles for Hand Tools
8. Proper Lifting and Carrying Techniques Training
9. Ergonomic Seating in Vehicles
10. Hearing Protection and Communication Devices
11. Worksite Organization
12. Anti-Slip Footwear
13. Task-Specific Ergonomic Tools
14. Real-Time Feedback Devices



COMMON EIPS (VEHICLE DESIGN)

1. Ergonomic Truck/Van Design
2. Adjustable Shelving and Storage
3. Lift-Assist Systems
4. Sliding Platforms
5. Drawer Organizers
6. Ergonomic Handles on Equipment
7. Anti-Slip Surfaces
8. Ergonomic Straps and Tie-Downs
9. Assistive Devices for Ladders
10. Ergonomic Seating in the Cab
11. Backup Cameras and Sensors
12. Weather Protection
13. Training on Safe Lifting Techniques
14. Regular Maintenance of Equipment

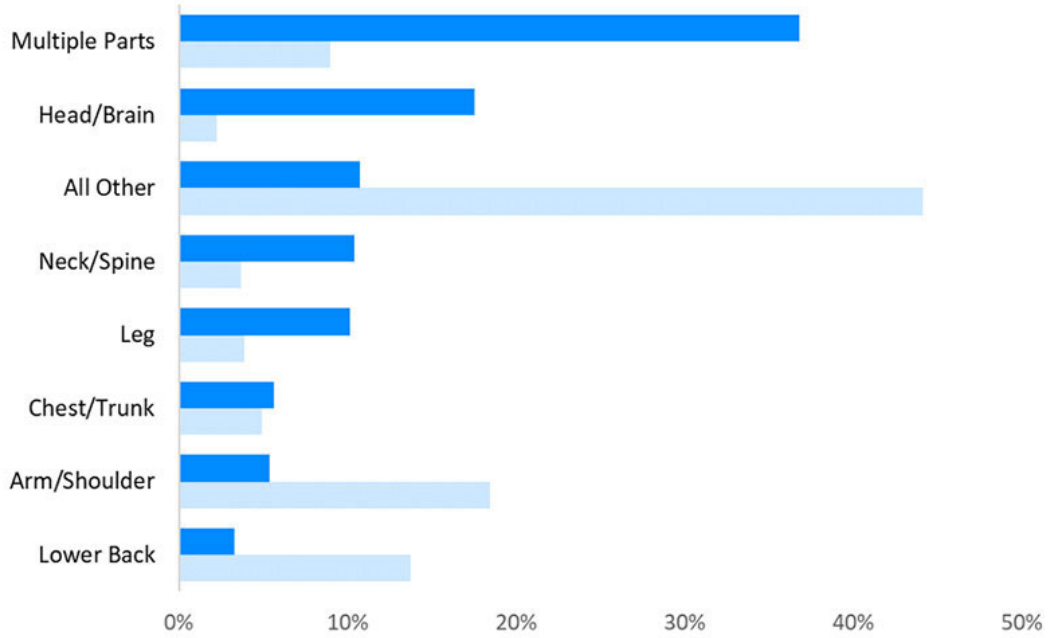
POLLING QUESTION

SELLING ERGONOMICS

1. Data-driven approach
2. ROI focus
   - https://www.pshfes.org/cost-calculator
3. Strategic alignment
4. Compliance assurance
   - OSHA and other regulations
5. Ethical Responsibility and Employee Well-being
   - Moral, Legal, and Ethical considerations
6. Long-Term Health and Productivity
7. Recruiting and Retention
8. Company Reputation

SELLING ERGONOMICS

Data-driven approach



SELLING ERGONOMICS

Data-driven approach

- **40% of WC costs = musculoskeletal disorders**
- **Cisco and Accenture pilot studies (10,000 EEs)**
  - **Persistent discomfort - pulled off task 5 minutes out every 15 minutes**
  - **Lost time/day/employee: 2.6 hours**
  - **Lost time/week/employee: 13 hours**
- **62% decrease in reported discomfort**
- **39% decrease in claims for ergonomic injuries**

Strains, sprains, and discomfort

- 40% of WC costs = musculoskeletal disorders
- Cisco and Accenture pilot studies (10,000 EEs)
  - Persistent discomfort - pulled off task 5 minutes out every 15 minutes
  - Lost time/day/employee: 2.6 hours
  - Lost time/week/employee: 13 hours
- 62% decrease in reported discomfort
- 39% decrease in claims for ergonomic injuries

SELLING ERGONOMICS

ROI focus

- https://www.pshfes.org/cost-calculator

SELLING ERGONOMICS

ROI focus

- https://www.pshfes.org/cost-calculator

Cornell Ergonomics ROI Estimator	Values
Enter average annual salary	0
Enter # employees	0
Enter expected % productivity increase	0
Enter cost per employee of the ergonomics intervention	0
1 year ROI (%)	NaN
3 years ROI (%)	NaN
Payback period (months)	NaN

Number of employees in this job/dept./org.:

Average hourly salary for these employees: per hour

Number of WMSD claims for this job/ dept./ org. per year:

This past year:	Type	Back strain	Number		Typical costs:	$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
					Total costs for year:	$ -
The year before:	Type	Back strain	Number		Typical costs:	$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
					Total costs for year:	$ -
2 years before:	Type	Back strain	Number		Typical costs:	$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
	Type	Back strain	Number			$ -
					Total costs for year:	$ -

Average annual WMSD claim costs: $ -

Estimated annual indirect costs: $ -

SELLING ERGONOMICS

Strategic alignment

Xywfyjlmh%fqnlsr jsy%hx%f%uwthjxx%ymfy%xmfujx mt | %fs%twlfsnjfynts,x%
wjxtzwhjx1%xywzhyzwj1%fsi%hzqyzwj%nfs%mjqu%xzuutwy%ny%x%r nxxnts fsi%{nxnts3

"At GPC, our culture is all about being true to ourselves, living our values, and doing the right thing for each other and our customers. We take the well-being of everyone on our team to heart because we're not just parts."

SELLING ERGONOMICS

1. Compliance assurance
   - OSHA and other regulations

OSHA fines Suamico company $180,000 for repeated fall protection failures

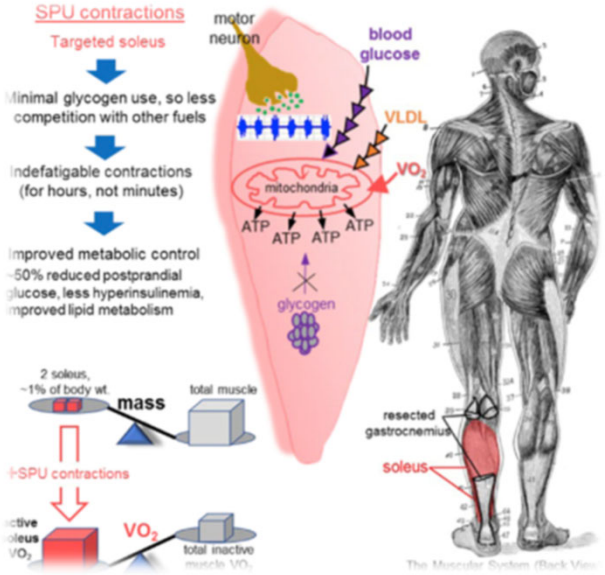
Dollar General has paid a fraction of the $21 million it owes in fines for hazardous working conditions

Alex Bitter Jul 17, 2023, 12:32 PM PDT

SELLING ERGONOMICS

Ethical Responsibility and Employee Well-being

- Moral, Legal, and Ethical considerations



THE SOLEUS MUSCLE

Micro Exercise – of the soleus muscle (beneath/part of the calf muscle)

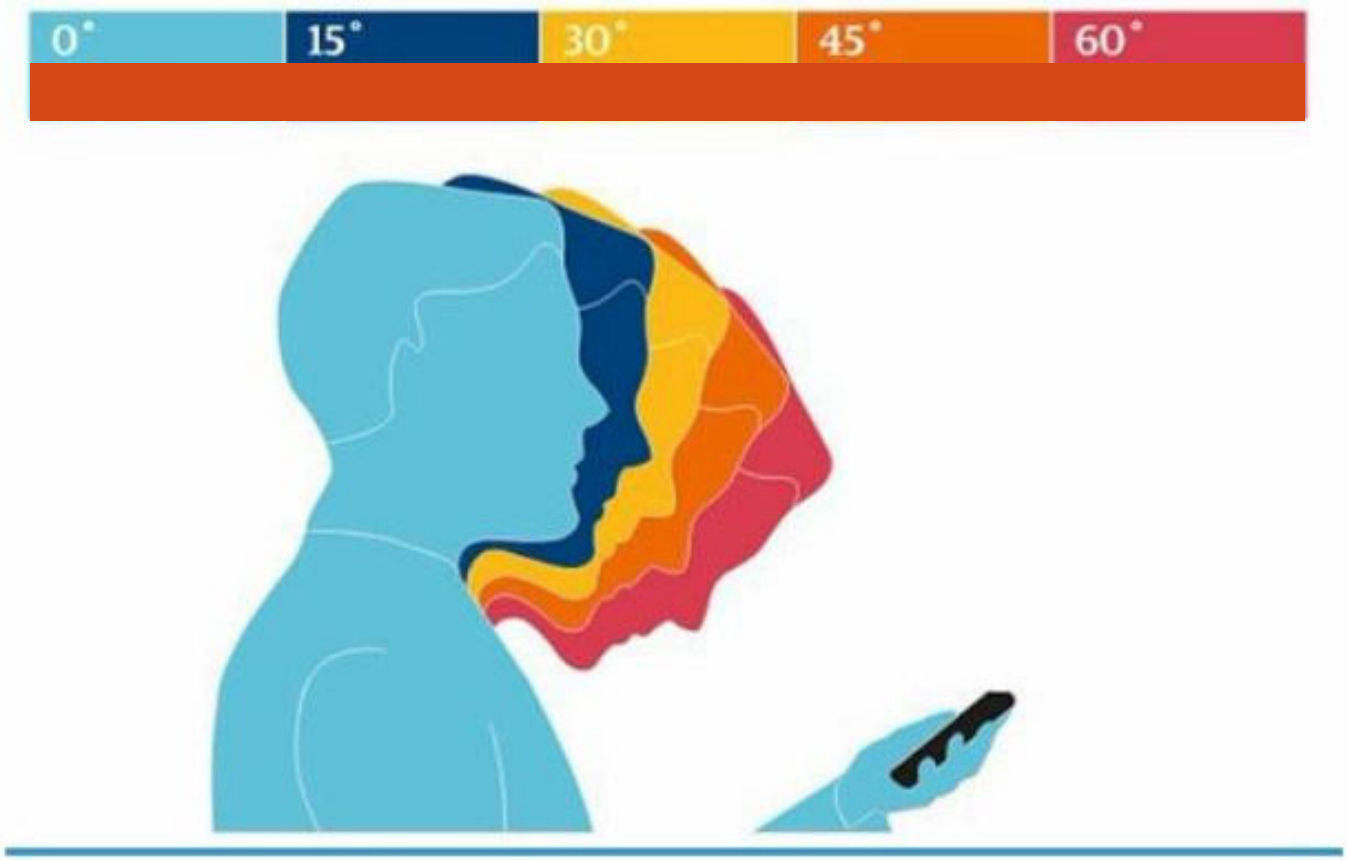
- Stabilizes the body while walking, standing
- Study conducted on people who sit much of the day

- Soleus oxidative metabolism
  - lowers blood sugar
  - Improves glucose and lipid regulation

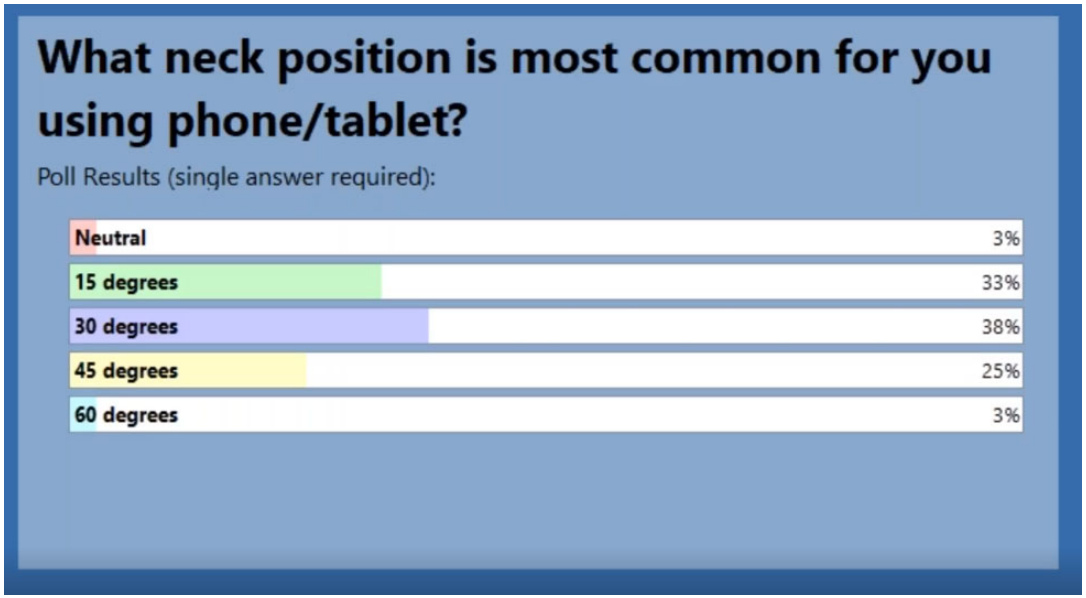
- Soleus pushup (up to 270 minutes)
  - 52% less increase in blood sugar

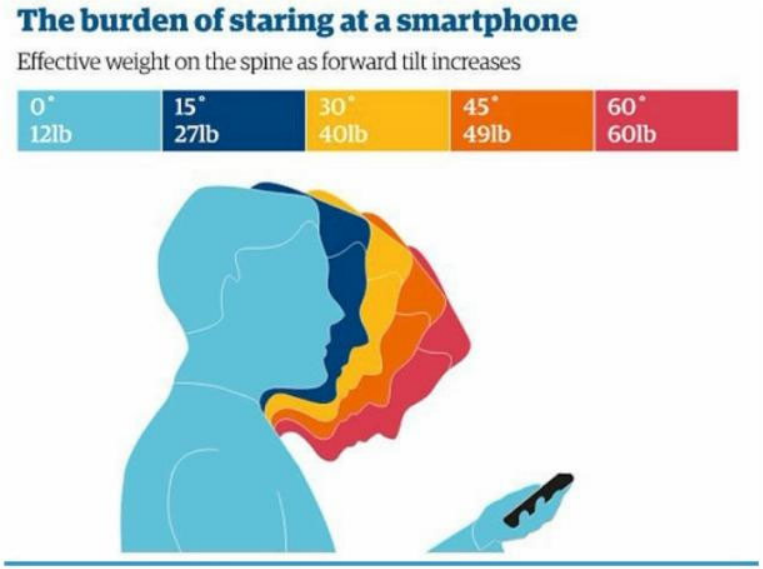
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9404652/

NECK POSITION



HOW DO YOU COMPARE (2 YEARS OF DATA)





Guardian Graphic. Source: Surgical Technology International

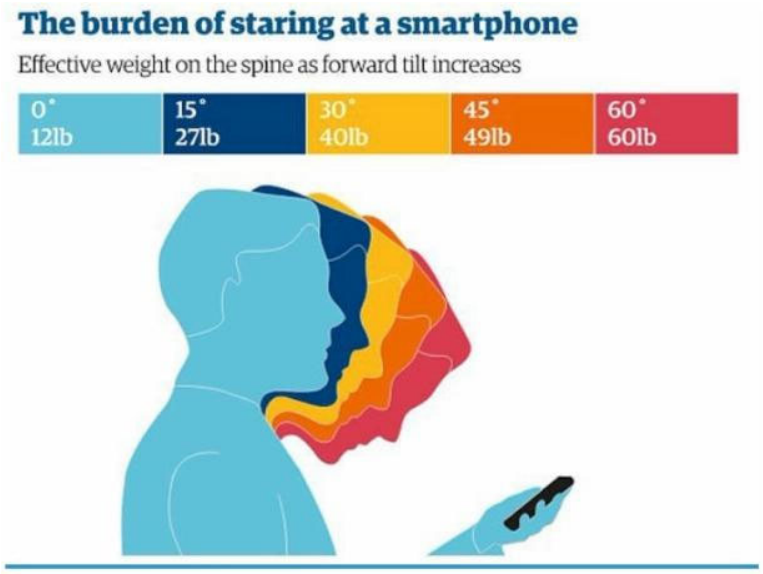
25 pounds = an average 2-year-old | 33 pounds = a cinder block

36 pounds = a mid-size microwave | 40 pounds = a 5-gallon bottle of water

50 pounds = a small bale of hay | 55 pounds = a 5000 BTU air conditioner

BEST PRACTICES
SMART PHONE / TABLET

- When sitting, maintain comfortable and natural posture
- When holding the tablet, keep your elbows close to your body and vary the tablet position. Limit activities that may cause neck problems – when possible, bring your phone closer to eye level
- Switch hands to keep neck postures – healthy
- Limit postures that cause you to lean or hunch forward
- Take a short (1-2 minute break) for every 15-30 minutes
- Integrate stretching of your neck muscles regularly – take a short (1-2 minute break) for every 15-30 minutes. Take regular breaks from prolonged sitting
- Don't cradle phone
- Support arm



Guardian Graphic. Source: Surgical Technology International

25 pounds = an average 2-year-old | 33 pounds = a cinder block

36 pounds = a mid-size microwave | 40 pounds = a 5-gallon bottle of water

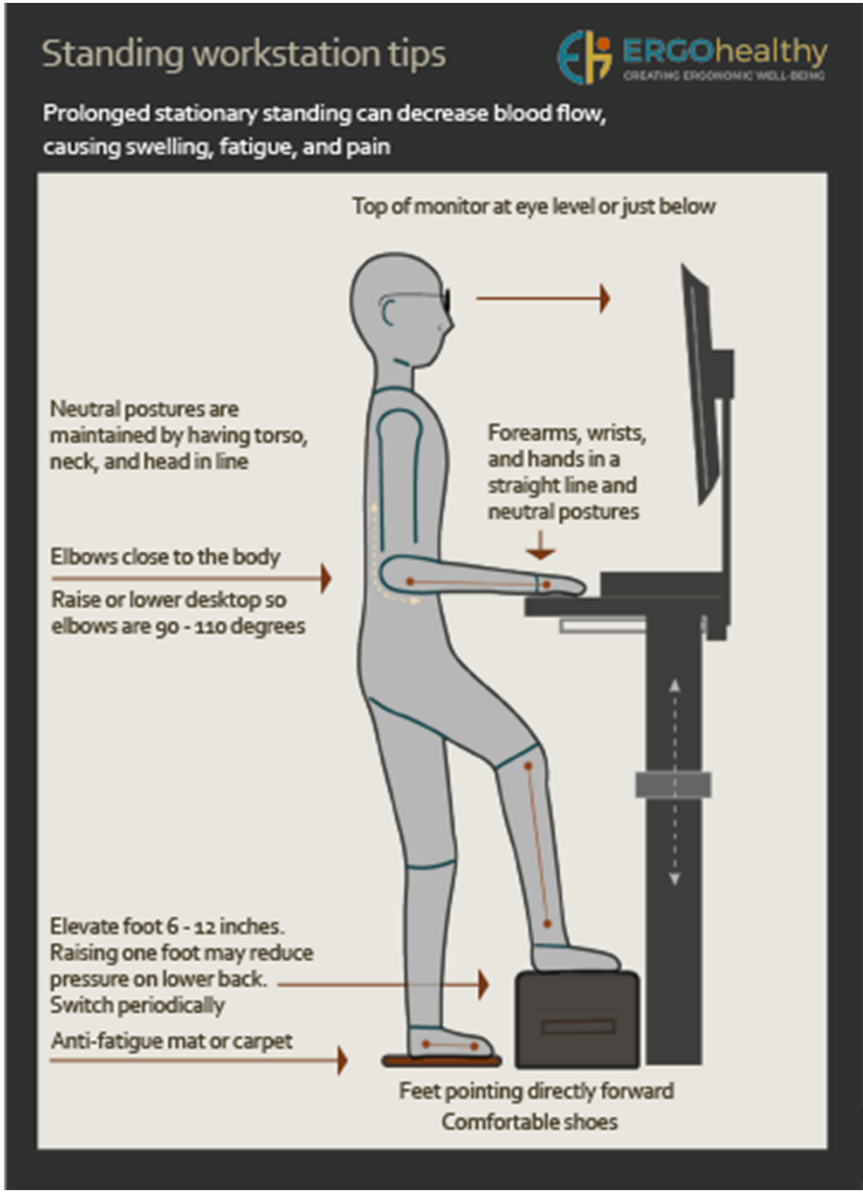
50 pounds = a small bale of hay | 55 pounds = a 5000 BTU air conditioner

BEST PRACTICES – STANDING / SIT-STAND

- Change positions frequently when standing for prolonged periods
- Use a footrest/stool/box (approximately six inches) to prop one foot up, and switch sides every so often
- Vary tasks to avoid static postures
- Work on a carpet pad or mat. Wear shoes in most cases
- Alternate mouse between right and left
- Limit postures that cause you to lean or hunch forward

Additional Considerations

- Prolonged standing for some may have health risks
- Can be difficult for single laptop into ergonomic position



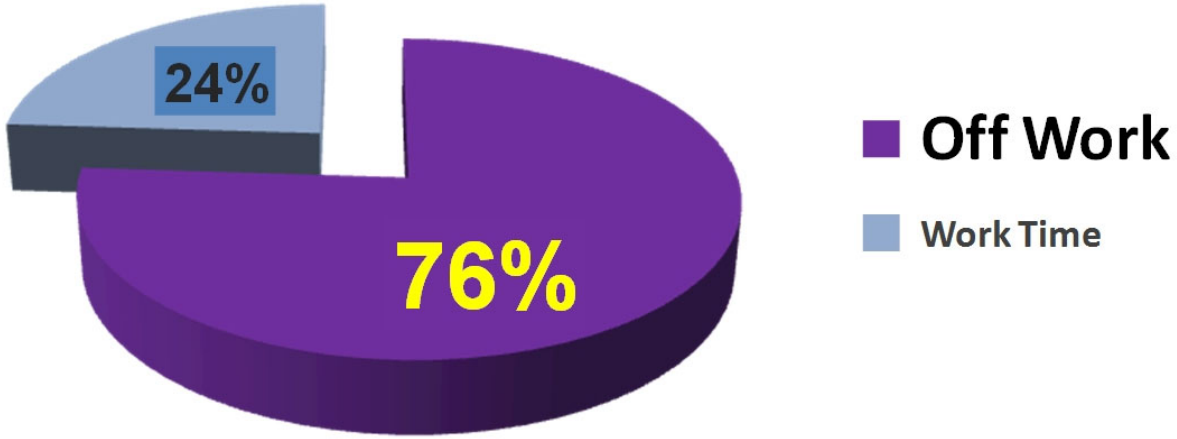
SIT-STAND GUIDANCE (CORNELL UNIVERSITY)

- 30-minute period
- 20 minutes sitting (in a good posture)
- 8 minutes standing (for sit-stand workstations)
- 2 minutes of standing and moving

For a 7.5 hours workday (lunch is excluded) this means a daily regimen with a total of 5 hours of sitting, 16 sit-to-stand changes, 2 hours of standing and .5 hours of moving.

HOW MUCH TIME IS (REALLY) SPENT AT WORK

- 24 hours/day X 7 days = 168 total hours
- Average work hours = 40/week
- 40 work hours per week / 168 total hours = 24%



BEST PRACTICES – ERGO CHAMP ©

- **E**RGO BREAK. Take a short (3–5 minute break) for every hour of sitting
- **R**EMOVE or lower armrests from chair – especially if they block arm motions or prevent from being close enough to keyboard, pad, or mouse
- **G**O gentle on yourself – ergonomics is not a perfect science
- **O**UTSIDE the box thinking – it's ok use common sense. For example, rotate between your right and left hand for mouse use
- **C**OMFORT. Find your place of comfort. Is it sitting with back support; unsupported sitting more forward, or is it a combination of both
- **H**ANG the arms straight down at your side for 60 seconds every hour
- **A**CTIVITY. Use ergo techniques for away-from-work activities
- **M**IX it up. Your base position of comfort is your go-to place… but it's ok to occasionally hunch, or bend, or tilt throughout the day
- **P**OSTURE. Integrate GREAT POSTURE! Head sitting upright on your shoulders, and shoulders over your hips

Arms hanging straight at side

- EDUCATION & AWARENESS
- KEY STAKEHOLDER
- SUCCESS STORIES
- PARTICIPATION

BUILDING A CULTURE OF ERGONOMIC WELLBEING

COMMON CULTURE ASSESSMENT TECHNIQUES

- Peer-to-Peer Observations
- Camera Observations
- Leading / Lagging Indicators

BEHAVIORS/CULTURES THAT PREVENT INJURIES

CARING

A safety culture is part of an organization where people look out for the safety and welfare of others.

LISTENING

Mindful listening is fully concentrating on what is being said rather than just passively "hearing."

LEARNING

Learning is **NOT** telling nor training.

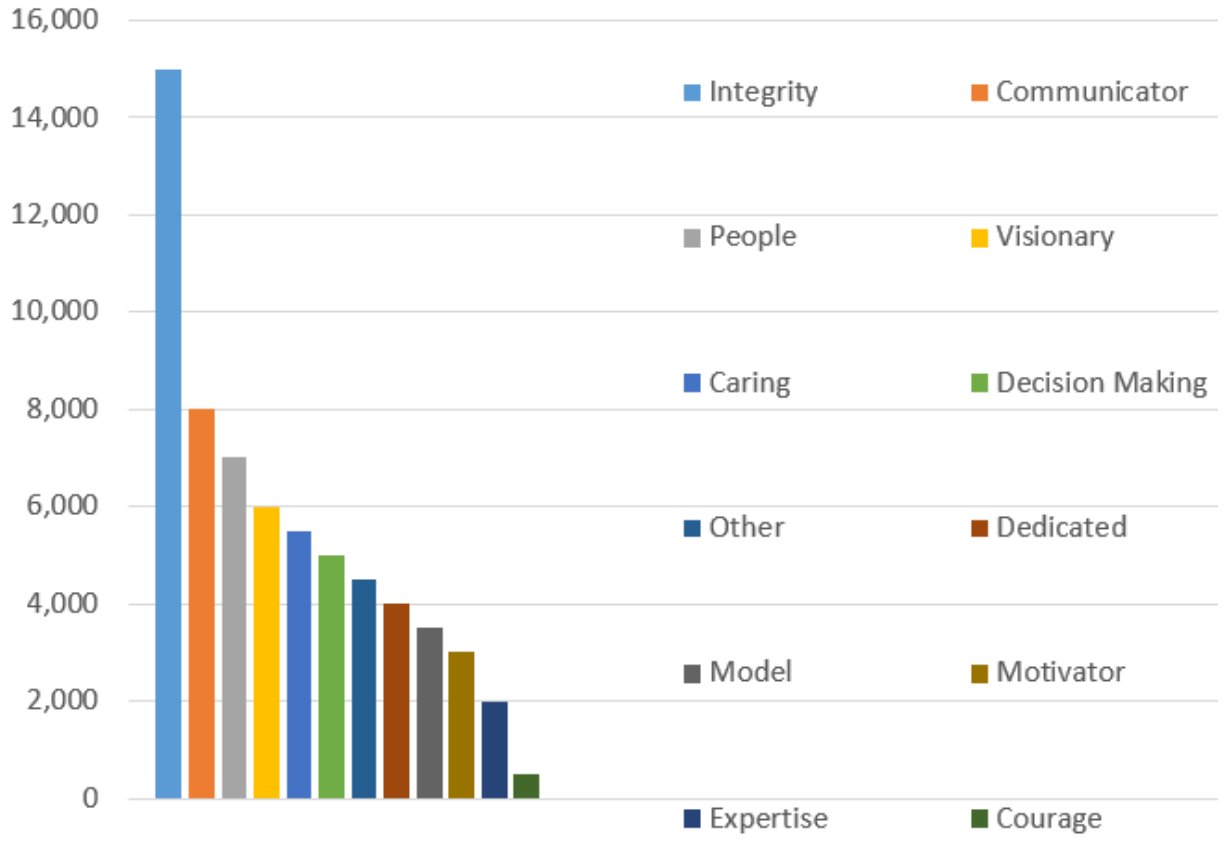
Learning is discovery, observation, and trial and error.

HELPING

Teamwork helps move a safety program forward.

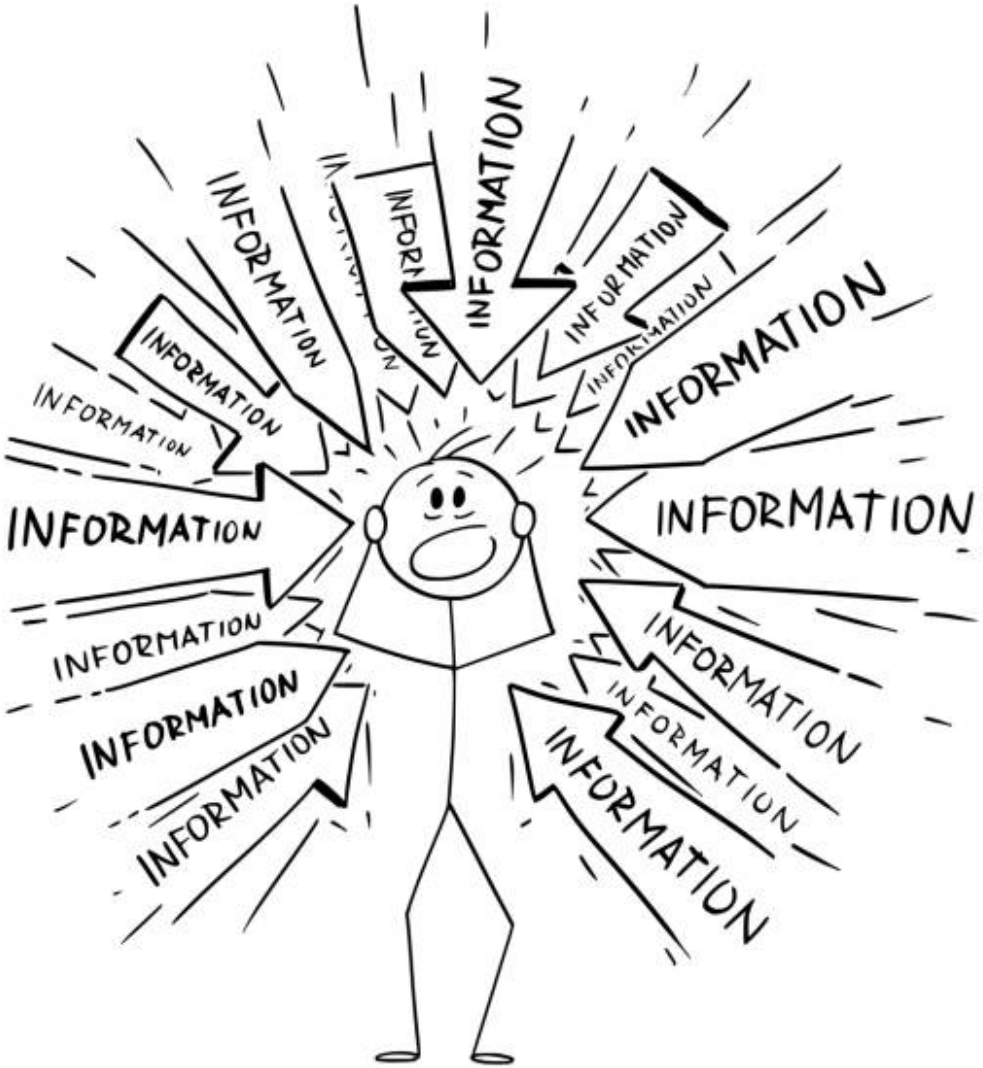
It's about exploring, understanding, and acting.

WHAT MAKES A GREAT SUPERVISOR OR MANAGER



10 ERGONOMIC CULTURE CHANGE STRATEGIES

1. Ergonomic Pledge at Hiring
2. Commitment Cards
3. Ergonomics Mentorship Program
4. Ergonomic Recognition Program
5. Interactive Ergonomic Workshops
6. Ergonomic Task Forces
7. Continuous Feedback Mechanism
8. Ergonomic Challenges and Competitions
9. Ergonomics Scorecards
10. Ergonomic Leadership Development



WE LOVE FEEDBACK

Tell us one thing you learned today

THANK YOU!

HEFFERNAN CONSULTING

ASPEN
RISK MANAGEMENT GROUP
A TRISTAR COMPANY

STRONGER, SAFER, HEALTHIER

Strategies for Championing and Revitalizing Workplace Ergonomics

Steve Thompson, ARM, COSS, CCSHCO, CSHCO – Aspen Risk Management Group