

Ergonomic and individual risk evaluation

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Abstract. The ergonomic risks constitute a vital aspect of study and prevention for the worker's health, especially for people with different capacities. Very job has and implies certain type of risk for the worker's health, depending on the conditions it is done with the use of tools or without them. Aplicated techniques: posturogram, baropodometry, Schober test, biocinematic chain test, Fukuda test, propioceptiva plataform in personnel with special capabilities

Keywords: Ergonomic risk, posturogram, special capabilities, propioceptiva platform, preventive injuries.

1. Introduction - In general terms, every job has and implies certain type of risk for the worker's health, depending on the conditions it is done with the use of tools or without them. Ergonomics is a new scientific discipline takes into charge the relationship between the individual and his or her work.

The ergonomic risks constitute a vital aspect of study and prevention for the worker's health, especially for people with different capacities.

The main causes of the risks constitute forced postures, repetitive movements, inadequate manage of charges, between others, whose late detection may cause a serious problem not only for the different capacity worker or physically, mentally or disabled in any other way personnel as much as for the company that has hired them.

On the other hand, worldwide statistics put the musculoskeletal as the major risk in task execution, because 8 of every 10 persons present back pain that causes absence, economic loses, production delay and alteration of enterprise politics directed to sales and acquired compromises.

2. - General Objective of the Ergonomic Evaluation Concerning Individual Risk

Identify and evaluate the individual risk of workers and officials with different capacities at Universidad de las Américas.

3. - Specific Objectives

To identify the individual risk of 11 workers with special capacities at Universidad de las Américas through the use of international tools.

Recommend the preventive and corrective measures for each case.

4. - Methodology

Conceptual Aspects

What Is The Individual Laboral Risk?

It is the possibility or probability of damages that the worker in a muscle skeleton level may suffer (director, officer, operative) in his/her laboral performance. The individual risk is product of the presence or potential appearance, or potentialization (time damage) of an activity or occupational situation capable of generate damage.

The risk situation depends on various factors, which are:

- Postural biomechanical disarrangements in which the task is done.
- Inadequate plantar support.
- Sustentation Base alterations.
- Loss of flexibility in the spinal column
- Balance alteration of the muscular chains (biocinematic) that hold the posture or execute the task.
- Frequency with which determinate corporal segment is used.
- Basic daily activities

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- Sports or different types of activities the individual does.

This occupational risk conditions are treated by Clinical Posturology, a main part in ergonomics, throughout which potential injuries may be detected; outcomes of the relationship between specific occupational and individual activity.

Individual Risk Identification Parameters

Individual postural standing situation.
Plantar support characteristics.
Flexibility levels of the spinal column
Cinematic Muscular chains state
Daily habits concerning activities like driving, resting, sports and others.

Applied Techniques

- Posturogram
- Baropodometry
- Schober Test or Spinal Column flexibility
- Biocinematic Chains Test
- Fukuda Test
- Postural Photographic Register
- Proprioceptive COBS Platform

Procedures

In the first phase the individual risk evaluation was done using the clinical Posturological tools and correlated results with the radio graphical existent studies of the spinal column of the Medical Department of the Company.

In the second phase, eight of the worker's cinematic chains, there was a special emphasis in those cinematic muscular chains used in the most frequent work position, in order to determine the disarrangement or existent deviations.

The third one associated the two previous phases, each worker was particularly instructed for the prevention and individual correction, throughout strengthening exercises, flexibility, corrective foot pads, postural re education, etc.

5. - Evaluation Individual Risk Results

Evaluated Population General Characteristics

The studied personnel were integrated by 11 workers. The distribution of age groups is registered in the following graphics.

Posturogram Application

Posturogram- Posturedecoding

In order to decode each of the body's parts posture, Clinic Posturology divides the evaluations in three different layouts, previous, posterior and sagittal, assigning each one of the to a increasing punctuation, the lowest the risk associated to the posture.

The natural aligned positions have a punctuation of 10, extreme postures or positions that induce to postural deviations are qualified with a 0. Light or moderate postural deviations are qualified with a 5. In some cases, the main posture segment and its correspondent punctuation is evaluated with a series of conditions that may contribute to increase or decrease the risk involved.

The quantified posturological method ensures that the principal body's zones are included in the analysis, because the forced positions of neck, back and legs may influence negatively in the superior extremities, becoming a serious factor that had to be considered in the risk evaluation.

Baropodometry Application

Individual evaluation using electronic podometer.

It allows identifying:

Static Posture

Dynamic Posture

Static Posture

Identification of the plantar arch type: normal, cave or plain

Balance with eyes open

Gravity Center

Plantar pressures: forefoot, midfoot and hind foot.

Deviations

Dynamic Posture

Walking Characteristics

Walking Biodynamic

Forward movement from Gravity Center

Plantar pressures in the support phase

Spinal Column Flexibility Codification

This test allows detecting the spinal column's flexibility index based on three factors:

Exterior leg muscle flexibility (isioquitable)

Articular hip Displacement

Spinal Column flexibility in the cervical, dorsal and lumbar flexibility.

Four risk degrees levels have been established slow to the simulation of the race.

Proprioceptive COBS Platform

It registers the force index, defines the average. Left and right force and the body weight measures the printed force in the Left and right independently from body weight in nanos (gravity force), where we are able to determine the force put in the hemi bodies.

Personnel With Special Capabilities Group Risk Profiles

The coordination index registers movements the higher the value the more coordination. Symmetric index defines the coherence or irregularity between measurements and time.

6. Resultados

Risk Denomination	Risk No.	%	%
		From The Total Of Evaluated People	Of The Total Risk
Weak Abdominal Muscles	8	73%	10%
Buttocks Muscles Hypotonia	8	73%	10%
Isiquiotable Muscle Shortening	9	82%	11%
Overweight	0	0%	0%
Hallux Valgus	0	0%	0%
Valgus Feet	0	0%	0%
Inferior Members Dissymmetry	5	36%	5%
Hip Rotation Decrease	9	82%	11%
Scoliosis	1	9%	1%
Varous Feet	0	0%	0%
Cave Feet	6	55%	8%
Rotation Shoulder Muscles Shortening	2	18%	3%
Plain Feet	0	0%	0%
	4	36%	5%
Repetitive Effort Injurie	6	55%	8%
Imbalanced Posture	9	82%	11%
Kyphosis	5	45%	6%
Non Ionizing Radiation	5	45%	6%
Positive Fukuda Test	4	36%	5%
TOTAL OF RISKS			
TOTAL OF PERSONNEL	11		

Type	High Impact	Or-thesist	Up-grades	Finger Separators	Heel Soles
Nºof rescrip-ciones	5	8	4	1	9

Prescribed Foot Pads

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