Ergonomics

Hazard Assessment, Mitigation Techniques & App Training

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Worker Rights Under OSHA Law

- The information in the following slides is presented with all TPM training modules either formally or informally.

Workers' Rights Under OSH Act

Workers are entitled to working conditions that do not pose a risk of serious harm. To help assure a safe and healthful workplace, OSHA also provides workers with the right to:

- Ask OSHA to inspect their workplace;
- Use their rights under the law without retaliation and discrimination;
- Receive information and training about hazards, methods to prevent harm, and the OSHA standards that apply to their workplace. The training must be in a language you can understand;
- Get copies of test results done to find hazards in the workplace;
- Review records of work-related injuries and illnesses;
- Get copies of their medical records.

Employer Responsibilities

Under the OSH law, employers have a responsibility to provide a safe workplace. This is a short summary of key employer responsibilities:

- Provide a workplace free from serious recognized hazards and comply with standards, rules and regulations issued under the OSH Act.
- Examine workplace conditions to make sure they conform to applicable OSHA standards.
- Make sure employees have and use safe tools and equipment and properly maintain this equipment.
- Use color codes, posters, labels or signs to warn employees of potential hazards.
- Establish or update operating procedures and communicate them so that employees follow safety and health requirements.
- Employers must provide safety training in a language and vocabulary workers can understand.
- Employers with hazardous chemicals in the workplace must develop and implement a written hazard communication program and train employees on the hazards they are exposed to and proper precautions (and a copy of safety data sheets must be readily available). See the OSHA page on Hazard Communication.
- Provide medical examinations and training when required by OSHA standards.
- Post, at a prominent location within the workplace, the OSHA poster (or the state-plan equivalent) informing employees of their rights and responsibilities.
- Report to the nearest OSHA office within 8 hours any fatal accident or one that results in the hospitalization of three or more employees. Call our toll-free number: 1-800-321-OSHA (6742); TTY 1-877-889-5627
- Keep records of work-related injuries and illnesses. (Note: Employers with 10 or fewer employees and employers in certain low-hazard industries are exempt from this requirement.
- Provide employees, former employees and their representatives access to the Log of Work-Related Injuries and Illnesses (OSHA Form 300). On February 1, and for three months, covered employers must post the summary of the OSHA log of injuries and illnesses (OSHA Form 300A).
- Provide access to employee medical records and exposure records to employees or their authorized representatives.
- Provide to the OSHA compliance officer the names of authorized employee representatives who may be asked to accompany the compliance officer during an inspection.
- Not discriminate against employees who exercise their rights under the Act. See our "Whistleblower Protection" webpage.
- Post OSHA citations at or near the work area involved. Each citation must remain posted until the violation has been corrected, or for three working days, whichever is longer. Post abatement verification documents or tags.

Right to File a Complaint

- The Occupational Safety and Health Act of 1970 gives employees and their representatives the right to file a complaint and request an OSHA inspection of their workplace if they believe there is a serious hazard or their employer is not following OSHA standards. Further, the Act gives complainants the right to request that their names not be revealed to their employers.
- Complaints from employees and their representatives are taken seriously by OSHA. It is against the law for an employer to fire, demote, transfer, or discriminate in any way against a worker for filing a complaint or using other OSHA rights.
- OSHA will keep your information confidential.

Whistleblower Protections

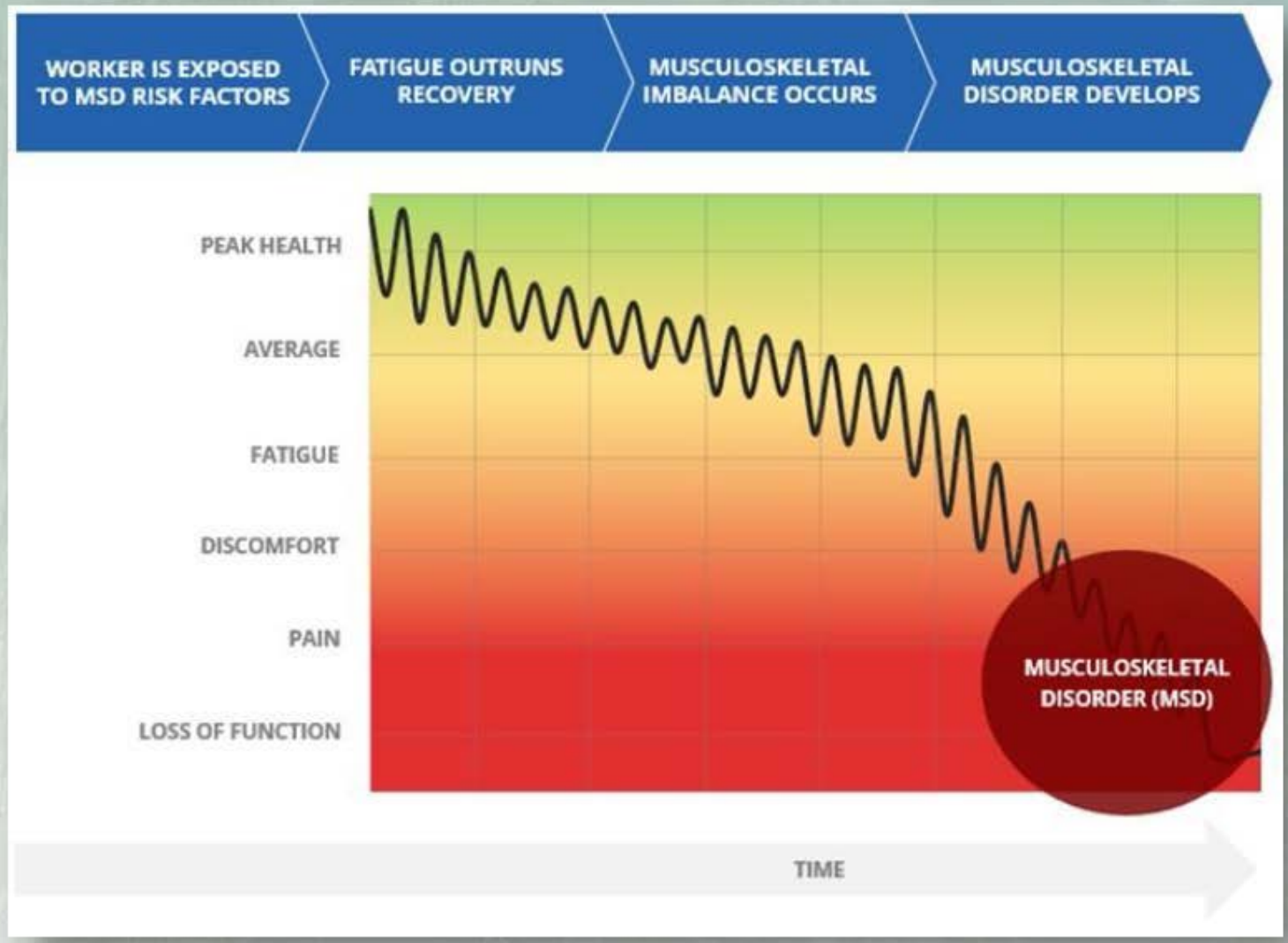
- OSHA's Whistleblower Protection Program enforces the whistleblower provisions of more than twenty whistleblower statutes protecting employees who report violations of various workplace safety laws.

Protection from discrimination means that an employer cannot retaliate by taking "adverse action" against workers, such as:

- Firing or laying off
- Blacklisting
- Demoting
- Denying overtime or promotion
- Disciplining
- Denial of benefits
- Failure to hire or rehire
- Intimidation
- Making threats
- Reassignment affecting prospects for promotion
- Reducing pay or hours

Why?

Musculoskeletal Injury / Disorder



Ergonomics

- Work station
- Tools
- Motions
- Physical Condition
- Physical Limitations
- Environment
- Nutrition

Ergonomic Hazards

- Identify the Hazard
  - Hazard Assessment
- Control the Hazard
  - Mitigation Techniques

Ergonomic Hazard Assessment

- Review injury and illness records
- Rate and number of repetitions: performance of the same motion or motion patterns every few seconds for more than two hours at a time.
- Postures and limb positions: fixed or awkward work postures such as overhead work, twisted or bent back, bent wrist, stooping, or squatting, for more than a total of two hours.
- Vibration: use of vibrating or impact tools or equipment for more than a total of two hours.

Ergonomic Hazard Assessment

- Loads/lifted: lifting, lowering, or carrying of anything weighing more than 25 pounds (11.34 kg) more than once during the work shift.

- Loads/static: holding a fixed or awkward position with arms or neck for more than ten seconds.
- Muscle forces: continually pulling or pushing objects.
- Work pace: piece rate or machine paced work for more than four hours at a time (legally required breaks cannot be included when totaling the four hour limit).

Ergonomic Risk Jobs

- List of job titles that expose employees to ergonomic injury risk
- List some jobs…..
  - Computer user
  - Lumber handler
  - Mechanic Wrenching

Hazard Mitigation Techniques

Engineering Controls

Reduce employees' exposures by removing the hazard from the process or by placing a barrier between the hazard and the employee. Engineering controls protect employees effectively without placing primary responsibility of implementation on the employee.

Hazard Mitigation Techniques

Engineering Controls

Preferred Method

Work Station Design

Tool Design

Equipment Design

Hazard Mitigation Techniques

Administrative Controls

The term administrative control refers to employer-dictated work practices and policies to reduce or prevent hazardous exposures. Their effectiveness depends on employer commitment and employee acceptance. Regular monitoring and reinforcement are necessary to ensure that policies and procedures are followed consistently.

Hazard Mitigation Techniques

Job:	Time:
Material Handling Position 1	8AM – 10AM
Clean Up	10AM - Noon
Material Handling Position 2	1PM – 3PM
Material Handling Position 3	3PM – 5PM

Administrative Controls

Job Rotation

Shift Length

Overtime Management

Rest Breaks

Production Rates

Proper lifting

- Size up the load
- Bend your knees
- Do not twist
- Clear path
- Lower slowly
- Push carts/dollies
- Get a buddy

Ergonomic Hazards Backs

- Back – bending more than 30 Degrees
  - 4 hour limit per day
- Back – bending more than 45 Degrees
  - 2 hour limit per day
- Lifting – varies depending on the hand placement, frequency of lift, and weight of the board

Ergonomic Hazards
Shoulders, Arms, & Hands

- Gripping – Every few seconds with a force of more than 10 pounds
  - 3 hour limit per day
  - Bent wrist = 2 hour limit per day
- Working with hands over head or reaching more than once per minute for a total of more than 4 hours

Ergonomic Hazards Necks

- Neck – bent more than 45 Degrees
  - 4 hour per day limit
- Position monitors and control panels to improve neck postures

Ergonomic Hazards Hips, Knees, Ankles, & Feet

- Standing for long periods of time
  - Anti-fatigue mats
  - Cushioned insoles
  - 6 inch foot rest bar

- Repetitively operating foot controls in awkward postures
  - Recess the foot control into floor to reduce upward flexion of the foot

Job Rotation

- Limits employee exposure to risk factors
- Reduces potential for injury MSD
- Learning curve - Give adequate training and break-in periods
- Keep to a minimum 2 or 3 jobs
- Strengthens your teams average knowledge and flexibility

Hazard Assessment

- Requirement for all employers to have an accident prevention program tailored to their operations and the specific hazards involved

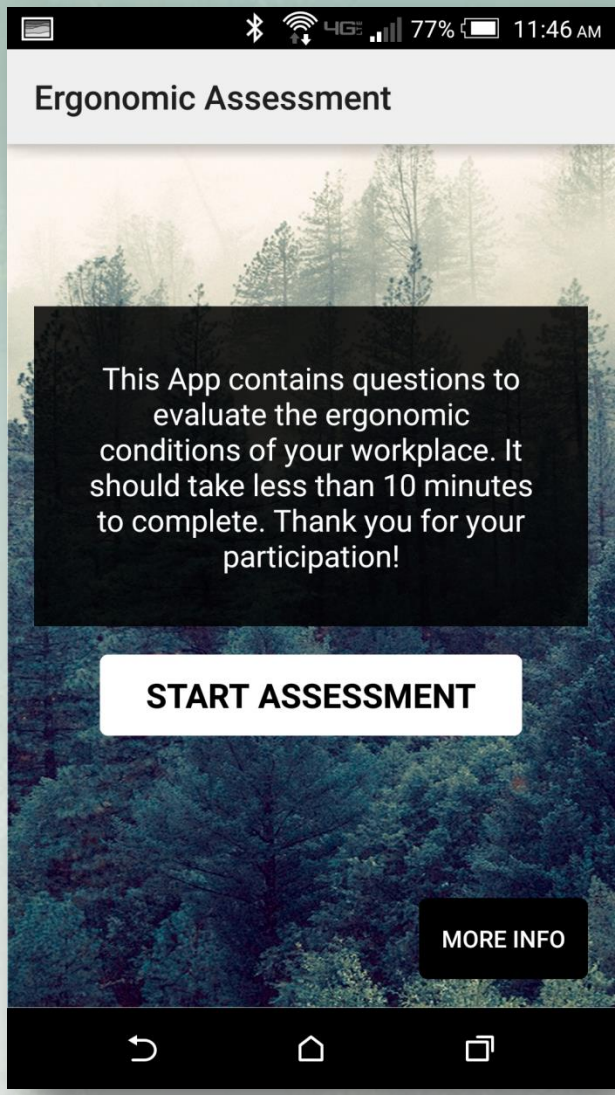
- You have to conduct a hazard assessment so you know what to prevent and figure out how to then control them.
- Plan?

Hazard Assessment

Technology Tools

Smart Phone & Tablet Application

- TPM Built a smart phone and tablet application w/ OSHA grant
- Ergonomic Hazard Assessment
  - 20 Questions
  - Enter Hazard Specifics
  - Add Photos
  - Publish Report as time and date stamped PDF
  - Mitigation Techniques for identified hazards



Smart Phone & Tablet Application

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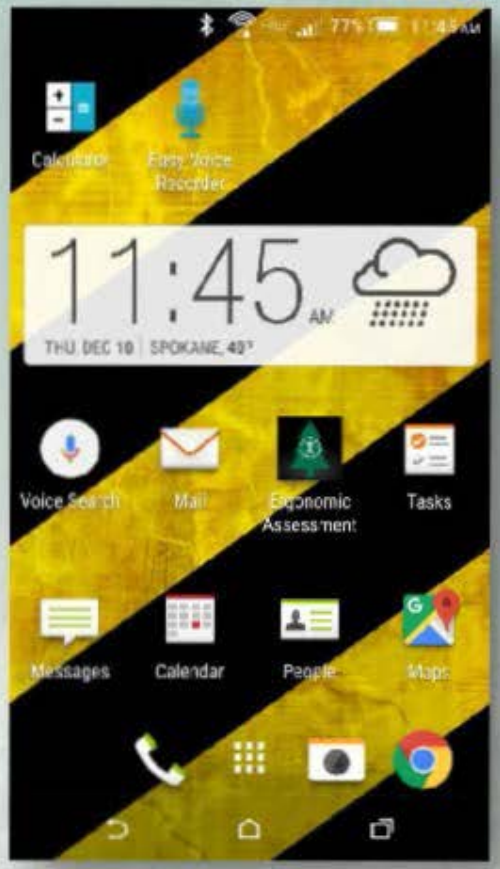
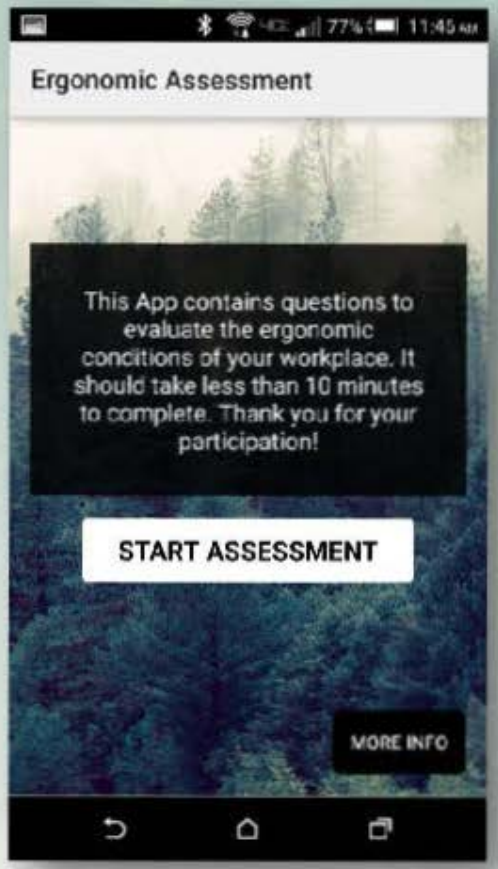


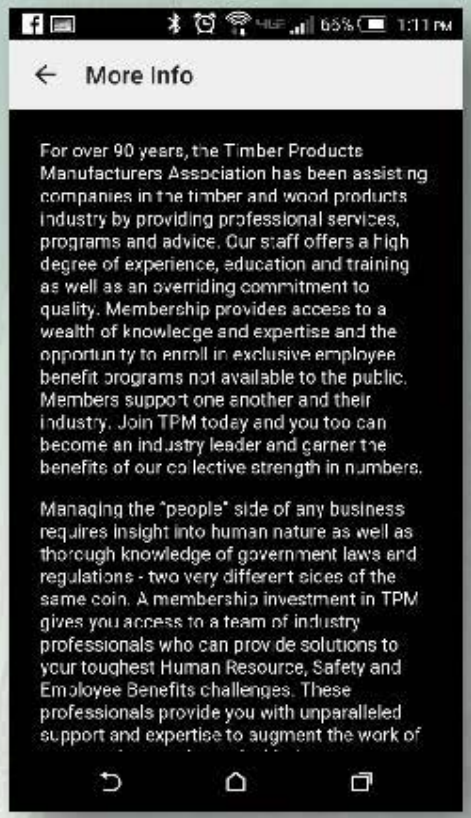
Splash

Main

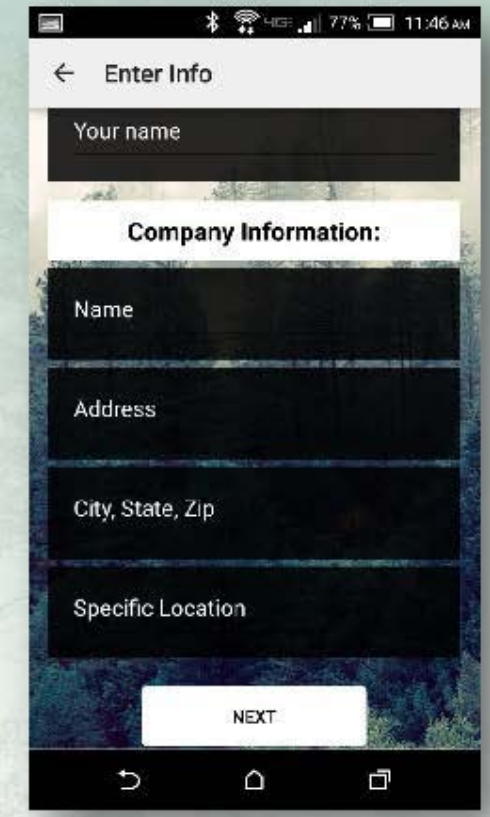


Smart Phone & Tablet Application

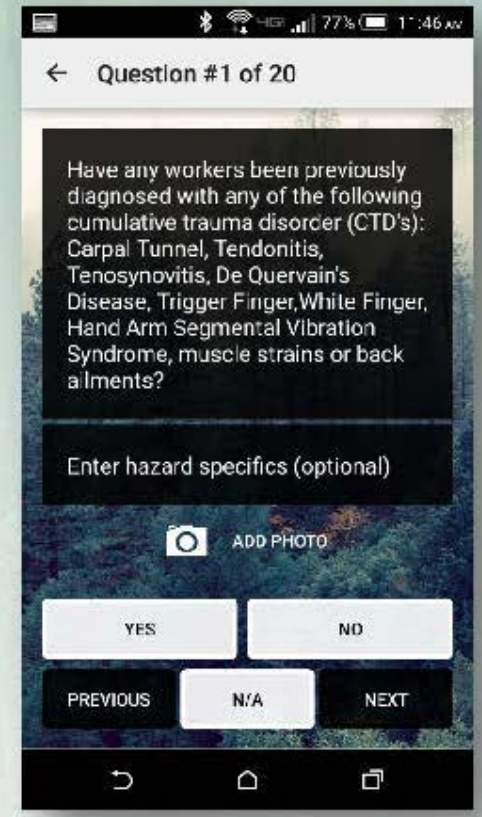
More Info



Company Info



Questions



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Hazard Assessment

QUESTIONS

Hazard Assessment

1. Have any workers been previously diagnosed with any of the following cumulative trauma disorder (CTD's): Carpal Tunnel, Tendonitis, Tenosynovitis, De Quervain's Disease, Trigger Finger, White Finger, Hand Arm Segmental Vibration Syndrome, muscle strains or back ailments?

- Other: Workers with previous ergonomic related injuries in the past are at increased risk in the future. Additional care should be taken to accommodate individuals that have experienced conditions such as Carpal Tunnel, Tendonitis, Tenosynovitis, De Quervain's Disease, Trigger Finger, White Finger, Hand Arm Segmental Vibration Syndrome, muscle strains, or back pain. Encourage employees to report symptoms early before they develop into a disability.

2. Have there ever been any worker complaints concerning ergonomic issues? Body soreness: back, shoulders, neck, hips, knees, and/or feet.

- ✓ Administrative Control: Conduct an ergonomic job specific assessment. Observe body movements and their frequency. Look for awkward movements that involve moving materials with bad postures away from neutral. Establish an ergonomics program that can be used to reduce injury by controlling hazards.

Hazard Assessment

3. Do any employees perform highly repetitive tasks?

(>100 reps/hour or 2000 per/day)

- ✓ Engineering Control: Observe job tasks and research ways to reduce frequency of material handling through automation or engineering controls.
- ✓ Administrative Control: Establish systems to rotate workers between tasks to minimize the effects of continuous exertion, repetitive motion, and/or awkward postures. Job rotations are best when each new task requires a different muscle group. Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards and ways to control them.

4. Do the employee's routine tasks require repeated lifting of weights over 20 lbs. and/or occasional lifting of weights over 50 lbs.?

- ✓ Engineering Control: Use mechanical aids when lifting and/or repositioning heavy objects. Reduce the weight of load to limit excessive force exertion.
- ✓ Administrative Control: Provide training in the use of mechanical aids, implement "buddy-lift" requirements and/or other lifting routines.

Hazard Assessment

5. Are employees using tools well suited to the task? (i.e. usage of tool maintains neutral positions/postures)

- ✓ Engineering Control: Redesign or install tools that promote neutral postures.
- ✓ Administrative Control: Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards and ways to control them.

6. Do employees perform tasks while assuming awkward postures (e.g. hunching, bending, squatting, etc.) or that require excessive flexion/extension of a joint for extended periods of time? ("Awkward" refers to any positioning of body and/or appendage significantly outside preferred neutral position while tasks are performed.)

- ✓ Engineering Control: Redesign or install adjustable workstations to reduce awkward joint angles. Encourage workers to change posture through out work shift. Position work in ways that eliminate long/excessive reach, decrease joint flexion/extension requirements, and promote neutral postures. Avoid requiring employees to work below knees and above shoulders. Provide tools that promote neutral joint angles.
- ✓ Administrative Control: The greater the elbow angle the greater the stress. Train workers to keep elbows closer to body and in neutral posture as they work. Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards.

Hazard Assessment

7. Do employees ever perform tasks requiring excessive force application?

- ✓ Engineering Control: Use mechanical aids when lifting and/or repositioning heavy objects. Reduce the weight of load to limit excessive force exertion.
- ✓ Administrative Control: Provide training in the use of mechanical aids, implement "buddy-lift" requirements and/or other lifting routines.

8. Are high impact and/or high vibration tools routinely used? (e.g. riveters, bucking bars, die grinders, sanders, weed eaters, or impact wrenches.)

- ✓ Engineering Control: Redesign or install tools that promote neutral postures.
- ✓ Administrative Control: Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards and ways to control them.

Hazard Assessment

9. Is ergonomic job specific training given to workers?

- ✓ Administrative Control: Job training should include techniques and recommendations on body positioning to reduce stress. Ergonomic training should be specific to the job to make workers aware of ergonomic hazards and ways to control them for each job's specific tasks.

10. Are procedures in place to accommodate fluctuations in staffing levels?

- ✓ Administrative Control: Reduce mandatory overtime hours to allow for more time for rest and recovery time. Recovery time is essential to reduce the risk of repetitive motion injuries.

Hazard Assessment

11. Are channels in place for employees to communicate ergonomic concerns?“

- ✓ Administrative Control: Employer should set up an ergonomic committee or a suggestion box that employees can use to share ideas.

12.Do jobs have unnecessary steps? Observe jobs to determine this.

- ✓ Administrative Control: Unnecessary steps in work sequence unnecessarily increases employee risk for injuries due to extra work stress. Conduct procedural reviews to examine efficiency of task sequence. Establish standard operating procedures that explain the most ergonomically efficient way to do the job.

Hazard Assessment

13. Have workers been observed showing signs of fatigue? Does a worker's production rate decrease near the end of work shift?

- ✓ Engineering Control: Environmental factors contribute to the onset of fatigue. Insufficient lighting, loud noise, and warm temperatures increase fatigue. Brighten up and quiet down the work space and cool down the temperature.
- ✓ Administrative Control: Establish systems to rotate workers between tasks to minimize the effects of continuous exertion, repetitive motion, and/or awkward postures. Job rotations are best when each new task requires a different muscle group. Try to rotate from a job with high exertion to a job of lower exertion. Limit shift work to 12 hours.

14. Are workstation work surfaces too high/low? (Material greater than 18 inches from hands at neutral.)

- ✓ Engineering Control: Adjust work station height to keep work as close to neutral posture as possible.
- ✓ Administrative Control: Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards and ways to control them.

Hazard Assessment

15.Does the location of materials promote reaching? (Material greater that 18 inches in front of the worker.)

- ✓ Engineering Control: Adjust material flow closer to worker to minimize reaching.
- ✓ Administrative Control: Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards.

16. Does angle or orientation of material transfer surfaces promote twisting?

- ✓ Engineering Control: Line up materials in angles that reduce the twisting when workers are transferring them.
- ✓ Administrative Control: Increase the frequency of job rotation from jobs with high frequency of twisting to jobs with no twisting. Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards and ways to control them.

Hazard Assessment

17. Are there potential obstacles on floor that can prevent a clear path of travel? (Uneven, slippery, sloping, or trip hazards.)

- ✓ Engineering Control: Control source of hazards.
- ✓ Administrative Control: Install a housekeeping plan to monitor and control hazards.

18. Are materials handled above the shoulders or below the knees?

- ✓ Engineering Control: Adjust workstation to reduce material handling in awkward positions.
- ✓ Administrative Control: Increase the frequency of job rotation from jobs with high frequency of over head or below knee work to jobs with none. Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards.

Hazard Assessment

19.Does the material handling require placing objects accurately/precisely?

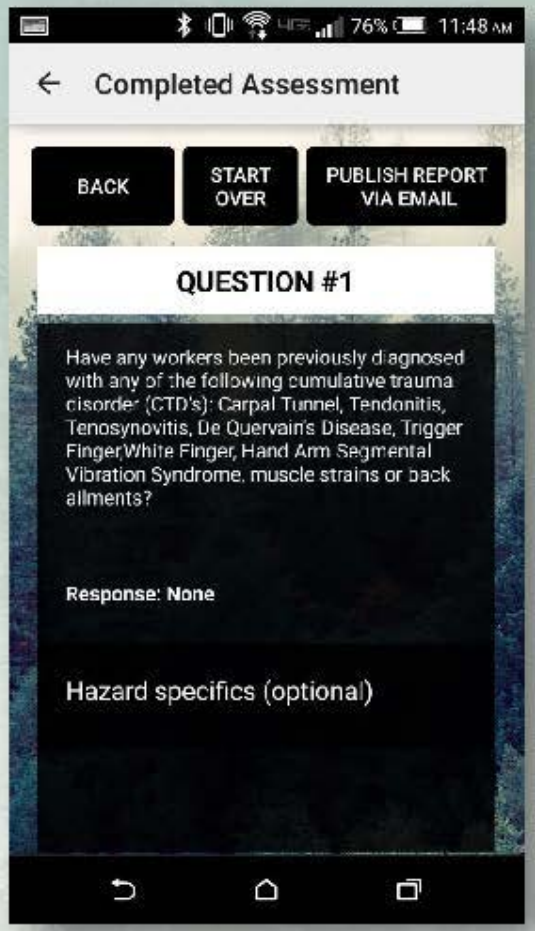
- ✓ Engineering Control: Install a sorting system that organizes the materials automatically to reduce stress on workers. Lift table can be used to reduce reaching when materials have to be placed.
- ✓ Administrative Control: Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards.

20. Is good nutrition practiced?

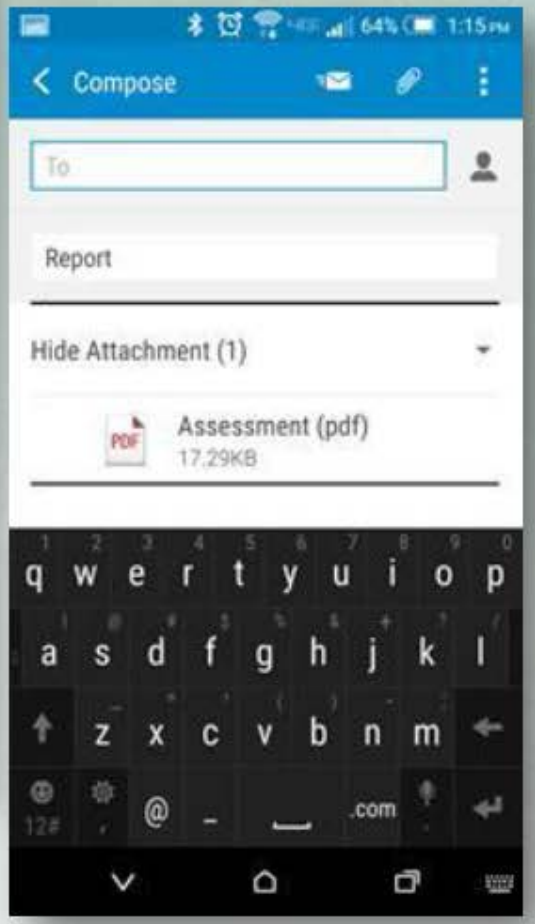
- ✓ Engineering Control: Provide healthy snacks for workers.
- ✓ Administrative Control: Establish a health program that encourages a healthy lifestyle including training on good nutrition.

Smart Phone & Tablet Application

Review Assessment



Publish Assessment Report



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Smart Phone & Tablet Application

PDF Report

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Summary

- Hazard Assessment – App tool?
- Set up a time table for establishment of controls
- Prioritize controls
- Abate hazards
- Risk reduction
- Compliance achieved!

What Decisions Will You Make?

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