PREVENTION OF MUSCULOSKELETAL DISORDERS IN THE WORKPLACE

BY

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Introduction

What is Ergonomics?

- It is the process of designing or arranging workplaces, products and systems so that they fit the people who use them (according to Dohrmann Consulting)
- According to Merriam Webster; Ergonomics is applied science concerned with designing and arranging things people use so that the people and things interact most efficiently and safely.
- According to Amb. Jasper E. Ikpesu; Ergonomics is a process of designing workstations in the workplace to fit worker's capabilities.

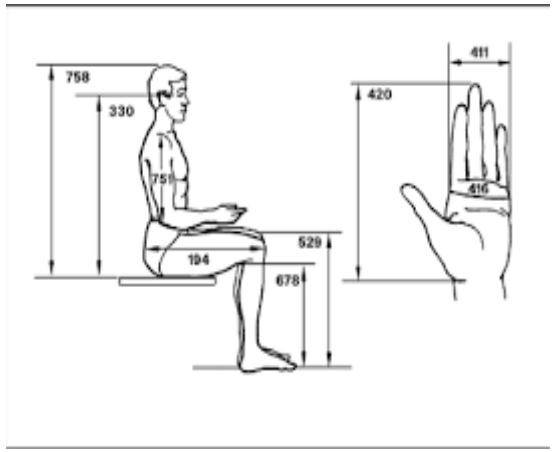
Based on the above definitions MSD can only occur when fatigue outruns recovery as a result of muscle imbalance in the body that eventually leads to a musculoskeletal disorder

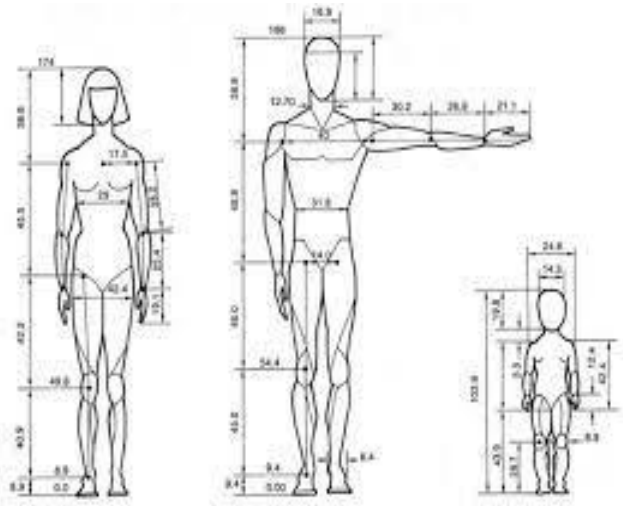
AIM/OBJECTIVE

- To Establish The Enabling Environment For Better Workplace Design And How The Overall Musculosketal Health Contribute To Productivity

The Anthropometry Approach to Workplace Design

A) Ergonomic chair

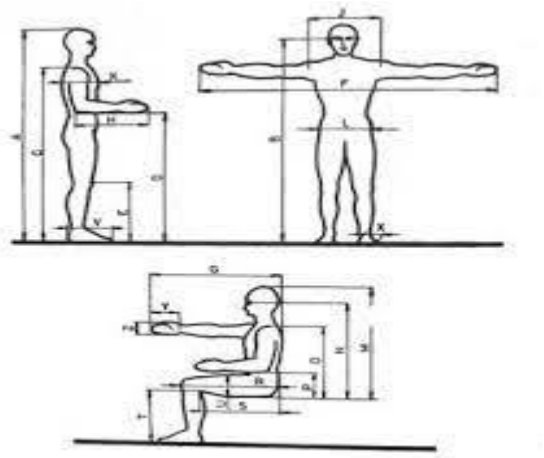




B) Improving quality of workplace

Design Principle

- Adjustability
- Reach
- Allowance/Clearance



C) Simulation of human gait in solid works

What is a Musculoskeletal Disorders (MSDs)?

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

Common MSDs include:

- Carpal Tunnel Syndrome
- Tendonitis
- Muscle / Tendon strain
- Ligament Sprain
- Tension Neck Syndrome
- Thoracic Outlet Compression
- DeQuervain's Syndrome
- Mechanical Back Syndrome
- Rotator Cuff Tendonitis
- Epicondylitis
- Radial Tunnel Syndrome
- Digital Neuritis
- Trigger Finger / Thumb
- Degenerative Disc Disease
- Ruptured / Herniated Disc,

Clarity on MSD Meaning

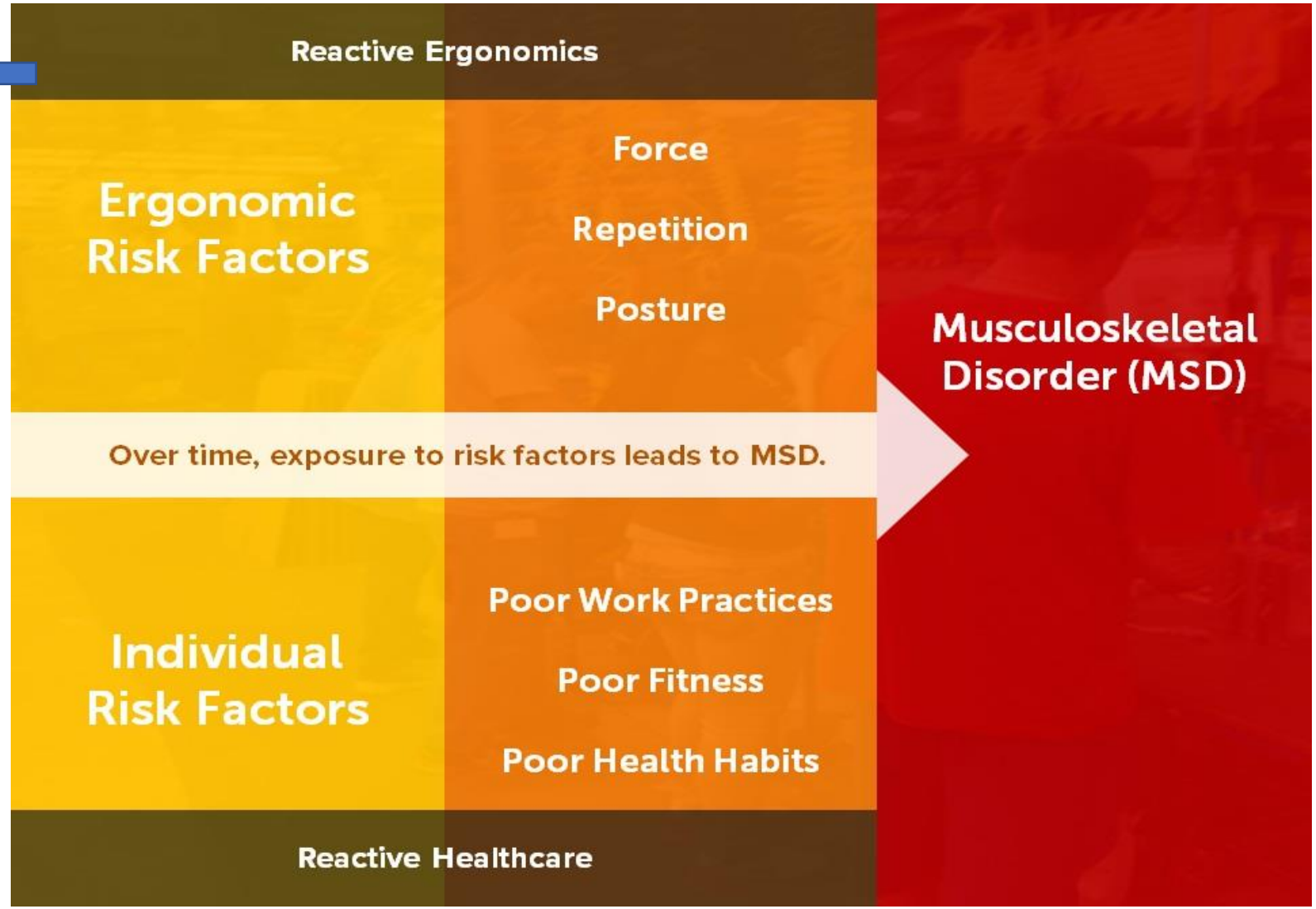
- Manual material handling tasks can be stressful on the bodies of workers. **The physical nature of the work fatigues the musculoskeletal system** — when fatigue outruns recovery it creates a muscle imbalance that can eventually lead to a musculoskeletal disorder
- The reason for providing the definition of an MSD before we talk about MSD risk factors is because people often misinterpret what an MSD is. MSDs are often referred to as “repetitive motion injuries”, “ergonomic injuries”, and many other similar names.
- The second point above is a wrong language to describe them and will inhibit your ability to create a prevention strategy with a chance of success.
- **NB:** A “musculoskeletal disorder” **is not** a “repetitive motion injury” or an “ergonomic injury” or any other term.
- There is no “repetitive motion” part of the human body. There is no “ergonomics” in the human body. A musculoskeletal disorder is a musculoskeletal disorder. It’s an injury/disorder to the human body’s musculoskeletal system.
- Using “repetitive motion” or “ergonomic injury” or any other term besides musculoskeletal disorder to describe these injuries is an attempt to designate a singular cause to the injury. **This will always hinder your MSD prevention efforts because there is no singular cause of MSDs.**

Work-related musculoskeletal disorders (WMSDs)

- Work postures and movements.
- Repetitiveness and pace of work.
- Force of movements.
- Vibration.
- Temperature.
- Lack of influence or control over one's job.
- Increase pressure (e.g., to produce more).
- Lack of or poor communication.

ERGONOMIC RISK FACTORS

Ergonomic risk factors are risk factors related to work activity that can make it more difficult to maintain a healthy balance of the musculoskeletal system, and increase the probability that some individuals may develop an MSD.



A reactive ergonomics process allows ergonomic risk factors to exist in your workplace. The reactive approach is the cause of MSD

ERGONOMIC RISK FACTORS

1. Forceful Exertions

- Many tasks require high force loads on the human body.
- Muscle effort increases in response to high force requirements, and this increase associated fatigue which can lead to MSD.

Material handling tasks with high exertion levels increases the risk of injury.

2. High Task Repetition

- Many work tasks and cycles are repetitive in nature, and are frequently controlled by hourly or daily production targets and work processes.
- High task repetition, when combined with other risks factors such high force and/or awkward postures, can contribute to the formation of MSD.
- A job is considered highly repetitive if the cycle time is 30 seconds or less.

Material handling tasks with high repetition increases the risk of injury.

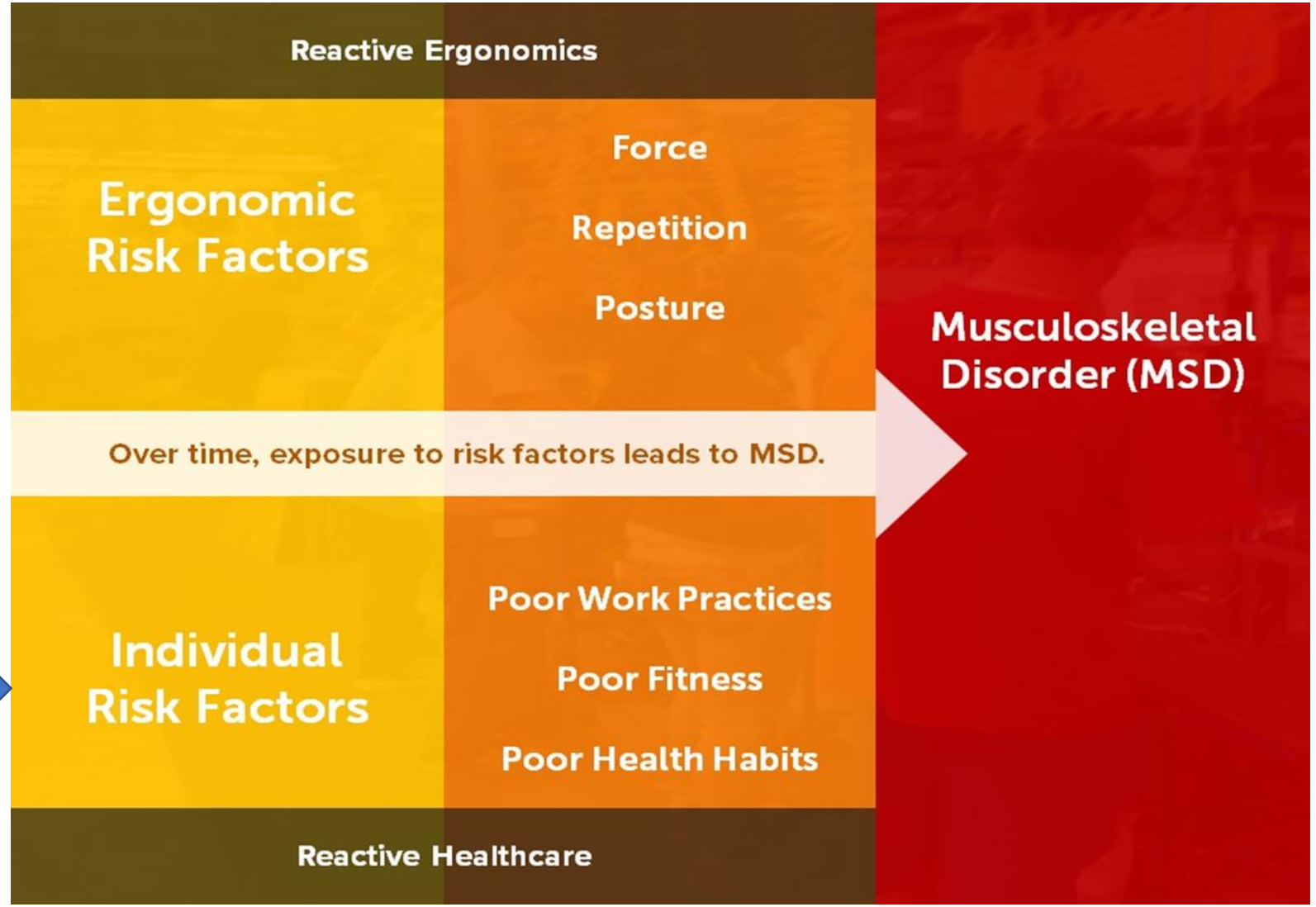
3. Sustained Awkward Postures

- Awkward postures place excessive force on joints and overload the muscles and tendons around the effected joint.
- Joints of the body are most efficient when they operate closest to the mid-range motion of the joint.
- Risk of MSD is increased when joints are worked outside of this mid-range repetitively or for sustained periods of time without adequate recovery time.

Material handling tasks with repetitive/ awkward postures increases the risk of injury

Individual Risk Factors in Manual Material Handling

- A reactive healthcare philosophy allows workers to be exposed to individual risk factors and only provides help after an injury occurs.



Individual Risk Factors in Manual Material Handling

1. Poor work practices

- Workers who use poor work practices, body mechanics and lifting techniques are introducing unnecessary risk factors that can contribute to MSDs.
- These poor practices create unnecessary stress on their bodies that increases fatigue and decreases their body's ability to properly recover.

- See pictures below for poor work practices

2. Poor self-care habits

- MSDs develop when fatigue outruns the workplace athlete's recovery system, causing a musculoskeletal imbalance.
- Workers who do not properly warm-up for work or get adequate rest and recovery after work put themselves at a higher risk of developing an MSD.

- Workers involve in manual material handling environments especially need to take heed of this one. They're extremely active at work and need to pay special attention to their musculoskeletal health and wellness.

3. Poor health habits

Workers who smoke, drink excessively, are obese, or exhibit numerous other poor health habits are putting themselves at risk for not only musculoskeletal disorders, but also for other chronic diseases that will shorten their life and health span.

Musculoskeletal Disorders (MSDs) Prevention in Manual Material Handling (MMH)

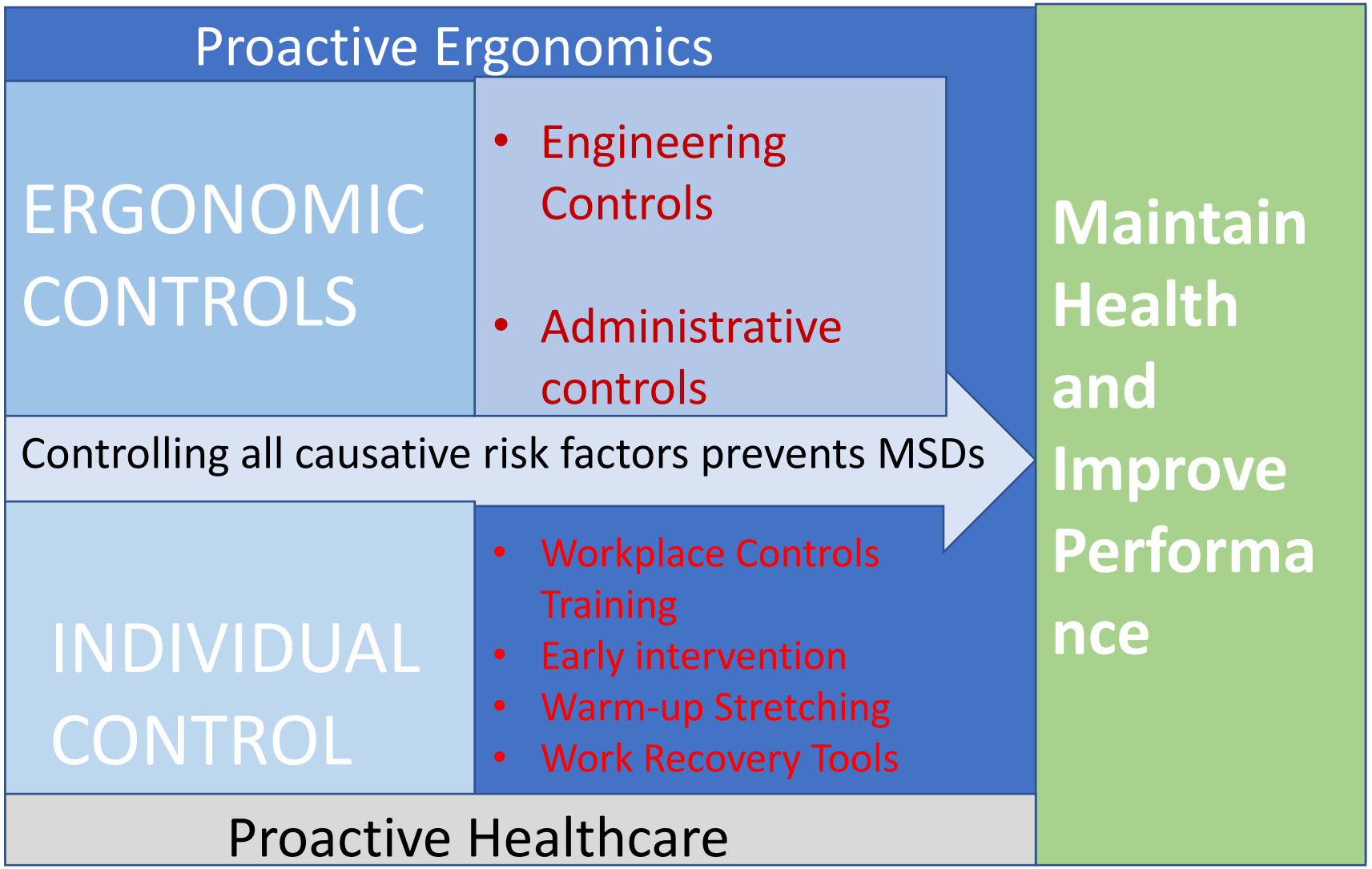
- MMH can be stressful on the human body (e . g Lifting, carrying, moving, lowering, pushing, pulling of loads — it can add up, especially when workforce do it eight hours a day for a living.

- The physical stress and strain inherent in the manual material handling environment often leads to muscle imbalances that eventually lead to MSDs.

The Key Factors to MSD Prevention

NB: Prevention is proactive

- You must be proactive and put control measures in place for every causative MSD risk factor.
- Since MSDs are the result of a reactive approach to ergonomics and healthcare, **then prevention is going to require a proactive approach to ergonomics and healthcare**.



Proactive Ergonomics in MMH

A proactive ergonomics process identifies ergonomic risk and then reduces them through engineering and administrative controls **before an injury occurs**.

1. Engineering Controls:

- ✓ eliminate or reduce awkward postures with ergonomic modifications that seek to maintain joint range of motion to accomplish work tasks.
- ✓ Proper ergonomic tools should be utilized that allow workers to maintain optimal joint positions.

2. Administrative Controls: include work practice controls, job rotation and counteractive stretch breaks.

- ✓ *Work Practice Controls* – Work procedures that consider and reduce awkward postures should be implemented.
- ✓ workers should be trained on proper work technique and encouraged to accept their responsibility to use their body properly and to avoid awkward postures whenever possible.
- ✓ *Job Rotation* – this reduce repeated and sustained awkward postures that can lead to MSD.
- ✓ *Counteractive Stretch Breaks* – Implement rest or stretch break to provide an opportunity to counteract any repeated or sustained awkward postures and allow for adequate recovery time.

Characteristics of Proactive Ergonomics

- Is implemented before an injury occurs
- Is viewed as a continuous improvement process (not a one-time program or event)
- Is tied to strategic initiatives and organizational goals
- Gets the funding and leadership support it needs to succeed
- Develops talent and trains up a workforce with an above average ergonomics IQ
- Gets transformational results

Proactive Healthcare in MMH

- **This is proactive, or preventive, healthcare where the goal is to prevent injuries and avoid costly reactive healthcare.**

- A proactive healthcare process doesn't wait for a worker to develop an MSD before that worker gets the training, information and coaching they need to remain healthy.

- MSDs develop over **long periods of time** due to microscopic wear and tear to the soft tissues every day. The earlier you provide healthcare, the better the outcome for the worker and the company.

1. **Worker's Training:**
   Teach your workers proper body mechanics, good work practices, and a self-care program designed to improve both performance and recovery.
2. **Early Intervention:**
   This is a proactive strategy to find early signs of fatigue and **prevent fatigue from developing into an injury**. When workplace athletes recognize they are experiencing fatigue, they are encouraged to report it.
3. **Warm-up Stretching:**
   This ensure team members are physically ready for work, reduces injury risk and promotes a health, safety and team culture. Implementing a Work Readiness System ensures workers are warmed up and ready for their workday.
4. **Work Recovery Methods and Tools:**
   Good sleep habits, and multiple methods of stretching exercises should be recommended and encouraged for all worker. These methods and tools should be regularly reviewed through group and one-on-one training sessions, as this will help to maintain balance.

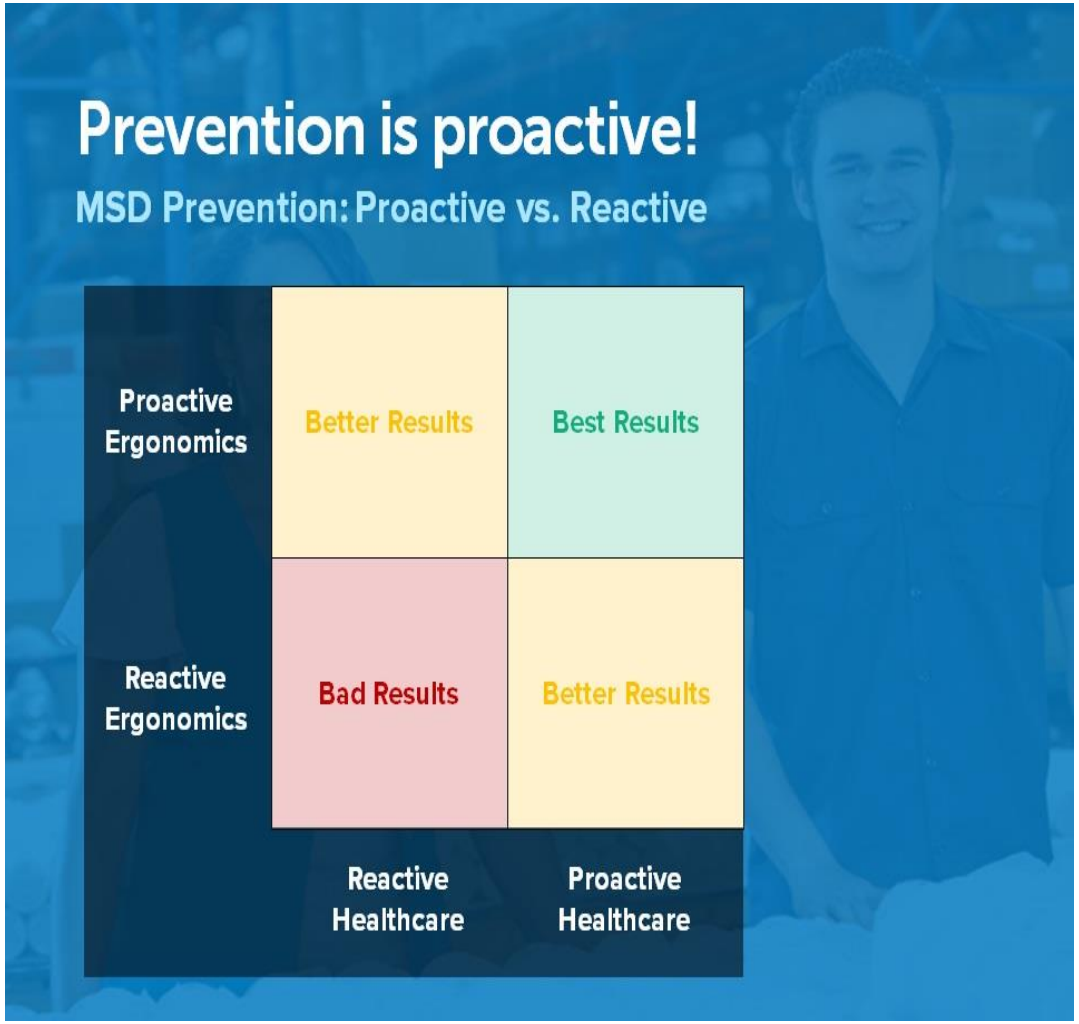
Characteristics of Proactive Healthcare

- Is implemented before an injury occurs
- Provides worker with injury prevention tools and techniques through group education workshops and one-on-one training
- Delivers the best health outcome for the workplace athlete
- Is the least costly form of healthcare for the company, providing a strong return on investment

The Advantage of a Comprehensive Prevention Process

MSD prevention is about proactively reducing risk through ergonomics and proactive healthcare. It's impossible to prevent these injuries in a consistent and predictably way if comprehensive process is not in place to reduce all contributing risk factors.

NB: The best possible results will come when you are proactive in all areas of your MSD prevention process.



Three Reasons For Improving Workplace Design

1. Take care of your people.

Making workplace improvements with a proactive ergonomics process makes life easier for your people. That alone makes the effort worth it.

2. Take care of your business.

You should always take care of your people because they're the ones taking care of your business. Reducing injury risk through proactive ergonomics and proactive healthcare has been proven time and time again to have a positive impact on the key metrics of your business: safety, productivity, and overall profitability.

3. Seize the opportunity.

Implementing a process with proactive ergonomics and proactive healthcare is a **huge opportunity for safety leaders**. MSDs are preventable injuries, yet they are common and costly in manual material handling environments today. That can change — seize this opportunity to make an impact on your organization and your career.

How to Prevent musculoskeletal disorders in the workplace

Prevention

- Warm up and stretch before starting activities that are repetitive, static or prolonged.
- Take frequent breaks from any sustained posture every 20-30 minutes and stretch stiff muscles.
- Respect pain. Change positions or stop whenever activities cause pain.
- Recognize early signs of the inflammatory process, and treat early.
- Only use splints and wrist supports after instruction by your physician or therapist.

How to Prevent musculoskeletal disorders in the workplace

Posture

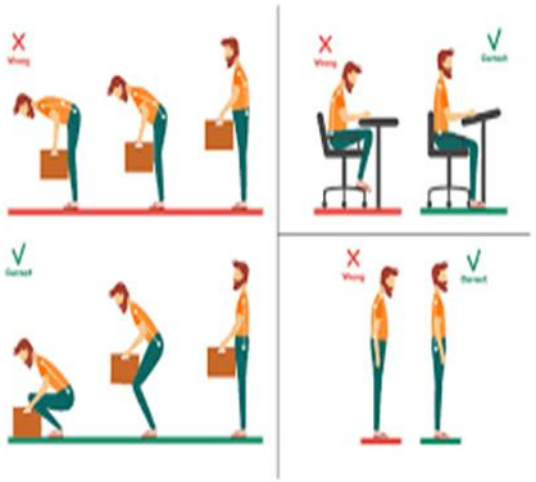
- Maintain erect position of back and neck with shoulders relaxed. Minimize twisting and bending motions. Position equipment and work tasks so that your body is directly in front of and close to your major work tasks.
- Use proper positioning during all activities. Keep upper arms close to the body, elbows at 100 degrees, forearms neutral (thumb toward ceiling), and wrist straight. Keep feet flat on the floor when seated by proper adjustment of your chair, or use of a footrest.
- Keep wrists as neutral as possible. Avoid extreme motions. There is a safe zone of movement for your wrist. This zone is about 15 degrees in all directions.
- Avoid bending neck forward for prolonged periods of time. If typing from a manuscript, place the document on a holder beside or below your computer screen.
- Avoid static positions for prolonged periods. Muscles fatigue faster when they are held in one position. Keep moving to increase your blood circulation.

How to Prevent musculoskeletal disorders in the workplace

Task Modification

- Whenever possible, alternate activities frequently throughout the day. Rotate heavy and/or repetitive tasks with lighter, less repetitive tasks.
- If symptoms become worse, or a specific activity consistently causes discomfort, reassess the task setup and look for alternative methods.
- Avoid repetitive or prolonged grip/pretension activities. Avoid pinching with wrist flexion or wrist deviation (bending to side). Take frequent breaks to stretch and rest hands.
- Avoid tugging, jerking, or pounding with the hand. Tool/Environmental Modification:
- Avoid tools with finger grooves, hard plastic handles, sharp edges, small diameter, or large diameter handles.
- Use power devices when available.
- Use grips/tape to build up small diameter pens/pencils for writing. Better still, select large diameter pens with soft grip pads.
- Use the longest tool possible (screwdrivers, wrenches) for the best leverage.
- Use vises, clamps, or jigs to stabilize objects to avoid sustaining forceful gripping with the hand.
- Use a step stool or ladder when necessary to reach above shoulder level, or to lift objects overhead.
- Use carts/dollies to carry heavy loads. Avoid the need to handle heavy loads by making several trips.
- Use forearm troughs, armrests, or pillows under forearms during tasks if needed.
- Use adjustable keyboard trays large enough to support a pointing device to properly position your keyboard. Negative tilt adjustability is highly recommended if you sit in an upright position to work.
- Tilt containers or objects to avoid bending the wrist to pick up objects.

How to Prevent musculoskeletal disorders in the workplace



Body Mechanics

- Use the largest joints and muscles to do the job.
- Use two hands to lift rather than one, even with light objects and tasks. Avoid lifting with the forearm in full pronation (palms down) or supination (palms up).
- Slide or push and pull objects instead of lifting.
- Keep reaching to a minimum. Position objects close to the body within easy reach. Carry objects close to body at waist level.

Conclusion

Bad or wrong workplace design decrease efficiency and productivity, and increase the following;

- Workers absenteeism
- Workers and customers complaint
- Poor production
- Fatality
- Increase in MSDs, and etc.

Therefore, let us consider the worker's capabilities in our designs in order to improve on the workplace quality and worker's wellbeing.


thank
you