

Ergonomics and Return-to-Work: Beyond the Regulations

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Introduction

- Ergonomics is an interdisciplinary science combining engineering, psychology, biomechanics, sociology, and physiology
- It is a complex tool that can both prevent incidents and reduce the organizational & personal costs associated with incidents
- This presentation will cover:
 - Statistics on CTDs
 - Introduction to ergonomics
 - Ergonomic program elements
 - Process for introducing ergonomics to the RTW process
 - Psychosocial aspects of RTW



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CTD Statistics

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Cumulative Trauma Disorders

(classified as an occupational illness by US DOL)

- 308,000 or 62% of all occupational illness cases were due to disorders associated with repetitive motion related trauma (not including low back disorders)
- Musculoskeletal disorders (MSDs):
 - 7% of the medical problems of the general population
 - result in 14% of all physician visits
 - these visits yield 19% of hospital stays and
 - overall 14% of the population report some degree of limitation their activities due to medical problems while 62% of those with MSDs report some degree of limitation on activity

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Cumulative Trauma Disorders (cont)

(classified as an occupational illness by US DOL)

- 23,000 cases in 1981; 223,600 in 1991
- Medical costs and lost wage claims for work related injuries double every five years
- 18% of all occupational illness in 1981; 61% in 1991
- \$68 billion direct costs in 1994 expected to rise to \$140 billion by the year 2000
- Average cost per claim \$8,000-\$24,000; Indirect costs = 2-3 x direct costs
- [Data from NIOSH, 1997, Liberty Mutual, 1994, US DOL-Bureau of Labor Statistics, 1991]



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Low Back Disorders

(classified as an occupational injury by US DOL)

- 65% of work related injuries involving days away from work are back related. Among the back related claims:
 - 42% were primarily due to pushing/pulling related overexertion
 - 58% were due to holding, carrying, or turning overexertion
- 50% of working aged people report low back pain each year
- Average loss of 28.6 days/100 workers each year, including a mean of 9 days bed rest
- 3rd ranking surgery in the United States (258,000/yr)
- Represents 10% of all chronic health conditions



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Low Back Disorders (cont)

(classified as an occupational injury by US DOL)

- \$20–50 billion annual cost in US
- \$2000–4,700 mean direct cost/claim – indirect costs 2–3x direct cost
- [*Data from US BLS, 1994, Nachemson, 1992, Anderson, 1991; Springler et. Al., 1986; Kelsey, et. Al., 1980; Sternback, 1986*]

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Introduction to Ergonomics

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What is Ergonomics?

“Ergonomics is the interdisciplinary science behind the fusion of humans, machines, and the environment resulting in a more healthy, enjoyable, and efficient system.”

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- Study of human capabilities and limitations at work
- Compares human capabilities and limitations to system requirements
- Optimizes the system to maximize human capabilities and not exceed human limitations
- Focuses on meeting stakeholder requirements for the system

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Ergonomics Engineering Model

- WMSDs happen because there is a “gap”
- Gap is defined by four separate, integrated systems
- Interventions must occur in each system



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Solution Methods

- Engineering controls
 - physical change in the equipment
 - if appropriate, effective and usually permanent
 - can result in significant process/quality benefits
- Administrative controls
 - administrative (or management) decision required
 - adding staff, job rotations
 - usually temporary, but often faster to implement
- Work practices controls
 - changes in the organization, task, and procedures
 - includes training
 - usually temporary requiring significant effort to maintain
- Best solution mixes all three



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Ergonomic Risk Factors

ERGONOMIC JOB FACTORS	ERGONOMIC RISK FACTOR COMPONENTS OF JOB FACTORS
Physical demands of the work tasks or job	<ul style="list-style-type: none"> • Force • Repetition • Work postures • Duration • Local contact stress
Workstation layout and space	<ul style="list-style-type: none"> • Work reaches • Work heights • Seating • Floor surfaces • Contact stress
Equipment used and objects handled	<ul style="list-style-type: none"> • Size and shape • Weight and weight distribution • Handles and grasp surfaces • Vibration
Environmental conditions	<ul style="list-style-type: none"> • Cold and heat • Glare
Work organization	<ul style="list-style-type: none"> • Work-recovery cycles • Work rate • Task variability



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Work-related Musculoskeletal Disorder Hazards in Industrial Environments



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Ergonomic Program Elements

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Program Elements Critical to Soft Tissue Injury Reduction

- Active commitment from all levels of management and employees
- Written facility implementation program
- Proactive and reactive workstation review and evaluation using appropriate measurements and criteria
- Implementation of ergonomic risk factor controls
- Program activity and effectiveness evaluations with corrective action



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Program Elements Critical to Soft Tissue Injury Reduction (cont)

- Facility Ergonomics Teams
- Job Physical Requirements Demands analysis for each task
- Tracking and reporting program
- Program evaluation and implementation of corrective actions
- Recordkeeping
- MSD management procedures
- General awareness and job-specific training program
- Provision of needed organizational authority and resources



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Ergonomics and the RTW Process: A Literature Review

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Current Literature

- Greatest determinants of RTW and disability for low back pain are: pain, physical functioning, affective status, all subjective (Linn, et al, 2001)
- Demands analyses can serve as the basis for devising a holistic treatment plan and can facilitate work reintegration (Canelon, 1995)
- An aggressive RTW program, including work hardening and addressing psychosocial issues, are cost-effective and can prevent chronic disability (Greenberg, et al, 1996)
- Greatest determinants of time off work for upper extremity cases are: psychosocial and physical demands (Bonzani, 1997)



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Current Literature (cont)

- Patients with hand/arm symptoms for more than one year were found to have significant improvements with pharmacologic intervention, work simulation, and psychological treatment (Barthel, 1998)
- John Hopkins implemented a RTW program including an IH to facilitate placement according to ergonomic guidelines. After 10 years, 55% decrease in LWD cases, 50% reduction in LWDs, with an increase in RWDs (Bernacki, et al., 2000)
- An integrated job analysis can guide meaningful pre-placement exams, physical agility tests, training criteria, rehab, and RTW (Schulze, 2001)



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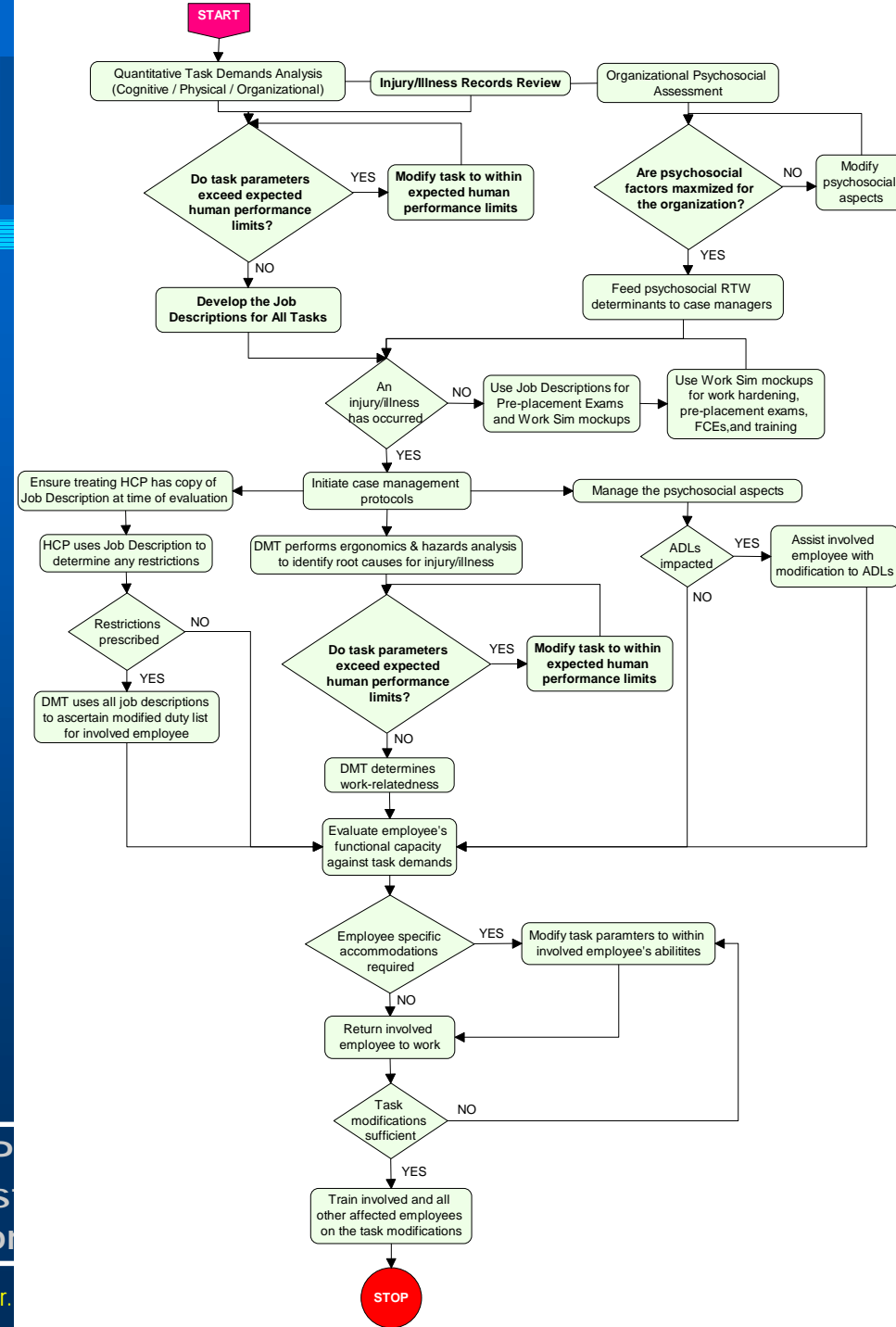
Process for Incorporating Ergonomics into the RTW Process

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Flowchart

- Please refer to the handout
- Charts the RTW process from an ergonomist's perspective
- Will refer to each piece along the way.



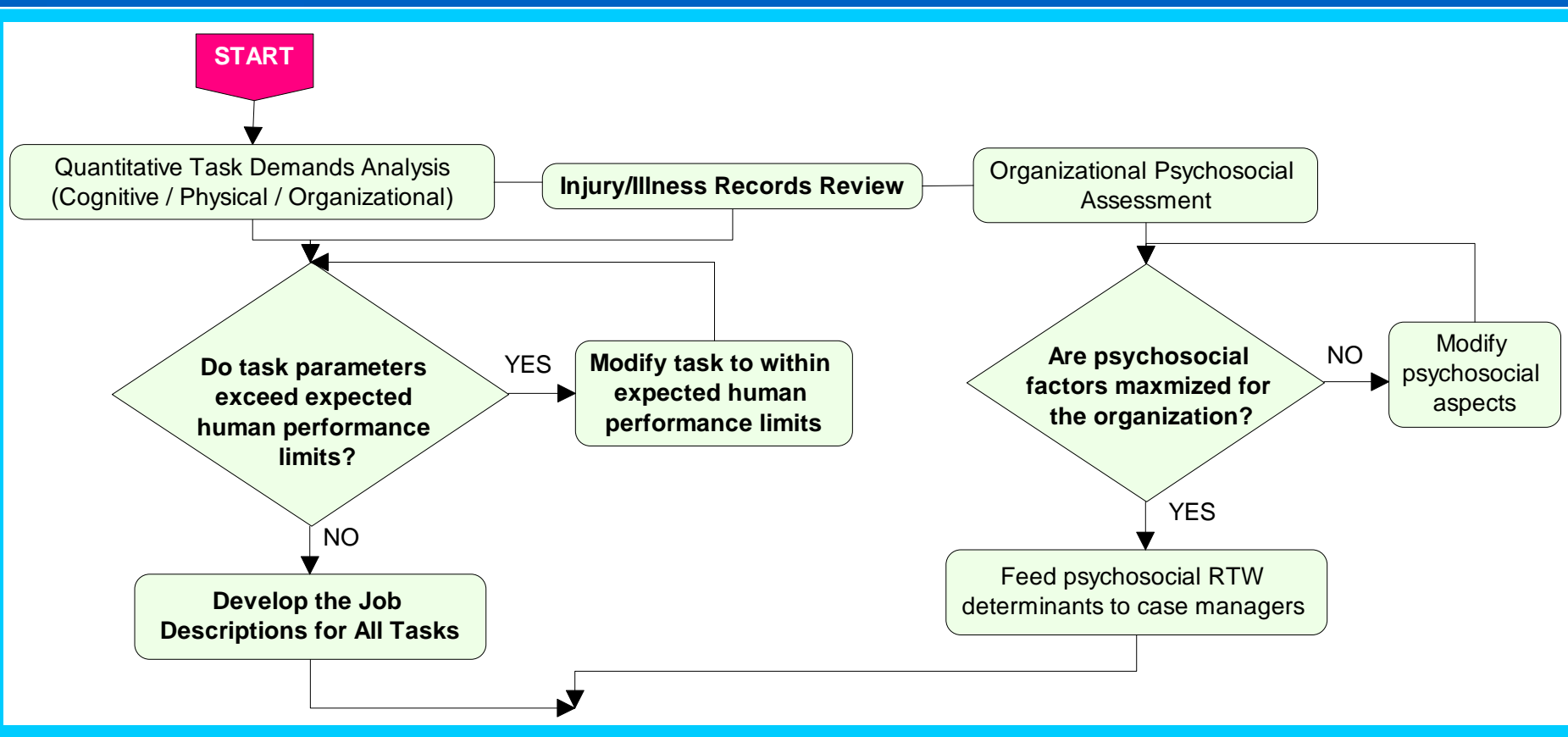
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First Step: Prevention

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Prevention is the First, Best Step



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Most Critical Step: Quantitative Task Demands Analysis

- The best ergonomic and RTW effort begins with a good understanding of the task
- Needs to be quantitative
- Must use a scientific, objective basis



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Quantitative Task Demands Analysis Must Include:

- Biomechanical
- Timed Activity Analysis (frequency, internally or externally paced)
- Physical Effort (load, isometric and dynamic)
- Environmental (ambient conditions and protective ensemble)
- Mental and Perceptual Requirements (cognitive demands)
- Organizational factors



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Injury/Illness Records Review

- For existing processes
- Will help ascertain the risk level
- Will focus your efforts

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Analyze task

- Using established methods of ergonomic analysis, analyze the task
- Compare the analysis results to established guidelines for human performance
- If the task exceeds human performance capabilities, reduce the task demands
- This will reduce the risk gap and thereby reduce the number of MSDs



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Job Descriptions

- A standard form needs to be used to capture all the data from the Quantitative Task Demands Analysis
- Needs to be databased for quick reference by the:
 - Disability Management Teram (DMT)
 - Health Care Professional (HCP)
 - Human Resources
 - Employee
 - Safety & Health team members



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Organizational Psychosocial Assessment

- Macro (organization) and micro (personal) level
- Formal & informal communication analysis
- Procedural reviews
- Job Satisfaction Survey
- Roles & responsibilities reviews
- Conflict resolution procedures
- Useful for predicting RTW profile
- Also useful for your Behavior Based Safety processes



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Modifying Psychosocial Aspects

- Ensure RTW protocols incorporate psychosocial issues
 - Warning signs of depression
 - Contact with EAP
 - Maintain communication with peers and supervisors
 - etc
- Ensure supervisors and staff are trained on
 - behaviors, attitudes, and motivations regarding injury prevention and issues in RTW
 - communication issues with regard to RTW issues,
 - conflict resolution with regard to RTW issues,
 - organizational roles that promote a positive work atmosphere



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Modifying Psychosocial Aspects (cont)

- Educate supervisors and staff about the psychosocial issues with long-term absence from work.
- Ensure a reporting mechanism to standardize responses from the EAP system.
- Offer onsite workshops or in-services for workers and families



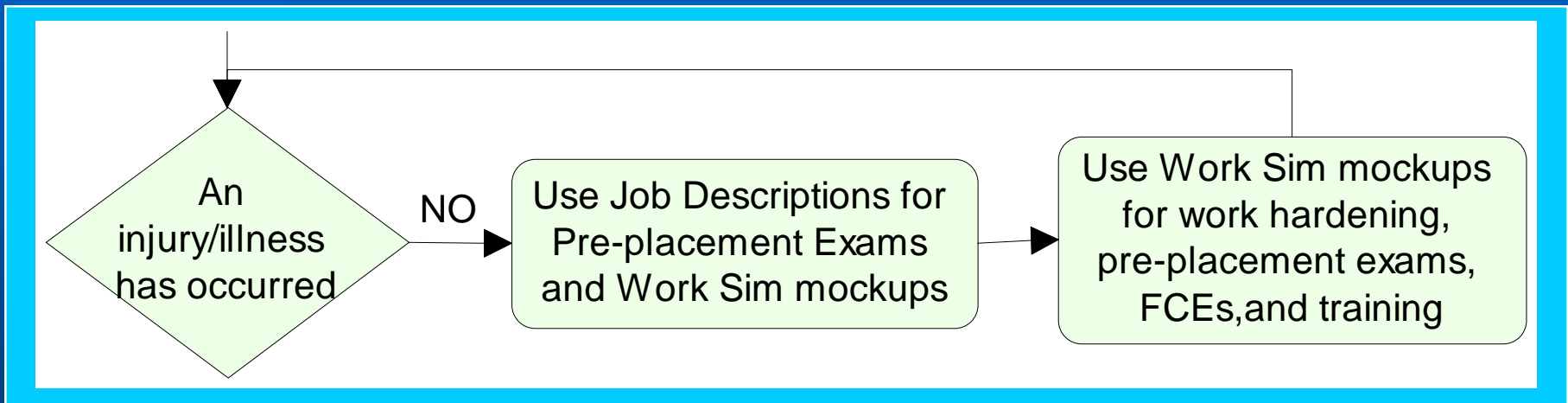
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Proactive Approach



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Using Demands Analyses Proactively



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Using the Demands Analysis Data

- Data can be used to set-up appropriate pre-placement exams
- Define the human population with the necessary capabilities
- Develop work simulations for training, pre-placement exams, and work hardening



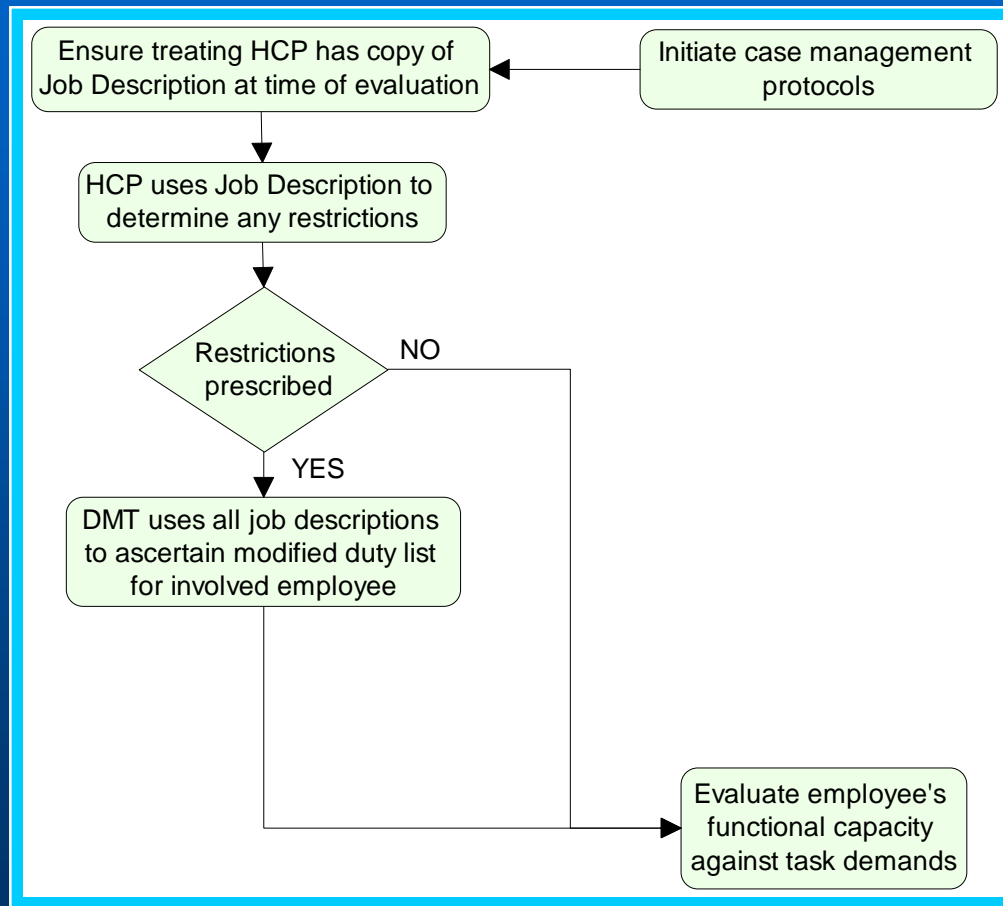
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Ergonomics and Medical Management

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Using Demands Analyses Reactively



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So now an incident has occurred...

- It is important the the Health Care Professional (HCP) is provided good data regarding task demands during the initial evaluation and during any follow-up assessment
- The HCP will use the data to determine if restrictions are needed
- If restrictions are needed, then HCP will be able to more directly prescribe them versus just doing so generically
- The Disability Management Team (DMT) can use the HCPs diagnosis and prescription along with the Demands Analysis data to identify light duty assignments



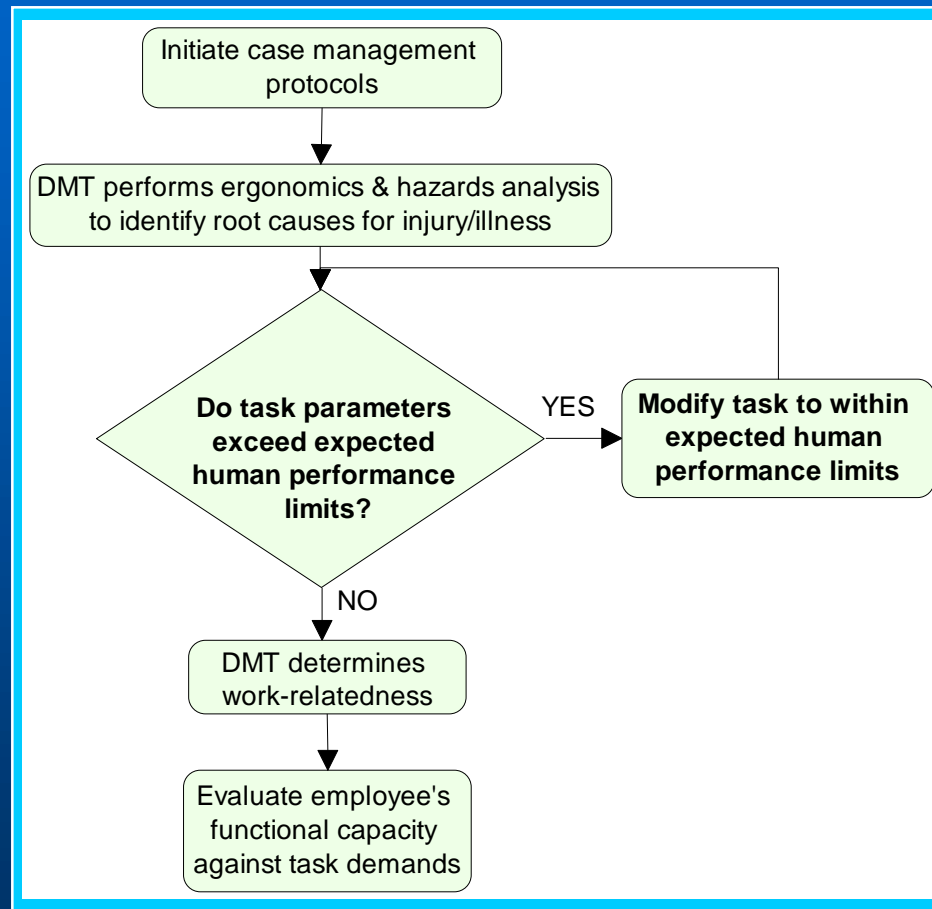
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Reactive Approach



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Ergonomics During the RTW Process



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Could there still be risks in the workplace?

- Even though you may have spent a great deal of time and effort in the first critical step of modifying tasks to be within human performance limits, there may still be risk factors inherent in the workplace
- A check of the workplace and task is necessary to ascertain if risks still exist.
- If risks exist, the task still needs to be modified
- Finally, using the quantitative data, a defensible determination of work-relatedness is possible



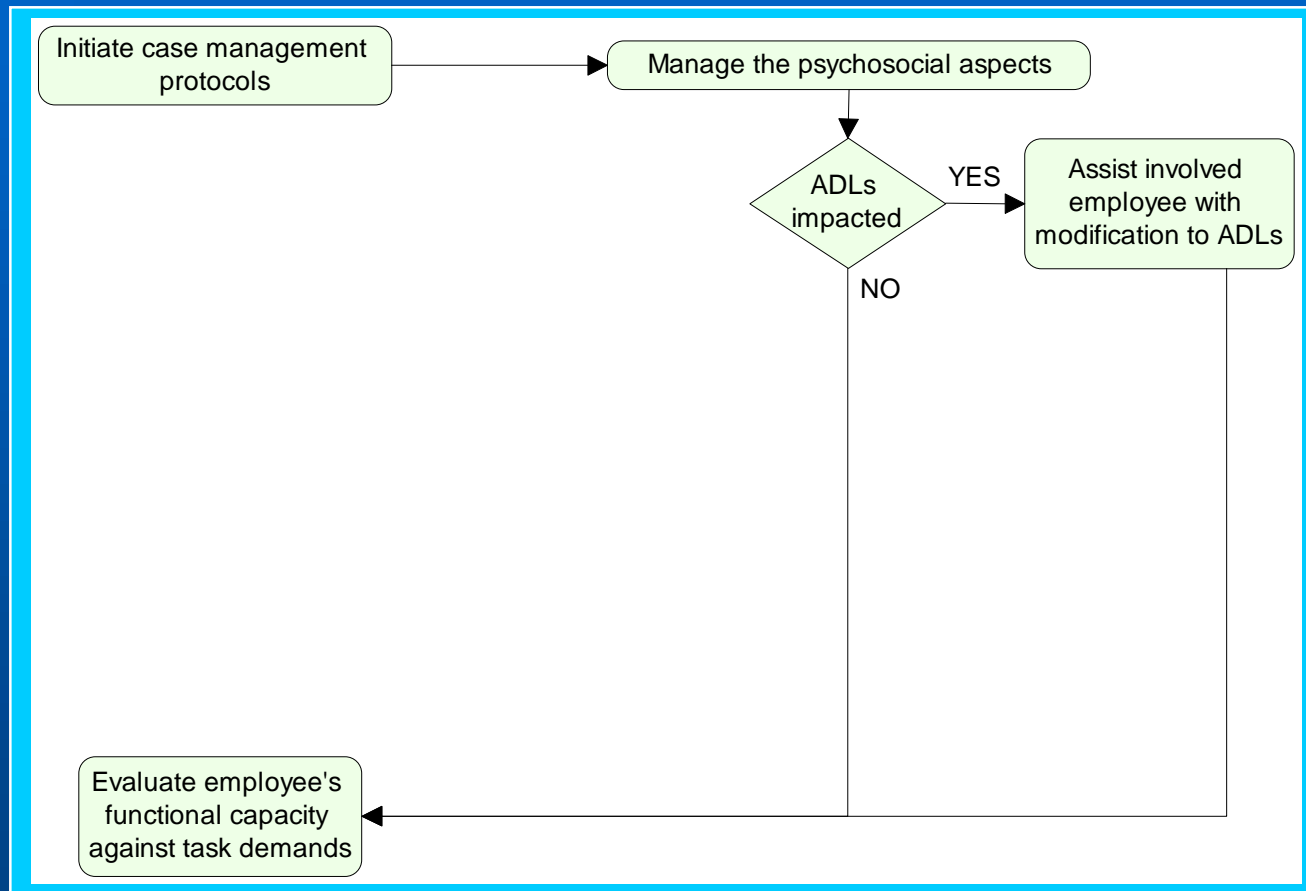
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Psychosocial Aspects of RTW

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Dealing with Administrative and Psychosocial Issues



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Manage the Psychosocial aspects

- Depression, isolation, helplessness and anxiety
- Self-esteem issues
- Anger and frustration
- Possible substance abuse issues
- Loss of income and other financial stressors
- Concern with peer expectations and pressure
- Mental health of the individual prior to the accident is a strong predictor of days away from work
- Injured persons have to accommodate and adjust to their newly limited physical capacity
- Feels desperate for the situation to change but doubts the current medical intervention.



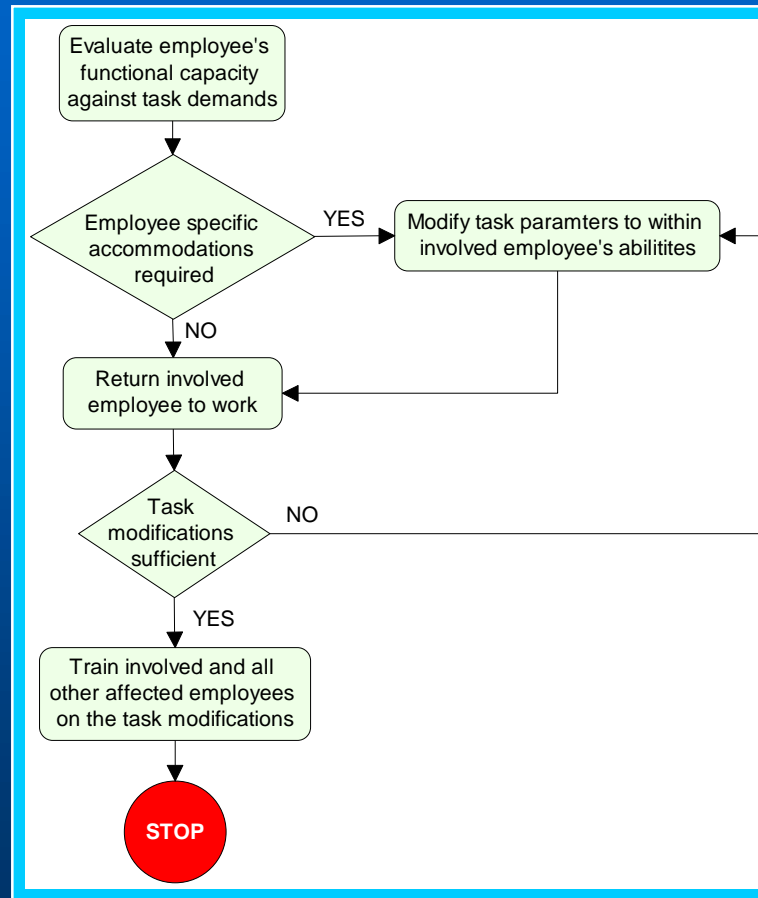
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Re-integrating the Involved Employee

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Returning the Employee to Work



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Physically Reintegrating the Employee

- First, need to determine if the employee is capable of returning and at what percent
- Requires some type of functional capacity evaluation
- Results of FCE need to be compared against previous task demand analysis
- In some cases, the employee has a permanent impairment that needs to be accommodated in the workplace (recent Toyota and US Airways case)
- If further task modifications are needed, then all affected employees need to be trained in the accommodations



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Psychosocial aspects of re-integrating into the workplace

- When a person is ready to return to work physically it is important that both person and organization is psychologically ready
- When a worker is absent from the job for an extended period of time
 - Significant loss of skill to perform that task can happen
 - Loss of personal relationships
 - Loss of business contacts
 - Loss of job skills and best methods
 - Physical deterioration
 - Loss of personal relationships developed off-work



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Psychosocial aspects of re-integrating into the workplace (cont)

- Monitor the person's performance and job productivity once they are re-inserted into the workforce
- Behaviors of a person returning to work can affect the reactions of co-workers
- Misunderstandings are commonplace because pain levels in people fluctuate
- Supervisor, co-workers, medical personnel, and family all need to reinforce wellness behaviors



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Conclusions

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Ergonomics and the RTW Process: A Necessary Partnership

- Whether regulations or guidelines require it, ergonomics and the RTW process are a necessary and sensible partnership
- It all begins with the recognition of human limitations and system demands
- The greatest determinant of DAW and disability profile is the psychosocial situation, not the medical situation of the incident
- Managing the psychosocial issues throughout the RTW situation and after re-integration is vital



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