一般工業環境改造培訓
Ergonomics Training for General Industry

本教材是由職業安全衛生局及美國勞工部提供的SH-19505-09-60-F-6 資助編製。並不一定反映美國勞工部的政策，又內容提及的商業名稱，產品或組織的名字亦不反映得到美國政府的確定。

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培訓目標
Training Objectives

1. 了解環境改造及骨胳肌肉病變的徵狀

   To understand ergonomics and symptoms of the Musculoskeletal Disorders

2. 了解環境改造的風險因素

   To understand ergonomic risk factors

3. 了解及討論環境改造可解決的辦法

   To understand and discuss possible ergonomic solutions

4. 了解及討論工人採取「行動」的步驟

   To understand and discuss the "action" step for the workers

環境改造是甚麼？
What is Ergonomics?

- 將工作配合工人的一門科學

  A science of fitting jobs to the workers.

- 集中於設計工作站，工具及工序以達到安全，舒適及有效率的環境

  It focuses on designing workstations, tools and work tasks for safety, efficiency and comfort.

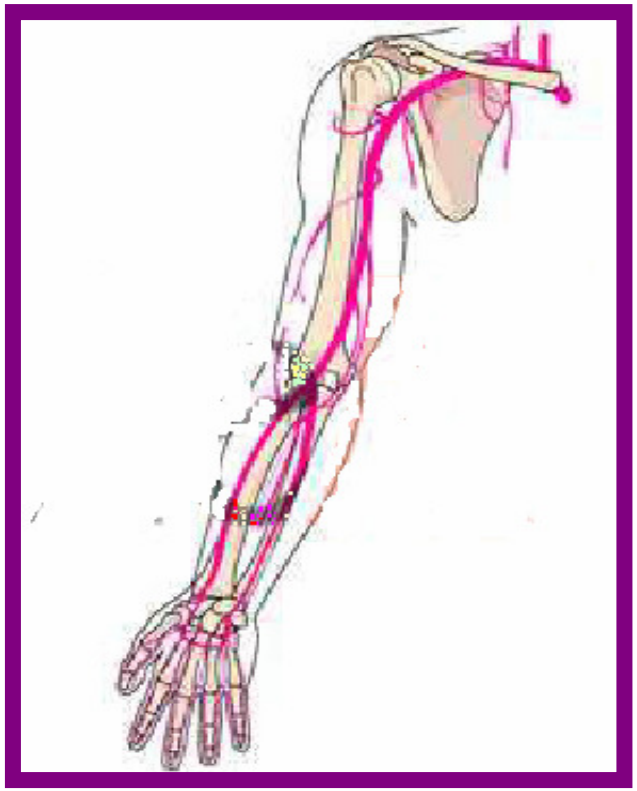
- 環境改造尋求方法去降低勞累，同時增進舒適，生產力，工作上的滿足感及安全度

  Ergonomics seeks to decrease fatigue and injuries, along with increasing comfort, productivity, job satisfaction, and SAFETY.

甚麼是骨骼肌肉病變？
What are Musculoskeletal Disorders?

- 由於不當行動或不依環境改造原則而造成的肌肉，腱 ，韌帶 ，關節，神經及椎間盤受傷或加劇傷痛

  Injuries to the muscles, tendons, ligaments, joints, nerves and discs that are caused or aggravated by our actions and/or environment that does not follow ergonomic principles.



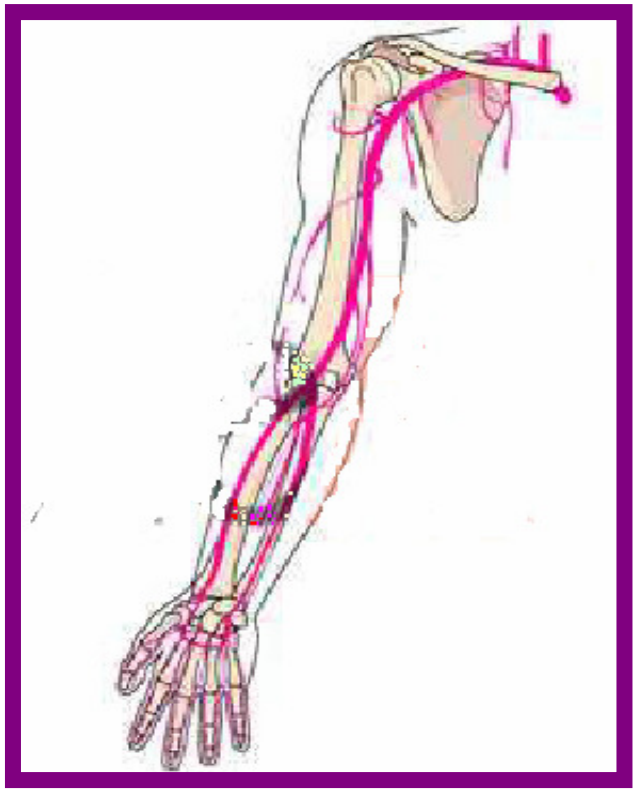
環境改造可以幫助那些一般性的受傷？
What are common injuries that ergonomics can help?

- 由於不當行動或不依環境改造原則而造成的肌肉，腱 ，韌帶 ，關節，神經及椎間盤病變或加劇傷痛

  Disorders to the muscles, tendons, ligaments, joints, nerves and discs that are caused or aggravated by our actions and/or environment that does not follow ergonomic principles.

- 這又名叫「骨骼肌肉病變」

  Also known as “MusculoSkeletal Disorders”.



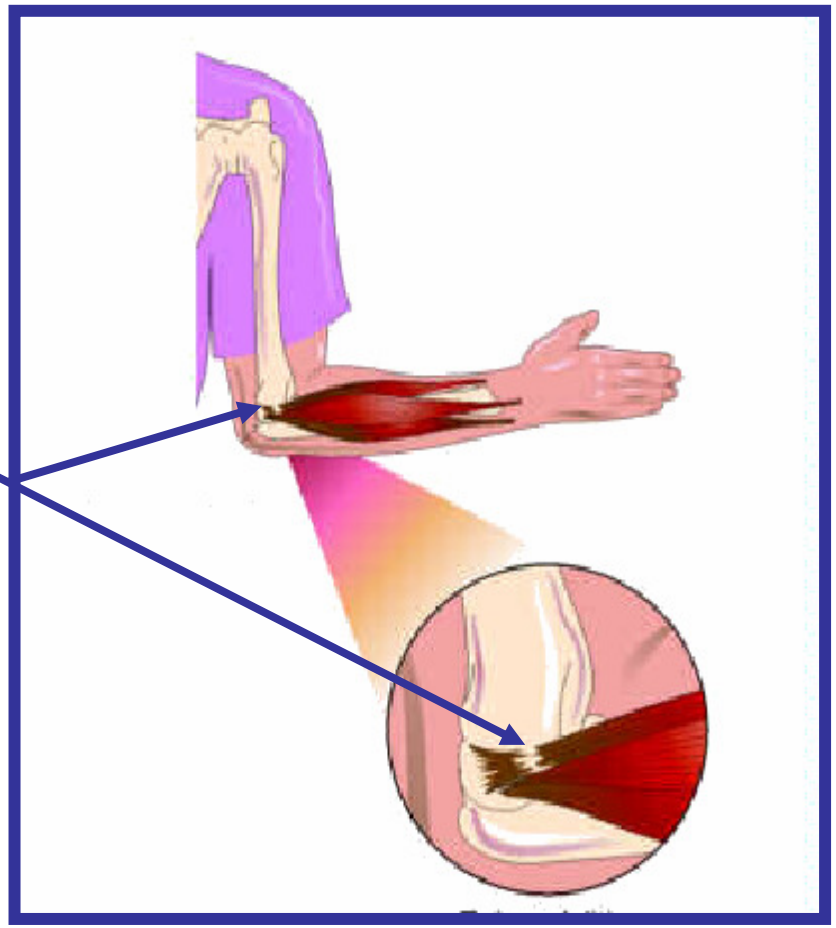
解剖學的探索
Anatomy Review

- 肌肉 – 提供身體各部份動力
  Muscles – Provide the power for you to move your body parts
- 腱 – 骨與骨之間的連結，以穩定關節
  Ligaments – Connects bone to bone, stabilizing the joints
- 韌帶 – 肌肉與骨胳之間的「滑輪 」協助身體各部份的活動
  Tendons – "Pulleys" that attach muscle to bone, helping to move body parts
- 關節 – 骨與骨之間的連接
  Joints – Connection between bones.
- 神經 – 腦部與身體其他各部份的通訊
  Nerves – Carry messages between the brain and other parts of the body.

使用肌肉過度會怎樣？
What happens when you use your muscles too much?

使內用肌肉過度會令肌肉輕微撕裂…

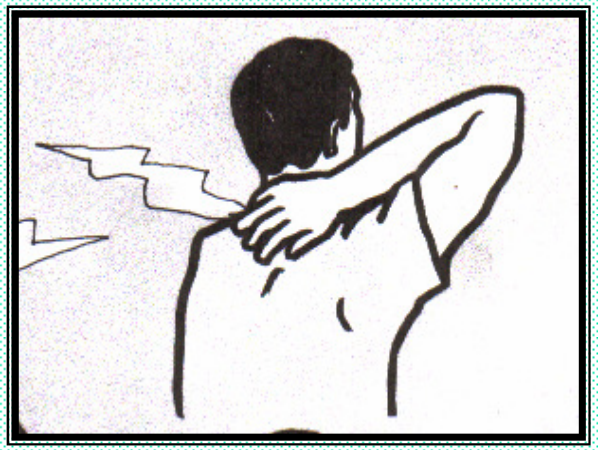
When you use your muscles too much, They get little tears...



令肌肉腫脹及感到…
This makes your muscle swell and feel …

這是骨骼肌肉病變的警號：
These are the warning signs of MusculoSkeletal Disorders:

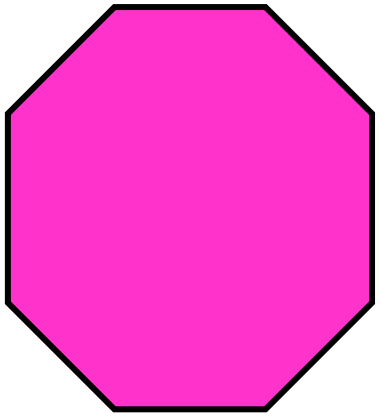
- 痛楚 **pain**
- 麻痺 **numbness**
- 刺痛 **tingling**
- 無力 **weakness**
- 腫脹 **swelling**
- 發熱 **hot feeling**



妳若有任何上述的徵狀，就要採取行動了！

If you feel any of these symptoms, it's time to take action!

尋求早期醫治
Seek early medical treatment



徵狀越長不獲治療，則日後越難治好！

The longer you have symptoms without treatment, the harder it will get to treat them successfully later!

預防工作上的骨骼肌肉病變
To Prevent MSD at work

- 找出環境改造風險因素

  Identify ergonomic risk factors

  - 環境改造風險因素是引致身體勞損，導致受傷的工作環境

    Ergonomic risk factors are workplace situations that cause wear and tear on the body and can cause injury

- 尋找方法去減少或消除這些因素

  Work on finding ways to reduce or eliminate them

風險因素及解決辦法
導致骨骼肌肉病變的因素...
Risk Factors & Solutions
These can lead to Musculoskeletal Disorders…

- 風險因素：重複

  Risk Factor: Repetition
- 定義：同一動作不斷重複

  Definition: Making the same motion over and over
- 可解決辦法：重新設計工序減少重複；增加重複動作之間的休息時間；以不同的動作工序循環

  Possible Solutions: Redesign task to reduce repetitions; increase rest time between repetitions; rotate among tasks with different motions

風險因素及解決辦法
導致骨骼肌肉病變的因素...
Risk Factors & Solutions
These can lead to Musculoskeletal Disorders...

- 風險因素：不良姿勢

  Risk Factor: Awkward Posture

- 定義：彎腰，探腰，跪下，蹲下或身體任何部份時間太長

  Definition: Prolonged bending, reaching, kneeling, squatting, or twisting any part of your body

- 可解決辦法：重設工序及儀器以保持身體在較「中正」的位置

  Possible Solutions: Redesign tasks and equipment to keep the body in more "neutral" positions

風險因素及解決辦法

導致骨骼肌肉病變的因素...

Risk Factors & Solutions

These can lead to Musculoskeletal Disorders…

- 風險因素：重力的行動

  Risk Factor: Forceful Motion

- 定義：需要過度的力量去做拉，猛擊 ，推提舉的動作

  Definition: Excessive effort needed to do tasks such as pulling, pounding, pushing, lifting

- 可解決的辦法：重新設計工序以減少費力；增加員工；使用機械以協助

  Possible Solutions: Redesign task to reduce the exertion needed; assign more staff; use mechanical assists

風險因素及解決辦法

導致骨骼肌肉病變的因素...

Risk Factors & Solutions

These can lead to Musculoskeletal Disorders…

- 風險因素： 不移動的位置

  Risk Factor: Stationary Position

- 定義：停留在一個位置太久，引致肌肉及關節勞累

  Definition: Staying in one position too long, causing fatigue in muscles and joints

- 可解決的辦法：重新設計工序以避免固定一個位置；提供改換位置的機會

  Possible Solutions: Redesign task to avoid stationary positions; provide opportunities to change position

風險因素及解決辦法
導致骨骼肌肉病變的因素...
Risk Factors & Solutions
These can lead to Musculoskeletal Disorders...

- 風險因素：直接壓力

  Risk Factor: Direct Pressure
- 定義：身體與硬面或尖角接壓時間太長

  Definition: Prolonged contact of the body with a hard surface or edge
- 可解決的辦法：改善工具及儀器的設計或擺放以減輕壓力；提供軟墊物

  Possible Solutions: Improve tool and equipment design or layout to eliminate pressure; provide cushioning material

風險因素及解決辦法
導致骨骼肌肉病變的因素...
Risk Factors & Solutions
These can lead to Musculoskeletal Disorders…

- 風險因素：震動

  Risk Factor: Vibration
- 定義：使用震動性的用具或儀器

  Definition: Using vibrating tools or equipment
- 可解決的辦法：使手部與身體與震動隔開；好好保養儀器 以減低多餘的震動

  Possible Solutions: Insulate the hand or body from vibration; keep tools or equipment in good condition to reduce excessive vibration

風險因素及解決辦法
導致骨骼肌肉病變的因素...
Risk Factors & Solutions
These can lead to Musculoskeletal Disorders…

- 風險因素：極端的溫度
  Risk Factor: Extreme Temperature
- 定義：在太熱或太冷的地方工作。炎寒減弱人的感覺，血液的流動，減低體力。炎熱增力人的勞累

  Definition: Working where it is too hot or too cold. Cold reduces feeling, blood flow, and strength. Heat increases fatigue.
- 可解決的辦法：盡可能控制溫度；帶手套及穿暖衣服以保暖；在熱環境中給與休息時間及食水

  Possible Solutions: Control temperature where possible; insulate the body against cold by wearing gloves and warm clothing; provide breaks and fresh water in hot environments.

風險因素及解決辦法

導致骨骼肌肉病變的因素...

Risk Factors & Solutions

These can lead to Musculoskeletal Disorders…

- 風險因素：工作壓力

  Risk Factor: Work Stress

- 定義：包括機器的速度，不足的小息，單一不變的工作，機件的斷續，不良的工序或缺少監管

  Definition: Includes machine-paced work, inadequate breaks, monotonous tasks, multiple interruptions, poor work organization, or poor supervision

- 可解決的辦法：編定合理的工作量，足夠的小息，不同的工種，個人的自治力

  Possible Solutions: Establish reasonable workload, sufficient breaks, task variety, individual autonomy

風險因素及解決辦法

導致骨骼肌肉病變的因素...

Risk Factors & Solutions

These can lead to Musculoskeletal Disorders…

- 你面對風險因素越大，受傷的機會越大

  The more risk factors you face, the greater your chance of injury.

- 接觸風險因素越長，受傷的機會越大

  The longer you are exposed to a risk factor, the greater your chance of injury.

- 減少或消除風險因素，受傷的機會減低

  By reducing or eliminating risk factors, the chance of injury can be decreased.

採取行動！
Taking Actions!!

- 與你的工友傾談

  Talk to your co-workers

- 與你的僱主傾談：僱主是負責工作環境的

  Talk to your employer: employer is responsible for work environment.

- 組成安全委員會討論及預防工地的受傷

  Organize a safety committee to discuss and prevent workplace injuries.

僱主要負責
Employer is responsible

- 超過一位僱員獲診斷是工傷

  More than one employee have been diagnosed with an ergonomic injury

- 傷自同一工種

  From the exact same tasks

- 醫生診斷爲與工作有關

  Have been diagnosed by a doctor as work related

加州職業安全衛生署 Cal/OSHA

- 僱主必須依循由名爲加州職業安全衛生署的政府機構制定的工地安全條例。這些條例保障工人在工地受到危害，生病及受傷

  Employers must follow workplace safety regulations made by a government agency called Cal/OSHA. These regulations protect workers from hazards, illnesses, and injuries in the workplace.

加州職業安全衛生署 Cal/OSHA

- 若僱主違反這條例，可向加州職業安全衛生署作健康及安全投訴

  If an employer violates such regulations, a health and safety complaint can be reported to Cal/OSHA.

- 投訴是守密的。加州職業安全衛生署會調查該工地是否遵照這些安全條例

  Complaints are confidential. Cal/OSHA can investigate to see if the workplace is following these safety regulations.

總結：In Conclusion:
緊記... Remember to...

- 減少及消除環境改造風險因素

  Reduce and eliminate ergonomic risk factors
- 徵狀出現時要及早治療

  Get early treatment if symptoms arise
- 採取行動！

  Take Action!!
  - 安全委員會
  - Safety Committee
  - 向負責你的全工作安全環境的僱主傾談

    Talk to your employer who is responsible for your safe work environment
  - 加州職業安全衞生署

    Cal/OSHA

問 題
Questions

? ? ?

謝謝！
Thank You!!

本培訓資料節錄自加州公共健康部，加州勞資關係部，柏克萊加大職業及環境健康中心的工人職業安全及健康專訓補充單元

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