高雄醫學大學人因性危害防止計畫

Kaohsiung Medical University
Ergonomic Hazards Prevention Program

108 年 12 月 24 日 108 學年度第 2 次環保暨職業安全委員會議通過

December 24, 2019 Passed by the 2nd Environmental Protection and Occupational Safety Committee meeting in Academic Year 2019-2020

壹、 法源依據

Article 1 Legal Basis

職業安全衛生法第 6 條第 2 項。

Article 6, Paragraph 2 of the Occupational Safety and Health Act.

貳、 目的

Article 2 Objective

為預防本校工作者，因長期在設計不理想的工作環境、重複性作業、不良的作業姿勢或者工作時間管理不當下，應採取相關預防措施，以防止因工作引起肌肉骨骼傷害或疾病的人因性危害

To prevent Kaohsiung Medical University's (KMU's) workers from ergonomic hazards of work-induced musculoskeletal disorders or diseases due to long-term work in undesirable working environment, repeated operation, bad work posture, or poor work time management by taking appropriate preventive measures.

參、 適用對象

Article 3 Applicability

本校教職員工

KMU faculty and staff

肆、 權責單位

Article 4 Responsible Units

一、 環保暨職業安全衛生室

1. Office of Environmental Protection, Occupational Safety and Health

(一) 職業安全管理師

Occupational Safety Management Specialist

(1) 擬訂並規劃本計劃之各項措施。

(1) Draft and plan all measures of this program.

(2) 協助預防計畫之工作人因風險評估。

(2) Assist in the assessment of work-related ergonomic risks under the preventive program.

(3) 人因風險評估及協助給予單位執行改善指施。

(3) Ergonomic risk assessment and help provide executive improvement measures for the relevant units.

(4) 作業現場改善措施之執行。

(4) Implementation of improvement measures at the work site.

(二) 臨場健康服務醫師

On-site Health Service Physician

(1) 協助確認人因工程危害因子。

(1) Assist in verifying ergonomic hazards.

(2) 與工作者進行健康指導面談。

(2) Conduct health coach interviews with workers.

(三) 職業衛生護理師

Occupational Health Nurse

(1) 協助工作者傷害調查及肌肉傷害之後續追蹤、醫療諮詢服務。

(1) Assist in worker injury survey, and follow-up and medical consultation service after muscle injuries.

(2) 協助預防肌肉骨骼傷害、疾病或其他危害之宣導。

(2) Assist in promoting the prevention of musculoskeletal disorders, diseases, or other hazards.

二、 單位主管

2. Head of Unit

(一) 本計畫之推動及協助執行。

Promotion of this program and assistance in implementation.

(二) 協助工作危害評估及風險評估。

Assist in the work hazard assessment and risk assessment.

(三) 依風險評估結果，協助預防計畫工作調整、更換，以及作業現場改善措施之執行。

Assist in the work adjustment and change of the preventive program and implementation of improvement measures at the work site in accordance with the risk assessment result.

三、 工作者

3. Workers

(一) 填寫相關檢核表，實施自主健康管理。

Fill in the related checklists, and carry out health self-management.

(二) 本計畫為預防性之管理，若身體已有不適症狀應儘速就醫及通報環安室。

This is a preventive management program; please consult a doctor as soon as possible and report to the Office of Environmental Protection, Occupational Safety and Health if symptoms of physical discomfort are already shown.

伍、 計劃內容

Article 5 Program Contents

一、 需求評估

1. Needs Assessment

(一) 肌肉骨骼傷病：針對疑似通報職業病案例，進行肌肉骨骼症狀問卷調查表(附表一)，了解相關危險因子，以及引發肌肉骨骼或可能有潛在肌肉骨骼傷病風險之作業方式。

Musculoskeletal disorders: Administer the Musculoskeletal Symptoms Questionnaire survey (Table 1) for suspected cases of reported occupational diseases to understand the relevant risk factors and the operating methods that may cause musculoskeletal symptoms or have potential musculoskeletal disorder risks.

(二) 自覺有肌肉骨骼症狀工作者：針對校內工作者有身體的疲勞、酸痛等不適之症狀，進行症狀調查，了解不適之程度，並瞭解其作業內容評估之危害。

Workers with self-perceived musculoskeletal symptoms: Conduct symptoms survey for KMU workers with physical discomfort such as fatigue and soreness to understand the level of discomfort and discern the assessed hazard of the work content.

(三) 針對前項調查結果，將確認區分個案分級（如附表二）。

Confirm and distinguish the case grading (Table 2) based on the survey result as described in the preceding paragraph.

二、 作業分析及危害評估：職業安全衛生人員進行危害評估與改善。

2. Work Analysis and Hazards Assessment: Occupational safety and health officers carry out hazards assessment and improvement.

(一) 依調查結果發現需進一步評估之對象，再依其工作特性選擇適當的評估方法實施評估，如簡易人因工程檢核表、KIM (LHC 與 PP)。

Those who need further assessment based on the survey result shall be assessed with an appropriate method based on their job characteristics, e.g., Easy-to-follow Ergonomics Checklist, KIM (LHC and PP).

(二) 依據評估方法將其中之主要危害因子找出來，以擬定改善方法。
Identify the main hazards according to the assessment method in order to devise the improvement approach.

三、 提出改善方案：依單位、工作類別改善優先順序及難易度，擬訂具有可行性之改善方案。
3. Proposal of Improvement Solution: Draft a feasible improvement solution based on the unit, and priority and difficulty of job type improvement.

(一) 行政管理：如避免長時間重複使用身體某一部位。

Administrative management: For example, use of a body part repeatedly for extended time.

(二) 工程控制：如電腦工作者鍵盤位置、滑鼠位置等建議（如附圖二）。

Engineering control: For example, suggestions on the keyboard and mouse positions for computer users (Figure 2).

(三) 改善方案分成
Improvement solutions are categorized into:

(1) 簡易人因工程改善：依據「簡易人因工程檢核表」(附)，檢核重複性作業中可能促發肌肉骨骼傷病之危害因子。
(1) Simple ergonomic improvement: Verify the hazards that may precipitate musculoskeletal disorders in accordance with the Easy-to-follow Ergonomics Checklist (appended).

(2) 「進階人因工程改善」：當簡易人因工程改善無法完成危害因子移除時，需由作業單位主管、職業安全管理師、人因工程專家及職業醫學科專科醫師共同計畫執行進階人因工程改善，流程需包括「現況觀察」、「問題陳述」、「改善方案」、「成效評估」等四個步驟。
(2) Advanced Ergonomic Improvement: When the simple ergonomic improvement cannot remove the hazards, occupational safety management specialists, ergonomic experts, and occupational medicine specialists shall jointly plan and execute the Advanced Ergonomic Improvement program under the lead of the work unit. The procedures shall include the following four steps: “observation of current status,” “problem statement,” “improvement solution,” and “effectiveness evaluation.”

四、 執行成效之評估及改善
4. Effectiveness Evaluation and Improvement

(一) 對於改善方案之執行情形持續管控追蹤，評估是否符合預期成效。

Keep track of the implementation of the improvement solution and evaluate if the expected result is fulfilled.

(二) 對於成效不如預期之成果，再次進行評估，確定危害因子，並修正改善。

In the event that the result fails to meet the expectation, a re-evaluation shall be carried out to verify the hazards and make corrections and improvements.

(三) 人因工程預防之相關成果定期於環保暨安全衛生委員會報告。
The relevant ergonomic prevention outcomes shall be regularly reported at the Environmental Protection, Safety and Health Committee.

五、 其他事項。
5. Other Business

(一) 依人因性危害分析與改善流程進行相關管理。

Implement relevant management in accordance with the ergonomic hazards analysis and improvement procedures.

(二) 相關文件需有書面資料紀錄，並保存 3 年
The relevant documents shall be kept in written records for 3 years.

陸、 本要點(計畫)經本校環保暨職業安全委員會審議後，陳請校長核定後公布實施；修正時亦同。
Article 6 The directives of this Program shall be reviewed by the KMU Environmental Protection, Safety and Health Committee, submitted to the President for approval and then promulgated and implemented, and shall apply to subsequent amendments.

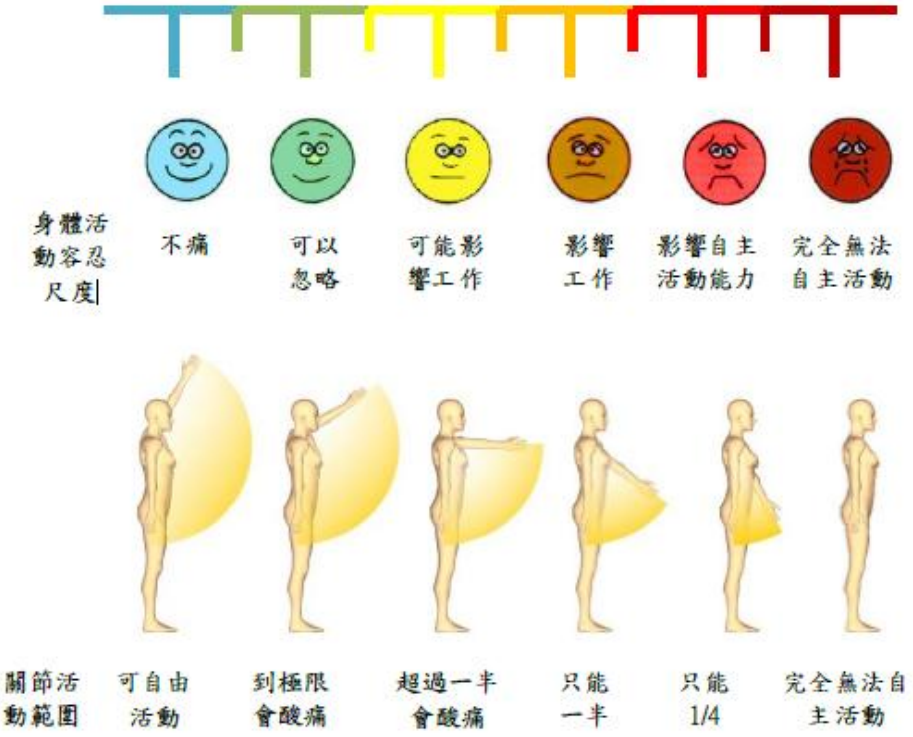
附表一　肌肉骨骼症狀調查表

肌肉骨骼症狀問卷調查表

A. 填表說明

下列任何部位請以酸痛不適與影響關節活動評斷。任選分數高者。

- 酸痛不適程度與關節活動能力：（以肩關節為例）



附表一　　肌肉骨骼症狀調查表

Table 1　　Musculoskeletal Symptoms Questionnaire

肌肉骨骼症狀問卷調查表

Musculoskeletal Symptoms Questionnaire

A. 填表說明

A. Instructions

下列任何部位請以酸痛不適與影響關節活動評斷。任選分數高者。

Please judge according to the soreness and discomfort of any of the following parts, and the influence on joint activity. The higher score will be taken for random choice.

酸痛不適程度與關節活動能力：（以肩關節為例）

Level of soreness and joint activity: (the example of shoulder joint)

身體活動容忍尺度 Tolerance of physical activity

不痛 No pain
可以忽略 Can be neglected
可能影響工作 May affect work
影響工作 Affect work
影響自主活動能力 Affect autonomous activity
完全無法自主活動 Absolutely no autonomous activity
關節活動範圍 Range of motion (ROM)
可自由活動 Capable of activity freely
到極限會酸痛 Soreness at the limits
超過一半會酸痛 Soreness at half range
只能一半 Can only reach half range
只能 1/4 Can only reach 1/4 range
完全無法自主活動 Absolutely no autonomous activity

肌肉骨骼症狀調查表

填表日期：　　/　　/

B. 基本資料

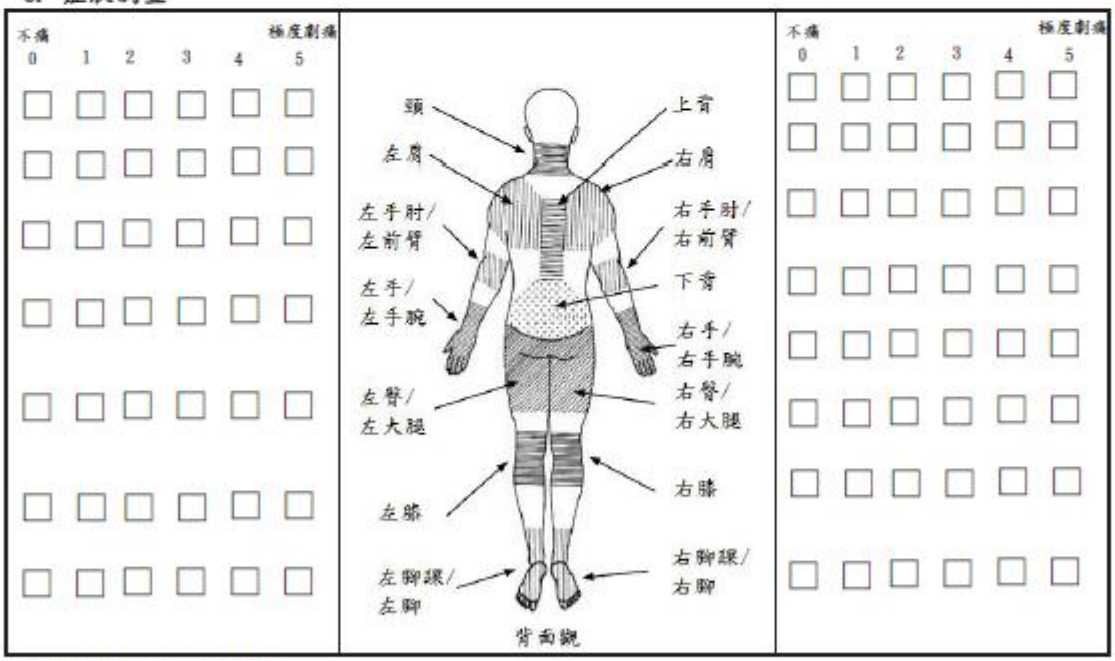
單位	單位分機	職稱	姓名	職號

作業名稱	性別	年齡	年資	身高	體重	慣用手
	□男 □女					□左手 □右手

1. 您在過去的1年內，身體是否有長達2星期以上的疲勞、酸痛、發麻、刺痛等不舒服，或關節活動受到限制？
   □否　□是（若否，結束此調查表；若是，請繼續填寫下列表格。）

2. 下表的身體部位酸痛、不適或影響關節活動之情形持續多久時間？
   □1個月　□3個月　□6個月　□1年　□3年　□3年以上

C. 症狀調查



其他症狀、病史說明

自評者簽名：

肌肉骨骼症狀調查表
Musculoskeletal Symptoms Questionnaire
B. 基本資料
B. Basic Information
填表日期：
Date:

單位 Unit
單位分機 Unit extension number
職稱 Position title
姓名 Name
職號 Position name
作業名稱 Job name
性別 Sex
男 M
女 F
年齡 Age
年資 Year of service
身高 Height
體重 Weight
慣用手 Dominant hand
左手 Left hand
右手 Right hand

1. 你在過去的 1 年內，身體是否有長達 2 星期以上的疲勞、酸痛、發麻、刺痛等不舒服，或關節活動受到限制？
1. In the past 1 year, do you suffer any physical discomfort such as fatigue, soreness, numbness, pain, etc. for a period longer than 2 weeks, or are your joint activities subject to restriction?
否 No
是 Yes
（若否，結束此調查表；若是，請繼續填寫下列表格。）
(If no, please end this survey; if yes, please continue to complete the questionnaire.)
2. 下表的身體部位酸痛、不適或影響關節活動之情形持續多久時間？
2. How long has soreness, discomfort, or affected joint activity at the following body parts continued?
1 個月 1 month
3 個月 3 months
6 個月 6 months
1 年 1 year
3 年 3 years
3 年以上 Over 3 years
C. 症狀調查
C. Symptoms Survey

不痛 No pain
極度劇痛 Extreme pain
頸 Neck
左肩 Left shoulder
左手肘 Left elbow
左前臂 Left forearm
左手 Left hand
左手腕 Left wrist

左臀 Left hip
左大腿 Left thigh
左膝 Left knee
左腳踝 Left ankle
左腳 Left foot
上背 Upper back
右肩 Right shoulder
右手肘 Right elbow
右前臂 Right forearm
下背 Lower back
右手 Right hand
右手腕 Right wrist
右臀 Right hip
右大腿 Right thigh
右膝 Right knee
右腳踝 Right ankle
右腳 Right foot
背面觀 Back View
其他症狀、病史說明 Description of other symptoms and medical history
自評者簽名： Self-evaluator's Signature:

附表二 肌肉骨骼傷病調查危害等級區分表

危害等級	判定標準	顏色標示	建議處置方案
確診疾病	確診肌肉骨骼傷病	紅色	行政改善
有危害	調查通報中疑似個案(經常索取痠痛貼布或常就醫者)	深黃色	人因工程改善、健康促進、行政改善
疑似有危害	問卷調查評分 3 分以上(含 3 分)	黃色	健康促進、行政改善
無危害	問卷調查評分 2 分以下(含 2 分)	綠色	管控

附表二 肌肉骨骼傷病調查危害等級區分表
Table 2 Musculoskeletal Disorder Hazards Grading Scheme
危害等級 Hazard Grades
確診疾病 Confirmed case
有危害 Hazard

疑似有危害 Suspected hazard
無危害 No hazard
判定標準 Judgment Criteria
確診肌肉骨骼傷病 Confirmed musculoskeletal disorders
調查通報中疑似個案（經常索取痠痛貼布或常就醫者） Suspected cases investigated and reported (Frequently request pain relief patch or frequently seek medical care)
問卷調查評分 3 分以上（含 3 分） Score more than 3 in the questionnaire survey (including 3)
問卷調查評分 2 分以下（含 2 分） Score less than 2 in the questionnaire survey (including 2)
顏色標示 Color Code
紅色 Red
深黃色 Dark yellow
黃色 Yellow
綠色 Green
建議處置方案 Suggested Treatment
行政改善 Administrative improvement
人因工程改善、健康促進、行政改善 Ergonomic improvement, health promotion, administrative improvement
健康促進、行政改善 Health promotion, administrative improvement
管控 Control

附表三 Table 3

肌肉骨骼症狀調查與管控一覽表

Musculoskeletal Disorders Survey and Control List

單位名稱 Unit Name	作業名稱 Job Name	職稱 Position Title	員工編號 Staff No.	姓名 Name	性別 Sex	年齡 Age	年資 Year of Sertive	身高 Height	體重 Weight	慣用手 Dominant Hand	職業病 Occupational Disease	通報中 Reported	問卷調查 Questionnaire Survey	是否不適 Discomfort or not?	酸痛持續時間 Duration of soreness or pain	症狀調查 Symptoms Survey	人因工程改善方案 Ergonomic Improvement	是否改善 Improvement or not?

症狀調查代碼如下，若有多處不適，請填入多個代碼：

Codes for symptoms survey are as follows; in case of multiple discomforts, please enter multiple codes:

1.頸 2.上背 3.下背 4.左肩 5.右肩 6.左手肘/前臂 7.右手肘/前臂 8.左手/腕 9.右手/腕 10.左臀/大腿 11.右臀/大腿 12.左膝 13.右膝 14.左腳踝/腳 15.右腳踝/腳

1. Neck 2. Upper back 3. Lower back 4. Left shoulder 5. Right shoulder 6. Left elbow/forearm 7. Right elbow/forearm 8. Left hand/wrist 9. Right hand/wrist 10. Left hip/thigh 11. Right hip/thigh 12. Left knee 13. Right knee 14. Left ankle/foot 15. Right ankle/foot

職業安全管理師：_____ 醫師/職業衛生護理師：

Occupational Safety Management Specialist: _____ Physician/Occupational Health Nurse:

附表四　　肌肉骨骼傷病人因工程改善管控追蹤一覽表

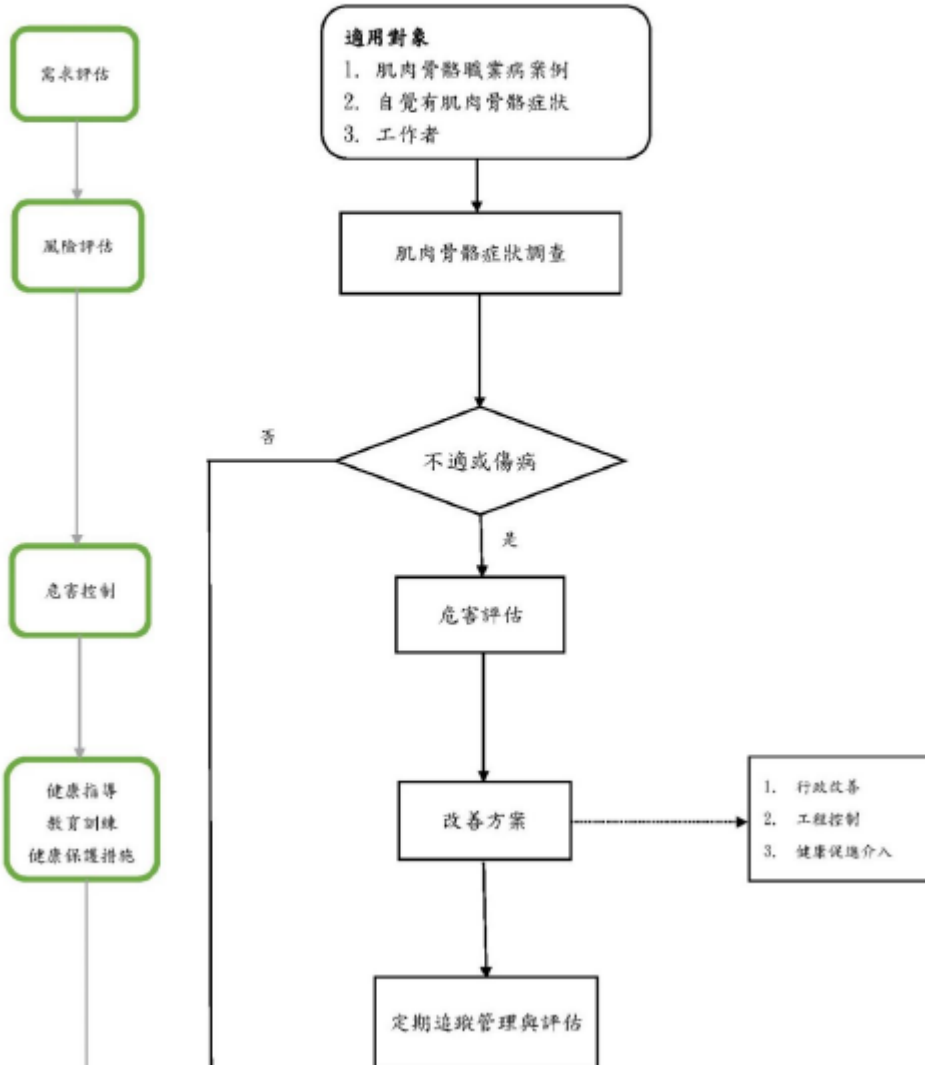
Table 4 Ergonomic Improvement & Control Tracking List for Musculoskeletal Disorders

危害情形 Hazardous Condition		危害因子(工作站、勞工及危害因子簡述) Hazard (Brief description of the workstation, laborer, and hazard)	檢核表編號 Checklist No.	改善方案 Improvement Solution	是否改善 Improved or not?
確診疾病 Confirmed Case	確診肌肉骨骼傷病 Confirmed musculoskeletal disorder				
	小計：0 名 Subtotal: 0				
有危害 Hazard	通報中的疑似肌肉骨骼傷病 Suspected musculoskeletal disorder reported				
	異常離職 Irregular resignation				

	經常性病假、缺工 Frequent sick leave and absence				
	經常性索取痠痛貼布、打針、或按摩等 Frequently request pain relief patch, injection, or message, etc.				
	小計：0 名 Subtotal: 0				
疑似有危害 Suspected Hazard	傷病問卷調查 Disorder questionnaire survey		簡易人因工程檢核表 Easy-to-follow Ergonomics Checklist		
小計：0 名 Subtotal: 0					
以上累計：0 名 Total: 0					

職業安全管理師：_____　職業衛生護理師： **Occupational Safety Management Specialist:_____　Occupational Health Nurse:**

附圖一 執行流程圖



附圖一　　執行流程圖

Table 1 Execution Flow Chart

需求評估 Needs assessment

風險評估 Risk assessment

危害控制 Hazard control

健康指導 Health coach

教育訓練 Education and training

健康保護措施 Health protection measures

適用對象 Applicable individuals

1. 肌肉骨骼職業病案例 1. Cases of musculoskeletal occupational diseases

2. 自覺有肌肉骨骼症狀 2. Self-perceived musculoskeletal symptoms

3. 工作者 3. Worker

肌肉骨骼症狀調查 Musculoskeletal symptoms survey

否 No

不適或傷病 Discomfort or disorder

是 Yes

危害評估 Hazard assessment

改善方案 Improvement solution

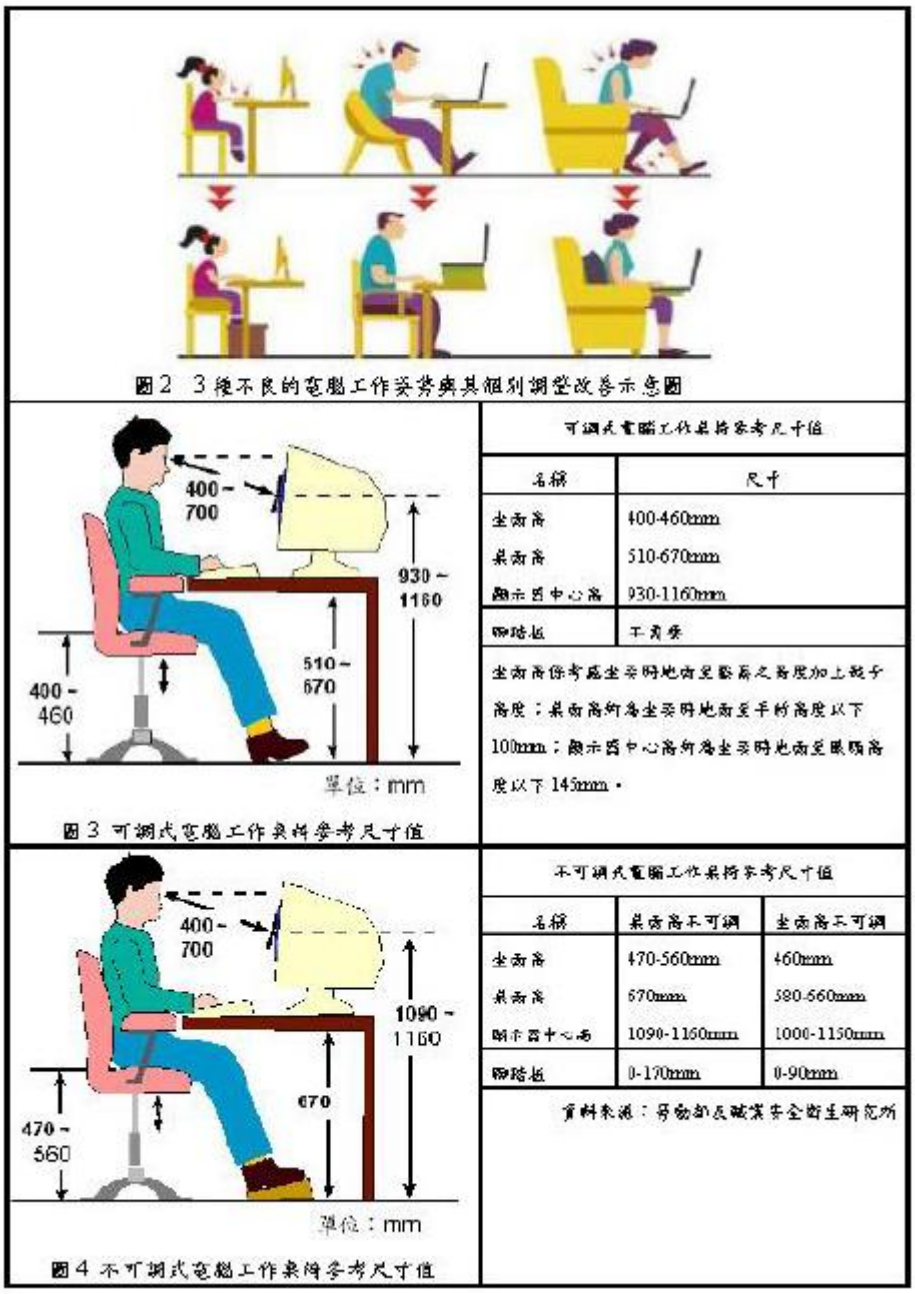
定期追蹤管理與評估 Regular follow-up management and evaluation

1. 行政改善 1. Administrative improvement

2. 工程控制 2. Engineering control

3. 健康促進介入 3. Health promoting intervention

附圖二 工程控制補充說明圖



附圖二　　工程控制補充說明圖

Table 2　　Supplementary Illustration of Engineering Control

圖 2　3 種不良的電腦工作姿勢與其個別調整改善示意圖

Fig. 2　3 types of poor computer work posture and individual adjustment and improvement illustrations

單位：mm

Unit: mm

圖 3　可調式電腦工作桌椅參考尺寸值

Fig. 3　Reference dimensions for adjustable computer desk

可調式電腦工作桌椅參考尺寸值

Reference dimensions for adjustable computer desk

名稱　Designation

尺寸　Dimensions

坐面高　　Seat height

桌面高　　Desk height

顯示器中心高　　Center of screen height

腳踏板　　Foot rest

坐面高係考慮坐姿時地面至膝窩之高度加鞋子高度；桌面高約為坐姿時地面至手肘高度以下 100mm；顯示器中心高約為坐姿時地面至眼睛高度以下 145mm。

Seat height is the height from the floor to the knee pits plus the shoes' height when one is seated; Desk height is approximately the height from the floor to 100mm below the elbow's level when one is seated; center of screen height is approximately the height from the floor to the 145mm below the eye's level when one is seated.

圖 4　不可調式電腦工作桌椅參考尺寸值

Fig. 4　Reference dimensions for non-adjustable computer desk

不可調式電腦工作桌椅參考尺寸值

Reference dimensions for non-adjustable computer desk

名稱　Designation

桌面高不可調　　Non-adjustable desk height

坐面高不可調　　Non-adjustable seat height

資料來源：勞動部勞動及職業安全衛生研究所

Source: Institute of Labor, Occupational Safety and Health, Ministry of Labor