




Muscle-skeletal disorders in a welding area workers

 Motion analysis approach

Course "Motion Analysis and clinics: why to set up a Motion Analysis Lab ?"

 - Clinical cases presentation - TRAMA Project – January 14 – 17th 2008


 Muscle-skeletal disorders MSD in a welding area workers

GENERAL DESCRIPTION

Colombian vehicle assembler

 Welding area


 100 workers

 Two shifts: 7 am- 4:30 pm, 4:30 pm- 1:00 am

 Assembling of 110 vehicles per day


 Gender: 100% masculine.


 Video:



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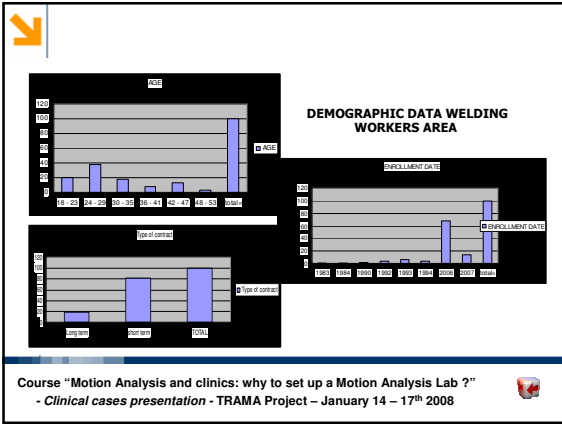


Main objectives

- Establish and analyze the critical conditions of the company related with absentism, muscle skeletal perceived morbidity, workers relocation in welding area.
- Identification, assessment & analysis of factors related to MSD
- Movement analysis in the working task developed
- Understanding of the MSD from the movement analysis point of view.

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MOVEMENT ANALYSIS PROTOCOL,

<p>GENERAL ISSUES TO IDENTIFY:</p> <ul style="list-style-type: none"> • WORK STATION SELECTION. • DEFINE TASK FOR ANALYSIS PROCESS. • ESTABLISH FLOWS AND PRODUCTION MOVEMENTS. • DEFINEN OPERATION. • ESTABLISH WORK CYCLES. • ANALYZE WORK TASK STRUCTURES AND COMPOSITION. • WORKERS SELECTION 	<p>SPECIFIC ISSUES TO EVALUATE DURING THE TASK PERFORMANCE (USING THE SENSORS CAPTIV. (BASED ON MOTOR GESTURE ANALYSIS)</p> <ul style="list-style-type: none"> • WORKERS DISPLACEMENTS (WORK STATION) total distance executed inside the work station. (PODOMETER) • RANGE OF JOINT MOTION: Lumbar spine inclinations (TORSIOMETER), shoulder flexion, abduction (inclinometer) wrist deviations, flex-ext (GONIOMETER). • MUSCULAR ACTIVITY: EMG SHOULDER DOMINANT SIDE (anterior and middle portion) WRIST (EXT & FLEXORS). • HEART RATE (POLAR)
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Physical Therapy Evaluation

<p>INITIAL</p> <ul style="list-style-type: none"> • General information (age, weight, habits, tall, pathologies, etc). • Posture. • Presence of pain • Muscular strength. • Flexibility • Range of motion • Functional assessment (shoulder, back, lower limbs) • Specific test (shoulder, wrist, lumbar spine, knees). • Endurance 	<p>WORK STATION</p> <ul style="list-style-type: none"> • Work station height. • Work station distance • Posture required by the task • Movement (frequency, type) • Confort angles • Force (load lifting, carry, placement) • Associated risk (vibration, temperature, stress) • Others (skills, training) 
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RESULTS

The task is composed by repetitive movements (high frequency) specially in shoulder, hand and lumbar spine. Due to the task characteristics and time cycle

- The type of muscular contraction is static (shoulder, elbow, wrist & lumbar spine) in order to hold and place the tweezers on the welding part.
- Use of wide range of motion (over 40 degrees flex, abd) in the shoulder to reach the specific spot and handle the welding tweezers.
- The worker should keep the lumbar spine in flexion, rotation and inclination, because the vertical and horizontal distance at the work station.
- The biomechanical stress is increased because the worker has to turn the tweezers several times per work cycle.

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