Using Computers to Gather and Provide Ergonomic Intelligence

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Professor Alan Hedge, Cornell University

John Duncan, MiS

Gregory Buscetto, MiS

Dr. Vincent Portera, Future Industrial Technologies

Presentation Content

- Regulations and Risk Assessment (John Duncan)
- Rationale for an Ergonomics Management System + Research (Alan Hedge)
- Implementation Issues (Greg Buscetto)
- Effective training (Vincent Portera)

Who needs an Ergonomics Management System?

Do you know:

1. What workers really do with their time?
2. How proficiently they work?
3. What pace they work at?
4. What postures they work in?
5. If they take recommended breaks?
6. Who is experiencing early signs of injury?
7. Who is exposed to ergonomic risks?
8. How you can directly measure productivity and assess ergonomic interventions that improve the bottom line?

"We are compelled to act. Employees are getting hurt. Workers are being sent home. People are suffering."

Charles Jeffress.
Assistant Labor Secretary for
Occupational Safety and Health

PITTSBURGH BUSINESS TIMES

Businesses battle to keep OSHA from setting ergonomics standards

Some say regulation could put many companies out of business

Investor's Business Daily

What Price Workplace Safety?

New Rules Spark Debate over Science, Business Costs

Cal OSHA Standard

- Any Company that reports a work related Repetitive Motion Musculoskeletal injury more than once in the previous (12) months, must address the following issues:
  1. Worksite Evaluations
  2. Control of Exposures
  3. Employee Training
  4. Job position and any related "like" positions must be evaluated:
  5. Controlling & minimizing RMI exposures through Administrative Controls

Cal OSHA Standard: Computer Tools

1. Worksite Evaluations:

   Computer Based Work Site Evaluation Program.

2. Control of Exposures:

   Work Pacing Activity Based Micro Breaking Software

3. Employee Training:

   Computer Based Training Programs

Cal OSHA Standard : Computer Tools

4. Job position and any related "like" positions must be evaluated:

   Computer Based Work Site Evaluation Program

5. Controlling & minimizing RMI exposures through. Administrative Controls:

   Work Pacing Activity Based Micro Breaking Software

Business Case for an Ergonomics Management System

- Compliance with OSHA Regulations
- Injury Prevention
- Inter-Active Training and Reinforcement of Safe Work Habits utilizing the PC
- Enterprise Resource Planning, Productivity Increases & ROI
- Improve Employee Moral

SMART approach to an Ergonomic Management System

Surveillance — Hazard identification - worker input on WMSD

Monitor — Hazard monitoring + Productivity measurement

Advise — Optimize workpace (Alerts + exercises)

Report — Record of risks worker actions

Train — Ergonomics training

Research Studies

Computers and Ergonomics

- Computers as a disabling technology:
  - Cumulative Trauma Disorders
- Computers As an enabling technology:
  - Manage risks and exposures
  - Educate users
  - Maintain records
  - Measure productivity

Ergonomic Management Software

- Manage Risks:
  - Assess postural risks (RULA)
  - Assess discomfort (Surveys)
  - Assess user issues and record interventions (User notes)

Ergonomic Management Software

- Manage Risks
- Manage exposures
  - Monitor keyboard/mouse use
  - Optimize workpace with effort-based rest breaks
  - Educate users
  - Exercise users
  - Maintain records
  - Measure productivity
  - Management reports

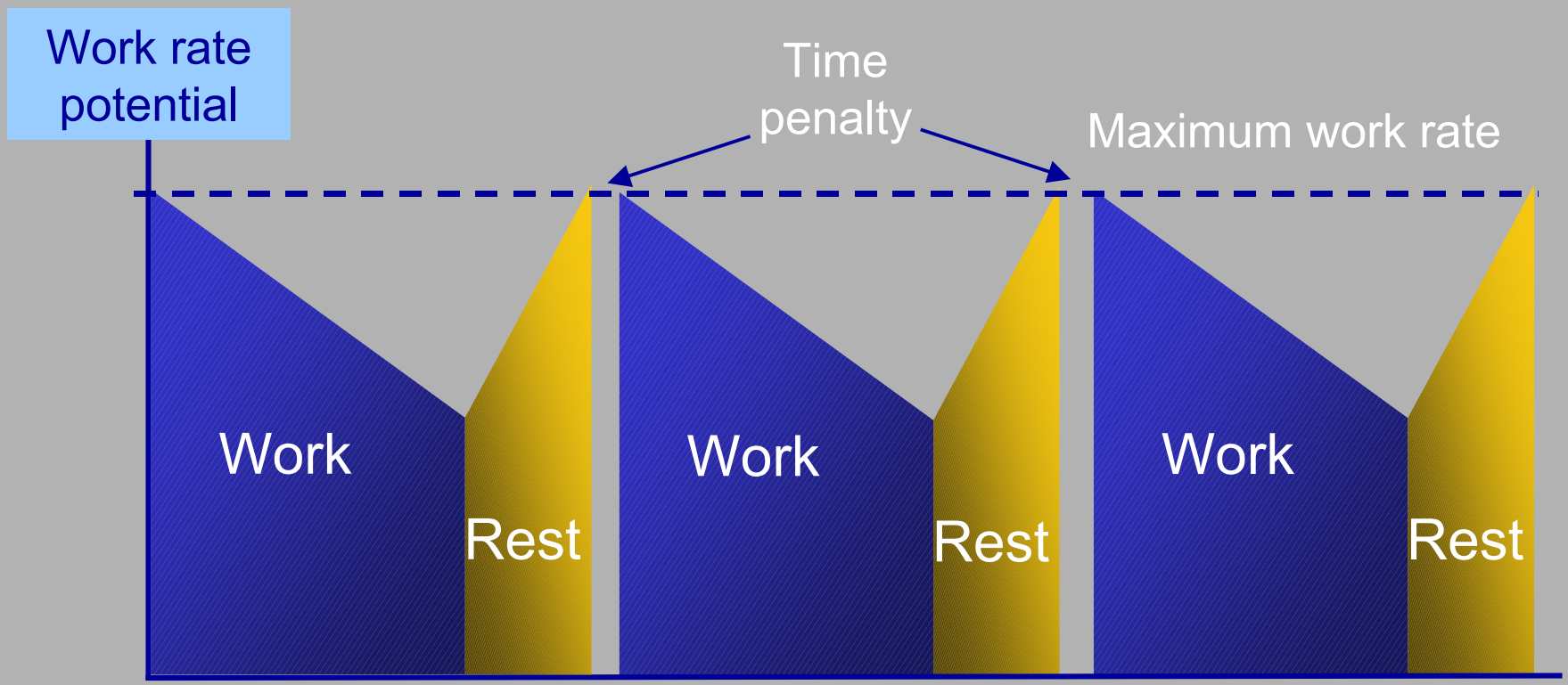
Limitations on Human Performance

- Static work (< 1 min)
- Heavy dynamic work (< 30 mins)
- Paced work (several hours)
  - work activities performed in low risk postures interspersed with optimal rest and recovery periods that include appropriate exercise and ergonomic information

VKP model of Human Performance

(Janaro & Bechtold, 1985)

- In a physically demanding task, subjects who worked less time and took rest breaks produced a 12.8% increase in work output!



Discretionary Rest Breaks

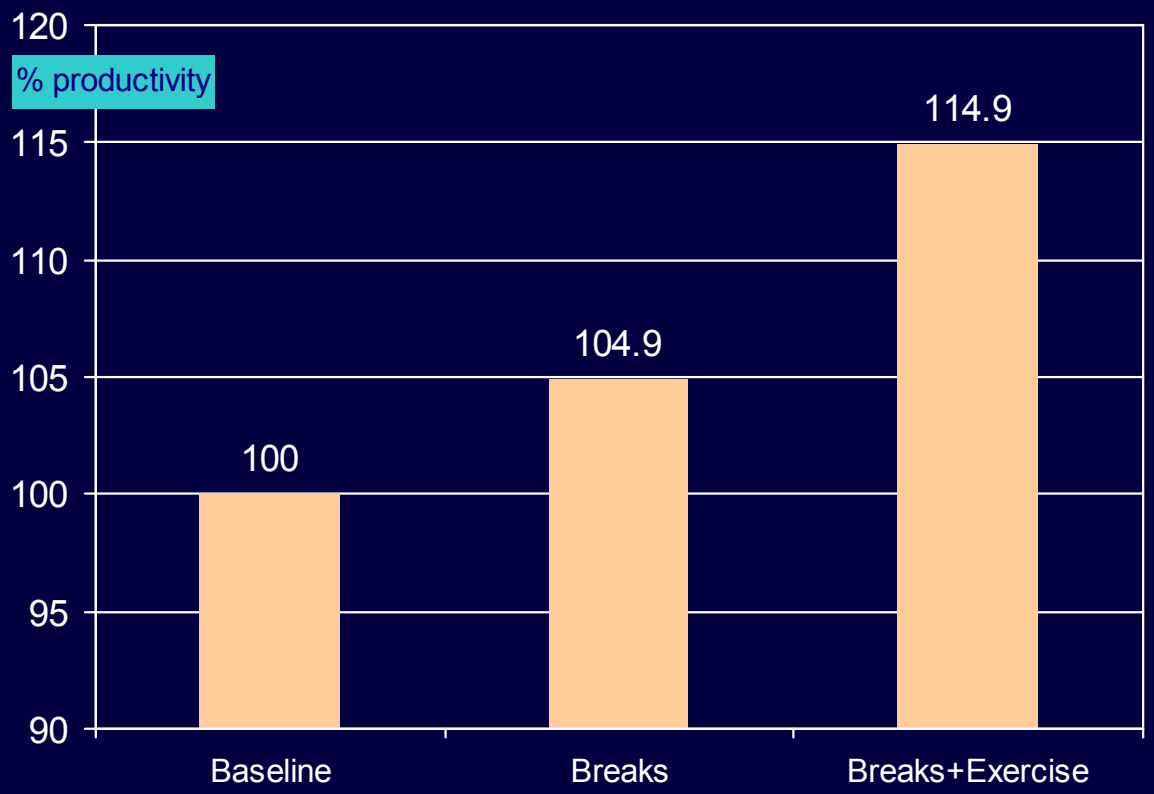
(Henning *et al.*, 1996)

- Studied effects of discretionary, short rest breaks with and without feedback.
- 2 experiments where typists received feedback about their rest break utilization (target of 30 secs. every 10 minutes).
- Results show that "rest breaks can reduce musculoskeletal discomfort and the risk of repetitive strain injury during intensive computer work."
- Feedback about discretionary rest breaks also reduced errors.

Rest Breaks and Computer Work

(Henning *et al.*, 1997)

- Compared computer workers given rest breaks (3 x 30 secs. + 3-min. per hour) with workers given rest breaks + stretching exercises.

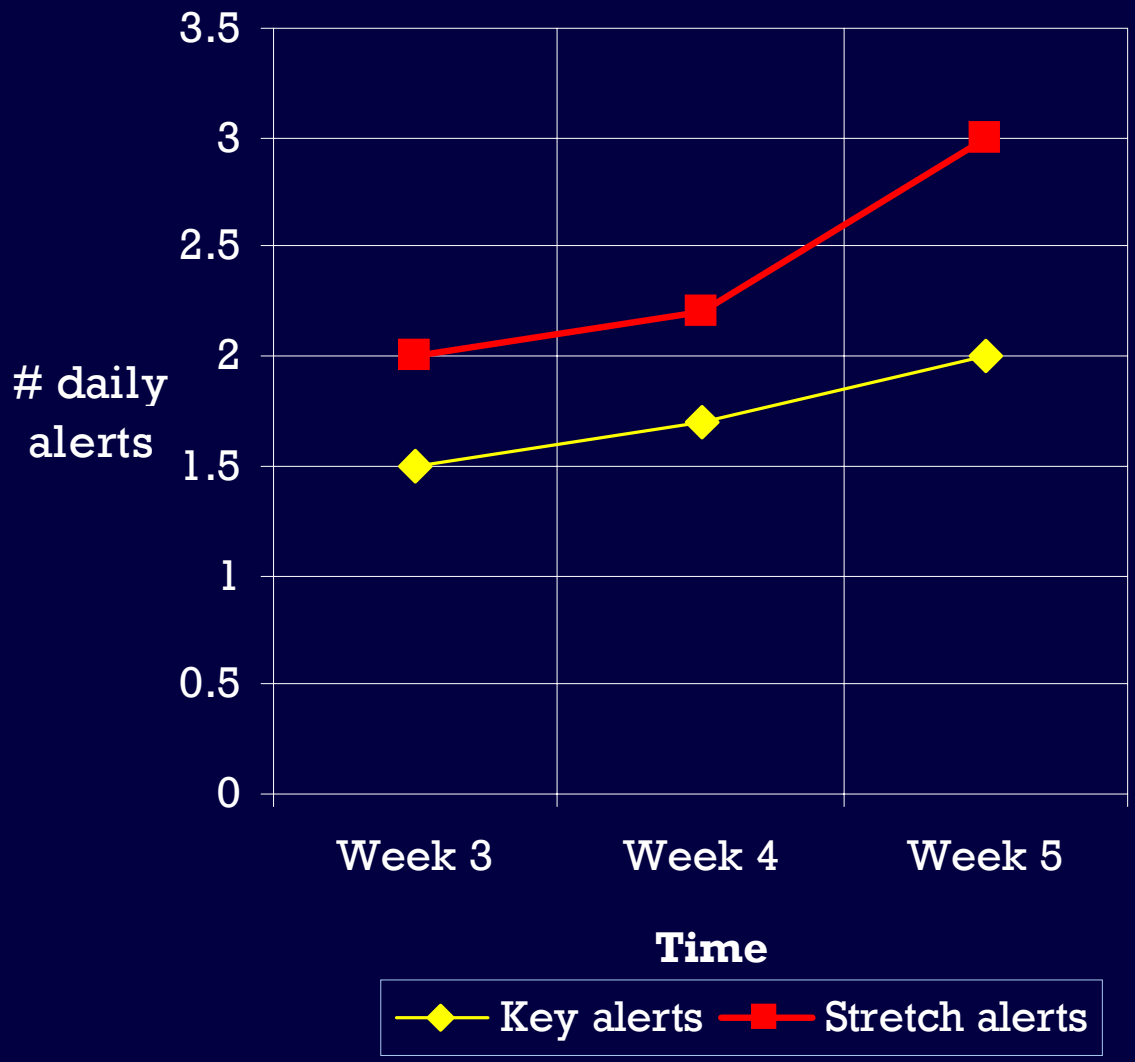


EMS Research Study

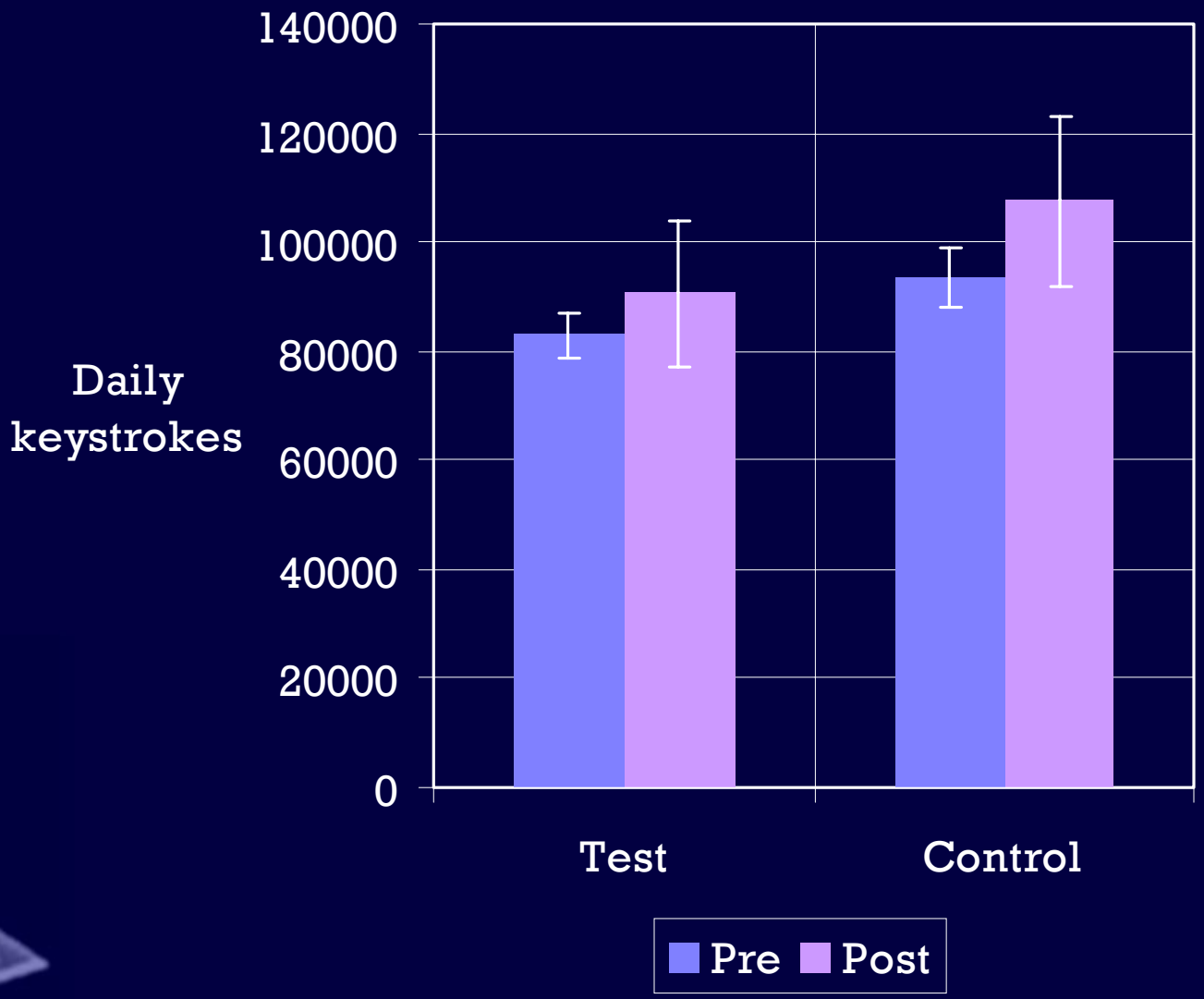
(Hedge, 1999)

- Wall Street office of a nationwide Insurance Brokerage firm (New Century Global)
- 21 workers (11 women, 10 men)
- Test (10) and Control group (11)
- 5 weeks baseline data collection, then 5 weeks EMS for the test group (over 6 million keystrokes).

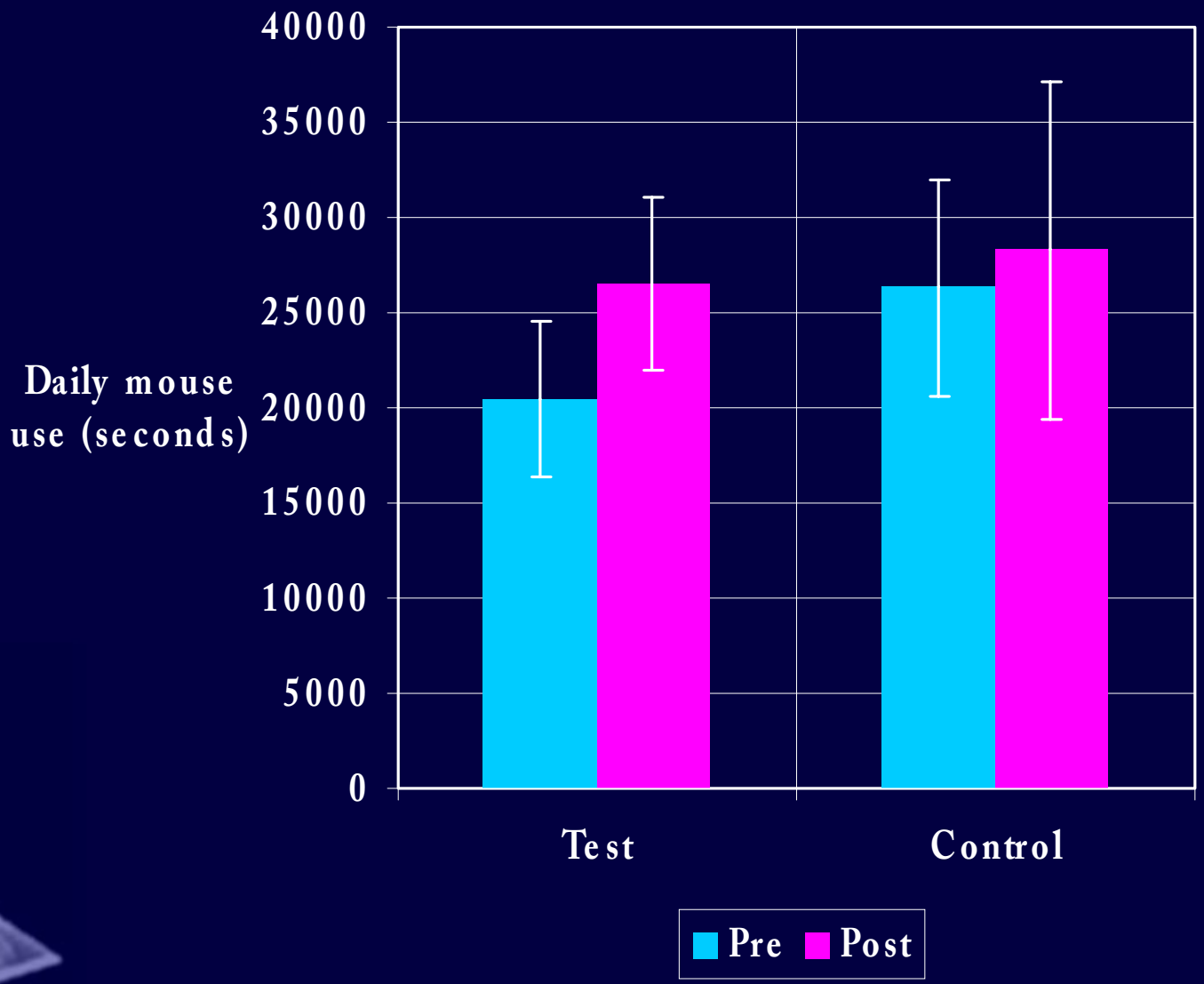
EMS Alerts for the Test Group



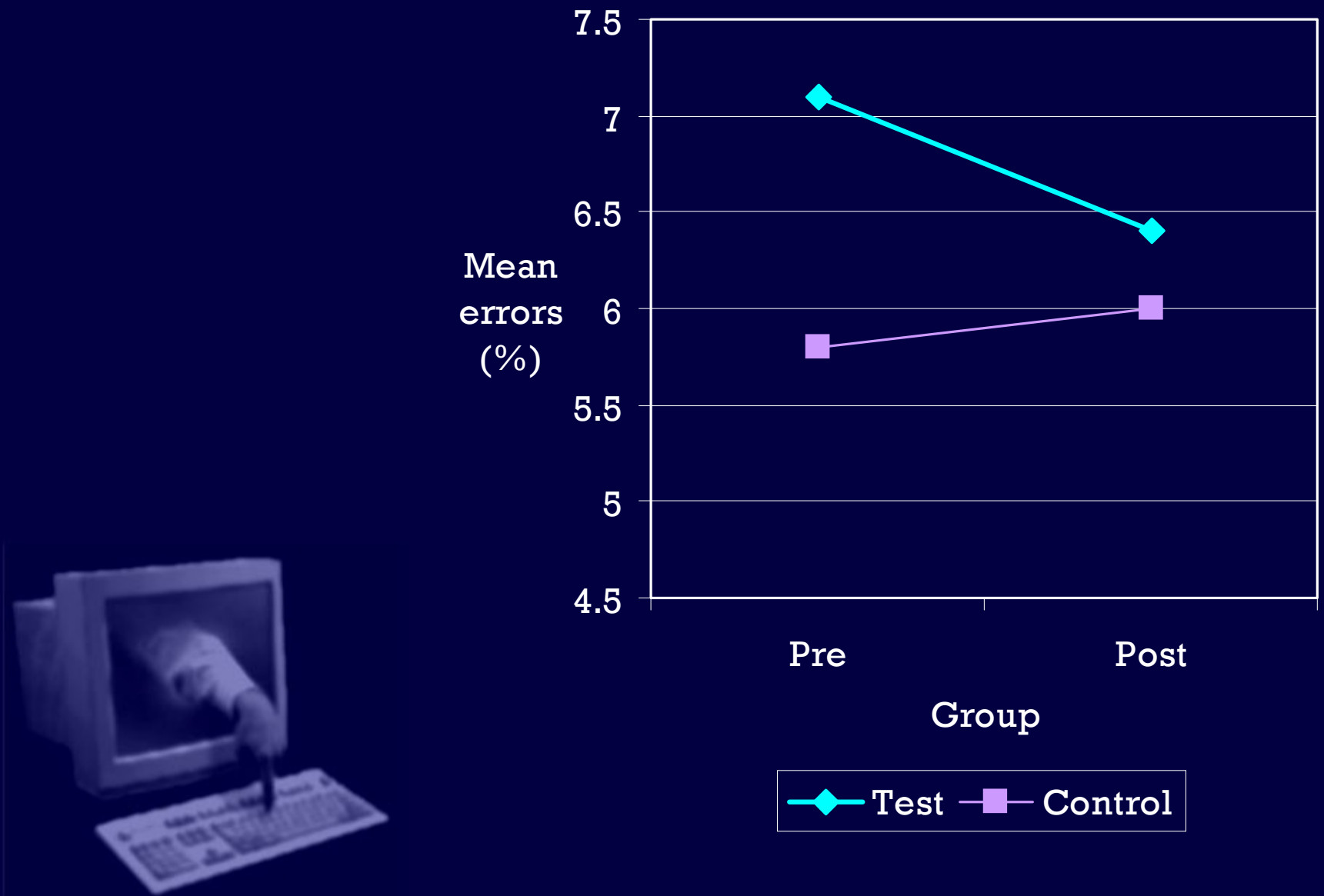
EMS and Keystroke Rates



EMS and Mouse Use



EMS and Error Rates



EMS and Error Rates

- Error rates increased with the # keystrokes for control group Ss.
- Error rates decreased with the # keystrokes for the EMS test group Ss.
- ROI from this effect on errors alone was < 3months .

Implementing a Computer Based System

System Simplicity

- Should be a Windows Based System that works on Both PC and Network.
  - Windows 2000
  - Windows NT
  - Windows ‘95 & 98
  - Windows Terminal Server
- Most of the software should reside on the individual PC reducing the Network Traffic.

System Simplicity

- Use the Network Servers for the Following:
  - Data Storage.
  - Accessing the Data by a limited Few.
  - Keep Bandwidth constraints minimal and be flexible with uploading to the Servers.

System Simplicity

- Make sure the system on the PC is Easy to:
  - Install for both Technical and Non-Technical.
  - Interface with utilizing.
    - Simple Icons and/or Sound Prompts.
    - Simple Intuitive Menus.
    - Simple Access for Senior Management
    - Simple Point and Click Reporting for Management.

Implementation Process

- Gather the necessary buy-in from some of the Following:
  - Environmental Health & Safety
  - Occupational Health and Medical
  - Human Resources
  - IT or MIS
  - Most Important Management

Implementation Process

- Bring Value to Every Entity you want Support From:
  - EH&S- Injury prevention, Reporting and Compliance
  - Occupational Medicine - Early Detection, Injury Tracking
  - Human Resources - Surveying Across the Company, Compliance.
  - IT/MIS - Remote Systems Diagnostics.
  - Senior Management - ROI, and Increase Productivity as well as Employee Moral.

Implementation Process

- Establish a Pilot Group.
  - Determine what will be a Success or Failure.
    - I.E. Productivity Gains, Increase Employee Moral, Reduction in Claims or Lost Days etc.
  - Be Able to Quantify That Process in Real Dollars.
  - Roll the Program out to the Pilot Group Utilizing the same Training methods for the entire Division or Corporate Wide.
  - Assess the Results. The Reporting process has to be simple.

Implementation Process

- Divisional or Corporate Wide?
  - Injury Rates by Title
    - CTD and/or MSD Injuries rates have increased vertically up the Corporate Ladder.
  - Growth in Electronic Traffic.
    - On average a computer worker spends 75% of their time on a PC based on the Cornell Study.
    - In a survey by the AMA last year they found that 58% of employers Monitor Email & Phone.

Implementation Process

- Divisional or Corporate Wide **cont.**
  - Compliance -
    - Introduction of the New Federal Ergonomics Standard.
    - Several States Looking at Similar Legislation.
  - Pro-Active vs. Re-Active
    - CTD and/or MSD cost on average 3 to 5 times the direct costs. Training, Re-Training, Job Placement etc.

Implementation Process

- Ongoing Maintenance:
  - System should be Low Memory and Exportable with Many options.
  - Vendor Should Provide a Maintenance and Technical Support with the Product or a separate contract which typically runs about 20% of the initial cost

Implementing a Computer Based System

Final Thoughts:

- Utilize the KISS Theory.
- Don't Try To Re-Invent the Wheel.
- Utilize Vendor Resources they have done this Before…

Adage For Effective Training

“The value of any training is only as good as it can be applied on a daily basis.”

Effective Training

Introduction

- Employee Buy-In
- WIIFM Principle (What's In It For Me?)

Effective Training: Exercise regime

- Stretching
  - 3 Minute Workout
  - Prepare body for physical stress
  - Relieve body of accumulated physical stress
  - Job specific stretches
  - Customizing stretches for the individual

The Messenger

- Knowledgeable in the subject
- Credible to the audience
- Good communication skills
- Interested in the welfare of the group
- Has time and dedication to implement

Long Term Results

- Implement
- Maintain
- Reinforce