National Taiwan Normal University

Ergonomic Hazard Prevention Program

Last Amended on March 21, 2022

Article 1. Purpose

National Taiwan Normal University (hereinafter referred to as NTNU) has formulated the Ergonomic Hazard Prevention Program (hereinafter referred to as "the Program") pursuant to Article 6, Paragraph 2, Subparagraph 1 of the *Occupational Safety and Health Act* and Article 9 of the *Enforcement Rules of the Occupational Safety and Health Act* to prevent ergonomic hazards including musculoskeletal injuries or diseases, thereby protecting employees from long-term exposure to badly designed work environments, repetitive operations, awkward postures, or mismanaged working hours.

Article 2. Scope

All NTNU employees.

Definition of Terms:

1. Ergonomics: Discovers and applies information on human behavior, abilities, limitations, and other characteristics to the design of tools, machines, systems, tasks, jobs, and environments for productive, safe, comfortable, and effective human use.
2. Work-related musculoskeletal disorders (MSDs): Soft-tissue injuries caused or aggravated by risk factors including repetition, force, and awkward postures.

Article 3. Division of Labor

1. Unit Director
   (1) Promotes and implements the Program.
   (2) Assesses occupational hazards and risks.
   (3) Advocates MSD prevention measures.
   (4) Helps implement work adjustments, job reassignment, and workplace improvement as outlined in the Program based on assessment results.
2. Environmental and Public Safety Center
   (1) Helps promote and implement the Program.
   (2) Identifies and assesses occupational hazards in the Program.
3. Health Center, Office of Student Affairs
   (1) Develops and plans measures for the Program.
   (2) Helps identify occupational hazards in the Program.
   (3) Onsite health service provider (physician):
      (a) Help identifies ergonomic hazards and risk factors.
      (b) Provides employees with health guidance and consultation.
   (4) Occupational Health Nurse (OHN):
      (a) Helps inform, educate, train, and instruct prevention of musculoskeletal injuries, disorders, and other hazards.
      (b) Helps with surveys and follow-up care and health

consultation on occupational and muscle injuries.

4. Athletic Department
   (1) Provides fitness tests and consultation.
   (2) Provides courses in fitness training and health promotion.
5. Employees
   (1) Periodically complete relevant forms for self-health management.
   (2) The Program is for preventive management. Seek immediate medical attention for symptoms of discomfort.

Article 4. Content

The work flow for the Program (Figure 1) is as follows:

1. Assess needs: Health and Safety Officer (HSO) asses the following hazards as necessary.
   (1) MSDs: Assess symptoms and categorize hazards (Attachment 1) by reviewing existing and suspected cases to determine risk factors and work activities that (potentially) cause MSDs.
   (2) Employees with MSD symptoms: Examine symptoms of discomfort (fatigue or muscle pain), determine levels, and assess hazards in work activities.
   (3) Health assessments: Assess employees regularly to identify MSD symptoms.
2. Assess risks: HSO identifies, assesses, and prevents the following hazards among the majority of employees in classrooms, laboratories/training sites, and offices as well as the minority involved in maintaining the campus environment:
   (1) Potential risk factors:
      (a) Incorrect posture for keyboard and mouse
      (b) Repetitive tasks for typing and mouse
      (c) Local prolonged strain on bodily tissues
      (d) Excessive use of eyes
      (e) Prolonged sitting or stationary posture
      (f) Incorrect sitting position
      (g) Prolonged working in confined space
      (h) Prolonged exposure to vibration (full body or localized area)
      (i) Use of poorly designed machinery, equipment, or tools
      (j) Excessive application of force
      (k) Incorrect posture for carrying loads
      (l) Incorrect stance or prolonged stance for teaching or lecturing
   (2) Examples of consequences as follows:
      (a) Back pain: Upper/lower back pain
         (i) Occupational risk factors: prolonged sitting or stationary position.
         (ii) Individual risk factors: History of lower back pain, smoking, obesity.
      (b) Soreness in upper limbs (wrists and arms): Upper extremities with prolonged repeated force
      (c) Carpal tunnel syndrome

(i) Occupational risk factors: Improper force in upper extremities, prolonged bent wrist posture, repetitive wrist movements, and data entry.
(ii) Individual risk factors: Diabetes, uremia, pregnancy, obesity, hypothyroidism, and wrist fracture or major trauma.

(d) Neck pain: In prolonged stationary position, particularly with improper posture (generally bent forward over 20° or backward over 5°).
(e) Waist soreness
(f) Soreness in lower extremities, including calves or feet.

3. Corrective Action
(1) Administrative controls
(a) Avoid prolonged repetitive use of specific body parts (wrists, fingers, etc.)
(b) Avoid prolonged improper force and excessive use of injured body parts.
(c) Perform correct stretching and strength training after symptoms or pain have disappeared.
(d) Consider work adjustments (reduce repetition or increase patterns).
(e) Voluntarily adjust posture and avoid spinal cord strain due to prolonged sitting. Standing computer desks may reduce localized fatigue.
(2) Engineering controls (see Attachment 2 for additional details)
(a) Improper machinery/equipment setups or tool for extended working hours shall be improved or replaced to avoid incidents or MSD aggravation.
(b) Ergonomic desks tailored to Taiwanese physique during prolonged computing to help prevent MSDs.
(c) Position top of monitors below eye level for facing and glancing forward and slightly downward to reduce neck strain from keeping head raised.
(d) Place keyboard directly in front at a height with arms relaxed and elbows at a 90° angle as well as mouse preferably close to centerline of body.
(3) Health management
(a) Self-examination: Check and modify work practices based on discomfort (eyestrain, wrist/purlicue/thumb soreness, or lower back pain due to prolonged repetitive movements).
(b) Medical exam: Analyze regular exam results with consideration of ergonomic risk factors to facilitate administrative control.
(c) Changing posture as necessary to effectively reduce fatigue.
(4) Education and training
(a) Encourage reasonable frequency and duration of breaks during work.
(b) Advocate MSD awareness and improve

engineering/administration

(c) Disseminate information to strengthen understanding of MSDs.

(d) Arrange proper fitness training to help maintain required muscle strength, endurance, limb extension, dexterity, and physical performance to effectively prevent skill fade, MSDs, and lower back pain.

(5) OHN keeps track of and records recovery progress (see Attachment 3: Overview of Follow-up Management of Corrective Action to Reduce Ergonomic Risk Factors for MSDs).

Article 5. Records of the Program (files and documents) shall be kept over 3 years and confidential.

Article 6. The Program and any amendments hereto shall be implemented upon approval by the Environmental Protection and Occupational Safety and Health Committee Meeting and the President.

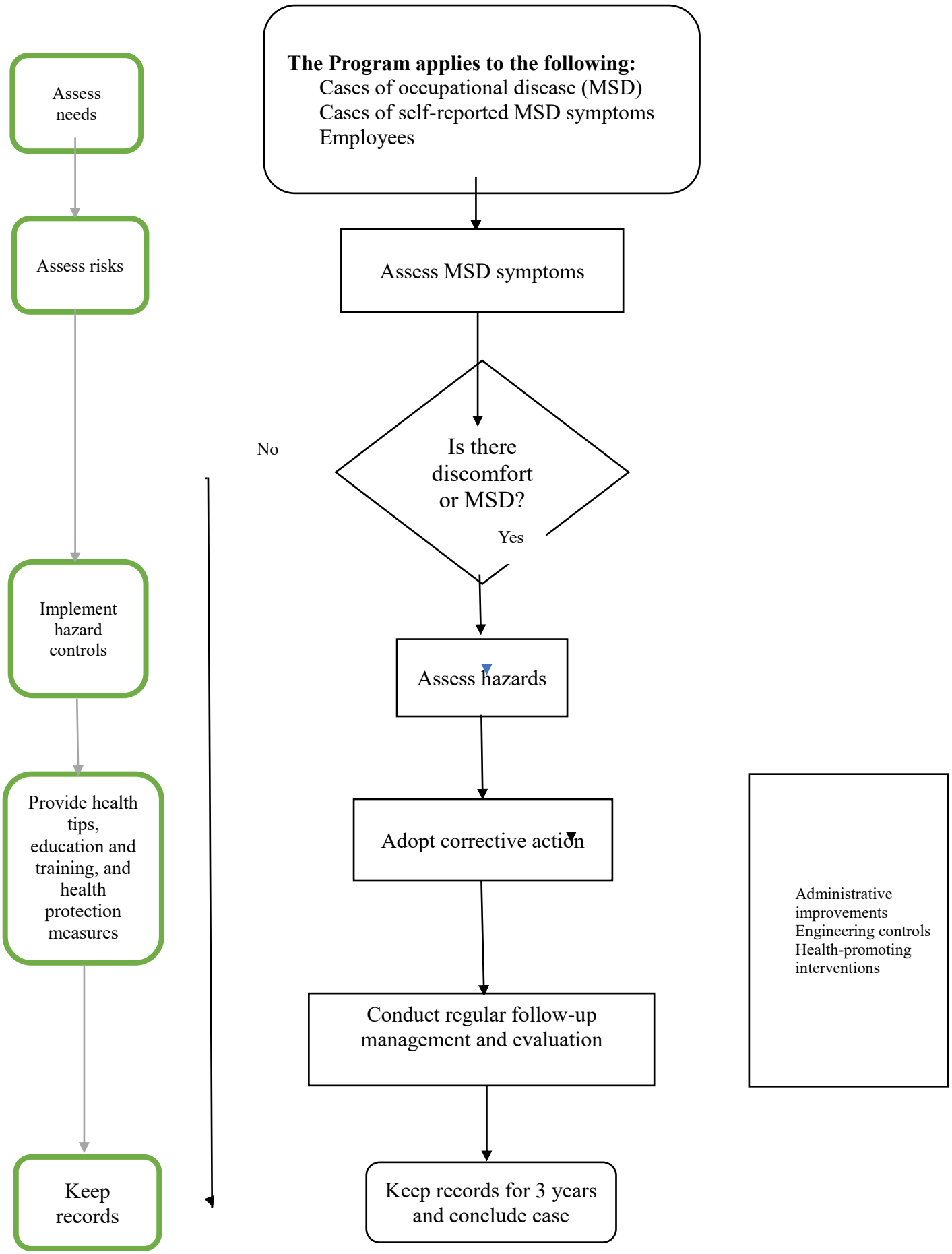

Figure 1. Work flow for Ergonomic Hazard Prevention Program

Attachment 1

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Musculoskeletal Symptom Assessment Form

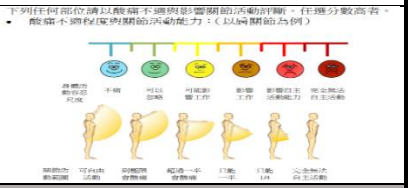
Completed on: (YYYY/MM/DD)

A. Basic Information

Unit	Position	Name	Gender	Age
			□ Male □ Female	
Contact No.	**Height**	**Weight**	**Handedness**	
			□ Left handed □ Right handed	

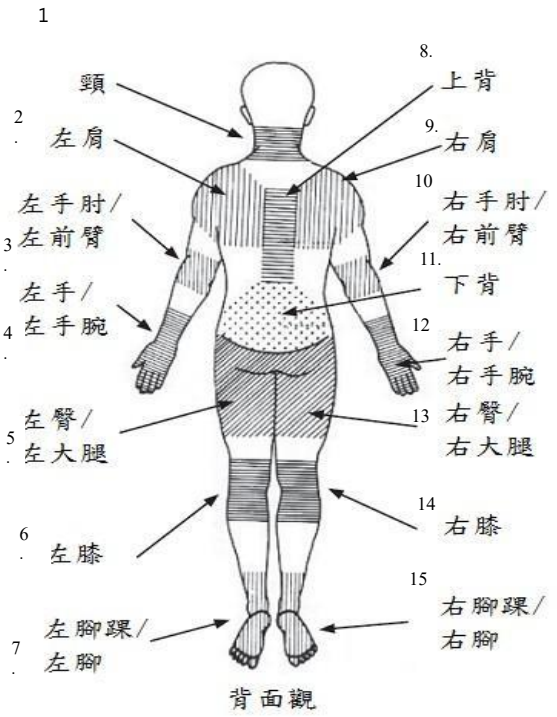
1. Has the patient experienced **discomfort (fatigue/soreness/numbness/pain)** or limited range of joint motion **over 2 weeks** in the past year?
□ No □ Yes (End here for 'No', please proceed for 'Yes')

2. How long has the soreness/pain/discomfort/limited range of joint motion **lasted**?
□ 1 month □ 3 months □ 6 months □ 1 year □ 3 years □ > 3 years



B. Symptom Assessment

	No pain Severe 0 1 2 3 4 5
1	□ □ □ □ □ □
2	□ □ □ □ □ □
3	□ □ □ □ □ □
4	□ □ □ □ □ □
5	□ □ □ □ □ □
6	□ □ □ □ □ □
7	□ □ □ □ □ □



	No pain Severe 0 1 2 3 4 5
8	□ □ □ □ □ □
9	□ □ □ □ □ □
10	□ □ □ □ □ □
11	□ □ □ □ □ □
12	□ □ □ □ □ □
13	□ □ □ □ □ □
14	□ □ □ □ □ □
15	□ □ □ □ □ □

Other (symptoms, medical history):

Signature/Seal of Patient	OHN

★Patient must sign and send a printed copy or electronic file to the Health Center, Office of Student Affairs (ext. #5754 or #6449).

Attachment 2

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Hazard Level Categories (based on MSD Assessment)

MSD Assessment			
Hazard Level	**Criteria**	**Color Label**	**Recommended Corrective Action**
Confirmed diagnosis of disease	Confirmed diagnosis of MSD	Red	administrative improvements
Hazardous	Suspected cases requiring frequent medical attention (visits to the Health Center or requests for muscle pain pads / medication from the nursing office); high turnover rates, leaves or absences	Dark yellow	ergonomic improvements, health promotion, administrative improvements
Potentially Hazardous	Pain rated at 3 or above in body parts listed in the questionnaire	Light yellow	health promotion, administrative improvements
No Hazard	Rating of 2 or below for body parts in the Nordic Musculoskeletal Questionnaire	No color	Control

Attachment 3

Detailed Description of Corrective Action

Figure 2. 3 improper posture and the corresponding correct posture at the computer

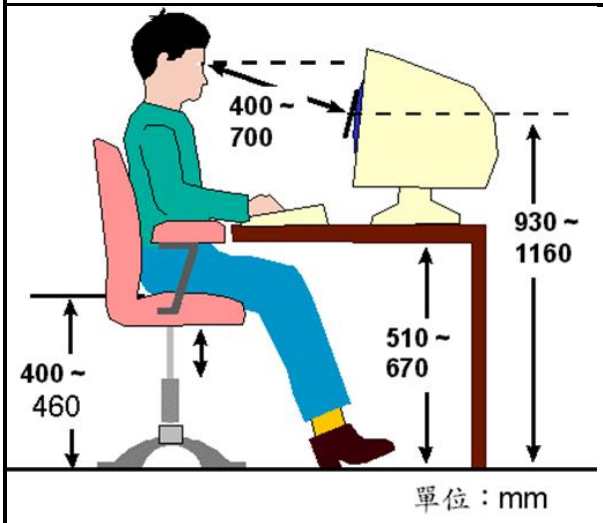

Figure 3. Reference values for adjustable computer workstations

Reference values for adjustable computer workstations

Item	Height
Chair height Desk height Center of monitor height	400–460 mm 510–670 mm 930–1160 mm
Footrest	Not required

When sitting, chair height refers to the height from the ground to knee plus shoes; desk height is from the ground to 100 mm below elbow; center of monitor height is from the ground to 145 mm below eyes.

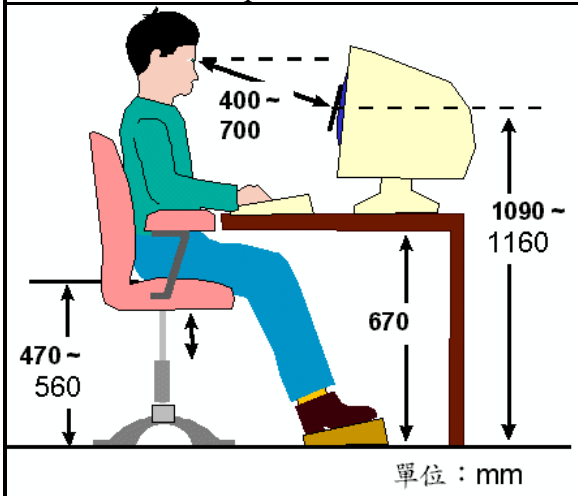

Figure 4. Reference values for non-adjustable computer workstations

Reference values for non-adjustable computer workstations

Item	Non-adjustable desk	Non-adjustable chair
Chair height Desk height Center of monitor height	470–560 mm 670 mm 1090–1160 mm	460 mm 580–660 mm 1000–1150 mm
Footrest	0–170 mm	0–90 mm

Data source: Institute of Labor, Occupation Safety and Health, MOL

Attachment 4

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Overview of Follow-up Management of Corrective Action to Reduce Ergonomic Risk Factors for MSDs

Statistics from _____ (month), _____ (year)

Hazard		Risk Factor	Form No.	Corrective Action	Corrected?
Confirmed diagnosis of disease	Confirmed diagnosis of MSD				
Subtotal: _____ (no. of employees)					
Hazardous	Suspected MSD				
	Above-normal resignations				
	Frequent leaves or absences				
	Frequent requests for muscle pain pads/relievers /massages				
	Subtotal: ____ (no. of employees)				
Potentially Hazardous	MSD Symptoms and Injuries Assessment Form				
	Subtotal: ____ (no. of employees)				
Total: _____ (no. of employees)					

OHN: _____ Unit Director: _____