SAFETY SOLUTIONS

Ergonomics & Safety Consultants

ERGO Rehab™

ERGO Rehab™ program is designed to assist the injured worker back to work through a modified or alternative work program. ERGO Rehab™ establishes a safe work environment through an ergonomic assessment by identifying repetitive motions and other ergonomic hazards which has resulted in Cumulative Trauma Disorders (CTD).

ERGO Rehab™, through an ergonomic assessment, develops the work restrictions utilizing ergonomic principles and rehabilitation techniques (PT / OT) in collaboration with the medical provider, claims adjustor, the injured worker and supervisor. The modified or alternative work program is implemented by incorporating the work restrictions using a progressive and graded plan of action. This process eliminates temporary duty (TD) payments, reduces medical and rehabilitation cost ensuring a successful outcome of return back to full duty.

ERGO Rehab™ is implemented at the time of notification of an industrial injury in a high risk job classification for best results. The cost of the initial ergonomic assessment and ERGO Rehab™ may be allocated against an open claim. An ergonomic assessment of the workstation(s) may be allocated toward loss control services if the assessment is preventive in nature. The employer may incurs the cost as part of their Injury Illness Prevention Program to ensure a safe work environment if the company is experiencing a high frequency and severity of injuries.

ANTHROPOMETRY DESIGN

Anthropometry is that part of ergonomics that deals with the dimension of the human body.

	Hispanic Asian 95%	Cauc. 95%	Hispanic Asian 50%	Cauc. 50%	Hispanic Asian 5%	Cauc. 5%
Stature	63"	68"	60"	64"	57"	60"
Floor to Elbow	40"	42"	38"	40"	36"	38"
Floor to Shoulder	51"	55"	49"	52"	47"	49"
Forward Functional Reach	27"	31"	26"	29"	25"	27"

DESIGN APPROACHES

Psychophysical Criterion

The psychophysical criterion is based on data defining workers' strength and capacity to perform manual lifting at different frequencies for different durations.

Definitions

H= Horizontal distance of load from the body (measurement from lumbar to hands)
V= Vertical location of the hands at the beginning of the lift measured from the floor
D= Vertical travel distance between the origin and the destination
F= Average frequency of lifts
RWL= Recommended Weight Limit

Task Descriptions

(floor-knuckle)	H= 16 ins.	V= 8 ins.	D= 30 ins.	F= 1/30 min.	RWL 16 lbs
(knuckle-shoulder)	H= 14 ins.	V= 30 ins.	D= 30 ins.	F= 1/30 min.	RWL 22 lbs
(floor-shoulder)	H= 16 ins.	V= 8 ins.	D= 50 ins.	F= 4/min.	RWL 9 lbs

Two-handed lifting

Under ideal circumstances when H= 10 ins., V= 30 ins. and D= 10 ins. acceptable maximum load for males= 51 lbs. and females= 44 lbs.

One-handed lifting, utilizing stronger and/or dominant hand

Under ideal circumstances, acceptable maximum load in the standing position on an infrequent basis for males should not exceed 28 lbs.
Under ideal circumstances, acceptable maximum load in the standing position on an infrequent basis for females should not exceed 22 lbs.

Two-person lifting
Under ideal circumstances, acceptable maximum load that a two person male team should lift should not exceed 119 lbs.
Under ideal circumstances, acceptable maximum load that a two person female team should lift should not exceed 88 lbs.

Two-handed carrying
Under ideal circumstances, acceptable maximum load for two-handed carrying a symmetrical load at a distances of 12 ft. for males= 40 lbs. and females= 31 lbs.

One-handed carrying
Under ideal circumstances, acceptable maximum load for one-handed carry a symmetrical load at a distances of 12 ft. for males= 20 lbs. and females= 15 lbs.

Biomechanical Criterion
The biomechanical approach estimates the mechanical stresses at the L5/S1 disc level. The maximum disc compression force at the L5/S1 level should not exceed 770 lbs.

Acceptable Standing Work Heights
HWH= Highest Work Height
LWH= Lowest Work Height
HRZ (Freq)= Horizontal Reach Zone standing on a frequent basis.
HRZ (Infreq) = Horizontal Reach Zone standing on an infrequent basis.

	Hispanic Asian 95%	Cauc. 95%	Hispanic Asian 50%	Cauc. 50%	Hispanic Asian 5%	Cauc. 5%
Floor to Elbow	40"	42"	38"	40"	36"	38"
HWH	44"	46"	42"	44"	40"	42"
LWH	36"	38"	34"	36"	32"	34"
HRZ (Freq)	15"	16"	14"	15"	13"	14"
HRZ (Infreq)	19"	22"	18"	20"	17"	18"

SAFETY SOLUTIONS, INC.

Ergonomics & Workplace Safety

GUIDELINES FOR WORK CAPACITY

These apply to pulmonary, heart disease, abdominal weakness and spinal disabilities. Guidelines a) through h) may be applied to lower extremity disabilities.

a) **Disability Precluding Very Heavy Lifting - 10%**
Contemplates the individual has lost approximately one-quarter of his pre-injury capacity for lifting.

(A statement "inability to lift 50 pounds" is not meaningful. The total lifting effort, including weight, distance, endurance, frequency, body position and similar factors should be considered with reference to the particular individual.)

b) **Disability Precluding Very Heavy Work - 15%**
Contemplates the individual has lost approximately one-quarter of his pre-injury capacity for performing such activities as bending stooping,lifting,pushing,pulling and climbing or other activities involving comparable physical effort.

c) **Disability Precluding Heavy Lifting - 20%**
Contemplates the individual has lost approximately half of his pre-injury capacity for lifting.

d) **Disability Precluding Heavy Lifting,Repeated Bending and Stooping - 25%**
Contemplates the individual has lost approximately half of his pre-injury capacity for lifting,bending and stooping.

e) **Disability Precluding Heavy Work - 30%**
Contemplates the individual has lost approximately half of his pre-injury capacity for performing such activities as bending,stooping,lifting,pushing,pulling, and climbing or other activities involving comparable physical effort.

f) **Disability Resulting in Limitation to Light Work - 50%**
Contemplates the individual can do work in a standing or walking position, with minimum of demands for physical effort.

g) **Disability Resulting in Limitation to Semi-Sedentary Work - 60%**
Contemplates the individual can do work approximately one half the time in a sitting position, and approximate on half the time in a standing or walking position, the minimum of demands for physical effort whether standing, walking or sitting.

h) **Disability Resulting in Limitation to Sedentary Work - 70%**
Contemplates the individual can do work predominantly in a sitting position at a bench, desk or table with a minimum of demands for physical effort and with some degree of walking and standing being permitted.

Labor Code of the State of California

JOB DESCRIPTION

Job Title: Laborer
Dept/Location: Job site(s) in LA, Orange and Riverside counties

Regular Work Hours: 8 am to 6 pm Overtime: As needed
Work Day Schedule: monday through friday
Job is supervised at all times

Essential Functions:

General labor
Sufficient verbal and written communication skills to perform tasks required.

Non-Essential Tasks: Duties and responsibilities assigned for the safe and continued operation of business.

Job Responsibilities:

Performs various material handling duties manually or with assistive equipment
Handles raw material or finished products
Cleanup of scrap material
Uses various hand tools
Comply with safety program, safety training, safe work practices, promote safe work conditions and use personal protective equipment as a condition of employment.

Productivity Standards: Yes, as directed by company

The following represents the physical, mental, environmental & sensory requirements for an average day.

PHYSICAL DEMANDS: (*ESSENTIAL FUNCTIONS)

Not Present:	Activity condition does not exits or exits 0% of the time.
Occasional:	.01 - 33% = from 48 mins. to 2 hrs and 30 mins.
Frequent:	34 - 66% = from 2 hrs. and 30 mins. to 5 hrs. and 20 mins.
Constant:	67 - 100% = from 5 hrs. and 20 mins. to 8 hrs.
Intermittent:	Activity occurs at various times throughout the work day.
Repetitive:	Activity occurs frequently during an 1 hour period.

Lifting: Very Light (under 10 lbs.) Light (10-20lbs.)
X Medium (20-50lbs.) Heavy(50-100lbs.) Very Heavy(100 +lbs.)

	Constant 67-100 %	Frequent 34-66 %	Occasional .01-33 %	Intermittent	Repetitive
Lifting*		X			
Carrying*			X		
Push or Pull*			X		
Sitting				X	
Standing*	X				
Walking*		X			
Crawling*				X	
Climbing*		X			
Bending Over:*		X			
Reaching Overhead*	X				
Squatting*		X			
Kneeling*		X			
Hand and finger manipulation*					
Simple grasping*	X				X
Power grasping*	X				X

Environmental Demands:

Driving cars, trucks, forklifts or other moving equipment*

Walking on uneven surface(s)

Exposure to dust, gas, fumes, paints or solvents*

Exposure to noise

Exposure to marked changes in temperature, sun or humidity

Visual, perceptual and auditory acuity required

Work at heights

Employee Works: Inside 98 % Outside _____ %

Mental Demands:

Decision making	low	medium	high
Problem solving	low	medium	high
Compling information	low	medium	high
Job knowledge	low	medium	high
Job related experience	low	medium	high

I have read this Job Description and fully understand the essential functions of the job, the job responsibilities, physical, environmental and mental demands of the position. I can fulfill the requirements of this position.

Preparer:_____ Date:_____

Applicant/Employee's Signature:_____ Date:_____

JOBDESCRIPTION

Job Title: Dietary Aide
Dept/Location: Food Service

Regular Work Hours: 7 am to 3 pm or 3pm to 7pm Overtime: As needed
Work Day Schedule: Per schedule
Job is supervised at all times

Essential Functions:

Assists in the preparation of food
Sufficient verbal and written communication skills to perform tasks required.

Non-Essential Tasks: Duties and responsibilities assigned for the safe and continued operation of business.

Job Responsibilities:

Assist cooks in food preparation, serving and cleanup
Maintain a clean work area, remove trash and other debris with assistive equipment or assistance by another coworker; do not lift anything that weights more than 50 pounds
Deliver food trays to residents rooms and/or dining room
Pickup food trays and take back to kitchen to dishwasher room and clean tables
Put dishes, utensils and other food preparation or serving equipment away
Comply with safety program, safety training, safe work practices, promote safe work conditions and use personal protective equipment as a condition of employment.

Productivity Standards: Yes, as directed by patient census and/or Administrator

The following represents the physical, mental, environmental & sensory requirements for an average day.

PHYSICAL DEMANDS: (*ESSENTIAL FUNCTIONS)

Not Present:	Activity condition does not exits or exits 0% of the time.
Occasional:	.01 - 33% = from 48 mins. to 2 hrs and 30 mins.
Frequent:	34 - 66% = from 2 hrs. and 30 mins. to 5 hrs. and 20 mins.
Constant:	67 - 100% = from 5 hrs. and 20 mins. to 8 hrs.
Intermittent:	Activity occurs at various times throughout the work day.
Repetitive:	Activity occurs frequently during an 1 hour period.

Lifting: Very Light (under 10 lbs.) Light (10-20lbs.)
X Medium (20-50lbs.) Heavy(50-100lbs.) Very Heavy(100 +lbs.)

	Constant 67-100 %	Frequent 34-66 %	Occasional .01-33 %	Intermittent	Repetitive
Lifting*		X			
Carrying*			X		
Push or Pull*			X		
Sitting				X	
Standing*	X				
Walking*	X				
Bending Over:*		X			
Reaching Overhead*			X		
Squatting*			X		
Kneeling*			X		
Hand and finger manipulation*					X
Simple grasping*					X
Power grasping*					X

Environmental Demands:

Exposure to dishwasher detergents*

Exposure to hot water temperature and steam

Exposure to noise less than 80 decibel @ 8 hour time weighted average

Visual, perceptual and auditory acuity required*

Employee Works: Inside 100 % Outside ____ %

Mental Demands: Underline denotes level of demand for job position

Decision making	low	medium	high
Problem solving	low	medium	high
Compiling information	low	medium	high
Job knowledge	low	medium	high
Job related experience	low	medium	high

I have read this Job Description and fully understand the essential functions of the job, the job responsibilities, physical, environmental and mental demands of the position. I can fulfill the requirements of this position.

Preparer:_____ Date:_____

Applicant/Employee's Signature:_____ Date:_____

ABSTRACT

PROGRESSIVE LIFTING CAPACITY WITH MASKED WEIGHTS: RELIABILITY STUDY.

Matheson L, Mooney V, Jarvis G, Caiozzo V, Lichter R, DeBerry C, Pottinger J, Levin K, Backlund K.
PAR Research Foundation, Physical Assessment and Reactivation Center, Irvine Medical Center, Irvine California.

Introduction - The evaluation of lifting capacity has received much attention in recent years. A "Progressive Isoinertial Lifting Evaluation" (PILE) is a brief test of frequent lifting that has been developed by Mayer and his colleagues. Unfortunately, the PILE allows evaluees to visually appraise the objects that are lifted. That is, the weight that the evaluee lifts is incremented by placing a greater number of weights in the lift container. For this reason a "blind" evaluation, in which the evaluee is kept naive of the load, is not possible. As an alternative, the Progressive Lifting Capacity (PLC) test has been developed. The PLC utilizes weighted cannisters which weigh either 5 pounds, 10 pounds, or 20 pounds. All cannisters are the same size, regardless of weight. While, as with the PILE, the evaluee can visually appraise the number of cannisters in the lift container, the cannisters and evaluation record are color-coded so that the evaluee is able to be kept naive of the load lifted. With this scheme, three cannisters in the container can range from 25 pounds to 70 pounds. Procedures and instructions were developed for the PLC to allow it to be used safely in a wide variety of settings, using "off the shelf" materials which cost less than $400. Safety of the PLC is enhanced by utilizing continuous heart rate and blood pressure monitoring to limit cardiovascular work load to 70% of age-predicted maximum heart rate and by calculating a "time-tension index" (heart rate x systolic blood pressure). Additionally, performance is limited to no more than 60% of ideal body weight, based on height and gender. The present study was designed to assess the reliability of the PLC on a "blind" basis over a 7-day interval with a sample of healthy female adults.

Methods - This study measured performance reliability in an dynamic test of healthy normal females (n = 30) aged 20 years to 44 years (mean=30 years). After appropriate cardiovascular, musculoskeletal, and general health screening, demographic data were collected, including activity level. A test - re-test reliability study with a seven day interval was undertaken. Subjects were tested over two vertical ranges of motion, from floor to 30 inches, and from 30 inches to 54 inches from the floor with a brief rest period in between.

Results - The test - re-test reliability study of the PLC test resulted in statistically significant correlations. Pearson correlation coefficients were $r = .77$ for the PLC from the floor to 30 inches ($p<.05$) and $r = .80$ for the PLC from 30 inches to 54 inches ($p<.05$). Maximum load ranged from 20 pounds to 80 pounds over both the lower range (mean=42, SD=15) and the upper range (mean=37, SD=13).

Discussion - The test - re-test correlation coefficients for the PLC are not as high as those obtained in a previous study reported by Mayer with the PILE. The latter test demonstrated correlation coefficients of $r=.87$ over the lower range and $r=.93$ over the upper range. However, the PILE used a one-day re-test interval and did not visually mask the weight of the container, thus allowing the subject to conceivably remember the number of weights from the previous test which would artificially inflate the correlations. Additionally, the PILE reliability study was conducted with only 10 subjects, generally recognized to be an insufficient sample size for a reliability study. With the advantage that the PLC offers in terms of visually masking the load in a lifting task, it may be superior to the PILE while the reliability of the PLC is adequate.