Strategic Considerations for Developing an Ergonomics Program

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Owner | Certified Professional Ergonomist

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Purpose of Session

Provide examples of program types, component options and thought-provoking questions to create **strategic considerations** when building an ergonomics program.

Value Statement

Your company is not identical to another and thus, it important to strategically align your ergonomics program elements to **fit** your organization's **specific** culture and needs.

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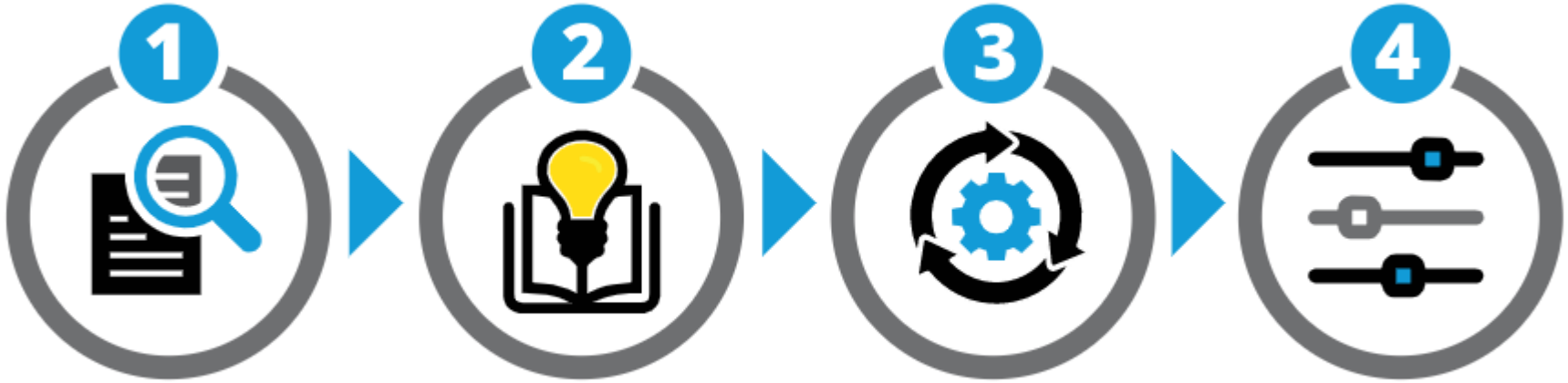
PHASES OF IMPROVEMENT



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Determining Goals

Improve Productivity, Quality, Energy Use

Improve Employee Engagement

Develop a “For-Profit” Product

Identify Risk Profile – Reduce Injuries

Ensure Reasonable Accommodations

Keep OSHA Away

Design for Human Use (usability)

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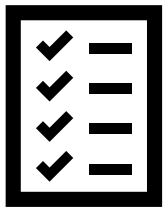
Types of Ergo Program Design?

Compliance Driven



- Program desires to meet minimal requirements
- Low commitment and high costs
- Use audits as form of effort and assurance

Expert Driven

- Rely on Ergonomist / Consultant with strong skills
- Limited internal procedures, guidelines & communication
- Small skill based to utilize
- Focused on technical projects

Cultural Driven

- Widespread ownership and engagement
- Procedures / systems are in place
- Widespread skill base / employee capability
- Efforts focused on mentoring and inclusion of many

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Types of Ergo Program Design?

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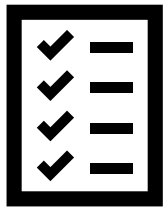

Pros
- Limited Initial $$$ Commitment (not really doing much)

Cons
- Reactive
- $$$$ - Issue Arises (OSHA)
- Ethics/ Values – Employee Care

Expert Driven

Pros
- Provided Expert Advice / Quality Service

Cons
- $$$ to Scale Success
- Limited Engagement w/ internal EE's

Cultural Driven

Pros
- Values and Long-Term Savings
- Exponential Success (3 years)
- Proactive

Cons
- Many don't have long term vision (this takes time)

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8 Components of a Holistic Program

1. Recognizing Existing & Potential Problems
2. Ergonomic Assessments of Jobs with Potential Problems
3. Corrections for Ergonomics Problems (Reactive Approaches)
4. Prevention of Ergonomic Problems (Proactive Approaches)
5. Medical Management
6. Ergonomic Training & Skill Development
7. Organization & Mgmt. of the Ergonomics Program
8. Ergonomic Results (i.e., quantitative improvements)

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Recognizing Existing & Potential Problems

Facility Ergo Committee

Micro Learning (example)

- What Type of Awareness Materials are Provided?
- Platforms for Communication
- Who is Identifying
- Methods of Identification
- Motivation of Identifying
- Location and Visibility of Identified Problems

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Recognizing Situation Example 1

"We desire to have widespread awareness but have a company COVID policy against classroom training".

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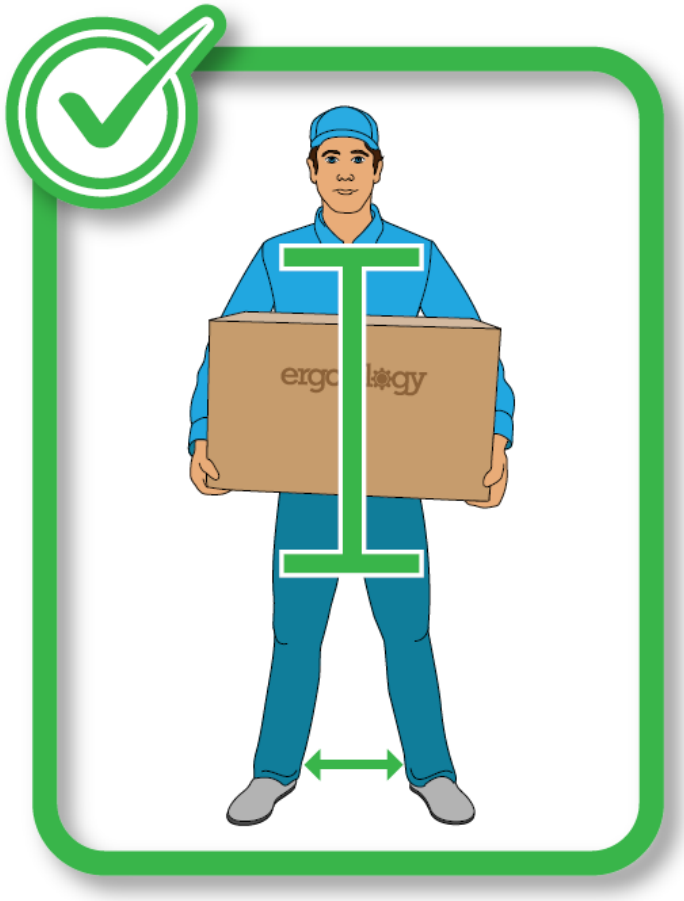
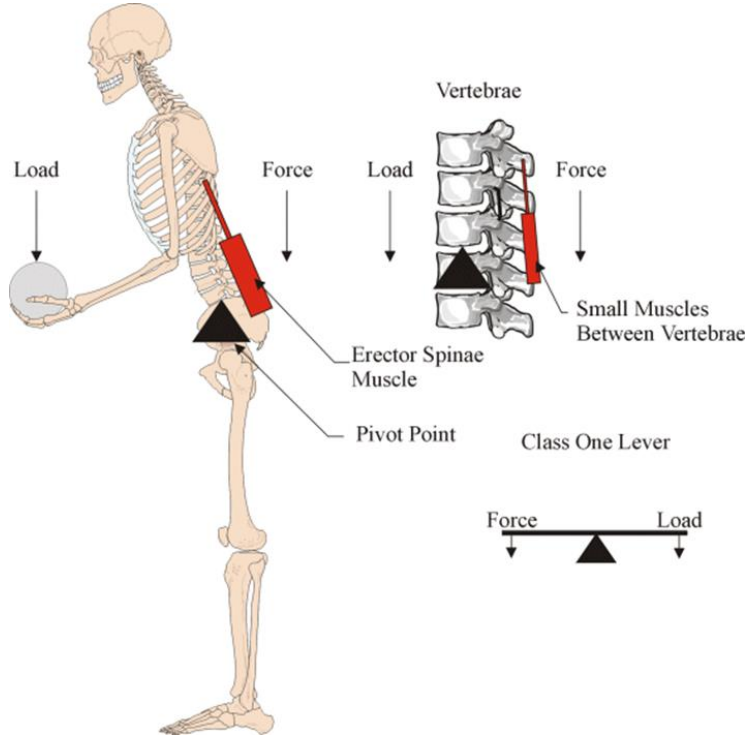
Recognizing Situation Example 2

"We have attempted generic material, but employees feel ergonomics is too technical for them."



	Upright/ walking	Upright	Slightly bent forward (>20°) (With/without support)	Bending far forward (>60°) (With/without support)
Standing			20 - 60° 20 - 60°	> 60° > 60°
Seated			>20°	
Kneeling / lying down				



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Recognizing Situation Example 3

"We have discussed various awareness topics, but employees still feel ergonomics does not apply to them."

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Ergonomic Assessments of Jobs with Potential Problems

Ergonomic Risk Assessment

Opportunity	Opportunity

Risk Assessment: Red = High, Orange = Medium, Yellow = Low, Green = No

Hand/ Wrist		Elbow		Shoulder		Back		Legs / Knee		Neck
Left	Right	Left	Right	Left	Right	Upper	Lower	Upper	Lower	

	Origin	Destination
Recommended Weight Limit (RWL)	17.86	19.17
Lifting Index (LI)	0.42	0.39

- Scope of Assessment / Type?
- Who is conducting Assessments (Process)?
- Influencers of Prioritization?
- Prioritization Platform

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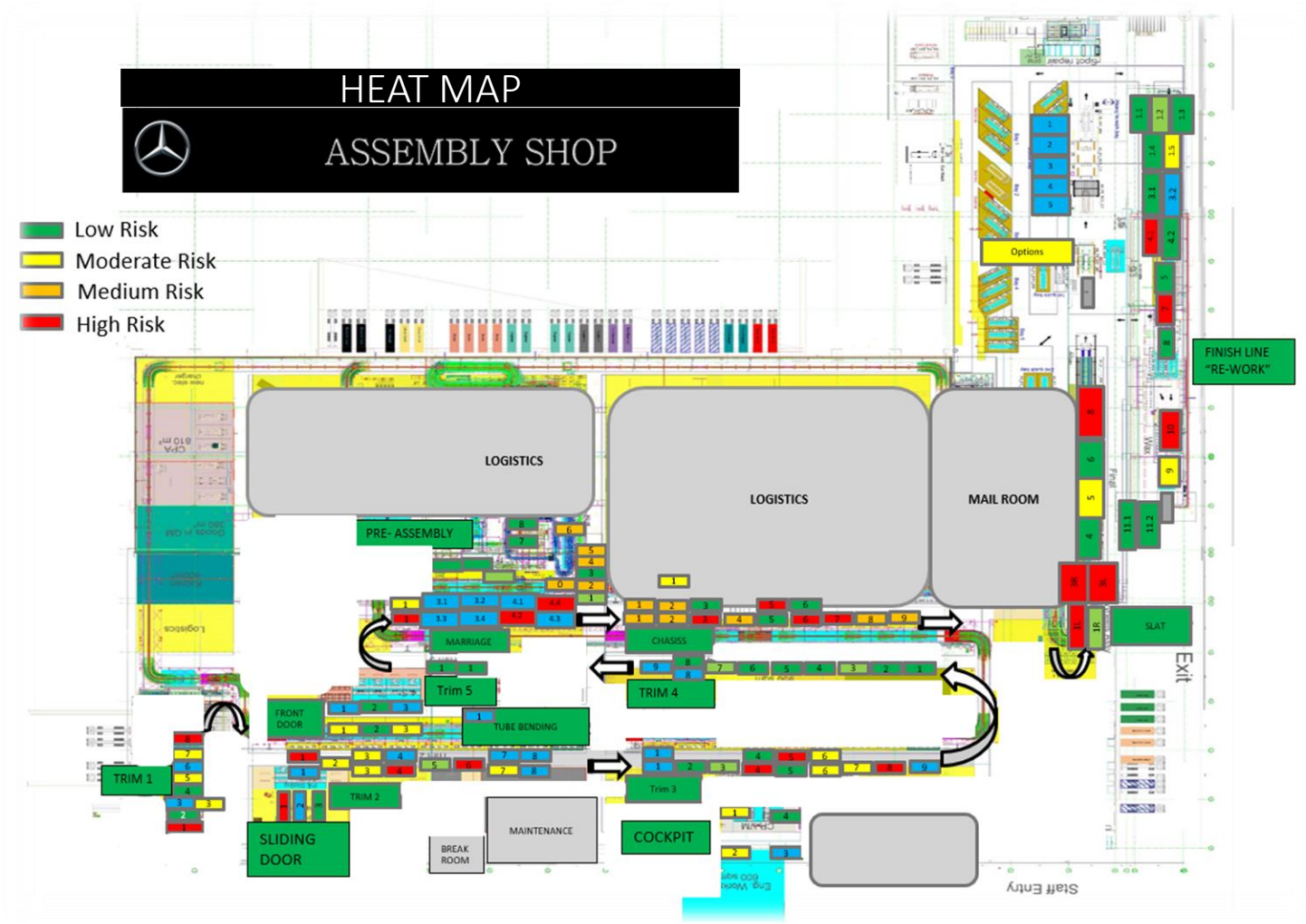
Specific Situation Example

"We just need to identify our general risk footprint and the level of risk at this point."



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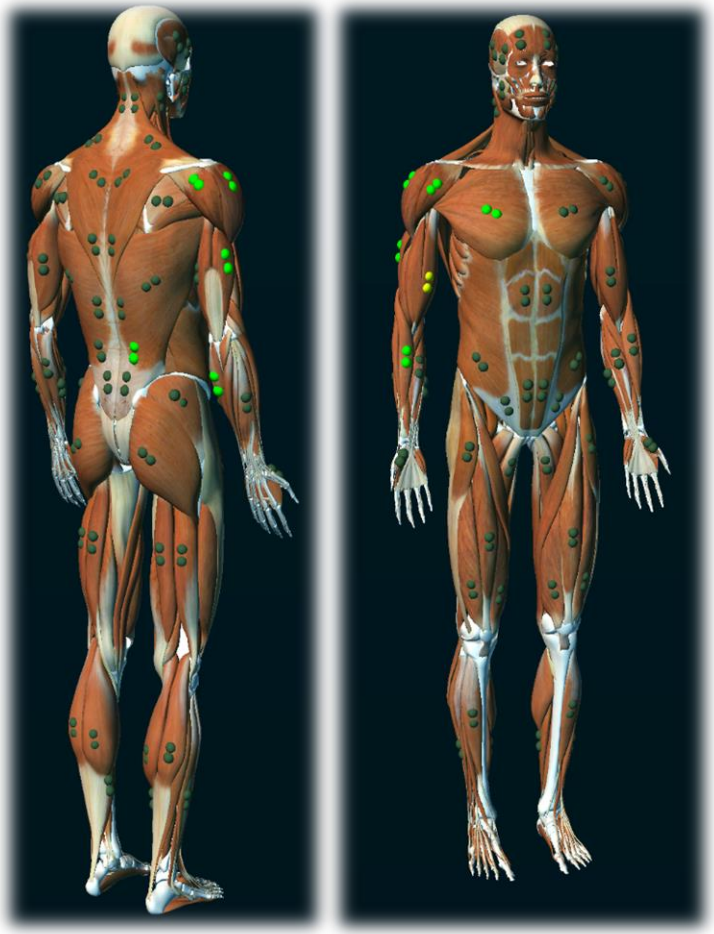
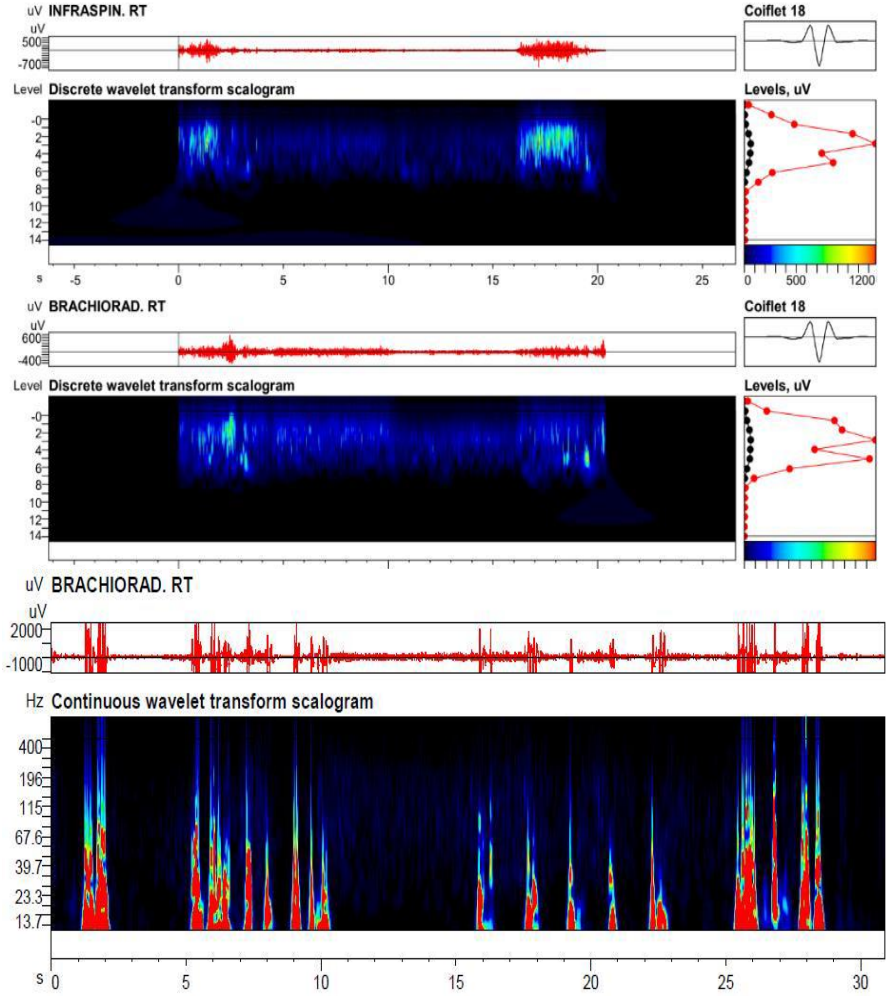
Specific Situation Example

"We need biometric responses to a specific situation to understand the level of usability and fatigue (risk)."





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Corrections / Prevention for Ergonomics Problems

ROI Justification (example)

Productivity Forecast: -8% | - $2K annually

Quality Forecast (wasted product): 9 % | $1K annually

Risk Reduction: 62% | 13K injury avoidance

Cost: $12,000.00

- Type of Ergonomic Problems
- Problem Complexity
- Process for Corrective Actions
- Considerations for Prevention
  - New Product / Facility Design
- Business Case / Implementation Justification

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Specific Situation Example 1

"We had engineering labor standards completed (time study) for our warehouse but employees still complain."

Men					
Age	**Avg. Fitness Level (VO2)**	**METS**	25%	33%	45%
20-29	48	13.71	3.428571	4.525714	6.171429
30-39	44	12.57	3.142857	4.148571	5.657143
40-49	40	11.43	2.857143	3.771429	5.142857
50-59	36	10.29	2.571429	3.394286	4.628571
60-69	31	8.86	2.214286	2.922857	3.985714
70+	26	7.43	2.451429	2.451429	3.342857

Subject	Metabolic Rate	Lift Count	Subject	Metabolic Rate	Lift Count
1	4.5 (35.8%)	131	4	4.8 (38.1%)	129
2	3.9 (31%)	99	5	4.2 (33.4%)	118
3	4.3 (34.2%)	116	6	5.1 (40.5%)	147

According to "Work Practices Guide for Manual Lifting" (NIOSH, 1981), NIOSH recommended that workers should limit their energy expenditure to 33% of their aerobic capacity (AC) if they are to perform the task for 8 hours, (25% for 12 hours).

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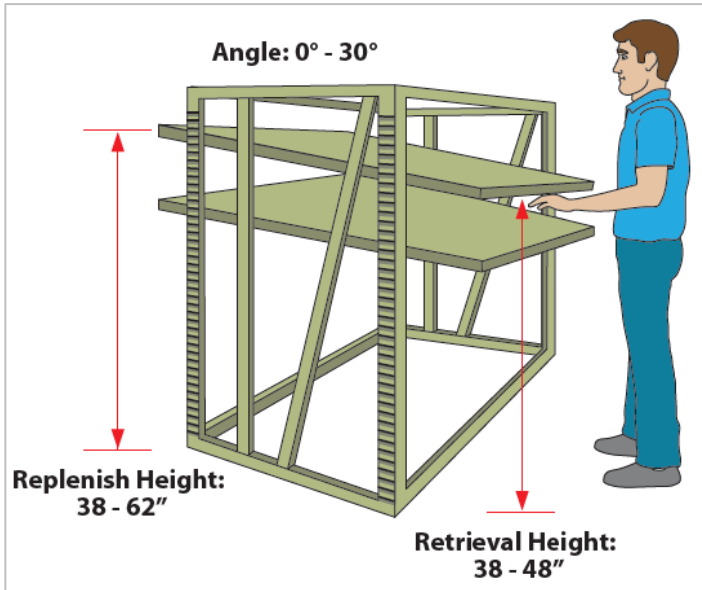
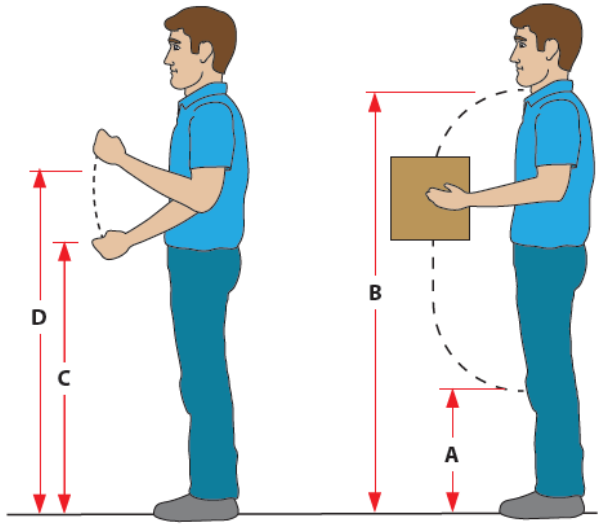
Specific Situation Example 2

"Our engineers consider items like materials, dimensions, durability but not the human conducting the work ."





Criteria	Dimensions
A. Working Height of Comfort Zone Bottom	NA & E Max. 24" (610 mm) A & LA Max. 22" (559 mm)
B. Working Height of Comfort Zone Top	NA & E Max. 62" (1.58 m) A & LA Max. 60" (1.52 m)
C. Hand Working Height Optimal Comfort Zone Bottom	NA & E Max. 38" (965 mm) A & LA Max. 37" (939 mm)
D. Hand Working Height Optimal Comfort Zone Top	NA & E Max. 48" (1.25 m) A & LA Max. 47" (1.19 m)

NA & E = North American & European
A & LA = Asain & Latin American

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Medical Management

Physical Ability Testing / Fit for Duty

Quantify Demands of Essential Job Tasks

Physical Abilities Test

- Identification of Injured Employees (Process)
- “Early” Intervention Programs
- Treatment (Case Management)
- Limitations / Return To Work

Pass : Fail Score
Required Prior to Employment
Required for Return to Work – Injured Employees

https://ergo-ology.com/physical-ability-testing/

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Specific Situation Example 1

"We understand the level of "risk" in our workstations but don't have physical demands to communicate with medical."

Physical Demand Analysis (PDA's)

● Metabolic Rates ● Shift Length ● Lifting ● Reaching ● Standing / Walking ● Carrying ● Push / Pull ● Sitting ● Climbing ● Work Conditions ● Tools, Equipment, Materials

1. Endurance	
Work Intensity	2.1 METs (moderate intensity)

2. Lift and Carry		
Objects Lifted	Stamped parts,	
Lift Description 1: Workers manually lift unstamped parts from bulk bin and insert into press		
Lift Description 2: Workers manually lift stamped parts and place in cardboard barrel		
	Maximum	**Average**
Weight	Up to 35 lbs. (cover beam & 8-28)	Up to 5 lbs.
Lowest Lift Point	25"	32" (low table height)
Highest Lift Point	Up to 48"	42"
Carry Distance	Up to 40 feet	Less than 5 feet
Frequency	Weekly	Continuous
Weight	**Lift**	**Carry**
<10 lbs	X	X
10-25 lbs	X	X
26-50 lbs	X	N/A
51-75 lbs	N/A	N/A
76-100 lbs	N/A	N/A
100 + lbs	N/A	N/A

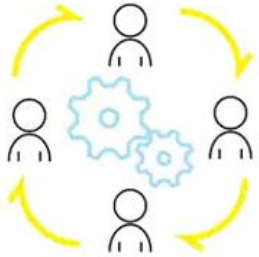
3. Push and Pull		
Objects Moved:	Stamped parts in barrels, pallet jack	
Push/Pull Description 1: Worker push/pulls pallet jacks with barrels of stamped parts to staging area. Low geared pallet jacks, required excessive number of pushes (down) on pallet jack handle.		
	Maximum	**Average**
Initial Force	Up to 36 lbs.	Up to 35 lbs.
Hand Height	36"" (Pallet Jack Handle)	32"
Distance	Up to 80 feet	Up to 60 feet

* sample page

Physical Ability Testing

RTW Communications

Determining Essential Functions (ADA)



Job Rotations

Light Duty Identification

Job Descriptions

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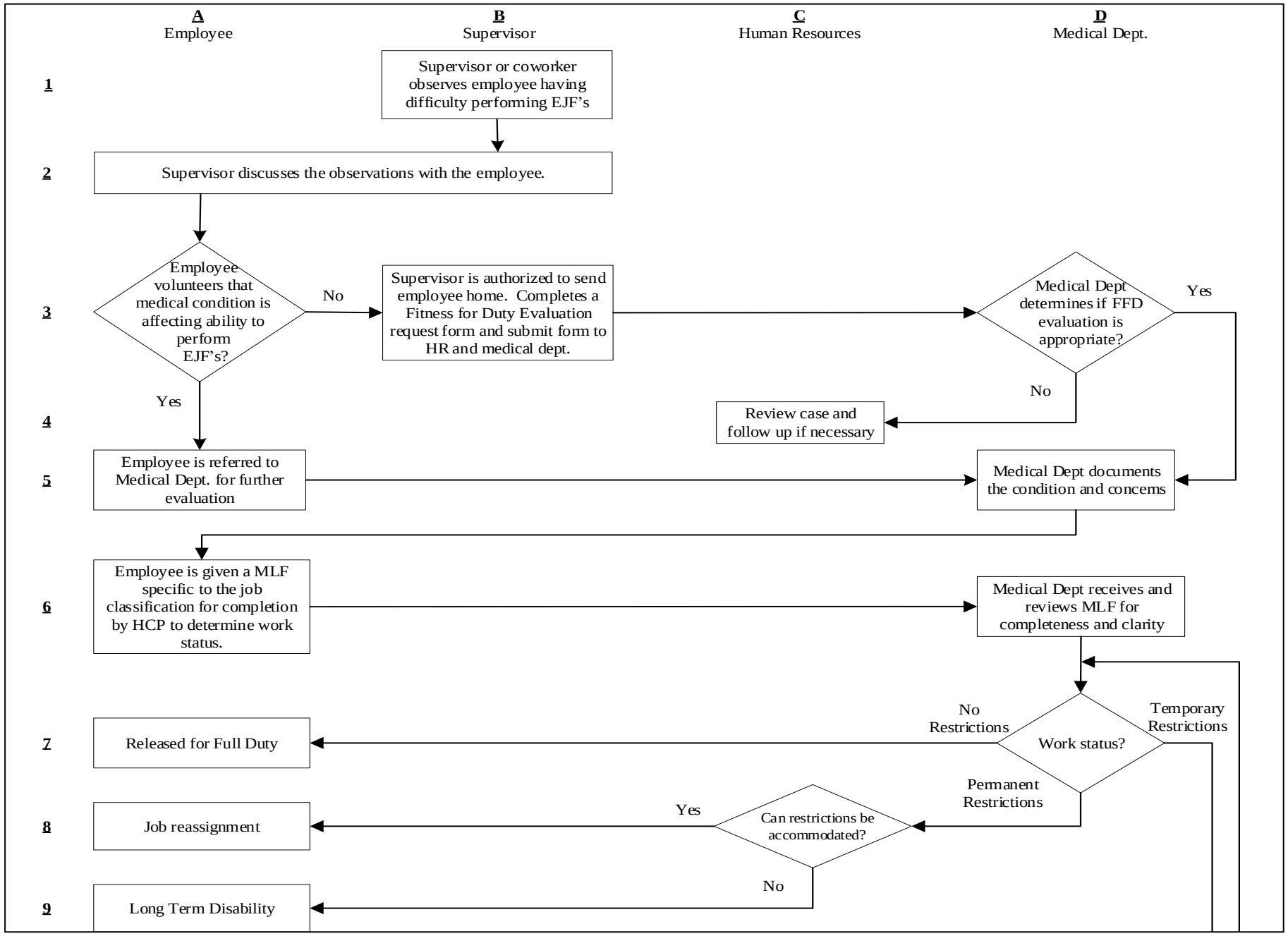
Medical Management: Swim Lane Diagram (screen shot example)



Specific Situation Example 2

"We don't have clear roles and responsibilities between stakeholders in our INTERNAL medical management program"

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Ergonomics Results

Did your efforts fit your organization's **specific** culture and goals?

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Specific Situation Example - Results

"Our goal is to reduce injuries from poor employee decisions and improper lifting behaviors".

Learn It
(Classroom)

Do It
(Obstacle Course)

See It
(Video Analysis)

Coca-Cola CONSOLIDATED

19% reduction in lifting type injuries (2017-2020)

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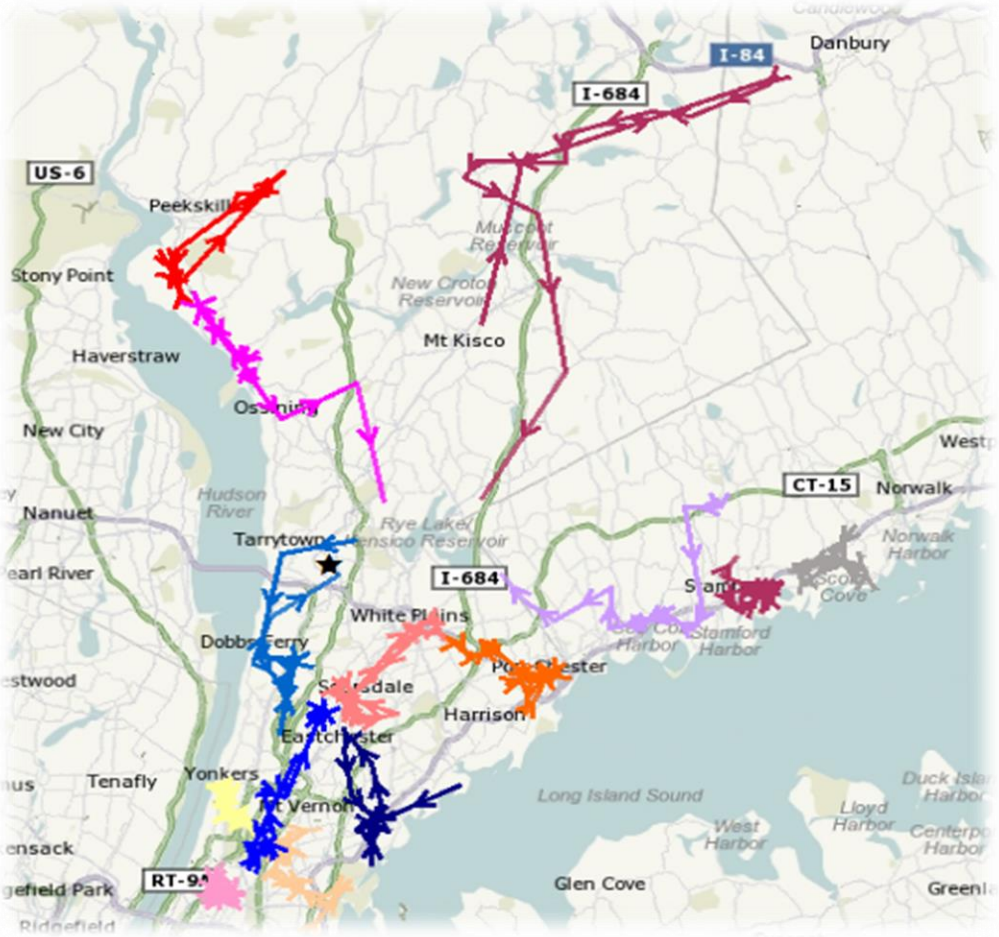
Specific Situation Example

"Our goal is to reduce our carbon footprint."

- **Work Volume**: Avg. **reduction in pushing distance by 2.3 miles**/ driver / day
- **Time**: **$16,425 / employee /year**
  - Avg.: 45 min/day
- **Sustainability:** **= $76,700 / facility / year (assume 260 days)**
  - **5-gals gas or $14.75 / truck /day ($2.95 gal)**
  - **14.75 / truck x 20 / = $295 / facility / day**
  - **$295 / facility / day = $76,700**



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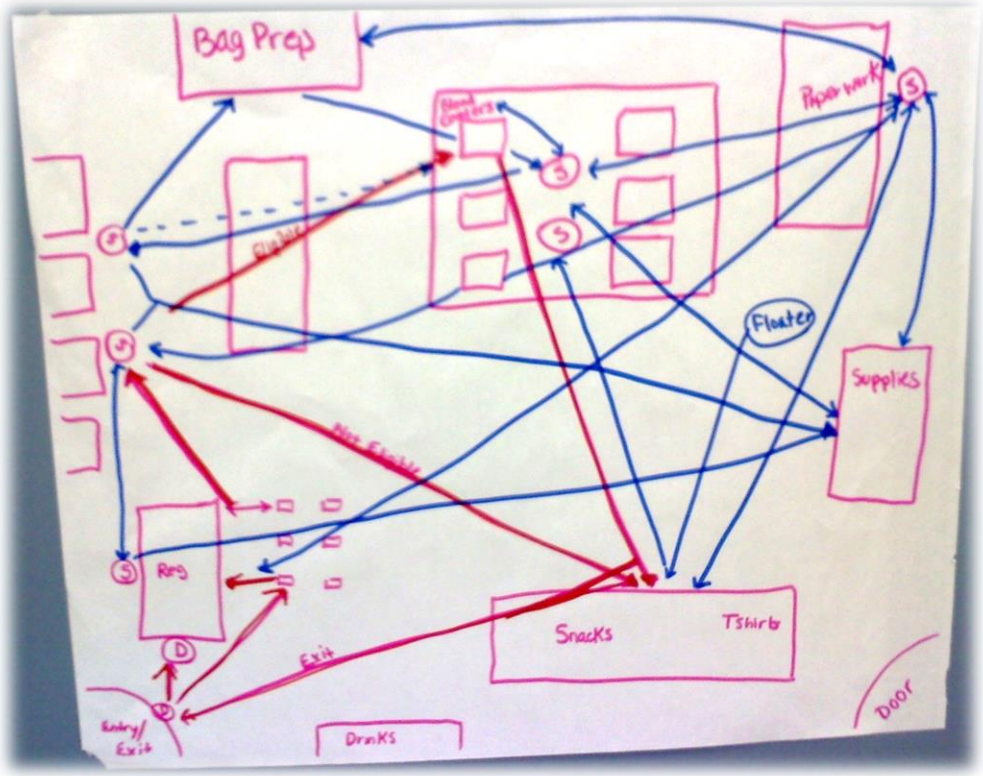
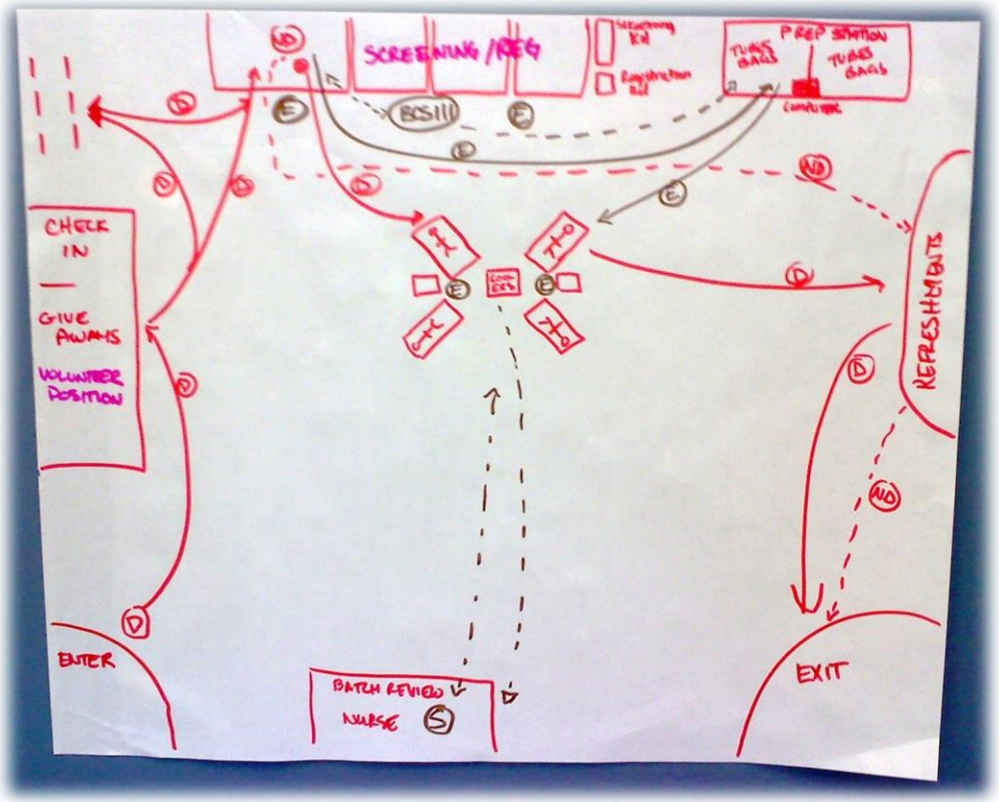
Specific Situation Example

"We have a goal to improve patient throughput (efficiency; patients seen per day)."





Phlebotomy Lab – Houston Medical 2018

<u>Patients realized : increased 38% / shift ($3.6M annually)</u>

Eliminated 63 lifting actions / shift and 11.3 miles (foot traffic)

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Specific Situation Example

"We want widespread ownership with all levels of the business aware and controlling risk."

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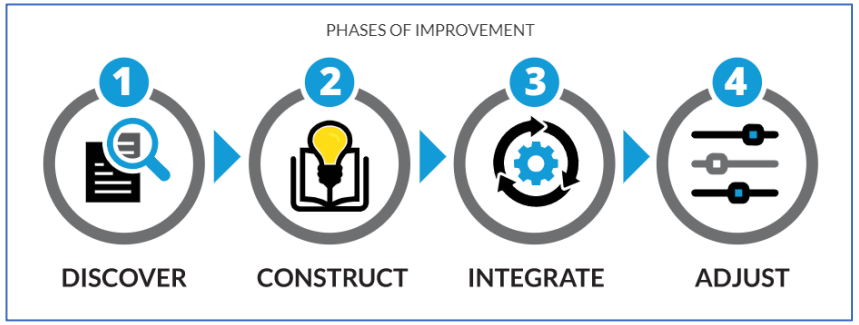
Where should I start with Ergo?

- What are your goals, constraints, prior efforts?



https://ergo-ology.com/our-approach/

- Is anyone trained in ergonomics at your facility?
- Have you discussed any ergonomics process framework?
- Does Management champion ergonomics yet?
- Has a list of problem jobs been identified?

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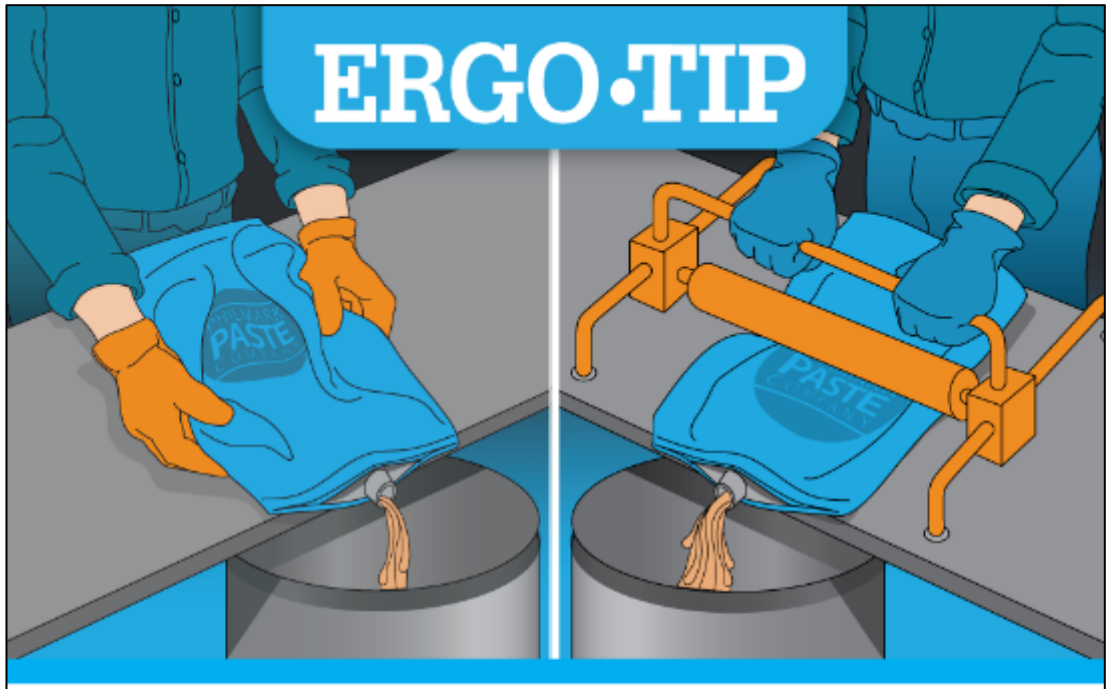

Manually removing product from packaging can require the hands and fingers to exert high forces. If automation is not possible, implementing a squeegee device will lower stress and improve productivity. Most also experience lower residual product being wasted too (quality savings).

Squeegee It Out!

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NATIONAL ERGONOMICS & Conference ErgoExpo

Physical Demand Gap Analysis:

The Bridge Between High-Performance Workforce and Peak-Safety Workplace

Presented by: Matt Jeffs DPT PSM REAS
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Onsite Health & Safety Specialist

by Margot Miller, PT

Facilitating Stay at Work/Return to Work

The therapist plays a key role in decreasing unnecessary work absence and keeping patients at work and productive.

Millions of American workers develop health problems that either temporarily or permanently keep them out of work each year. In most cases, this involves a relatively brief recovery period. However, approximately 10% of these workers are affected by conditions that result in significant work absences, and some can leave an individual out of work permanently. The estimated total annual cost of disability benefits paid under sick leave, workers' compensation, short-term and/or long-term disability, SSDI (Social Security Disability Insurance), FMLA (Family Medical Leave Act), and ADA (Americans with Disability Act) exceeds $100 billion. This article will focus on the therapist's role in facilitating Stay at Work or Return to Work (SAW/RTW) to decrease long duration absences from work.

The American College of Occupational and Environmental Medicine's "Preventing Needless Work Disability by Helping People Stay Employed" reported that the fundamental reason for most medically related lost work days and lost jobs is not medical necessity. Rather it is nonmedical decisions made during the SAW/RTW process, including administrative delays for treatment or specialty referral, lack of transitional or modified work, ineffective communication, and logistic problems.

The steps involved in determining SAW/RTW include the following:

1. A medical condition or precipitating event occurs—determine whether the worker can perform the job.
2. Assess worker's current ability.
   a. Functional capacity—determine what the worker is able to do today.
   b. Functional limitations—determine what the worker cannot do today that they can normally do.
   c. Medical restrictions—determine what the worker cannot do due to the potential of doing medical harm.
3. Understand/identify the job requirements.
4. Compare worker's job requirements to that person's current abilities.
5. Take necessary actions to return the worker to work. This may include modifying current job duties or identifying an alternate duty job to enable return to work.

When the medical condition will not worsen with work, when the worker wants to work, and when the employer will allow temporary modification of the job demands if needed, the above process steps can be accomplished quickly. It is at this point that therapists can be involved to facilitate SAW/RTW.

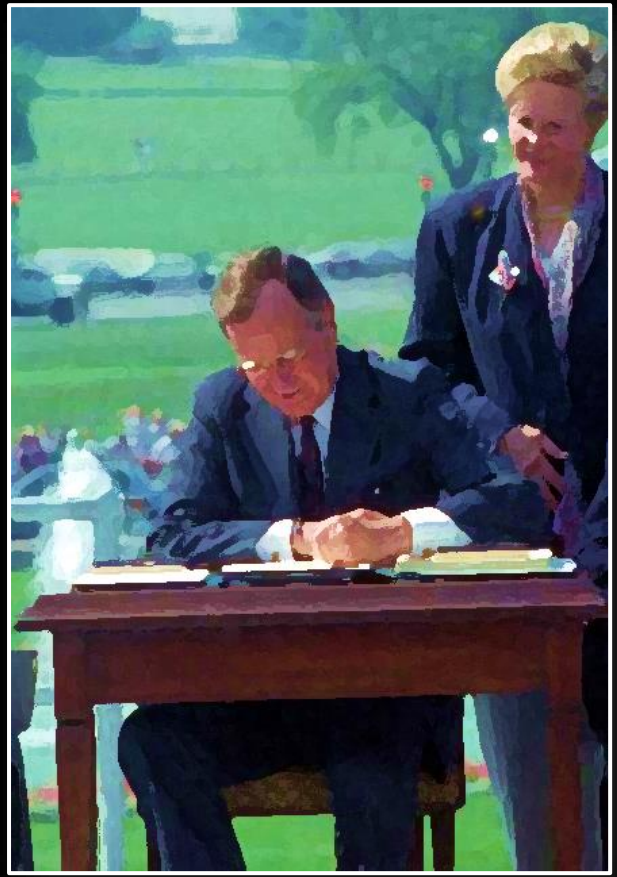
ASSESSING THE WORKER'S CURRENT CAPACITY

Functional capacity testing is appropriate to identify the impaired worker's current abilities as well as to identify limitations that could affect SAW/RTW. The testing should be job specific, testing the worker's functional abilities specific to the job requirements to establish a baseline of functional abilities. This functional capacity test serves as a work status test. A job-specific conditioning or job-specific functional restoration program can then be developed, in conjunction with appropriate treatment, to restore movement, maximize strength, decrease pain/symptoms, and improve functional abilities. Repeat functional tests are performed to assess functional gains. Education targeted to the medical condition and relative to the specific job functions increases the worker's knowledge and problem solving using injury prevention and rehabilitation principles. Job coaching performed at the worker's workstation assists integration of education principles, ie, appropriate movement patterns, posture changes, and strategies to reduce reported discomfort and improve safe job performance. As function improves, the worker should be able to perform more original job duties, until able to perform 100% of the job duties.

Matt Jeffs, DPT, CEAS II, performing job coaching with a worker to facilitate safe job performance.

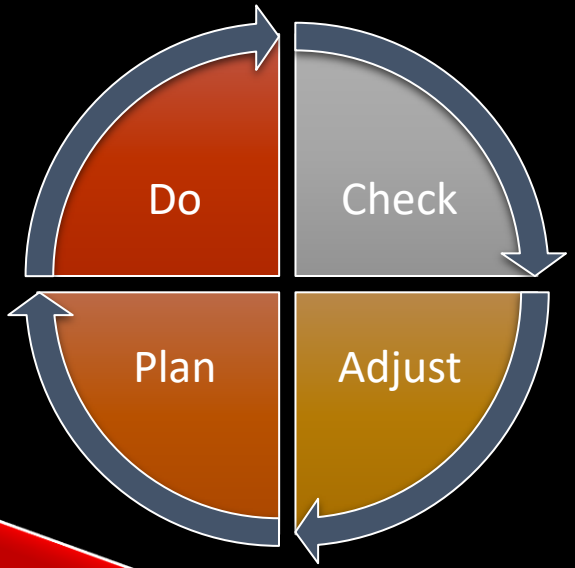
TECHNICAL ASSISTANCE MANUAL:

- Title I of the ADA - The ADA is intended to enable persons to compete in the workplace based on the same performance standards and requirements that employers expect of all persons holding that job title.




"Yeah…No…"
"Not so fast…"
"Think again…"

Lean Gap Analysis



‘5 Why’ Root Cause Analysis

Standard Work

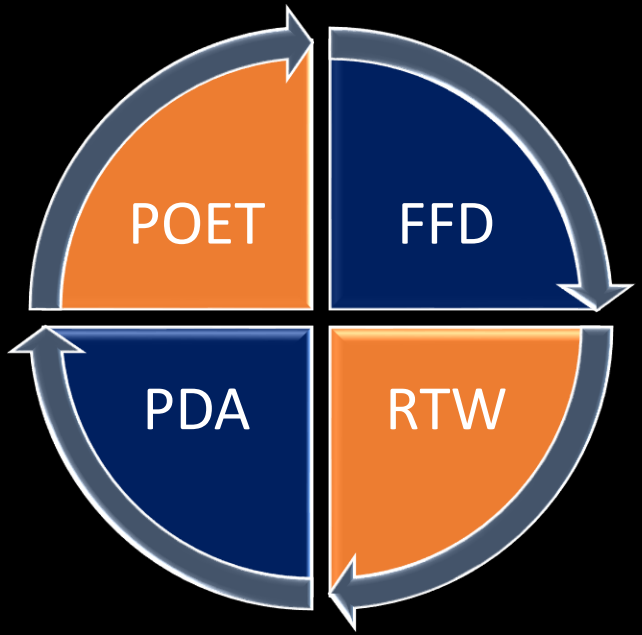
Kaizen – Continuous Improvement

The PDA Gap Analysis Process

5. What is the most effective and efficient way to enhance Safety & Ergonomics – and why does it demonstrate a workplace that makes safety a top priority business metric?

The Physical Demand Analysis

The PDA Gap Analysis Process



Four Stage Process

Information Gathering

- Stage-1: Screening – Interview
- Stage-2: Observation – Measurement

Source: Int Arch Occup Environ Health (2002) 75: 459–467DOI 10.1007/s00420-002-0327-3

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ORIGINAL ARTICLE

J.B. Malchaire · A. Piette

Co-ordinated strategy of prevention and control of the biomechanical factors associated with the risk of musculoskeletal disorders

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Abstract ***Objectives***: To propose a cost-effective set of methods (strategy) to improve biomechanical working conditions and prevent the development of musculoskeletal disorders. ***Methods***: The strategy was developed according to the philosophy already used for other aspects of working conditions. It was then tested in ten industrial situations with various characteristics, to check its understanding, its usability, and its efficiency. ***Results***: The strategy includes a five-page leaflet (*screening*) aimed at motivating the operators to check the problems and bring about immediate solutions if possible. A stage-2 *observation* checklist is then proposed to guide the discussions during a meeting of the protagonists (workers and management). The assistance of an occupational health practitioner might become indispensable at stage 3 to deepen the *analysis* of the remaining problems, while experts are requested only in exceptional cases (stage 4, *expertise*). This strategy was positively judged by the users and proved to be effective in motivating and co-ordinating the protagonists. ***Conclusion***: The strategy proved to consider effectively all biomechanical aspects that might contribute to the development of musculoskeletal disorders (MSDs). It proved also to be participatory, placing the operators and their management at the centre of the intervention as the main actors, and organising when to turn to an occupational health practitioner or an expert for assistance.

Keywords Prevention · Ergonomics · Repetitive strain injuries · Low back pain · MSD

Initial documents (in French and Dutch) can be downloaded from http://www.md.ucl.ac.be/hytr/new/fr/index.html

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Introduction

Numerous methods are described in the literature to evaluate the risk of musculoskeletal disorders (MSDs) of the upper limbs. These include checklists (Ahonen et al. 1989; Kilbom 1994; Silverstein 1997), assessment scales (Rodgers 1992; McAtamney and Corlett 1993; Moore and Garg 1995), observation techniques (Kemmlert 1995), or even very sophisticated measurement procedures (Ranaivosoa et al. 1992; Marras and Schoenmarklin 1993; Malchaire et al. 1997).

It appears, clearly, that the large majority deal with the biomechanical constraints only, and attempt to characterise the whole situation by a single figure or set of figures defined on semi-arbitrary scales of risk.

Most of these researchers published epidemiological studies aimed at defining the dose (constraints)–response or effect (complaints or disorders) relationship. In such studies, subjects from many diverse workplaces were included and the range of constraints was the largest possible. Numerical indices were required for the statistics (logistic regressions) and for including, in the study, constraints for different body zones. These methods were then proposed in the literature and used by practitioners to assess the risk of MSDs at a given workplace.

The RULA method (McAtamney and Corlett 1993) is probably the archetype of these indices, summarising in a single number the constraints in all main body regions. Other similar methods were proposed by Occhipinti (1998) and Moore and Garg (1995). In these methods, the main issue for the authors was the scoring system, scoring that, undeniably, also became, for many users in practice, the main objective of the study.

Questions can be raised concerning the significance of such methods for industry:

1. They usually require qualifications and technical and time possibilities that few people have in practice in the field, in industry. This is particularly true in small and medium-sized companies where, whatever the

THE BACK SCHOOL

Date _____

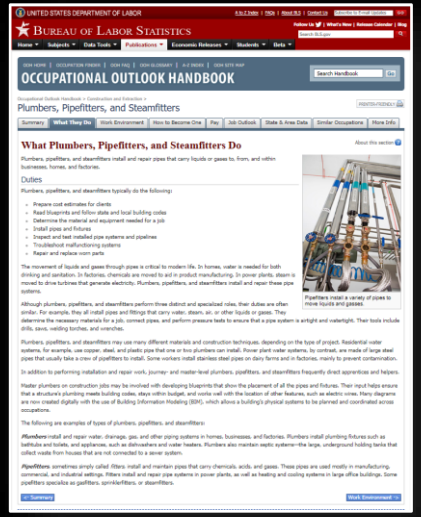
Name Art E. Fischel

Job Title Journeyman Plumber

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Plumber - Essential Job Functions – Job Specific**	Demand Level
	✓			Install pipes and fixtures such as sinks, urinals or toilets to complete job order	Light
✓				Install pipes and equipment such as water heaters or dishwashers to complete job order	N/A
		✓		Inspect and test installed pipe systems and pipelines during routine maintenance	Heavy
			✓	Troubleshoot malfunctioning systems	Light
		✓		Repair and replace worn parts	Heavy
	✓			Connect pipes and perform pressure tests to ensure a system is airtight and watertight	Medium
			✓	Use power tools including grinders, threaders, drills and saws	Heavy
	✓			Use welding torches and welding equipment	Light
✓				Direct electrician apprentices and helpers	N/A

Additions / Deletions: Check equipment sheds, tool rooms and supply closets for some of our heavy, awkward machines & materials

Signature Art E. Fischel




Carrying Loads
Over Distances


Static Balance
Dynamic Balance


Lifting Loads
Lowering Loads


Awkward Working
Postures

Four Stage Process

Information Processing

- Stage-3: Analysis – Assessment
- Stage-4: Expertise – Report Prep

Source: Int Arch Occup Environ Health (2002) 75: 459–467DOI 10.1007/s00420-002-0327-3

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ORIGINAL ARTICLE

J.B. Malchaire · A. Piette

Co-ordinated strategy of prevention and control of the biomechanical factors associated with the risk of musculoskeletal disorders

Received: 22 October 2001 / Accepted: 16 February 2002 / Published online: 12 June 2002
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Abstract ***Objectives***: To propose a cost-effective set of methods (strategy) to improve biomechanical working conditions and prevent the development of musculoskeletal disorders. ***Methods***: The strategy was developed according to the philosophy already used for other aspects of working conditions. It was then tested in ten industrial situations with various characteristics, to check its understanding, its usability, and its efficiency. ***Results***: The strategy includes a five-page leaflet (*screening*) aimed at motivating the operators to check the problems and bring about immediate solutions if possible. A stage-2 *observation* checklist is then proposed to guide the discussions during a meeting of the protagonists (workers and management). The assistance of an occupational health practitioner might become indispensable at stage 3 to deepen the *analysis* of the remaining problems, while experts are requested only in exceptional cases (stage 4, *expertise*). This strategy was positively judged by the users and proved to be effective in motivating and co-ordinating the protagonists. ***Conclusion***: The strategy proved to consider effectively all biomechanical aspects that might contribute to the development of musculoskeletal disorders (MSDs). It proved also to be participatory, placing the operators and their management at the centre of the intervention as the main actors, and organising when to turn to an occupational health practitioner or an expert for assistance.

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Questions can be raised concerning the significance of such methods for industry:

1. They usually require qualifications and technical and time possibilities that few people have in practice in the field, in industry. This is particularly true in small and medium-sized companies where, whatever the

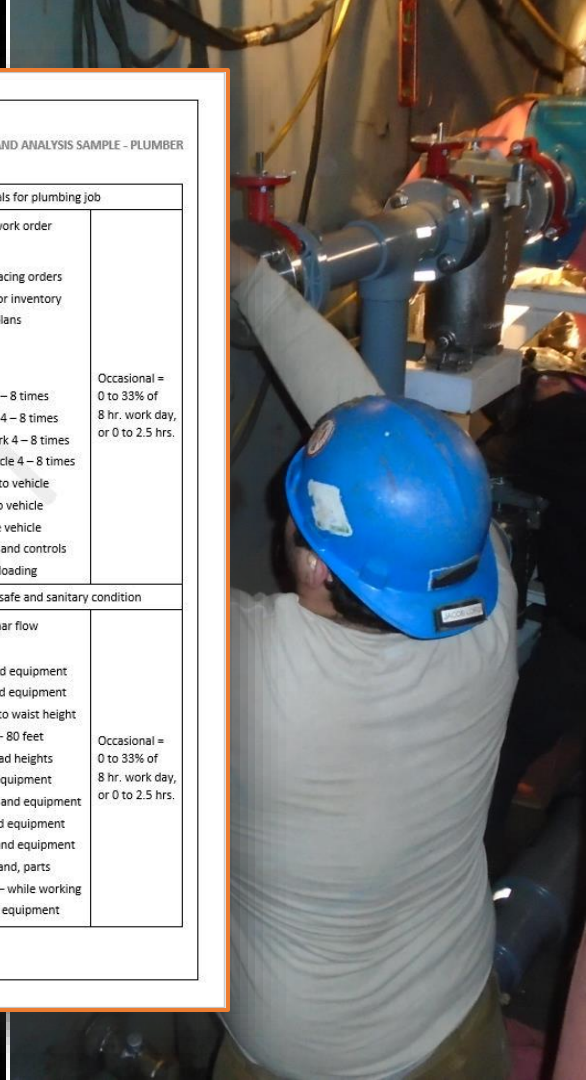
COMPANY NAME	Sample Company
JOB TITLE	Plumber
DEPARTMENT	Plumbing Department
SUPERVISOR / CONTACT	Plant Maintenance Manager
PHYSICAL DEMAND LEVEL OF JOB	Heavy

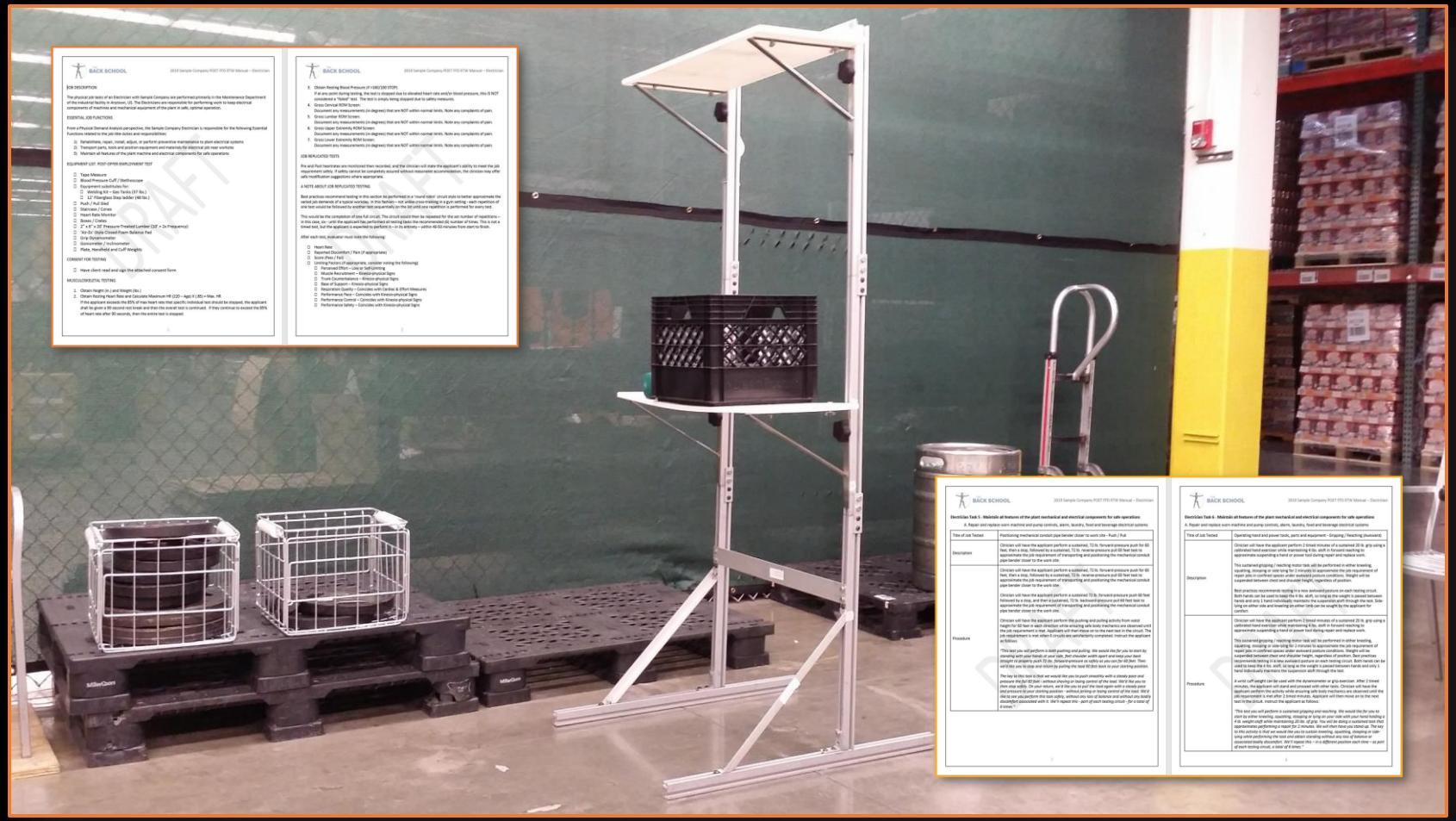
BASIC JOB PURPOSE

Repairing and maintaining all above and below ground plumbing systems in the plant, including its fire systems. This includes installation, troubleshooting, and repair of plant plumbing to be kept in safe and sanitary conditions.

MAIN DUTIES AND RESPONSIBILITIES	% of Workday
Essential Function 1. Installation, troubleshooting, and repair of plumbing systems for the entire facility	
A. Repair and replace worn plumbing parts, piping systems and fixtures such as sinks, urinals toilets or water heaters to complete job orders as needed Physical Demands: Lifting – 55.0 lbs. (B hands) toilet from floor to waist to (re)position near work 4 – 8 times Carrying – 55.0 lbs. (B hands) toilet 10 – 20 ft. to set-up and position near worksite 4 – 8 times Lifting – 48.0 lbs. (B hands) 12 ft. step ladder from floor to waist to position near work 4 – 8 times Carrying – 48.0 lbs. (B hands) 12 ft. step ladder 60 - 80 ft. to position near worksite 4 – 8 times Lifting – 37.0 lbs. (1 hand) gas welding kit from floor to waist to position near work 4 - 8 times Carrying – 37.0 lbs. (1 hand) gas welding kit 60 - 80 ft. to position near worksite 4 – 8 times Lifting – 31.0 lbs. (1 hand) tool bucket from floor to waist to position near work 4 – 8 times Carrying – 31.0 lbs. (1 hand) tool bucket 60 - 80 ft. to set-up and position near work 4 – 8 times Pushing – Up to 49.0 lbs. hand truck positioning sinks, toilets, water heaters 20-40 feet 4 – 8 times Pulling – Up to 49.0 lbs. hand truck positioning sinks, toilets, water heaters 20-40 feet 4 – 8 times Lifting – 9.5 lbs. (1 hand) 24" pipe wrench varying between floor and overhead heights 4- 8 times Reaching – Repeatedly at varied heights holding hand and power tools, parts or equipment Gripping - Using 18 to 34 lbs. gripping pipe wrenches, hand tools, plumbing parts and equipment Dexterity – Up to 45 min. using both hands manipulating hand tools, plumbing parts and rigging Walking – Up to 15 min. continuously while surveying worksite requirements for repairs Kneeling / Squatting – Up to 15 min. while surveying worksite requirements for repairs Climbing – Up to 10 – 20 feet up and down ladders 4 – 8 times while holding tools and parts Crawling – Up to 60 ft. on varied surfaces holding hand tools, plumbing parts and equipment Standing – Up to 45 min. on varied surfaces using hand and power tools, parts and equipment Stooping / Forward Bending – Up to 15 min. on varied surfaces using parts, hand and power tools	Frequent = 34 to 66% of 8 hr. work day, or 2.5 to 5.25 hrs.

Essential Function 2. Transport tools and position machinery, equipment and materials for plumbing job	
A. Read blueprints, prepare costs / supplies / equipment manpower estimates for work order Physical Demands: Standing – Up to 30 min. voluntarily while reading blueprints, preparing costs, placing orders Sitting – Up to 15 min. voluntarily while operating computer mouse / keyboard for inventory Dexterity – Up to 45 min. with work orders manipulating paper documents and plans B. Load, transport and / or unload manufactured or plumbing materials at job site Physical Demands: Lifting – 55.0 lbs. (B hands) toilet from floor to waist to load / unload in vehicle 4 – 8 times Lifting – 48.0 lbs. (B hands) 12 ft. step ladder from floor to waist to load / unload 4 – 8 times Lifting – 37.0 lbs. (1 hand) gas welding kit from floor to waist to position near work 4 – 8 times Lifting – 31.0 lbs. (1 hand) tool bucket from floor to waist to load / unload in vehicle 4 – 8 times Pushing – Up to 49.0 lbs. hand truck with sinks, toilets, water heaters 40-60 feet to vehicle Pulling – Up to 49.0 lbs. hand truck with sinks, toilets, water heaters 40-60 feet to vehicle Reaching – Repeatedly at varied heights loading, unloading and operating service vehicle Dexterity – Up to 15 min. using both hands manipulating service vehicle steering and controls Climbing – Up to 12 – 24 in. into and out of service vehicle during loading and unloading	Occasional = 0 to 33% of 8 hr. work day, or 0 to 2.5 hrs.
Essential Function 3. Maintain all features of the plant water and sewer systems in a safe and sanitary condition	
A. Troubleshoot malfunctioning fresh water or sewer piping systems to return laminar flow Physical Demands: Standing – Up to 45 min. on varied surfaces using hand and power tools, parts and equipment Kneeling – Up to 45 min. on varied surfaces using hand and power tools, parts and equipment Lifting (2-man) – Up to 73.0 lbs. positioning gas powered water pump from floor to waist height Carrying (2-man) – Up to 73.0 lbs. positioning water pump from floor to waist 60 - 80 feet Lifting – 9.5 lbs. suspending a 24" pipe wrench varying between floor and overhead heights Reaching – Repeatedly at varied heights holding hand and power tools, parts or equipment Gripping - Using 18 to 34 lbs. gripping pipe wrenches, hand tools, plumbing parts and equipment Dexterity – Up to 45 min. manipulating hand and power tools, plumbing parts and equipment Walking – Up to 15 min. on varied surfaces holding hand and power tools, parts and equipment Climbing – Up to 10 feet up and down ladders 2-4 times / hr. while holding tools and, parts Balancing – Up to 15 minutes on narrow base of support – sometimes at heights – while working Crawling – Up to 60 ft. on varied surfaces holding hand tools, plumbing parts and equipment	Occasional = 0 to 33% of 8 hr. work day, or 0 to 2.5 hrs.





BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

JOB DESCRIPTION

The physical job tasks of an Electrician with Sample Company are performed primarily in the Maintenance Department of the industrial facility in Anytown, US. The Electricians are responsible for performing work to keep electrical components of machines and mechanical equipment of the plant in safe, optimal operation.

ESSENTIAL JOB FUNCTIONS

From a Physical Demand Analysis perspective, the Sample Company Electrician is responsible for the following Essential Functions related to the job title duties and responsibilities:

1) Rehabilitate, repair, install, adjust, or perform preventive maintenance to plant electrical systems
2) Transport parts, tools and position equipment and materials for electrical job near worksite
3) Maintain all features of the plant machine and electrical components for safe operations

EQUIPMENT LIST: POST-OFFER EMPLOYMENT TEST

- ☐ Tape Measure
- ☐ Blood Pressure Cuff / Stethoscope
- ☐ Equipment substitutes for:
  - ☐ Welding Kit – Gas Tanks (37 lbs.)
  - ☐ 12' Fiberglass Step ladder (40 lbs.)
- ☐ Push / Pull Sled
- ☐ Staircase / Cones
- ☐ Heart Rate Monitor
- ☐ Boxes / Crates
- ☐ 2" x 6" x 20' Pressure-Treated Lumber (32' = 3x Frequency)
- ☐ 'Air-fit' Style Closed-Foam Balance Pad
- ☐ Grip Dynamometer
- ☐ Goniometer / Inclinometer
- ☐ Plate, Handheld and Cuff Weights

CONSENT FOR TESTING

- ☐ Have client read and sign the attached consent form

MUSCULOSKELETAL TESTING

1. Obtain Height (in.) and Weight (lbs.)
2. Obtain Resting Heart Rate and Calculate Maximum HR (220 – Age); X (85) = Max. HR
   If the applicant exceeds the 85% of max heart rate that specific individual test should be stopped, the applicant shall be given a 90 second rest break and then the overall test is continued. If they continue to exceed the 85% of heart rate after 90 seconds, then the entire test is stopped.

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

3. Obtain Resting Blood Pressure (if >160/100 STOP)
   If at any point during testing, the test is stopped due to elevated heart rate and/or blood pressure, this IS NOT considered a "failed" test. The test is simply being stopped due to safety measures.
4. Gross Cervical ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
5. Gross Lumbar ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
6. Gross Upper Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
7. Gross Lower Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.

JOB REPLICATED TESTS

Pre and Post-heartrates are monitored then recorded, and the clinician will state the applicant's ability to meet the job requirement safely. If safety cannot be completely assured without reasonable accommodation, the clinician may offer safe modification suggestions where appropriate.

A NOTE ABOUT JOB REPLICATED TESTING

Best practices recommend testing in this section be performed in a 'round-robin' circuit style to better approximate the varied job demands of a typical workday, in this fashion – not unlike cross-training in a gym setting - each repetition of one test would be followed by another test sequentially on the 1st until one repetition is performed for every test.

This would be the completion of one full circuit. The circuit would then be repeated for the set number of repetitions – in this case, six – until the applicant has performed all testing tasks the recommended (6) number of times. This is not a timed test, but the applicant is expected to perform it – in its entirety – within 40-50 minutes from start to finish.

After each test, evaluator must note the following:

- ☐ Heart Rate
- ☐ Reported Discomfort / Pain (if appropriate)
- ☐ Score (Pass / Fail)
- ☐ Limiting Factors (if appropriate, consider noting the following):
  - ☐ Perceived Effort – Low or Self-Limiting
  - ☐ Muscle Recruitment – Kinesio-physical Signs
  - ☐ Trunk Countenance – Kinesio-physical Signs
  - ☐ Base of Support – Kinesio-physical Signs
  - ☐ Performance Pace – Coincides with Pain & Effort Measures
  - ☐ Performance Pace – Coincides with Kinesio-physical Signs
  - ☐ Performance Control – Coincides with Kinesio-physical Signs
  - ☐ Performance Safety – Coincides with Kinesio-physical Signs

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 5 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Positioning mechanical conduit pipe bender closer to work site – Push / Pull
Description	Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site.
Procedure	Clinician will have the applicant perform a sustained 72 lb. forward-pressure push 60 feet followed by a stop, and then a sustained, 72 lb. backward-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform the pushing and pulling activity from waist height for 60 feet in each direction while ensuring safe body mechanics are observed until the job requirement is met. Applicant will then move on to the next task in the circuit. The job requirement is met when 6 circuits are satisfactorily completed. Instruct the applicant as follows: *"This test you will perform is both pushing and pulling. We would like for you to start by standing with your hands at your side, feet shoulder width apart and keep your back straight to properly push 72 lbs. forward-pressure as safely as you can for 60 feet. Then we'd like you to stop and return by pushing the load 60 feet back to your starting position.* *The key to this test is that we would like you to push smoothly with a steady pace and pressure the full 60 feet - without checking on losing control of the load. We'd like you to then stop safely. On your return, we'd like you to pull the load again with a steady pace and pressure to your starting position - without jerking or losing control of the load. We'd like to see you perform this task safely, without any loss of balance and without any bodily discomfort associated with it. We'll repeat this - part of each testing circuit - for a total of 6 times."*

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 6 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Operating hand and power tools, parts and equipment - Gripping / Reaching (Awkward)
Description	Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position.
Procedure	Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. Side-lying on either side and kneeling on either limb can be sought by the applicant for comfort. Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position. Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. A wrist cuff weight can be used with the dynamometer or grip exerciser. After 2 timed minutes, the applicant will stand and proceed with other tests. Clinician will have the applicant perform this activity while ensuring safe body mechanics are observed until the job requirement is met after 2 timed minutes. Applicant will then move on to the next test in the circuit. Instruct the applicant as follows: *"This test you will perform is sustained gripping and reaching. We would like for you to start by either kneeling, squatting, stooping or lying at your side with your hand holding a 4 lb. weight shift while maintaining 20 lbs. of grip. You will be doing a sustained task that approximates performing a repair for 2 minutes. We will them have you stand up. The key to this activity is that we would like you to sustain kneeling, squatting, stooping or side-lying while performing the task and obtain standing without any loss of balance or associated bodily discomfort. We'll repeat this – in a different position each time – as part of each testing circuit, a total of 6 times."*

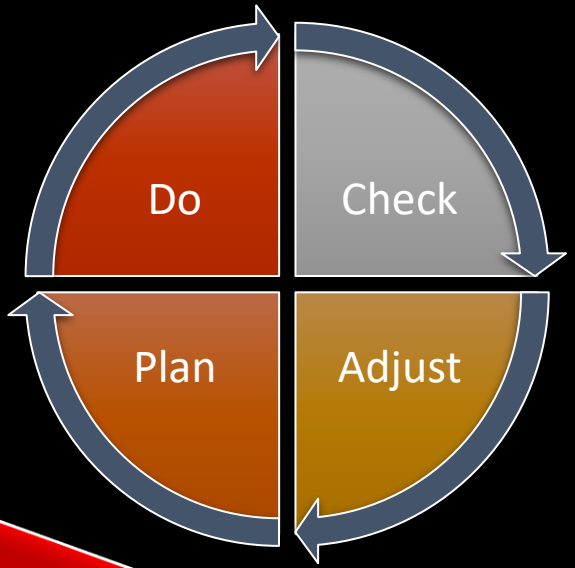
NATIONAL ERGONOMICS & Conference ErgoExpo

Physical Demand Gap Analysis:

The Bridge Between High-Performance Workforce and Peak-Safety Workplace

Presented by: Matt Jeffs DPT PSM REAS
matt@abilityondemand.com
matt@thebackschool.net

Lean Gap Analysis



‘5 Why’ Root Cause Analysis

Standard Work

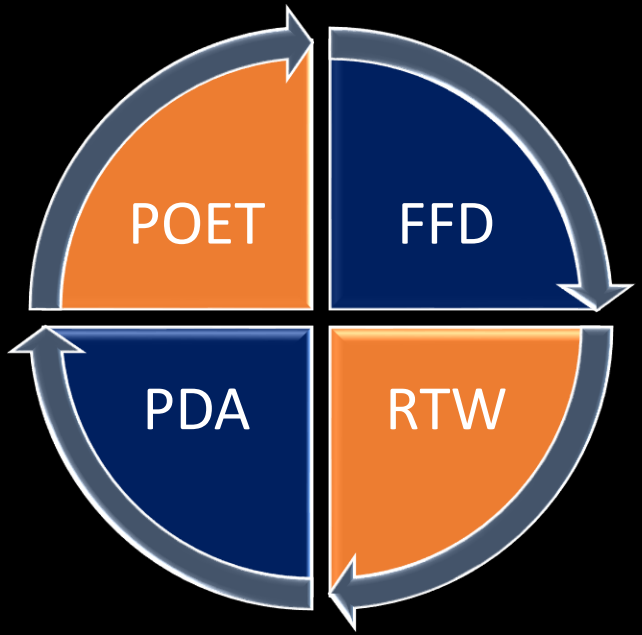
Kaizen – Continuous Improvement

The PDA Gap Analysis Process

4. What is the most effective and efficient way to reduce new hire injury exposure – and why does it enhance new hire onboarding, orientation and training?

The Post-Offer Employment Screen

The PDA Gap Analysis Process




Luis S. – Electrician
Rotator Cuff
Carl B. – Carpenter
Knee Osteoarthritis
Roger K. – Mechanic
Low Back Injury

Case Study: Luis S. – History of Rotator Cuff Surgery
Position: Electrician / POET New Hire

Luis S. is an energetic, 48-year-old Master Electrician who recently hired-in to our industrial plant to fill a vital role in the Maintenance Department.

Without prompting, he volunteered he had undergone a R shoulder rotator cuff repair 'a little over a year ago' and that 'sometimes, it still bothers me'.

His procedure was performed in an outpatient surgery center, after which he received extensive physical and occupational therapy as an outpatient for 6 months.

Electrician Physical Demand Analysis

Information Gathering

- Stage-1: Screening – Interview
- Stage-2: Observation – Measurement

https://www.bls.gov/ooh/construction-and-extraction/electricians.htm

THE BACK SCHOOL

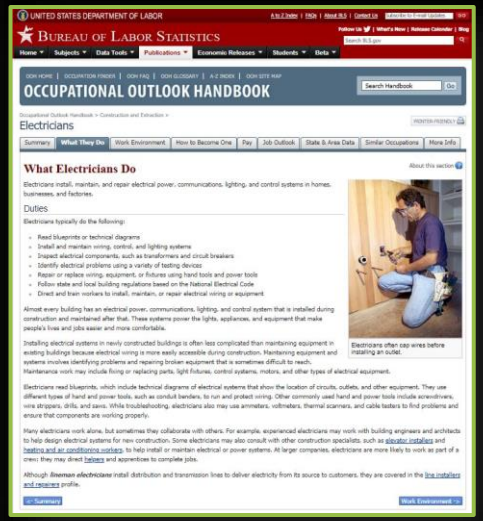
Date _____

Name Luis S- - - - -

Job Title Master Electrician

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Electrician - Essential Job Functions – General**	Demand Level
	✓			Clean and prepare work sites by removing debris and possible hazards	M
	✓			Load or unload manufactured or building materials at job site	H
	✓			Build or take apart bracing, scaffolding, and temporary structures	L
	✓			Operate or tend equipment / machines used in positioning manpower / rigging structures	L
	✓			Follow building plans / instructions from supervisors or coworkers	L
✓	✓			Assist other skilled building craftworkers with their duties when required	M
		✓		Repair and replace worn parts, equipment and accessories as needed	M / H
✓	✓			Maintain production area 5S cleanliness and orderliness for safety	L

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Electrician - Essential Job Functions – Job Specific**	Demand Level
✓	✓			Follow blueprints and building plans to meet the needs of work order	L
		✓		Install and maintain wiring, control, and lighting systems	M
		✓		Inspect electrical components, such as transformers and circuit breakers	M



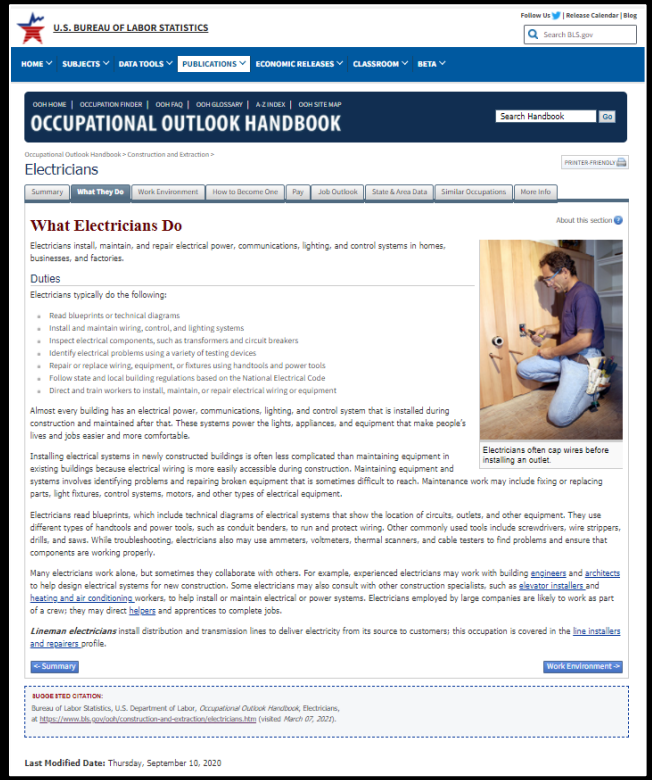
THE BACK SCHOOL®

Electrician Physical Demand Analysis

Information Processing

- Stage-3: Analysis – Assessment
- Stage-4: Expertise – Report Prep

https://www.bls.gov/ooh/construction-and-extraction/electricians.htm



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- ☐ 'Air-Ex'-Style Closed-Foam Balance Pad
- ☐ Grip Dynamometer
- ☐ Goniometer / Inclinometer
- ☐ Plate, Handheld and Cuff Weights

CONSENT FOR TESTING

- ☐ Have client read and sign the attached consent form

MUSCULOSKELETAL TESTING

1. Obtain Height (in.) and Weight (lbs.)
2. Obtain Resting Heart Rate and Calculate Maximum HR (220 – Age) X (.85) = Max. HR
   If the applicant exceeds the 85% of max heart rate that specific individual test should be stopped, the applicant shall be given a 90-second rest break and then the overall test is continued. If they continue to exceed the 85% of heart rate after 90 seconds, then the entire test is stopped.

3. Obtain Resting Blood Pressure (if >160/100 STOP)
   If at any point during testing, the test is stopped due to elevated heart rate and/or blood pressure, this IS NOT considered a "failed" test. The test is simply being stopped due to safety measures.
4. Gross Cervical ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
5. Gross Lumbar ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
6. Gross Upper Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
7. Gross Lower Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.

JOB REPLICATED TESTS

Pre and Post heartrates are monitored then recorded, and the clinician will state the applicant's ability to meet the job requirement safely. If safety cannot be completely assured without reasonable accommodation, the clinician may offer safe modification suggestions where appropriate.

A NOTE ABOUT JOB REPLICATED TESTING

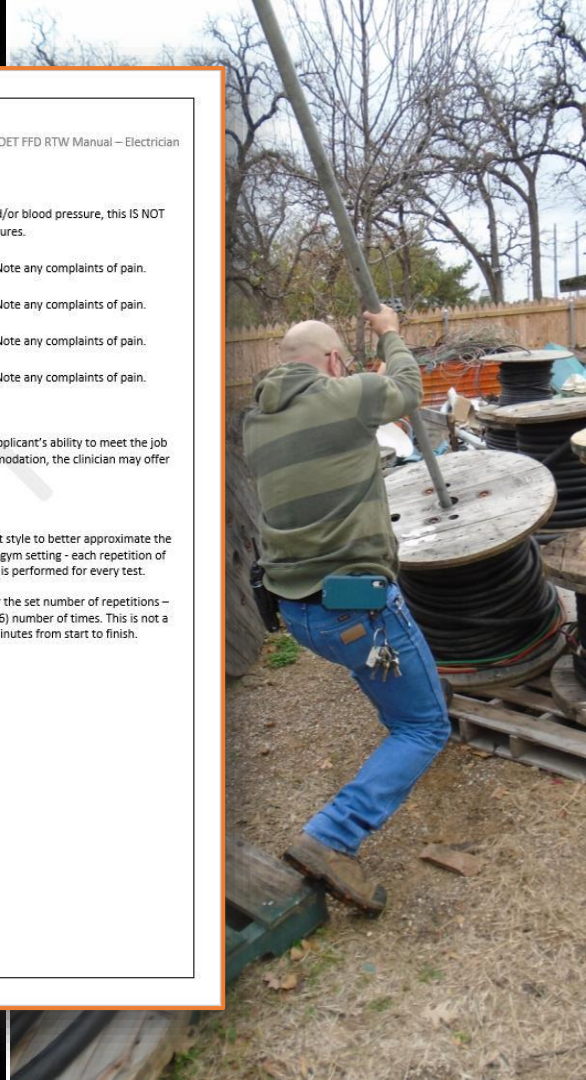
Best practices recommend testing in this section be performed in a 'round robin' circuit style to better approximate the varied job demands of a typical workday. In this fashion – not unlike cross-training in a gym setting - each repetition of one test would be followed by another test sequentially on the list until one repetition is performed for every test.

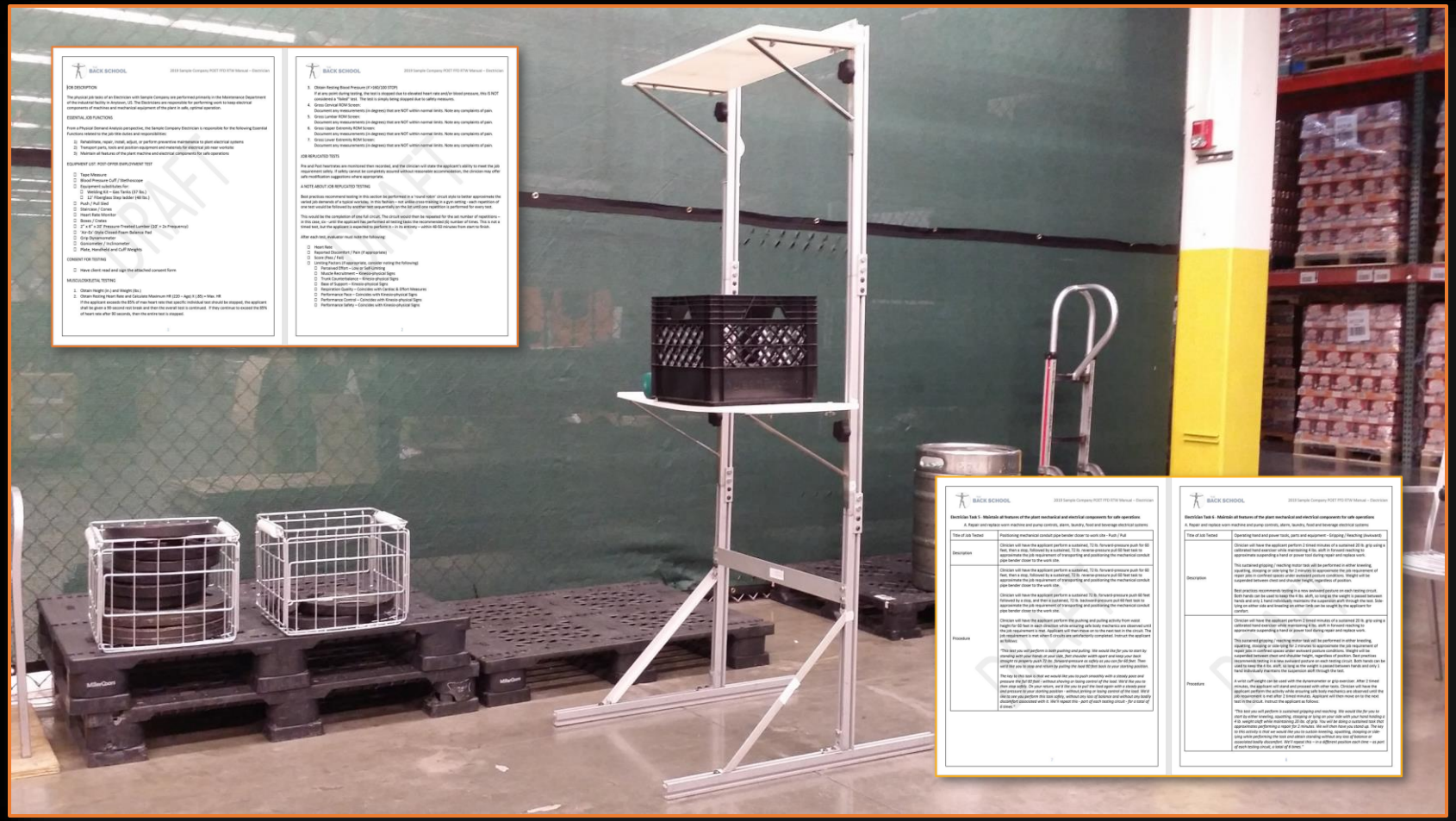
This would be the completion of one full circuit. The circuit would then be repeated for the set number of repetitions – in this case, six - until the applicant has performed all testing tasks the recommended (6) number of times. This is not a timed test, but the applicant is expected to perform it – in its entirety – within 40-50 minutes from start to finish.

After each test, evaluator must note the following:

- ☐ Heart Rate
- ☐ Reported Discomfort / Pain (if appropriate)
- ☐ Score (Pass / Fail)
- ☐ Limiting Factors (if appropriate, consider noting the following)
  - ☐ Perceived Effort – Low or Self-Limiting
  - ☐ Muscle Recruitment – Kinesio-physical Signs
  - ☐ Trunk Counterbalance – Kinesio-physical Signs
  - ☐ Base of Support – Kinesio-physical Signs
  - ☐ Respiration Quality – Coincides with Cardiac & Effort Measures
  - ☐ Performance Pace – Coincides with Kinesio-physical Signs
  - ☐ Performance Control – Coincides with Kinesio-physical Signs
  - ☐ Performance Safety – Coincides with Kinesio-physical Signs

DRAFT





BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

JOB DESCRIPTION

The physical job tasks of an Electrician with Sample Company are performed primarily in the Maintenance Department of the industrial facility in Anytown, US. The Electricians are responsible for performing work to keep electrical components of machines and mechanical equipment of the plant in safe, optimal operation.

ESSENTIAL JOB FUNCTIONS

From a Physical Demand Analysis perspective, the Sample Company Electrician is responsible for the following Essential Functions related to the job title duties and responsibilities:

1) Rehabilitate, repair, install, adjust, or perform preventive maintenance to plant electrical systems
2) Transport parts, tools and position equipment and materials for electrical job near worksite
3) Maintain all features of the plant machine and electrical components for safe operations

EQUIPMENT LIST: POST-OFFER EMPLOYMENT TEST

- ☐ Tape Measure
- ☐ Blood Pressure Cuff / Stethoscope
- ☐ Equipment substitutes for:
  - ☐ Welding Kit – Gas Tanks (37 lbs.)
  - ☐ 12' Fiberglass Step ladder (40 lbs.)
- ☐ Push / Pull Sled
- ☐ Staircase / Cones
- ☐ Heart Rate Monitor
- ☐ Boxes / Crates
- ☐ 2" x 6" x 20' Pressure-Treated Lumber (32' = 3x Frequency)
- ☐ 'Air-fit' Style Closed-Foam Balance Pad
- ☐ Grip Dynamometer
- ☐ Goniometer / Inclinometer
- ☐ Plate, Handheld and Cuff Weights

CONSENT FOR TESTING

- ☐ Have client read and sign the attached consent form

MUSCULOSKELETAL TESTING

1. Obtain Height (in.) and Weight (lbs.)
2. Obtain Resting Heart Rate and Calculate Maximum HR (220 – Age); X (85) = Max. HR
   If the applicant exceeds the 85% of max heart rate that specific individual test should be stopped, the applicant shall be given a 90 second rest break and then the overall test is continued. If they continue to exceed the 85% of heart rate after 90 seconds, then the entire test is stopped.

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

3. Obtain Resting Blood Pressure (if >160/100 STOP)
   If at any point during testing, the test is stopped due to elevated heart rate and/or blood pressure, this IS NOT considered a "failed" test. The test is simply being stopped due to safety measures.
4. Gross Cervical ROM Screen:
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   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
7. Gross Lower Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.

JOB REPLICATED TESTS

Pre and Post-heartrates are monitored then recorded, and the clinician will state the applicant's ability to meet the job requirement safely. If safety cannot be completely assured without reasonable accommodation, the clinician may offer safe modification suggestions where appropriate.

A NOTE ABOUT JOB REPLICATED TESTING

Best practices recommend testing in this section be performed in a 'round-robin' circuit style to better approximate the varied job demands of a typical workday, in this fashion – not unlike cross-training in a gym setting - each repetition of one test would be followed by another test sequentially on the 1st until one repetition is performed for every test.

This would be the completion of one full circuit. The circuit would then be repeated for the set number of repetitions – in this case, six – until the applicant has performed all testing tasks the recommended (6) number of times. This is not a timed test, but the applicant is expected to perform it – in its entirety – within 40-50 minutes from start to finish.

After each test, evaluator must note the following:

- ☐ Heart Rate
- ☐ Reported Discomfort / Pain (if appropriate)
- ☐ Score (Pass / Fail)
- ☐ Limiting Factors (if appropriate, consider noting the following):
  - ☐ Perceived Effort – Low or Self-Limiting
  - ☐ Muscle Recruitment – Kinesio-physical Signs
  - ☐ Trunk Countenance – Kinesio-physical Signs
  - ☐ Base of Support – Kinesio-physical Signs
  - ☐ Performance Pace – Coincides with Pain & Effort Measures
  - ☐ Performance Pace – Coincides with Kinesio-physical Signs
  - ☐ Performance Control – Coincides with Kinesio-physical Signs
  - ☐ Performance Safety – Coincides with Kinesio-physical Signs

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 5 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Positioning mechanical conduit pipe bender closer to work site – Push / Pull
Description	Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site.
Procedure	Clinician will have the applicant perform a sustained 72 lb. forward-pressure push 60 feet followed by a stop, and then a sustained, 72 lb. backward-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform the pushing and pulling activity from waist height for 60 feet in each direction while ensuring safe body mechanics are observed until the job requirement is met. Applicant will then move on to the next task in the circuit. The job requirement is met when 6 circuits are satisfactorily completed. Instruct the applicant as follows: *"This test you will perform is both pushing and pulling. We would like for you to start by standing with your hands at your side, feet shoulder width apart and keep your back straight to properly push 72 lbs. forward-pressure as safely as you can for 60 feet. Then we'd like you to stop and return by pushing the load 60 feet back to your starting position.* *The key to this test is that we would like you to push smoothly with a steady pace and pressure the full 60 feet - without checking on losing control of the load. We'd like you to then stop safely. On your return, we'd like you to pull the load again with a steady pace and pressure to your starting position - without jerking or losing control of the load. We'd like to see you perform this task safely, without any loss of balance and without any bodily discomfort associated with it. We'll repeat this - part of each testing circuit - for a total of 6 times."*

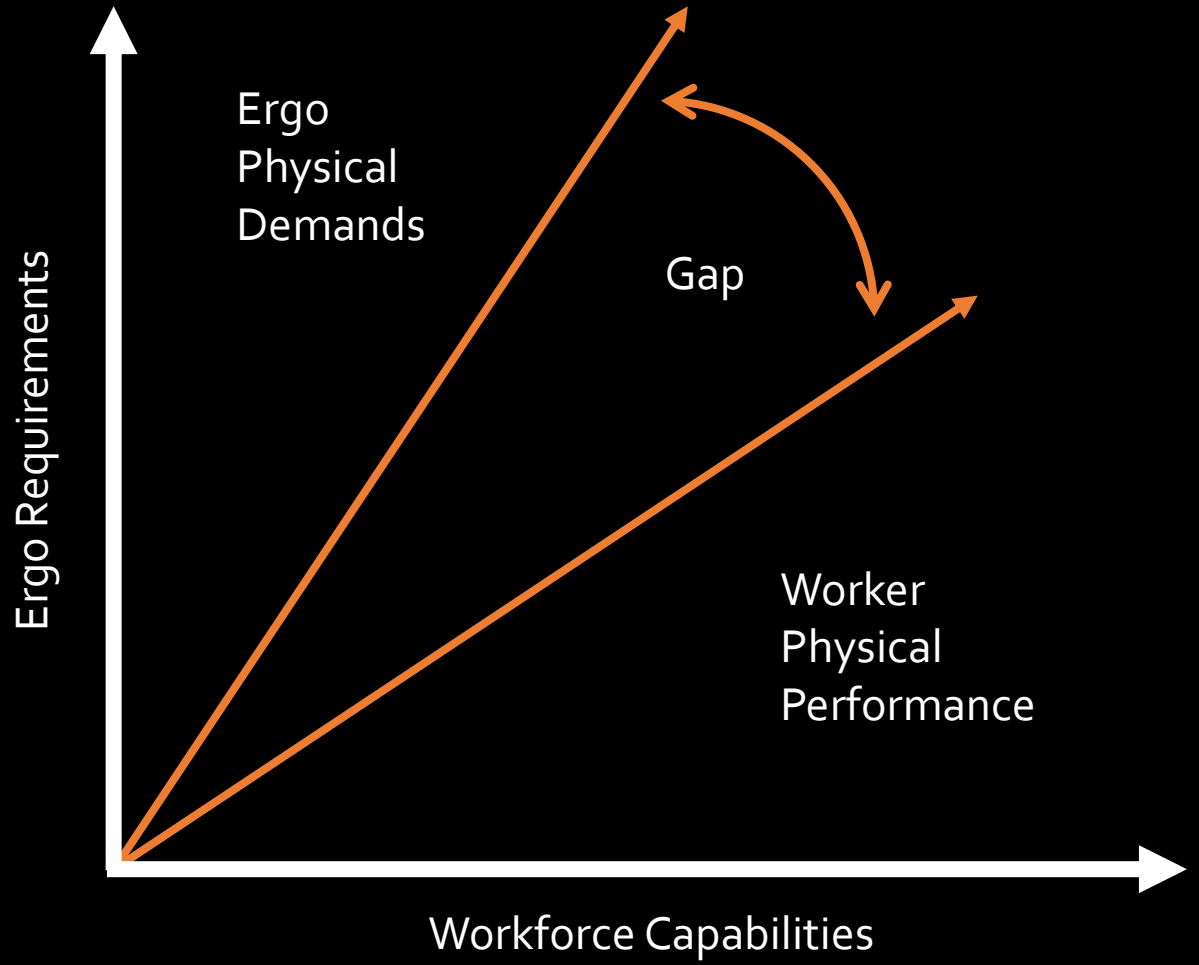
BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 6 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Operating hand and power tools, parts and equipment - Gripping / Reaching (Awkward)
Description	Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position.
Procedure	Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. Side-lying on either side and kneeling on either limb can be sought by the applicant for comfort. Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position. Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. A wrist cuff weight can be used with the dynamometer or grip exerciser. After 2 timed minutes, the applicant will stand and proceed with other tests. Clinician will have the applicant perform this activity while ensuring safe body mechanics are observed until the job requirement is met after 2 timed minutes. Applicant will then move on to the next test in the circuit. Instruct the applicant as follows: *"This test you will perform is sustained gripping and reaching. We would like for you to start by either kneeling, squatting, stooping or lying at your side with your hand holding a 4 lb. weight shift while maintaining 20 lbs. of grip. You will be doing a sustained task that approximates performing a repair for 2 minutes. We will them have you stand up. The key to this activity is that we would like you to sustain kneeling, squatting, stooping or side-lying while performing the task and obtain standing without any loss of balance or associated bodily discomfort. We'll repeat this – in a different position each time – as part of each testing circuit, a total of 6 times."*

POET Data Gap Analysis



Physical Demand Data-Driven SMART Goals

Specific – To the physical demands of the job

Measurable – Sequential to physical job demands

Attainable – Right-sized to manage and matter

Relevant – To physical job demands vs. clinically vague

Time-Based – Rapid rise to high-performance

Luis S. – Electrician
Rotator Cuff

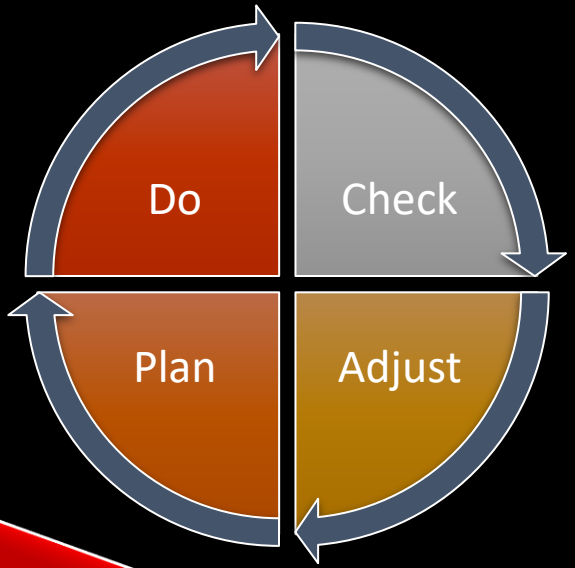
NATIONAL ERGONOMICS & Conference ErgoExpo

Physical Demand Gap Analysis:

The Bridge Between High-Performance Workforce and Peak-Safety Workplace

Presented by: Matt Jeffs DPT PSM REAS
matt@abilityondemand.com
matt@thebackschool.net

Lean Gap Analysis



‘5 Why’ Root Cause Analysis

Standard Work

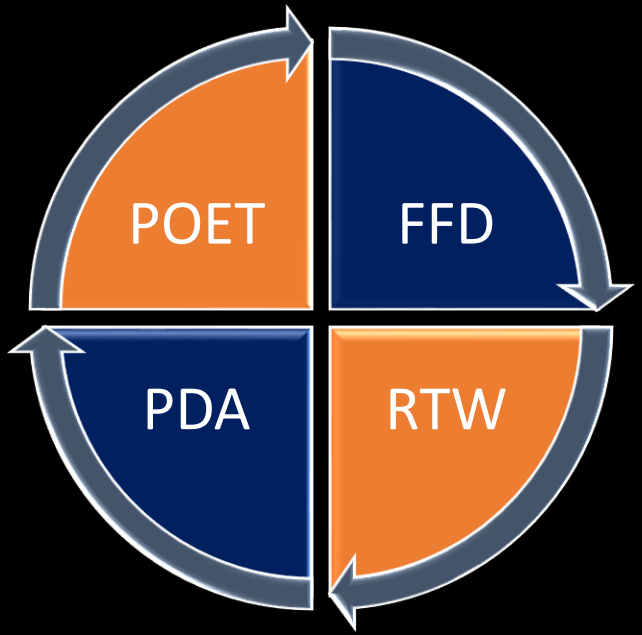
Kaizen – Continuous Improvement

The PDA Gap Analysis Process

3. What is the most effective and efficient way to reduce OSHA Recordable Incident Rates – and why does it reduce Work Comp premium inflation and Experience Modification Scores?

The Fit-For-Duty Screen

The PDA Gap Analysis Process




Luis S. – Electrician
Rotator Cuff
Carl B. – Carpenter
Knee Osteoarthritis
Roger K. – Mechanic
Low Back Injury

Case Study: Carl B. – Knee and Hip Arthritis

Position: Master Carpenter / FFD from FMLA

Carl B. is a pleasant and engaging 52-year-old carpenter complaining of B knee pain with functional limitations. These include moving from kneeling, squatting or sitting to standing, prolonged stair and ladder climbing and descending, and retrieving items from the floor.

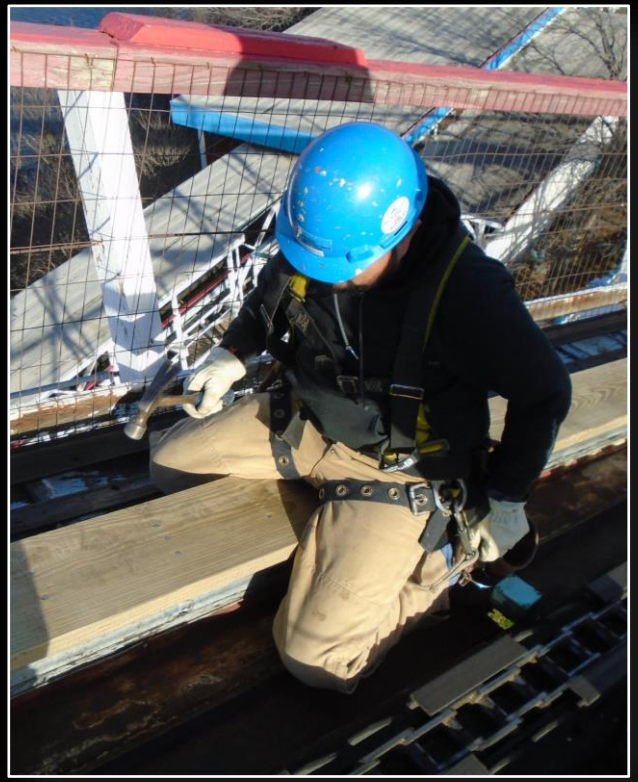
Pain interferes with his work activities as a Master Carpenter. He takes OTC extra-strength acetaminophen prn for pain relief however, he is concerned about its use as a long-term intervention.

Carpenter Physical Demand Analysis

Information Gathering

- Stage-1: Screening – Interview
- Stage-2: Observation – Measurement

https://www.bls.gov/ooh/construction-and-extraction/carpenters.htm#tab-2



THE BACK SCHOOL

Date

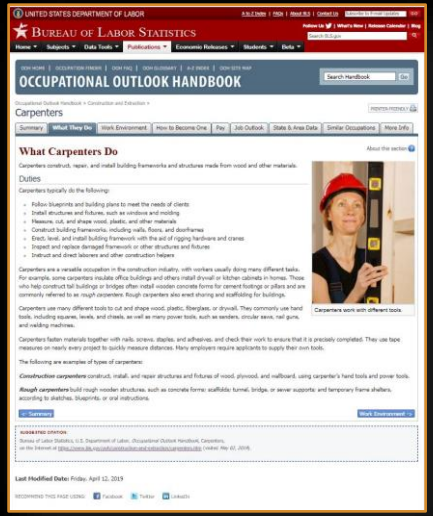
Name Carl B - - - - -

Job Title Master Carpenter

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Carpenter - Essential Job Functions – Job Specific**	Demand Level
		✓		Construct building frameworks, including walls, floors, and doorframes	H / VH
	✓			Erect, level, and install building framework with the aid of rigging hardware and cranes	L
			✓	Inspect and replace damaged framework or other structures and fixtures	L
		✓		Construct, repair, install building frameworks and structures made from wood etc.	H / VH
	✓			Insulate buildings and install drywall or kitchen cabinets	M
		✓		Wrap materials for blasting and spraying	M
		✓		Prep areas for paint, mask at risk materials, and spreading protective tarps and plastics	M
		✓		Brush and roller painting of structures as necessary	M
		✓		Install wooden concrete forms for cement footings or pillars	H
	✓			Erect shoring and scaffolding	H

Additions / Deletions: _____

Signature Carl B - - - - -



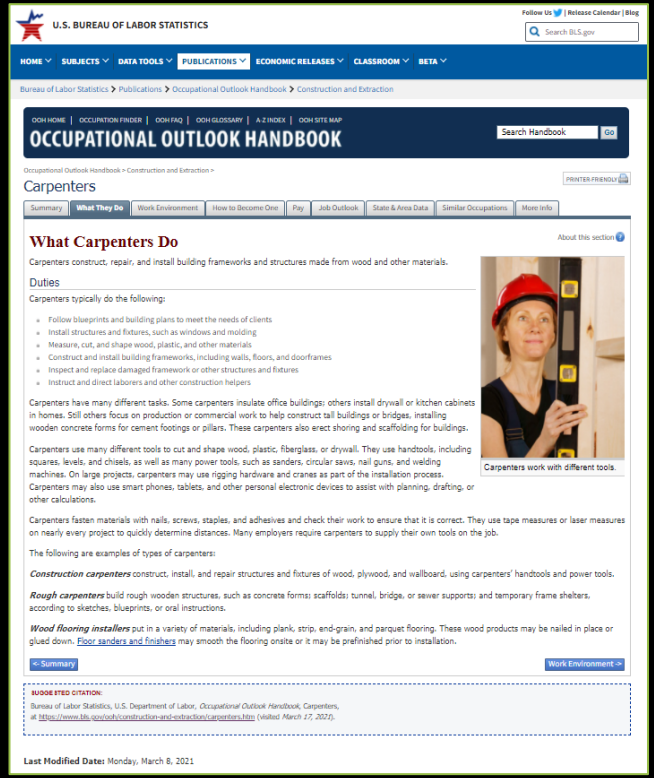

THE
BACK SCHOOL®

Carpenter Physical Demand Analysis

Information Processing

- Stage-3: Analysis – Assessment
- Stage-4: Expertise – Report Prep

https://www.bls.gov/ooh/construction-and-extraction/carpenters.htm#tab-2



Carpenter Task 1 - Installation, troubleshooting, and repair of wooden and structural components for the plant

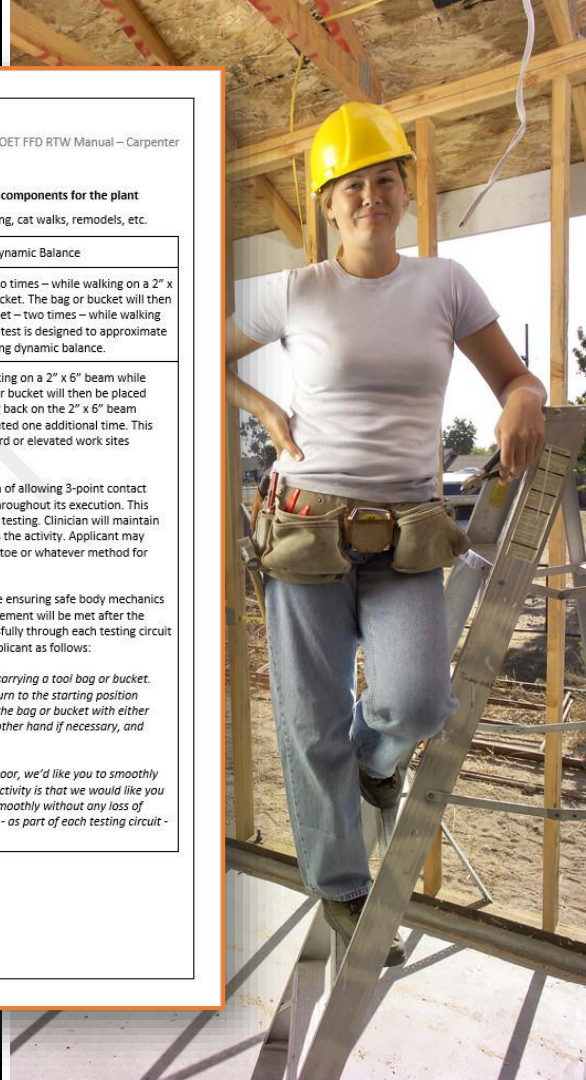
A. Repair and replace worn structural components of wooden structures, fencing, cat walks, remodels, etc.

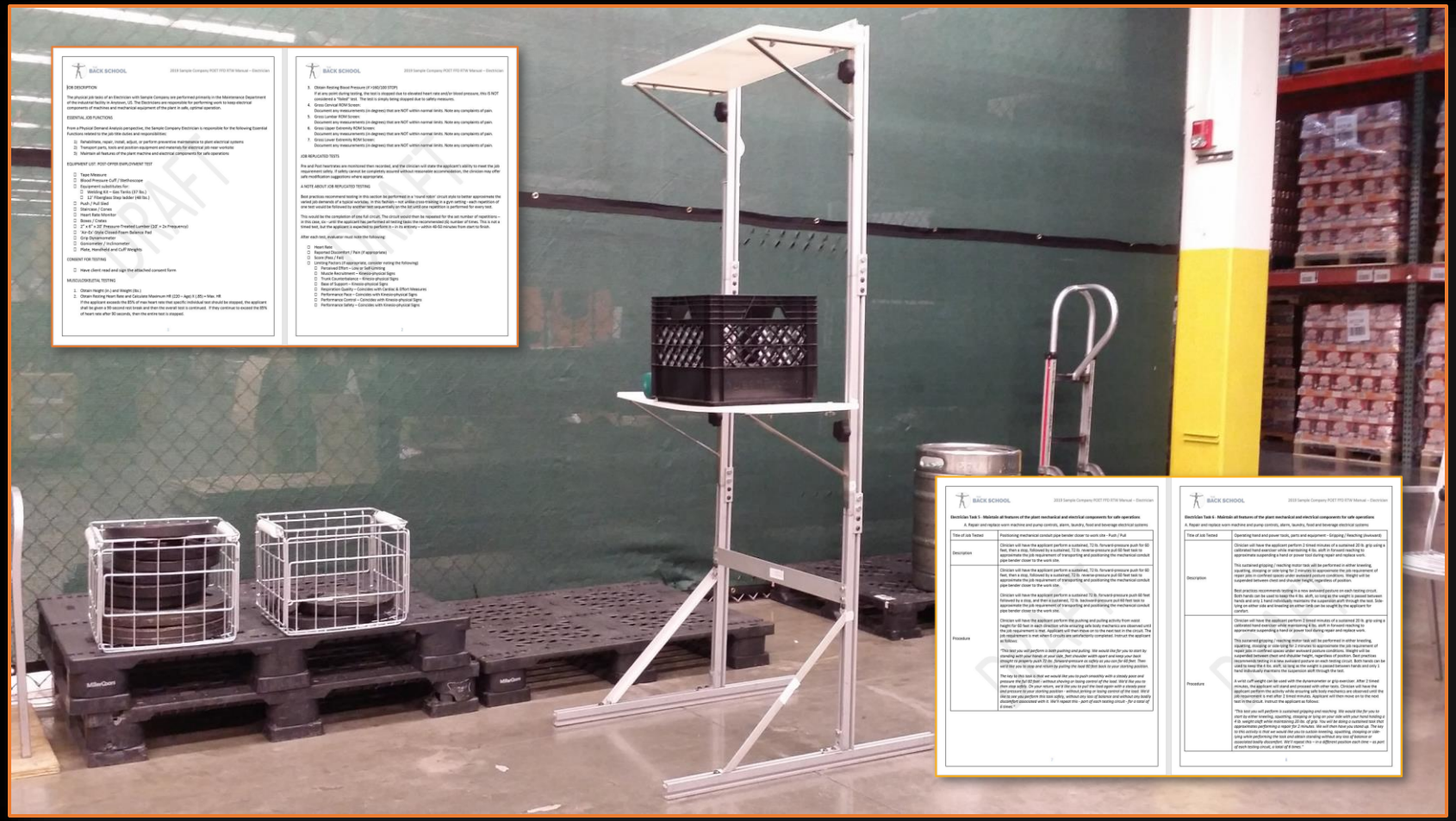
Title of Job Tested	Reach work areas in plant inaccessible at ground level – Romberg Static Balance
Description	Clinician will have the applicant perform 4 separate 30-second timed Romberg tests. This test is designed to evaluate and approximate safe access to narrow, uneven, awkward or elevated repair and replace work sites with limited visibility and requiring static balance.
Procedure	Clinician will have the applicant perform 4 separate 30-second timed tests over 2 minutes. In each test, the participant will be standing with feet side-by-side (though not necessarily touching) with arms-crossed over the chest, hands resting on each shoulder. Each 30-second test will advance as follows: Test 1) on a hard surface - eyes open – for 30 seconds; Test 2) on a hard surface - eyes closed – for 30 seconds; Test 3) on a soft surface - eyes open – for 30 seconds; and finally, Test 4) on a soft surface - eyes closed – for 30 seconds. The soft surface used is a standard 20" x 16" x 2.5" closed-foam 'Air-Ex'-style pad used for balance, proprioception and vestibular training. Test failure is defined as an applicant 1) needing to open their eyes during eyes-closed tests, 2) moving their arms or feet in order to achieve stability, or 3) beginning to fall or requiring provider intervention to maintain balance within a 30-second test interval. As there is a training effect, any subject who doesn't pass any one of each successive tests is given an opportunity to retry. This test is designed to approximate access to narrow, uneven, awkward or elevated repair and replace work sites with limited visibility that requires sustained static balance. These balancing tasks must be performed with the option of allowing 3-point contact (one hand, both feet) to either a rail, a wall or a person throughout its execution. This precaution is required to reduce exposure to a fall during testing. Clinician will have the applicant perform the activity while ensuring safety is observed until the job requirement is met. The requirement will be met after all four tests have been performed successfully - one time through each testing circuit - for a total of 6 times through the circuit. Instruct the applicant as follows: *"This test you will perform is static balance. We would like for you to start by performing the first of 4 separate 30-second timed tests. Each one is a little more challenging than the last one. In each test, you will be standing with feet closely side-by-side with arms-crossed over your chest, hands resting on each shoulder. Each 30-second test will advance as follows: Test 1) on a hard surface - eyes open – for 30 seconds; Test 2) on a hard surface - eyes closed – for 30 seconds; Test 3) on a soft surface - eyes open – for 30 seconds; and finally, Test 4) on a soft surface - eyes closed – for 30 seconds. The key to this activity is that we would like you to perform the 4 tasks safely and calmly without any falling, loss of balance or associated bodily discomfort 1 time, before moving on in each circuit interval. We'll repeat this - as part of each testing circuit – for a total of 6 times total."*

Carpenter Task 2 - Installation, troubleshooting, and repair of wooden and structural components for the plant

A. Repair and replace worn structural components of wooden structures, fencing, cat walks, remodels, etc.

Title of Job Tested	Reach work areas n plant inaccessible at ground level – Dynamic Balance
Description	Clinician will have the applicant perform twenty feet – two times – while walking on a 2" x 6" beam while unilaterally carrying a 34 lb. tool bag or bucket. The bag or bucket will then be placed down, and the applicant will perform twenty feet – two times – while walking back on the 2" x 6" beam without the bag or bucket. This test is designed to approximate access to narrow, awkward or elevated work sites requiring dynamic balance.
Procedure	Clinician will have the applicant perform twenty feet walking on a 2" x 6" beam while unilaterally carrying a 34 lb. tool bag or bucket. The bag or bucket will then be placed down, and the applicant will perform twenty feet walking back on the 2" x 6" beam without the bag or bucket. This activity will be then repeated one additional time. This test is designed to approximate access to narrow, awkward or elevated work sites requiring dynamic balance. These balancing tasks must be performed with the option of allowing 3-point contact (one hand, both feet) to either a rail, a wall or a person throughout its execution. This precaution is required to reduce exposure to a fall during testing. Clinician will maintain close-proximity safety guarding as the applicant performs the activity. Applicant may perform side-stepping, reciprocal foot-over-foot, heel-to-toe or whatever method for comfort, ease and safety. Clinician will have the applicant perform the activity while ensuring safe body mechanics are observed until the job requirement is met. The requirement will be met after the beam has been traversed twice in both directions successfully through each testing circuit - for a total of 6 times through the circuit. Instruct the applicant as follows: *"This test you will perform is dynamic balance while first carrying a tool bag or bucket. Then, the load will then be put down, and the you will return to the starting position without it. We would like for you to start by safely lifting the bag or bucket with either hand. Only grasp the handrail, wall or assistant with the other hand if necessary, and smoothly traverse the balance beam.* *After safely placing the bag or bucket back down on the floor, we'd like you to smoothly return to the starting position without it. The key to this activity is that we would like you to perform the task two times, doing so both safely and smoothly without any loss of balance or associated bodily discomfort. We'll repeat this - as part of each testing circuit - a total of 6 times."*





BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

JOB DESCRIPTION

The physical job tasks of an Electrician with Sample Company are performed primarily in the Maintenance Department of the industrial facility in Anytown, US. The Electricians are responsible for performing work to keep electrical components of machines and mechanical equipment of the plant in safe, optimal operation.

ESSENTIAL JOB FUNCTIONS

From a Physical Demand Analysis perspective, the Sample Company Electrician is responsible for the following Essential Functions related to the job title duties and responsibilities:

1) Rehabilitate, repair, install, adjust, or perform preventive maintenance to plant electrical systems
2) Transport parts, tools and position equipment and materials for electrical job near worksite
3) Maintain all features of the plant machine and electrical components for safe operations

EQUIPMENT LIST: POST-OFFER EMPLOYMENT TEST

- ☐ Tape Measure
- ☐ Blood Pressure Cuff / Stethoscope
- ☐ Equipment substitutes for:
  - ☐ Welding Kit – Gas Tanks (37 lbs.)
  - ☐ 12' Fiberglass Step ladder (40 lbs.)
- ☐ Push / Pull Sled
- ☐ Staircase / Cones
- ☐ Heart Rate Monitor
- ☐ Boxes / Crates
- ☐ 2" x 6" x 20' Pressure-Treated Lumber (32' = 3x Frequency)
- ☐ 'Air-fit' Style Closed-Foam Balance Pad
- ☐ Grip Dynamometer
- ☐ Goniometer / Inclinometer
- ☐ Plate, Handheld and Cuff Weights

CONSENT FOR TESTING

- ☐ Have client read and sign the attached consent form

MUSCULOSKELETAL TESTING

1. Obtain Height (in.) and Weight (lbs.)
2. Obtain Resting Heart Rate and Calculate Maximum HR (220 – Age); X (85) = Max. HR
   If the applicant exceeds the 85% of max heart rate that specific individual test should be stopped, the applicant shall be given a 90 second rest break and then the overall test is continued. If they continue to exceed the 85% of heart rate after 90 seconds, then the entire test is stopped.

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

3. Obtain Resting Blood Pressure (if >160/100 STOP)
   If at any point during testing, the test is stopped due to elevated heart rate and/or blood pressure, this IS NOT considered a "failed" test. The test is simply being stopped due to safety measures.
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JOB REPLICATED TESTS

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- ☐ Reported Discomfort / Pain (if appropriate)
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- ☐ Limiting Factors (if appropriate, consider noting the following):
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  - ☐ Muscle Recruitment – Kinesio-physical Signs
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  - ☐ Performance Safety – Coincides with Kinesio-physical Signs

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 5 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Positioning mechanical conduit pipe bender closer to work site – Push / Pull
Description	Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site.
Procedure	Clinician will have the applicant perform a sustained 72 lb. forward-pressure push 60 feet followed by a stop, and then a sustained, 72 lb. backward-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform the pushing and pulling activity from waist height for 60 feet in each direction while ensuring safe body mechanics are observed until the job requirement is met. Applicant will then move on to the next task in the circuit. The job requirement is met when 6 circuits are satisfactorily completed. Instruct the applicant as follows: *"This test you will perform is both pushing and pulling. We would like for you to start by standing with your hands at your side, feet shoulder width apart and keep your back straight to properly push 72 lbs. forward-pressure as safely as you can for 60 feet. Then we'd like you to stop and return by pushing the load 60 feet back to your starting position.* *The key to this test is that we would like you to push smoothly with a steady pace and pressure the full 60 feet - without checking on losing control of the load. We'd like you to then stop safely. On your return, we'd like you to pull the load again with a steady pace and pressure to your starting position - without jerking or losing control of the load. We'd like to see you perform this task safely, without any loss of balance and without any bodily discomfort associated with it. We'll repeat this - part of each testing circuit - for a total of 6 times."*

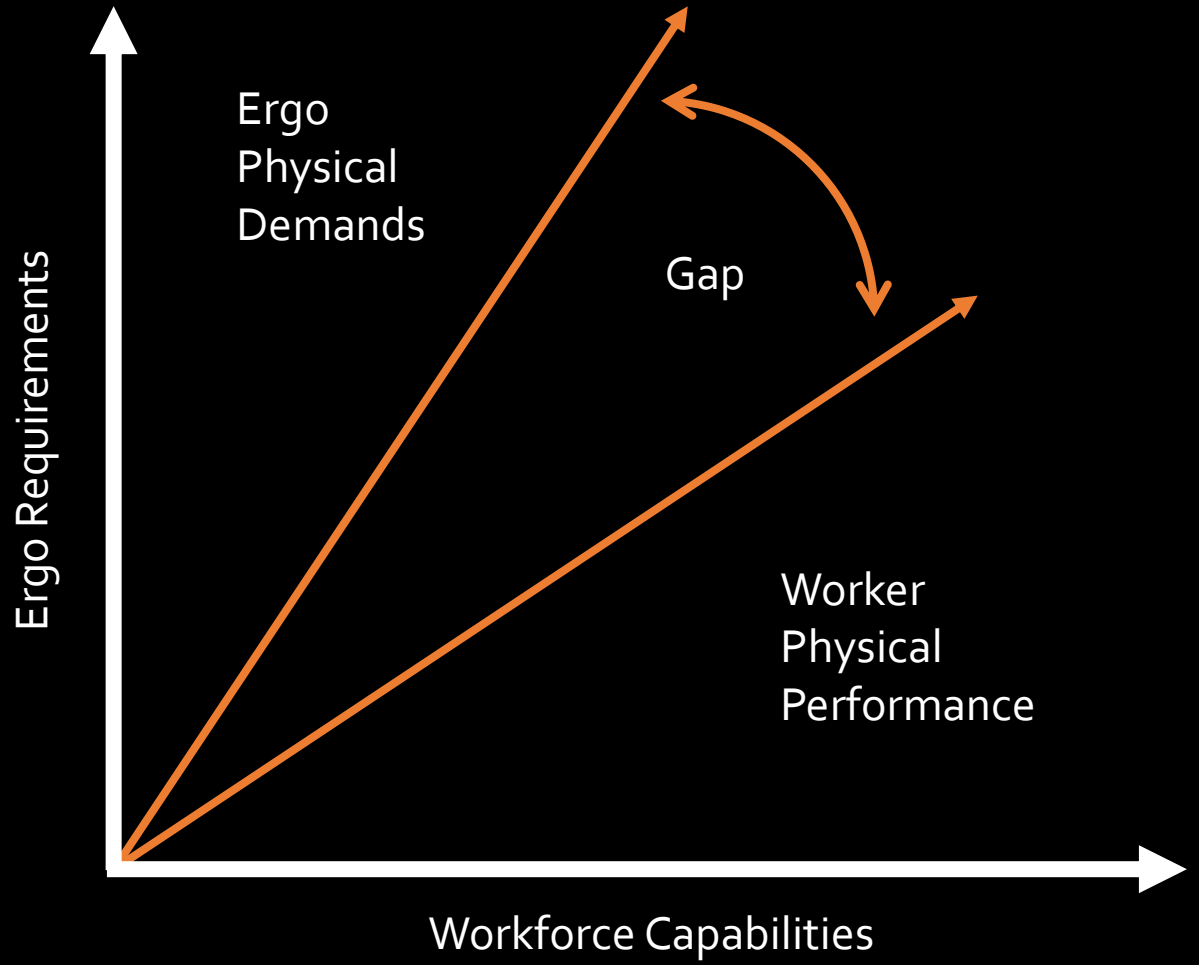
BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 6 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Operating hand and power tools, parts and equipment - Gripping / Reaching (Awkward)
Description	Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position.
Procedure	Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. Side-lying on either side and kneeling on either limb can be sought by the applicant for comfort. Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position. Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. A wrist cuff weight can be used with the dynamometer or grip exerciser. After 2 timed minutes, the applicant will stand and proceed with other tests. Clinician will have the applicant perform this activity while ensuring safe body mechanics are observed until the job requirement is met after 2 timed minutes. Applicant will then move on to the next test in the circuit. Instruct the applicant as follows: *"This test you will perform is sustained gripping and reaching. We would like for you to start by either kneeling, squatting, stooping or lying at your side with your hand holding a 4 lb. weight shift while maintaining 20 lbs. of grip. You will be doing a sustained task that approximates performing a repair for 2 minutes. We will them have you stand up. The key to this activity is that we would like you to sustain kneeling, squatting, stooping or side-lying while performing the task and obtain standing without any loss of balance or associated bodily discomfort. We'll repeat this – in a different position each time – as part of each testing circuit, a total of 6 times."*

FFD Data Gap Analysis



Physical Demand Data-Driven SMART Goals

Specific – To the physical demands of the job

Measurable – Sequential to physical job demands

Attainable – Right-sized to manage and matter

Relevant – To physical job demands vs. clinically vague

Time-Based – Step-wise performance enhancement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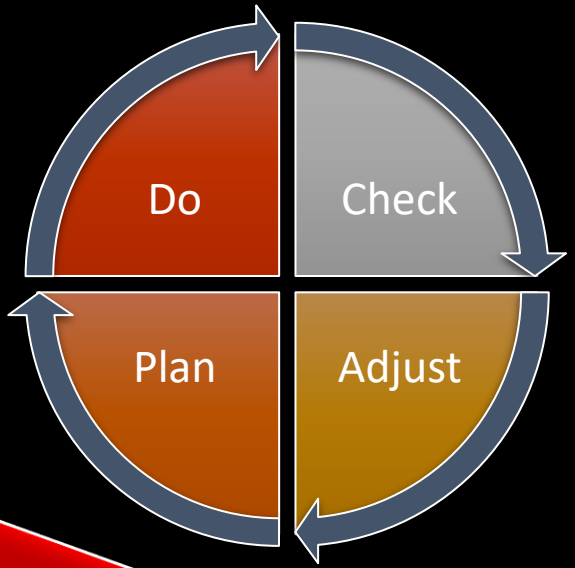
Physical Demand Gap Analysis:

The Bridge Between High-Performance Workforce and Peak-Safety Workplace

Presented by: Matt Jeffs DPT PSM REAS
matt@abilityondemand.com
matt@thebackschool.net

Lean Gap Analysis



‘5 Why’ Root Cause Analysis

Standard Work

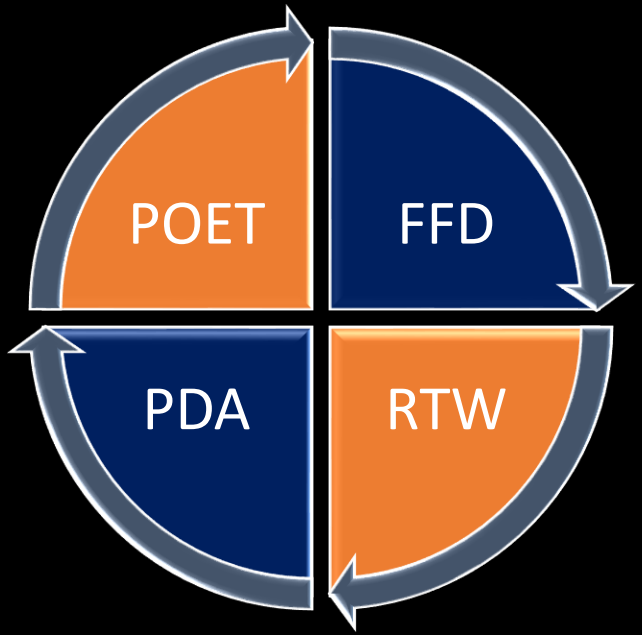
Kaizen – Continuous Improvement

The PDA Gap Analysis Process

2. What is the most effective and efficient way to compress Lost Time Workdays – and why does it deliver the most trackable, data-driven rehab and recovery progress reporting?

The Return-To-Work Screen

The PDA Gap Analysis Process




Luis S. – Electrician
Rotator Cuff
Carl B. – Carpenter
Knee Osteoarthritis
Roger K. – Mechanic
Low Back Injury

Case Study: Roger K. – Low Back Strain / Sprain

Position: Millwright / Machinist / RTW from WC

Roger K. is an easygoing, 54-year-old-male industrial machinist and mechanic – now in a supervisory role - who reports recurrent diffuse, lumbosacral discomfort.

He was ‘told he needed to start an exercise program’ by his physician to reduce compression on his lumbar spine. His family history includes two brothers who have undergone lower back surgery.

Machinist Physical Demand Analysis

Information Gathering

- Stage-1: Screening – Interview
- Stage-2: Observation – Measurement

https://www.bls.gov/ooh/production/machinists-and-tool-and-die-makers.htm#tab-2

THE BACK SCHOOL

Date _____

Name Roger K - - - - -

Job Title Master Mechanic

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Mechanic - Essential Job Functions – General**	Demand Level
		✓		Clean and prepare work sites by removing debris and possible hazards	M
		✓		Load or unload manufactured goods or materials at job site	M / H
	✓			Build or take apart bracing, scaffolding, and temporary structures	L
		✓		Operate or tend equipment / machines used in positioning manpower / rigging structures	L
			✓	Follow building plans / instructions from supervisors or coworkers	L
			✓	Assist other skilled building craftworkers with their duties when required	M
			✓	Repair and replace worn parts, equipment and accessories as needed	H / VH
			✓	Maintain production area 5S cleanliness and orderliness for safety	L

Never 0% shift	Occasional <33% shift	Frequent <66% shift	Constant >67% shift	**Mechanic - Essential Job Functions – Job Specific**	Demand Level
			✓	Read technical manuals to understand equipment and controls	L
		✓		Disassemble machinery and equipment when there is a problem	H
		✓		Repair or replace broken or malfunctioning components	H

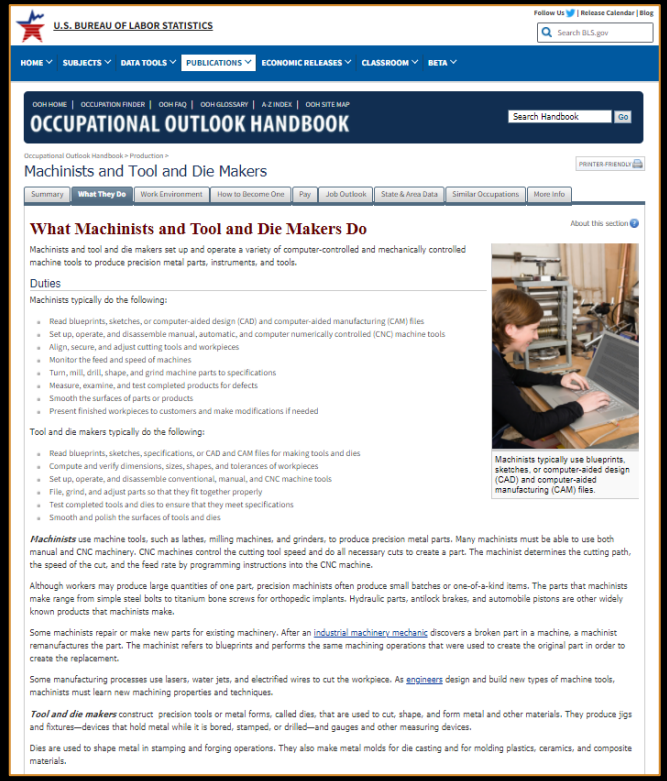

THE
BACK SCHOOL®
31.9
FGE-500HXY
DOWN
NEUTRAL
UP

Machinist Physical Demand Analysis

Information Processing

- Stage-3: Analysis – Assessment
- Stage-4: Expertise – Report Prep

https://www.bls.gov/ooh/production/machinists-and-tool-and-die-makers.htm#tab-2



Mechanic Task 3 - Rehabilitate, repair, install, adjust, or maintain plant machinery and operational systems

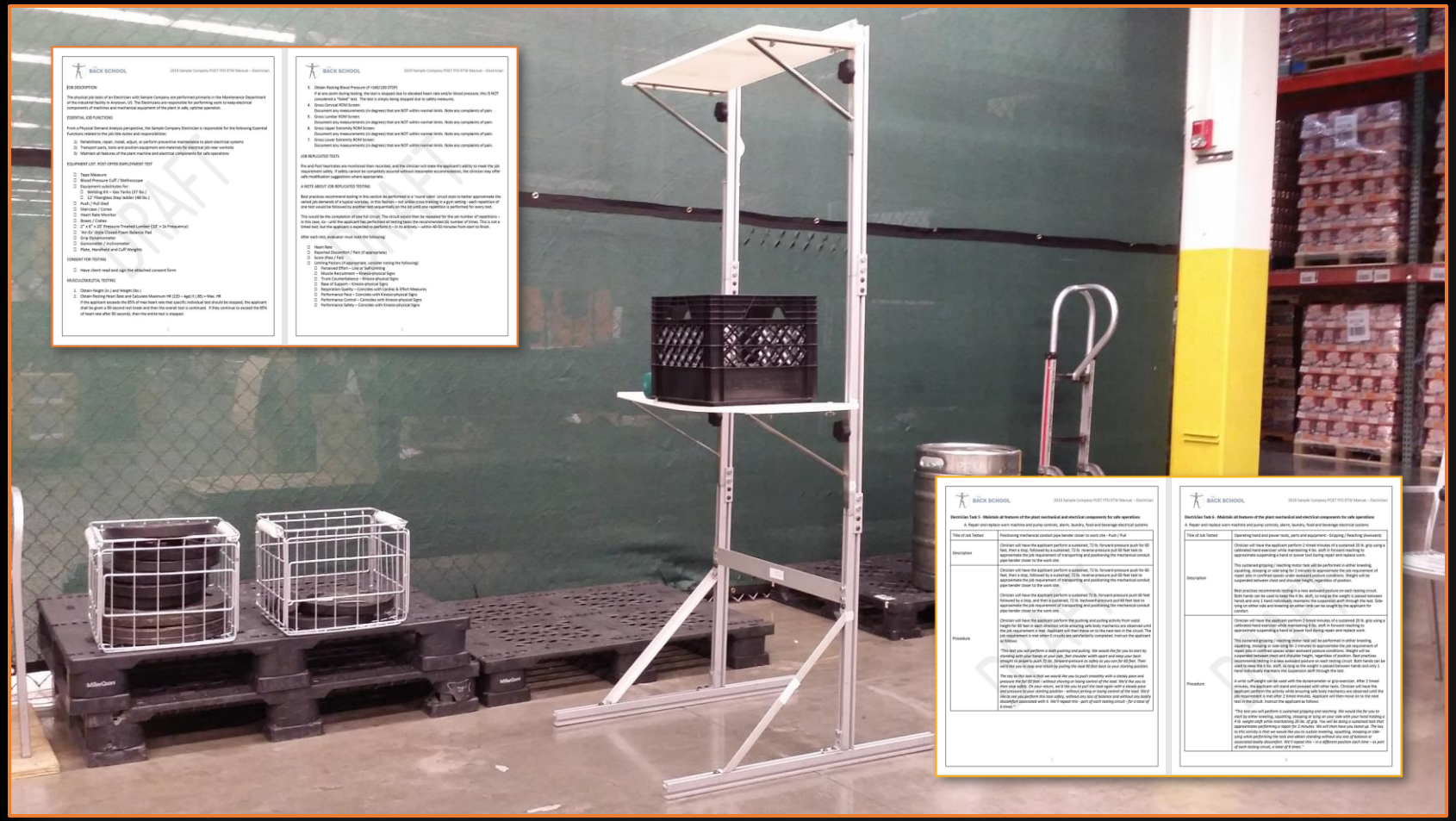
A. Repair and replace worn structural and operational components of machines, hydraulics, gear boxes, etc.

Title of Job Tested	Transport portable welding kit to position near work - Lifting / Carrying (Obstacles)
Description	Clinician will have the applicant perform a 37 lb. unilateral (1 hand) lift task from floor to hip height and 60 foot carrying task to approximate the job requirement of transporting to and setting up the portable welding kit to the work site.
Procedure	Clinician will have the applicant perform a 37 lb. unilateral (1 hand) lift task from floor to hip height and 60 foot carrying task to approximate the job requirement of transporting to and setting up the portable welding kit to the work site. To better approximate working conditions, clinician is encouraged to place obstacles (cones, etc.) in the path that can safely be stepped over or around while the weight is suspended during the carry. Close guarding for safety is recommended in case of unintended loss of balance during this task where obstacles are placed. Clinician will have the applicant perform the lifting and carrying activity from a floor to hip carrying height while ensuring safe body mechanics are observed until the job requirement is met after 60 feet. Applicant will then move on to the next test in the circuit. The job requirement will be met after 6 repetitions through the testing circuit. Instruct the applicant as follows: *"This test you will perform is lifting and carrying. We would like for you to start by standing with your hands at your side, feet shoulder width apart, and then bend at your knees and your hips – while keeping your back straight - to properly lift, carry 60 feet and lower 37 pounds - with either hand - as safely as you can, then return to your starting position.* *The key to this lift is that we would like you to lift from the floor height to the comfortable, straight-arm hip carrying height, carry the kit 60 feet, then return to your starting position safely without any loss of balance and without any bodily discomfort associated with it. We'll repeat this - as part of each testing circuit – a total of 6 times."*

Mechanic Task 4 - Rehabilitate, repair, install, adjust, or maintain plant machinery and operational systems

A. Repair and replace worn structural and operational components of machines, hydraulics, gear boxes, etc.

Title of Job Tested	Reach work areas in plant inaccessible at ground level – Stair and Ladder Climbing
Description	Clinician will have the applicant perform twenty-five (25) 7-inch steps up and twenty-five 7-inch steps down on stairs while unilaterally carrying a 37 lb. welding kit. The kit will then be placed down, and the applicant will perform five 12-inch rungs up and five 12-inch rungs down – 5 times, for a total of twenty-five (25) rungs - on a step ladder to approximate approaching elevated work sites. These climbing tasks must be performed with appropriate safety measures in place. The stair climb carrying the welding cabinet must be performed while maintaining 3-point contact (one hand, both feet) throughout its execution, and the ladder climb must be performed maintaining 4-point contact (both hands, both feet) throughout its execution.
Procedure	Clinician will have the applicant perform twenty-five (25) 7-inch steps up and twenty-five 7-inch steps down on stairs while unilaterally carrying a 37 lb. welding kit. The kit will then be placed down, and the applicant will perform five 12-inch rungs up and five 12-inch rungs down – 5 times, for a total of twenty-five (25) rungs - on a step ladder to approximate approaching elevated work sites. These climbing tasks must be performed with appropriate safety measures in place. The stair climb carrying the welding cabinet must be performed while maintaining 3-point contact (one hand, both feet) throughout its execution, and the ladder climb must be performed maintaining 4-point contact (both hands, both feet) throughout its execution. Clinician will maintain close-proximity safety guarding as the applicant performs the activity. Clinician will ensure safe body mechanics are observed until the job requirement is met. Stairs and ladders are climbed for a total 25 steps and 25 rungs, respectively to complete. Applicant will then move on to the next test in the circuit. The job requirement is met when the circuit is safely completed, 6 times. Instruct the applicant as follows: *"This test you will perform is climbing up and down stairs while carrying a welding kit. The welding kit will then be put down, and the you will then climb a ladder. We would like for you to start by safely lifting the welding kit with either hand, grasping the handrail with the other hand, and smoothly climb up, then down 25 steps. After safely placing the welding kit back down on the floor, we'd like you to smoothly climb up, then down 5 ladder rungs – 5 times - while holding on with both hands.* *The key to this activity is that we would like you to perform the task, both safely and smoothly without any loss of balance or associated bodily discomfort after 25 steps and 25 rungs are completed. We'll repeat this - as part of each testing circuit – for a total of 6 times."*



BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

JOB DESCRIPTION

The physical job tasks of an Electrician with Sample Company are performed primarily in the Maintenance Department of the industrial facility in Anytown, US. The Electricians are responsible for performing work to keep electrical components of machines and mechanical equipment of the plant in safe, optimal operation.

ESSENTIAL JOB FUNCTIONS

From a Physical Demand Analysis perspective, the Sample Company Electrician is responsible for the following Essential Functions related to the job title duties and responsibilities:

1) Rehabilitate, repair, install, adjust, or perform preventive maintenance to plant electrical systems
2) Transport parts, tools and position equipment and materials for electrical job near worksite
3) Maintain all features of the plant machine and electrical components for safe operations

EQUIPMENT LIST: POST-OFFER EMPLOYMENT TEST

- ☐ Tape Measure
- ☐ Blood Pressure Cuff / Stethoscope
- ☐ Equipment substitutes for:
  - ☐ Welding Kit – Gas Tanks (37 lbs.)
  - ☐ 12' Fiberglass Step ladder (40 lbs.)
- ☐ Push / Pull Sled
- ☐ Staircase / Cones
- ☐ Heart Rate Monitor
- ☐ Boxes / Crates
- ☐ 2" x 6" x 20' Pressure-Treated Lumber (32' = 3x Frequency)
- ☐ 'Air-fit' Style Closed-Foam Balance Pad
- ☐ Grip Dynamometer
- ☐ Goniometer / Inclinometer
- ☐ Plate, Handheld and Cuff Weights

CONSENT FOR TESTING

- ☐ Have client read and sign the attached consent form

MUSCULOSKELETAL TESTING

1. Obtain Height (in.) and Weight (lbs.)
2. Obtain Resting Heart Rate and Calculate Maximum HR (220 – Age); X (85) = Max. HR
   If the applicant exceeds the 85% of max heart rate that specific individual test should be stopped, the applicant shall be given a 90 second rest break and then the overall test is continued. If they continue to exceed the 85% of heart rate after 90 seconds, then the entire test is stopped.

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

3. Obtain Resting Blood Pressure (if >160/100 STOP)
   If at any point during testing, the test is stopped due to elevated heart rate and/or blood pressure, this IS NOT considered a "failed" test. The test is simply being stopped due to safety measures.
4. Gross Cervical ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
5. Gross Lumbar ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
6. Gross Upper Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.
7. Gross Lower Extremity ROM Screen:
   Document any measurements (in degrees) that are NOT within normal limits. Note any complaints of pain.

JOB REPLICATED TESTS

Pre and Post-heartrates are monitored then recorded, and the clinician will state the applicant's ability to meet the job requirement safely. If safety cannot be completely assured without reasonable accommodation, the clinician may offer safe modification suggestions where appropriate.

A NOTE ABOUT JOB REPLICATED TESTING

Best practices recommend testing in this section be performed in a 'round-robin' circuit style to better approximate the varied job demands of a typical workday, in this fashion – not unlike cross-training in a gym setting - each repetition of one test would be followed by another test sequentially on the 1st until one repetition is performed for every test.

This would be the completion of one full circuit. The circuit would then be repeated for the set number of repetitions – in this case, six – until the applicant has performed all testing tasks the recommended (6) number of times. This is not a timed test, but the applicant is expected to perform it – in its entirety – within 40-50 minutes from start to finish.

After each test, evaluator must note the following:

- ☐ Heart Rate
- ☐ Reported Discomfort / Pain (if appropriate)
- ☐ Score (Pass / Fail)
- ☐ Limiting Factors (if appropriate, consider noting the following):
  - ☐ Perceived Effort – Low or Self-Limiting
  - ☐ Muscle Recruitment – Kinesio-physical Signs
  - ☐ Trunk Countenance – Kinesio-physical Signs
  - ☐ Base of Support – Kinesio-physical Signs
  - ☐ Performance Pace – Coincides with Pain & Effort Measures
  - ☐ Performance Pace – Coincides with Kinesio-physical Signs
  - ☐ Performance Control – Coincides with Kinesio-physical Signs
  - ☐ Performance Safety – Coincides with Kinesio-physical Signs

BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 5 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Positioning mechanical conduit pipe bender closer to work site – Push / Pull
Description	Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform a sustained, 72 lb. forward-pressure push for 60 feet, then a stop, followed by a sustained, 72 lb. reverse-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site.
Procedure	Clinician will have the applicant perform a sustained 72 lb. forward-pressure push 60 feet followed by a stop, and then a sustained, 72 lb. backward-pressure pull 60 feet task to approximate the job requirement of transporting and positioning the mechanical conduit pipe bender closer to the work site. Clinician will have the applicant perform the pushing and pulling activity from waist height for 60 feet in each direction while ensuring safe body mechanics are observed until the job requirement is met. Applicant will then move on to the next task in the circuit. The job requirement is met when 6 circuits are satisfactorily completed. Instruct the applicant as follows: *"This test you will perform is both pushing and pulling. We would like for you to start by standing with your hands at your side, feet shoulder width apart and keep your back straight to properly push 72 lbs. forward-pressure as safely as you can for 60 feet. Then we'd like you to stop and return by pushing the load 60 feet back to your starting position.* *The key to this test is that we would like you to push smoothly with a steady pace and pressure the full 60 feet - without checking on losing control of the load. We'd like you to then stop safely. On your return, we'd like you to pull the load again with a steady pace and pressure to your starting position - without jerking or losing control of the load. We'd like to see you perform this task safely, without any loss of balance and without any bodily discomfort associated with it. We'll repeat this - part of each testing circuit - for a total of 6 times."*

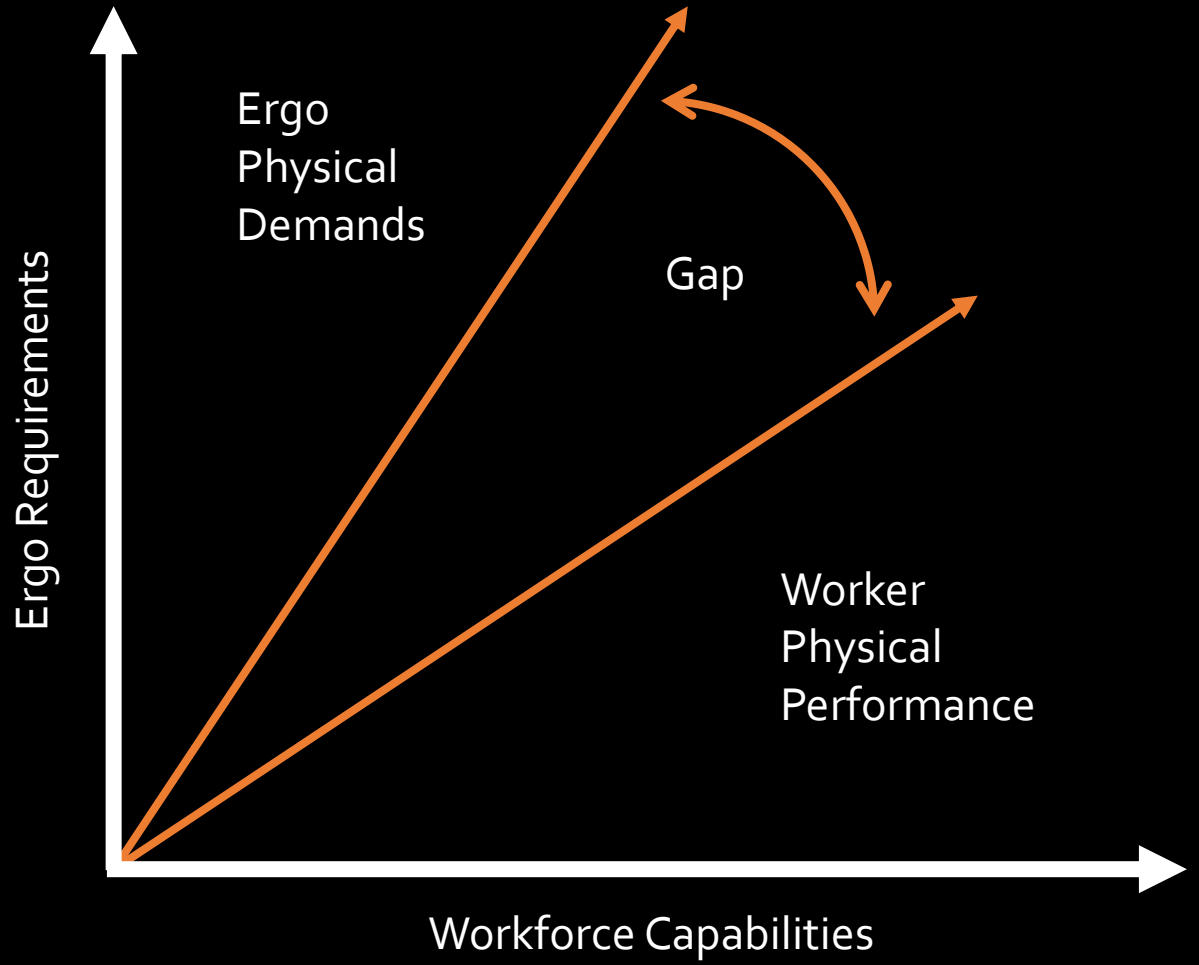
BACK SCHOOL 2019 Sample Company POST PTO RTW Manual – Electrician

Electrician Task 6 - Maintain all features of the plant mechanical and electrical components for safe operations

A. Repair and replace worn machine and pump controls, alarm, laundry, food and beverage electrical systems

Title of Job Tested	Operating hand and power tools, parts and equipment - Gripping / Reaching (Awkward)
Description	Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position.
Procedure	Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. Side-lying on either side and kneeling on either limb can be sought by the applicant for comfort. Clinician will have the applicant perform 2 timed minutes of a sustained 20 lb. grip using a calibrated hand exerciser while maintaining 4 lbs. shift in forward reaching to approximate suspending a hand or power tool during repair and replace work. This sustained gripping / reaching motor task will be performed in either kneeling, squatting, stooping or side-lying for 2 minutes to approximate the job requirement of repair jobs in confined spaces under awkward posture conditions. Weight will be suspended between chest and shoulder height, regardless of position. Best practices recommends testing in a new awkward posture on each testing circuit. Both hands can be used to keep the 4 lbs. shift, so long as the weight is passed between hands and only 1 hand individually maintains the suspension aloft through the test. A wrist cuff weight can be used with the dynamometer or grip exerciser. After 2 timed minutes, the applicant will stand and proceed with other tests. Clinician will have the applicant perform this activity while ensuring safe body mechanics are observed until the job requirement is met after 2 timed minutes. Applicant will then move on to the next test in the circuit. Instruct the applicant as follows: *"This test you will perform is sustained gripping and reaching. We would like for you to start by either kneeling, squatting, stooping or lying at your side with your hand holding a 4 lb. weight shift while maintaining 20 lbs. of grip. You will be doing a sustained task that approximates performing a repair for 2 minutes. We will them have you stand up. The key to this activity is that we would like you to sustain kneeling, squatting, stooping or side-lying while performing the task and obtain standing without any loss of balance or associated bodily discomfort. We'll repeat this – in a different position each time – as part of each testing circuit, a total of 6 times."*

RTW Data Gap Analysis



Physical Demand Data-Driven SMART Goals

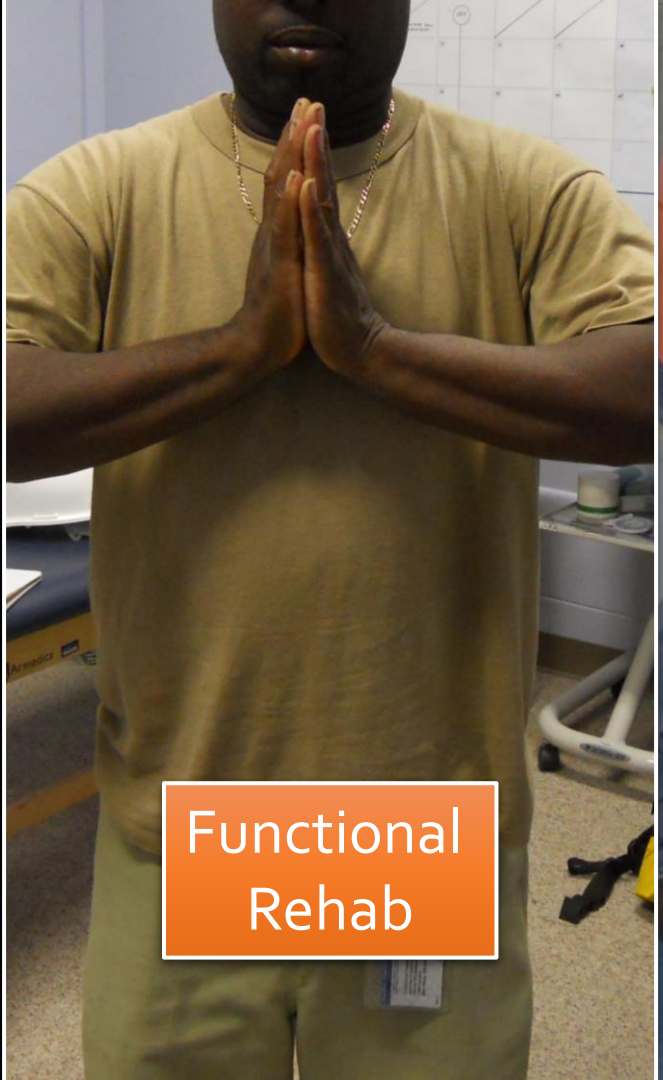
Specific – To the physical demands of the job

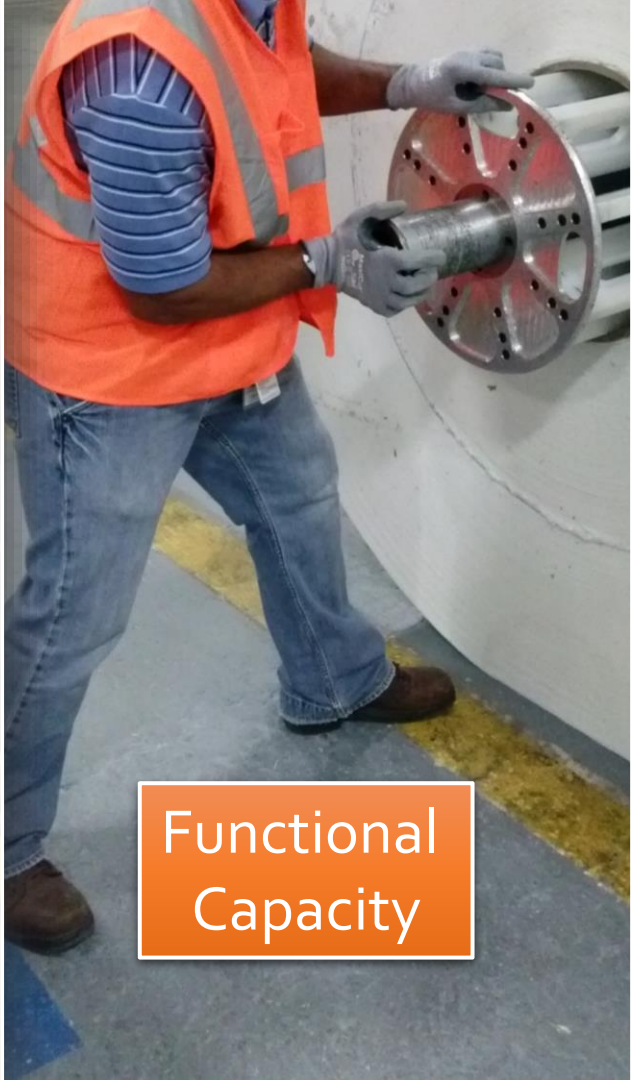
Measurable – Sequential to physical job demands

Attainable – Right-sized to manage and matter

Relevant – To physical job demands vs. clinical unfit

Time-Based – Return to work in a timely manner


Functional
Rehab


Functional
Capacity


Rapid Return
To Work

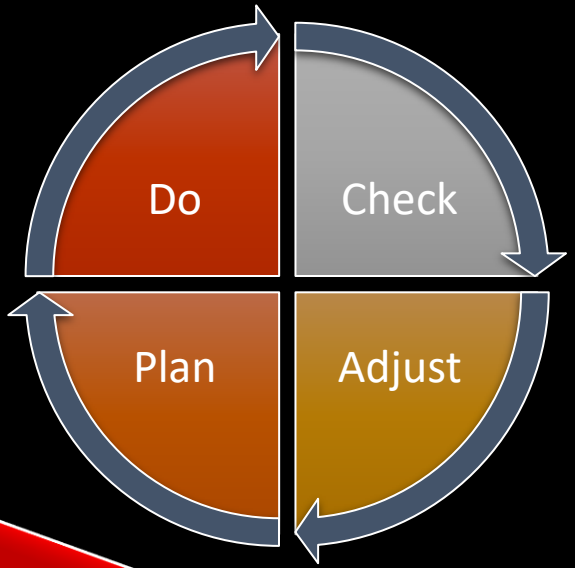
NATIONAL ERGONOMICS & Conference ErgoExpo

Physical Demand Gap Analysis:

The Bridge Between High-Performance Workforce and Peak-Safety Workplace

Presented by: Matt Jeffs DPT PSM REAS
matt@abilityondemand.com
matt@thebackschool.net

Lean Gap Analysis



‘5 Why’ Root Cause Analysis

Standard Work

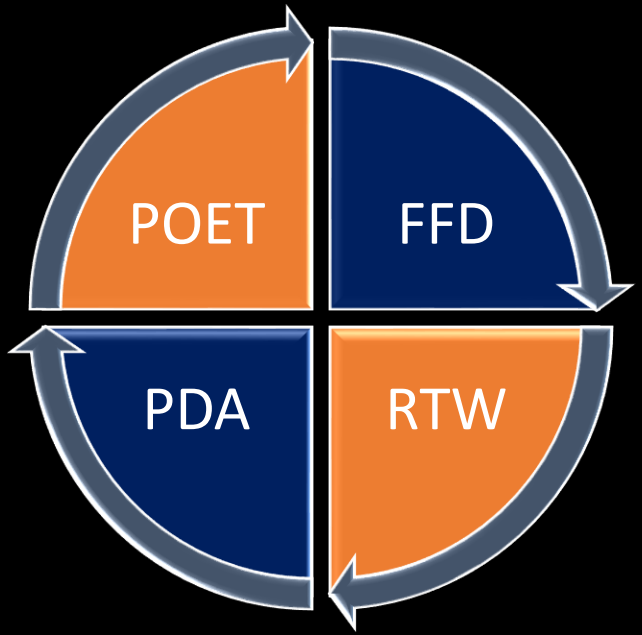
Kaizen – Continuous Improvement

The PDA Gap Analysis Process

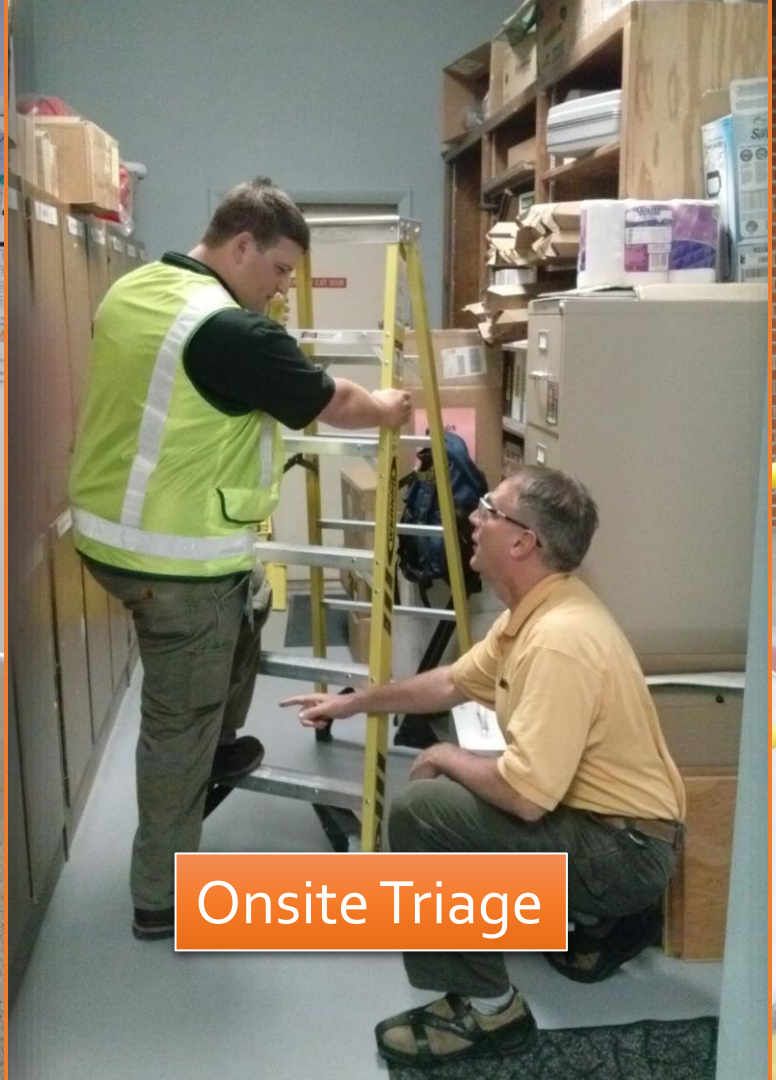
1. What is the most effective and efficient way to demonstrate a workplace that puts well-being first – and why does it drive Lean Ergonomics and Safety Process Improvement?

The PDA Gap Analysis Process

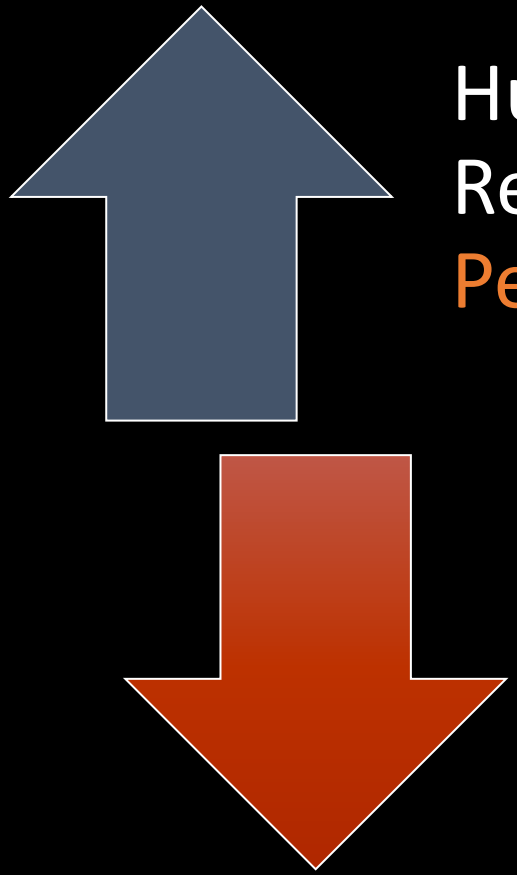
The PDA Gap Analysis Process




Fit-For-Duty


Onsite Triage

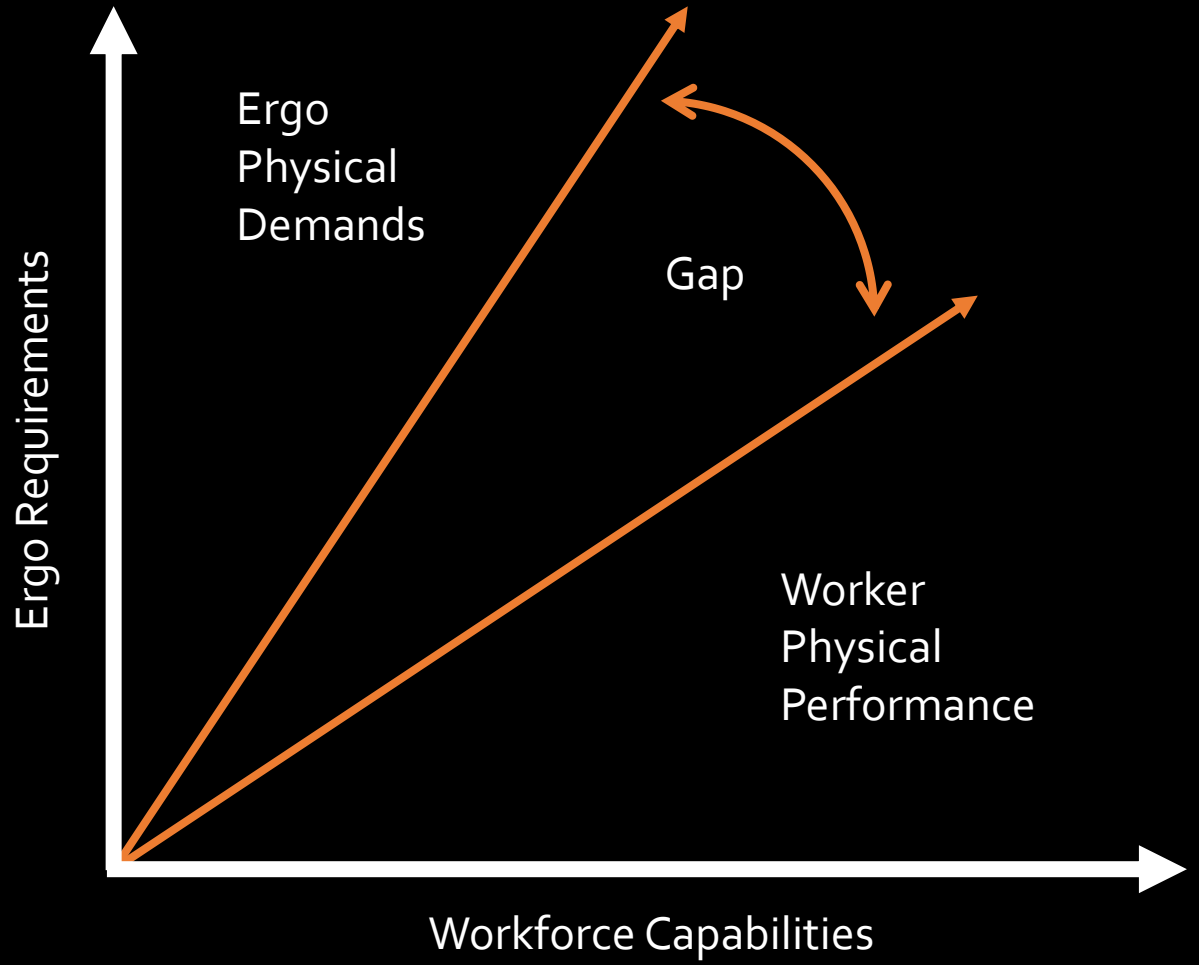

Stretch-&-Flex



Human
Resource
Performance

Environmental
Health & Safety
Remediation

PDA Data Gap Analysis



ISO 45001 - Occupational health and safety

Over 7 600 people die each day from work-related accidents or diseases - that's over 2.78 million every year*.

The burden of occupational injuries and diseases is significant, both for employers and the wider economy, resulting in losses from early retirements, staff absence and rising insurance premiums.

To combat the problem, ISO has developed a new standard, ISO 45001, *Occupational*

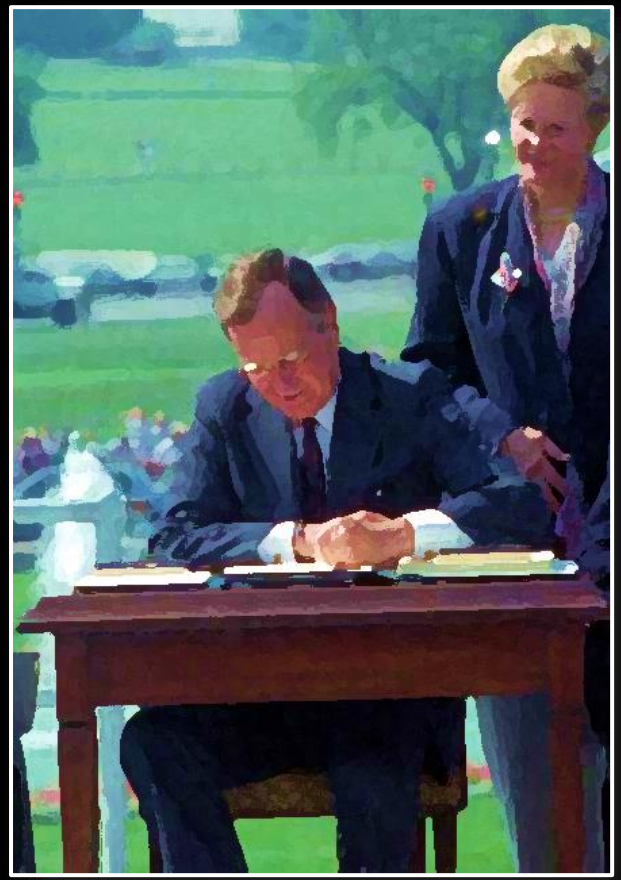
Management system standards

Providing a model to follow when setting up and operating a management system, find out more about how MSS work and where they can be applied.


"Thanks, friend."
"We're good."
"Much obliged."

TECHNICAL ASSISTANCE MANUAL:

- Title I of the ADA - The ADA is intended to enable persons to compete in the workplace based on the same performance standards and requirements that employers expect of all persons holding that job title.



Onsite Health & Safety Specialist

by Margot Miller, PT

Facilitating Stay at Work/Return to Work

The therapist plays a key role in decreasing unnecessary work absence and keeping patients at work and productive.

Millions of American workers develop health problems that either temporarily or permanently keep them out of work each year. In most cases, this involves a relatively brief recovery period. However, approximately 10% of these workers are affected by conditions that result in significant work absences, and some can leave an individual out of work permanently. The estimated total annual cost of disability benefits paid under sick leave, workers' compensation, short-term and/or long-term disability, SSDI (Social Security Disability Insurance), FMLA (Family Medical Leave Act), and ADA (Americans with Disability Act) exceeds $100 billion. This article will focus on the therapist's role in facilitating Stay at Work or Return to Work (SAW/RTW) to decrease long duration absences from work.

The American College of Occupational and Environmental Medicine's "Preventing Needless Work Disability by Helping People Stay Employed" reported that the fundamental reason for most medically related lost work days and lost jobs is not medical necessity. Rather it is nonmedical decisions made during the SAW/RTW process, including administrative delays for treatment or specialty referral, lack of transitional or modified work, ineffective communication, and logistic problems.

The steps involved in determining SAW/RTW include the following:

1. A medical condition or precipitating event occurs—determine whether the worker can perform the job.
2. Assess worker's current ability.
   a. Functional capacity—determine what the worker is able to do today.
   b. Functional limitations—determine what the worker cannot do today that they can normally do.
   c. Medical restrictions—determine what the worker cannot do due to the potential of doing medical harm.
3. Understand/identify the job requirements.
4. Compare worker's job requirements to that person's current abilities.
5. Take necessary actions to return the worker to work. This may include modifying current job duties or identifying an alternate duty job to enable return to work.

When the medical condition will not worsen with work, when the worker wants to work, and when the employer will allow temporary modification of the job demands if needed, the above process steps can be accomplished quickly. It is at this point that therapists can be involved to facilitate SAW/RTW.

ASSESSING THE WORKER'S CURRENT CAPACITY

Functional capacity testing is appropriate to identify the impaired worker's current abilities as well as to identify limitations that could affect SAW/RTW. The testing should be job specific, testing the worker's functional abilities specific to the job requirements to establish a baseline of functional abilities. This functional capacity test serves as a work status test. A job-specific conditioning or job-specific functional restoration program can then be developed, in conjunction with appropriate treatment, to restore movement, maximize strength, decrease pain/symptoms, and improve functional abilities. Repeat functional tests are performed to assess functional gains. Education targeted to the medical condition and relative to the specific job functions increases the worker's knowledge and problem solving using injury prevention and rehabilitation principles. Job coaching performed at the worker's workstation assists integration of education principles, ie, appropriate movement patterns, posture changes, and strategies to reduce reported discomfort and improve safe job performance. As function improves, the worker should be able to perform more original job duties, until able to perform 100% of the job duties.

Matt Jeffs, DPT, CEAS II, performing job coaching with a worker to facilitate safe job performance.

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