Assessing Workstation Safety Integrating Macroergonomics and STAMP

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1. Introduction

- Macroergonomics and STAMP share a common sociotechnical framework.
- These two perspectives will be integrated to illustrate implementation of a safety-relevant intervention.
- We argue that successful workplace interventions require simultaneous integration of scientific/technical knowledge with management/ organizational values and constraints.

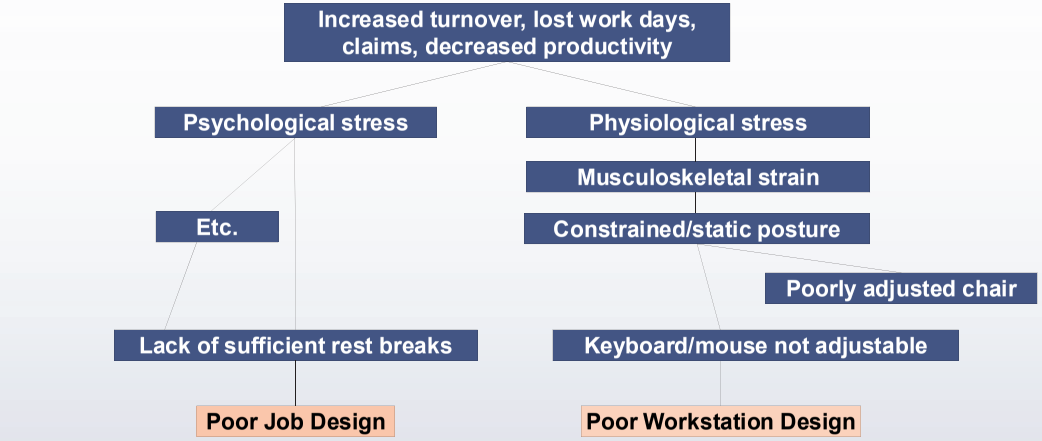
2. The Problem

- Sedentary prolonged computer use is a risk factor for musculoskeletal disorders as well as cardiovascular disease, diabetes, and obesity.
- Workplace ergonomics –combining work design, training and appropriate adjustable workstations—can ameliorate this risk.

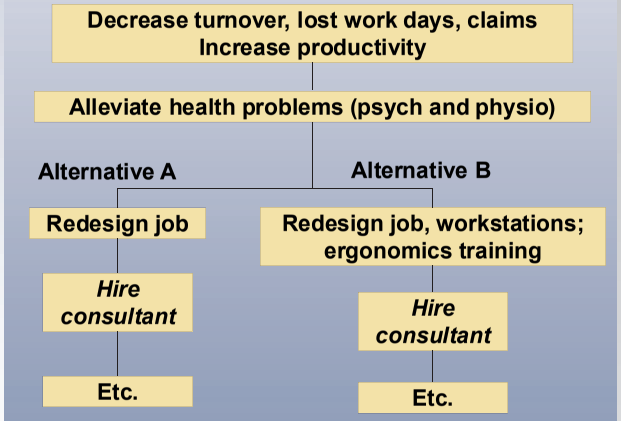
3. The Tools

- A macroergonomic methodology (SAT/IDEAS) allows a multi-functional team to systemically:
  - (a) Assess the problem
  - (b) Develop alternative solutions
  - (c) Develop evaluative criteria
  - (d) Evaluate the solutions in cost-benefit terms
- STAMP can be usefully integrated into the procedure to model solutions.
- Outcome: Application of solution led to successful outcome (reduced symptoms, improved work performance and perceptions related to the organization) in a field trial compared to control group.

4. Problem Factor Tree (simplification). Team, representing relevant stake-holders, defines and contextualizes problems and sub-problems (role for STPA as core component)



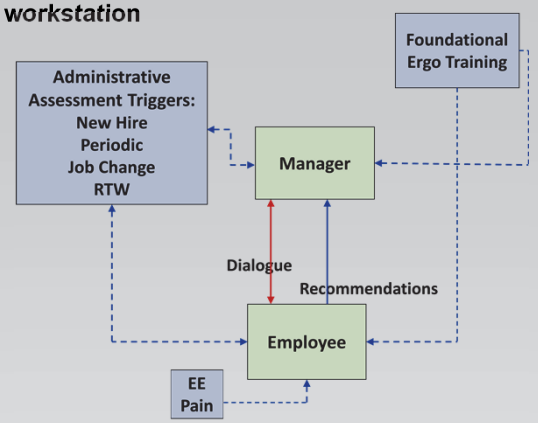
5. Objectives/Activities Tree. Team defines activities which will meet objectives: alternative solutions and interventions



6. Decision Criteria. Team defines preliminary criteria for evaluating alternatives

Scope	Risk of Failure	Costs	Benefits
Help entire organization	Employee resistance	Materials, equipment	Reduced turnover
Long term effectiveness	Management resistance	Human resources	Reduced claims

7. Input-Output Analysis. Description of components of one solution using STAMP-like model: assessment of employee ergonomic workstation



8. Evaluation. Team evaluations of each alternative using previously defined criteria

Alternative	Cost	Risk of Failure	Benefits	Over all
A	-3 ($175,000)	-2	+6	+1
B	-6 ($590,000)	-1	+9	+2