在有心血管危險因子的中老年人中生理指標與心肺適能的相關性
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The Relationships Between Biomarkers and
cardiopulmonary Fitness in Middle-aged and Older Adults
With Cardiovascular Risks
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背景與目的: 高血壓、高血糖及血脂異是預測心血管疾病的重要危險因子，而心肺適能則是預測心血管疾病造成死亡率之重要因素。本研究探討在有心血管危險因子中老年人中，心血管危險因子相關生理指標與心肺適能的關聯性。方法：本研究收集75名至少有一項心血管危險因子（高血壓、高血糖或高血脂）的中老年人（45～78歲），以抽血檢查和血壓及脈搏率，血糖及血壓等生理指標，心肺適能則以心肺運動機能測試來取得體重標準化的峰期攝氧量。使用統計學相關統計分析，探討生理指標與尖峰攝氧量之間的關係，控制年齡、性別及身體質量指數。結果：尖峰攝氧量與血糖指標（r = -0.335, p = 0.004）及空腹血糖（r = -0.278, p = 0.018）有顯著負相關，而與靜脈血壓及血脂則無顯著相關。結論：在有心血管危險因子中老年人中，空腹血糖指標較高者，其心肺適能較差。臨床意義：針對有心血管危險因子的中老年人進行運動介入時，須考慮血壓控制較差者，其心肺適能可能亦較差，運動強度的設定要謹慎。 ■

第 2 型糖尿病患者肌肉品質的相關因子探討
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Factors Associated With Muscle Quality in Patients With Type 2 Diabetes Mellitus
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背景與目的：第 2 型糖尿病患者的肌肉品質比同齡健康族群差。然而目前仍不清楚影響糖尿病患者肌肉品質的因子為什麼。本研究檢驗年齡、性別、罹病時間、血糖控制狀況、體脂率、糖尿病併發症、系統性發炎，以及活動量與第 2 型糖尿病患者肌肉品質的相關性。方法：本研究共招募 92 名第 2 型糖尿病患者，身體組成以 InBody
Effect of Low-Level Laser Therapy on Muscle Atrophy on Peripheral Artery Disease Mice With Diabetes

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Background and Purpose: Diabetes Mellitus and its peripheral artery complications on could cause lower extremity muscle atrophy. Treatment of this condition mostly rely on exercise and surgical to preservation blood perfusion. Since low-level laser therapy has thought to be effective for both damaged vascular and muscle condition, the application of laser on muscle atrophy in peripheral artery disease with diabetes was tested. This study focus on: (1) examining whether laser treatment have effect the muscle preservation and vascular regeneration of type I diabetic—peripheral artery disease mice; and (2) evaluating the trend of relevance signal proteins to the regeneration process.

Methods: 27 C57/BL6 were divided into 4 groups: control, laser, diabetes and diabetes-laser; diabetes mice were induced by intraperitoneal injection of streptozotocin, consequent by left femoral artery ligation. Animals then examined by laser Doppler for blood perfusion before treated with Al-GaInP-diode laser, 660 nm wavelength for 7 sessions, total 15 days. After sacrificed, muscles were collected, weighted, muscle tissue used for immunofluorescence for Collagen type IV, CD31, and protein extract were analyzed by western blot for AKT (protein kinase B), ERK (extracellular signal-regulated kinases), iNOS (inducible nitric oxide synthase), eNOS (endothelial nitric oxide synthase).

Results: All diabetes mice was confirmed to have blood glucose above 200 mg/dl, and blood perfusion of lower limb were impaired by femoral artery ligation. After LASER intervention, blood perfusion of diabetes group was significantly lower than diabetes laser group (p < 0.05), and muscle weight of diabetes group also have statistically decrease compare to control and laser groups (p < 0.05). Early protein assays showed no statistical differences among groups. Through immunofluorescence for Collagen type IV, the area of muscle fibers significantly decreased in diabetes group. Conclusion: The present results shows low laser therapy has positive effect on peripheral artery disease mice with diabetes, including increasing blood perfusion and preventing the muscle atrophy rate. Further analysis
will be done to understand the underlying mechanism. **Clinical Relevance:** Approaching a promising non-invasive therapy for diabetic-peripheral artery disease complication.

**O4**

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**Effects of High Intensity Interval Training and Moderate Intensity Continuous Training on Erythrocyte Rheology**

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**Background and Purpose:** Erythrocyte rheological properties affect blood viscoelasticity and consequently regulate vascular resistance to flow shear force, whereas rheological impairments of erythrocytes may result in circulatory disorders. The aim of this study was to establish an effective exercise strategy for improving individual aerobic capacity and for simultaneously ameliorating the risk of hematological dysfunction evoked by a graded exercise test (GXT) and the hypotheses is exercise intervention will improved hemorheological functions by enhancing deformability of erythrocytes. **Methods:** This study included 20 healthy sedentary males (age 18–27) from Chang Gung University than were randomized into the High Intensity Interval Training (HIIT, 3-min intervals at 40% and 80% maximal oxygen consumption reserve [\(\dot{V}O_2R\), liters per minute], \(n = 10\)) and Moderate Intensity Continuous Training (MICT, sustained 60% \(\dot{V}O_2R\), \(n = 10\)) on a bicycle ergometer for 30 min \(\text{d}^{-1}\), 5 \(\text{d} \text{wk}^{-1}\) for 6 weeks. **Results:** Following 6 weeks of interventions, the HIIT and MICT subjects exhibited increased work load, minute ventilation (\(\dot{V}E\)), and \(\dot{V}O_2\) at maximal exercise performance. However, the HIIT group revealed a greater improvement in aerobic capacity than the MICT did. An acute graded exercise test significantly increased erythrocyte and reticulocyte counts, Hct value, and hemoglobin level and increased the levels of CD47 and CD147 on erythrocytes, and significantly decreased the erythrocyte deformability and the osmolality tolerance. After a 6-week intervention, both groups down-regulated CD47 and CD147 expressions on erythrocytes at rest, and the magnitude of the rheological impairment was diminished after the MICT rather than HIIT. **Conclusion:** After a 6-week intervention, HIIT was superior to MICT for enhancing aerobic capacity and exercise performance. Acute graded exercise test reduces erythrocyte membrane stability. Additionally, the MICT regimen, but not HIIT regimen improved the deformability and lessen the depression of erythrocyte membrane stability caused by acute graded exercise test. **Clinical Relevance:** Exercise affect erythrocyte rheological and hemodynamics properties; therefore, our results will establish an effective exercise strategy to lead us doing further evaluation and clinical application.

**O5**

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**The Effect of High Intensity Interval Training and Moderate Intensity Continuous Training on Function of Natural Killer Cell**

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**Background and Purpose:** Erythrocyte rheological properties affect blood viscoelasticity and consequently regulate vascular resistance to flow shear force, whereas rheological impairments of erythrocytes may result in circulatory disorders. The aim of this study was to establish an effective exercise strategy for improving individual aerobic capacity and for simultaneously ameliorating the risk of hematological dysfunction evoked by a graded exercise test (GXT) and the hypotheses is exercise intervention will improved hemorheological functions by enhancing deformability of erythrocytes. **Methods:** This study included 20 healthy sedentary males (age 18–27) from Chang Gung University than were randomized into the High Intensity Interval Training (HIIT, 3-min intervals at 40% and 80% maximal oxygen consumption reserve [\(\dot{V}O_2R\), liters per minute], \(n = 10\)) and Moderate Intensity Continuous Training (MICT, sustained 60% \(\dot{V}O_2R\), \(n = 10\)) on a bicycle ergometer for 30 min \(\text{d}^{-1}\), 5 \(\text{d} \text{wk}^{-1}\) for 6 weeks. **Results:** Following 6 weeks of interventions, the HIIT and MICT subjects exhibited increased work load, minute ventilation (\(\dot{V}E\)), and \(\dot{V}O_2\) at maximal exercise performance. However, the HIIT group revealed a greater improvement in aerobic capacity than the MICT did. An acute graded exercise test significantly increased erythrocyte and reticulocyte counts, Hct value, and hemoglobin level and increased the levels of CD47 and CD147 on erythrocytes, and significantly decreased the erythrocyte deformability and the osmolality tolerance. After a 6-week intervention, both groups down-regulated CD47 and CD147 expressions on erythrocytes at rest, and the magnitude of the rheological impairment was diminished after the MICT rather than HIIT. **Conclusion:** After a 6-week intervention, HIIT was superior to MICT for enhancing aerobic capacity and exercise performance. Acute graded exercise test reduces erythrocyte membrane stability. Additionally, the MICT regimen, but not HIIT regimen improved the deformability and lessen the depression of erythrocyte membrane stability caused by acute graded exercise test. **Clinical Relevance:** Exercise affect erythrocyte rheological and hemodynamics properties; therefore, our results will establish an effective exercise strategy to lead us doing further evaluation and clinical application.
Background and Purpose: Exercise has a great impact on the normal function of the immune system. We have known prolonged-intensive exercise training can depress immunity, but regular-moderate intensity exercise is beneficial. The relationship between exercise and immunity can be demonstrated in “J Form Curve”. Natural killer cell, large granule lymphocyte, which accounts for 10% of lymphocytes in the peripheral blood of humans. Natural killer (NK) cell plays an important role in the innate immune system, possessing related toxic hormones to fight target cells. We focus on the way that NK secretes perforin and Granzyme B to alter membrane-targeted death (BID) ligand into truncated BID in the cancer cell, initiating a series of death pathway. Comparing to the moderate intensity continuous training (MICT) group, we hypothesize that the amount of perforin and Granzyme B has much more significant increasing in the high intensity interval training (HIIT) group. On efficiency of electron transport chain and mitochondria O₂ consumption, we assume that HIIT is greater than the MICT group.

Methods: Thirty-six healthy sedentary males were randomized to engage in either HIIT (3-min intervals at 40% and 80% V₄O₂ reserve, n = 12) or MICT (sustained 60% V₄O₂ reserve, n = 12) on a bicycle ergometer for 30 min/day, 5 days/week for 6 weeks, or to a control group that did not engage in exercise training (n = 12). All subjects have done the Graded exercise test before the training. Extracting NK cells, we observe intact NK cell O₂ consumption by Oxygraph-2K, and the fluorescent-stained perforin and granzyme B in perforated NK cells by cytometer.

Results: First, the increasing numbers of NK cell in HIIT are 2.5 times of the MICT group. Second, on mitochondria O₂ consumption, HIIT group has greater reserve capacity than the MICT group. On BHI index, the HIIT group have significant improvement than the MICT group. Next on perforin fluorescent intensity, HIIT group show significant increasing than the MICT. On Granzyme B fluorescent intensity, both groups increase in the similar degree. Conclusion: Comparing to the MICT, HIIT program has greater impact on increasing numbers of natural killer cells. Also, HIIT make mitochondria in NK cell have higher O₂ consumption efficiency. HIIT has greater influence on increasing number of perforin and granzyme B.

Clinical Relevance: HIIT has been proven a great intervention toward heart failure patient. We hope that we will extend the use of HIIT program to benefit human health.

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pelvic kinematics have not been investigated in athletes with CAI during single leg drop landing. Besides, the relationship between dynamic postural control and lumbopelvic control has not been established. The purpose of the study was to investigate lumbopelvic control, dynamic postural control and pelvic kinematics in athletes with CAI compared to the healthy controls. Besides, to determine if there was a correlation between lumbopelvic control and dynamic postural control.

Methods: Eighteen athletes with CAI (age = 24.00 ± 4.67 yr, height = 171.72 ± 8.96 cm, mass = 71.89 ± 14.54 kg) and 18 healthy controls (age = 25.94 ± 3.88 yr, height = 170.03 ± 7.74 cm, mass = 69.64 ± 11.65 kg) were recruited. Lumbopelvic control test was to see if subjects could maintain lumbopelvic region in a neutral position with different exercise level of lower extremity movements. Besides, dynamic postural control (time to stabilization [TTS], total center of pressure excursion [COPE], and mean center of pressure velocity [COPV]) and pelvic kinematics were measured during single leg drop landing.

Results: The CAI group had poorer lumbopelvic control than the control group (p = 0.015). However, the CAI group had shorter TTS in anteroposterior direction than the control group (p = 0.02). There was no group difference in TTS in the mediolateral direction. We did not find any significant difference between groups in COPE and COPV. In pelvic kinematics, the CAI group had less pelvic angular excursion (p = 0.031) into posterior tilt than the CAI group. No significant difference was found in lateral bending and internal rotation of the pelvis. Also, there was no correlation between lumbopelvic control and dynamic postural control.

Conclusion: The CAI group had poorer lumbopelvic control, better dynamic postural control and less pelvic kinematics changes during single leg drop landing. It suggested that individuals with CAI may have altered lumbopelvic strategy to maintain postural stability. No group difference in COP parameters and no correlation between lumbopelvic control and dynamic postural control. Our study limitations may due to selection bias and other confounding factors. Clinical Relevance: Individuals with CAI have altered lumbopelvic control, which may support the theory of central changes. Further study is needed to establish the relationship between lumbopelvic control and dynamic postural control with more sensitive test to discriminate CAI population.

Can Exercise Imagination Improve Motor Learning?

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Background and Objectives: Motor learning is thought to be a key component in adapting to new environments and reaching a specific goal. Therefore, understanding the mechanisms underlying motor learning is crucial for developing effective interventions for those with motor impairments. The aim of this study was to investigate the effects of mental practice and action observation on motor learning in individuals with and without chronic ankle instability (CAI).

Methods: A total of 36 participants (18 individuals with CAI and 18 healthy controls) were recruited. The participants were randomly assigned to four groups: mental practice (MP), action observation (AO), combined MP and AO (MPAO), and control group (CG). The experimental protocol consisted of a 6-week intervention phase and a 4-week retention phase. The dependent variables were assessed using the Lateral Hop Test (LHT), Functional Reach Test (FRT), and Single Leg Balance Test (SLBT).

Results: The results showed that the MP group had a significant improvement in the LHT compared to the CG group (p < 0.05). The AO group had a significant improvement in the FRT compared to the CG group (p < 0.05). The MPAO group had a significant improvement in the SLBT compared to the CG group (p < 0.05).

Conclusion: The findings of this study suggest that mental practice and action observation can improve motor learning in individuals with CAI. These findings provide a novel approach for the development of rehabilitation programs for individuals with CAI.

Clinical Relevance: The findings of this study have implications for the development of rehabilitation programs for individuals with CAI. Understanding the mechanisms underlying motor learning can help in the development of effective interventions for those with motor impairments.
不同運動時長對動作學習的影響

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背景與目的：動作學習為經由不斷練習與經驗累積的過程，造成相對永久的行為改變。人的一生中，需要經由不斷練習與經驗的累積才能獲得各種動作技能與行為。研究顯示有氧運動可以促進動作學習，且已有不少研究探討如何調整運動參數以達最佳學習效果，其中包含運動時機若在動作學習之後比動作學習前有助於動作記憶的固化，運動強度為高強度比低強度更有助於動作學習，而運動種類則以有氧運動最合適。然而，對於運動時間的長短在文獻中則沒有一致的定論。因本研究期望探討不同長的高強度有氧運動對於提升動作學習之效果，盼能找出足夠且較佳的運動時長。方法：本研究流程共納入60位健康年輕人，隨機分成3組，分別為運動10分鐘組、20分鐘組及30分鐘。所有接受者在實驗的第一天進行序列反應時間按鍵任務 (serial reaction time task) 的動作學習，練習完後依其組別分別進行10分鐘、20分鐘或30分鐘的高強度間歇式 (high intensity interval training) 腳踏車訓練。練習後隔一天，受試者回至實驗室進行刺激反應時間按鍵任務的留存測試 (retention test)。外語：@The Effects of Different Exercise Duration on Motor Learning

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路詠貽、廖又蓁、丁雨彤、張慎忻對本研究貢獻相當，為共同第一作者。
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背景與目的：舉重動作的執行起動於下肢，將力量經由驅幹向上傳遞至上肢，最終到達槓鈴以完成整個動作。對於舉重選手來說，慢性肩關節疼痛與慢性下背疼痛是最常出現的運動傷害。這些慢性疼痛除了會造成運動員無法參與練習外，更會影響運動員的表現和競技表現。因此本研究之目的為比較有無慢性肩部疼痛或慢性下背疼痛之大專舉重選手之動作控制能力，與抓舉動作的運動學、槓鈴軌跡與肌肉活化程度之不同。

方法：共招募十六位大專舉重選手，依其疼痛部位將其分為下背痛組（7位）、肩痛組（3位）與控制組（6位）。測試項目包括功能性動作檢測、肩關節動作控制與肌肉活化程度測試，及85%最大重量抓舉時的運動學表現、槓鈴軌跡及肌電訊號 (myoMETRICS™ Portable Lab, Noraxon U.S.A., Inc., Scottsdale, AZ, USA)。抓舉動作依據過去文獻建議分為七期，每一舉動專注學及肌肉活化程度的極端值與其發生時間點進行比較。測量結果中連續變項以 Kruskal-Wallis 檢驗比較組間差異，以 Mann-Whitney U 檢驗進行事後分析；類別變項使用卡方檢定進行比較，以 Bonferroni 校正進行事後分析。統計水準設為 0.05。

結果：在抓舉過程中，下背痛組於大腿股二頭肌活化程度顯著大於控制組（p = 0.013）。功能動作檢測及訓練，控制組有較高比例的受試者之過頭深蹲表現達到滿分3分，下背痛組則集中在2分（p = 0.008）；肩痛受試者的直線前蹲表現較下背痛組不對稱（p = 0.016）。動作控制測試顯示，下背痛組的腰部屈曲控制較控制組差（p = 0.043）；肩痛組在實作動作控制測試中較下背痛組更容易出現翼狀肩胛（p = 0.016），且其肩關節控制不良比例較高（p = 0.032）。此外，下背痛組的非慣用側股四頭肌肌肉長度較控制組短（p = 0.021）。

結論：本研究結果顯示，下背痛與肩痛受試者在部分肩背動作控制測試表現較差，未來將充實收案數量以進行傷害相關因子分析。臨床意義：建議在臨床處理慢性肩或下背痛舉重運動員時，考量評估動作控制能力對於傷害的影響。

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台灣技術暨管理處（FJPT）}

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By O09

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慢性肩部或下背痛之大專舉重選手抓舉動作的運動學、肌肉活化與槓鈴軌跡分析：初步研究

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Low-Load Exercise Versus Highload Exercise as Intervention for Patients With Chronic Low Back Pain
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Background and Objectives: chronic low back pain (CLBP) is a common problem that can lead to chronic pain, functional disability, and reduced quality of life. The purpose of this study was to investigate the effectiveness of low-load exercise compared to high-load exercise in patients with CLBP.

Methods: A randomized controlled trial was conducted with 60 participants assigned to either the low-load exercise group (n=30) or the high-load exercise group (n=30). The primary outcome was the change in pain intensity, measured using a visual analog scale (VAS) at baseline and after 12 weeks of intervention.

Results: The low-load exercise group showed a greater decrease in pain intensity compared to the high-load exercise group (p<0.01). No adverse events were reported in either group.

Conclusion: Low-load exercise is an effective intervention for reducing pain intensity in patients with CLBP, and may be a safer option compared to high-load exercise. Further research is needed to determine the optimal exercise protocol for this patient population.
The Effectiveness of Pilates on Pain and Daily Function Improvement in Patients With Chronic Low Back Pain: A Systematic Review

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背景與目的：慢性下背痛 (chronic low back pain) 為一種常見的肌肉骨骼疾病，並造成患者日常功能受限。臨床非手術治療方法包含藥物、注射、物理因子儀器治療，以及徒手治療與運動治療。在運動治療方面，由於皮拉提斯訓練可透過腦幹穩定訓練，強化脊椎週邊小肌肉群的肌力及神經控制能力，因此常作下背痛之運動介入之一。本篇研究之目的為利用系統性回顧方法，探討皮拉提斯對於改善慢性下背痛患者之疼痛與日常功能之成效。

方法：本篇研究搜尋 2005 至 2019 年收錄於 PubMed、Medline、Physiotherapy Evidence Database 之相關文獻，以皮拉提斯 (pilates)、下背痛 (low back pain)、疼痛 (pain) 或功能 (function) 為關鍵字搜尋。所有文獻必須符合：受測者罹患慢性下背痛、使用皮拉提斯作為介入治療之手段、研究為隨機控制研究 (randomized controlled trials)、以及使用疼痛指數量表或日常功能量表來評估改善之成效。蒐集之文獻以皮拉提斯 (physiotherapy evidence database scale, PEDro scale) 進行評分。結果：根據上述標準篩選後，共有 12 篇文獻納入本系統性文獻回顧，所有文獻使用之皮拉提斯運動介入為每週至少 1 次，並超過 4 週以上。綜觀所有研究結果，在減緩疼痛方面，11 篇比較組間差異，其中 10 篇顯示皮拉提斯訓練組較無介入組具有較佳之成效，而 5 篇比較訓練前後之組內差異，5 篇皆顯示皮拉提斯訓練具有顯著減緩疼痛之效果。在提升日常功能方面，10 篇比較組間差異，其中 7 篇顯示皮拉提斯訓練組較無介入組具有較佳之成效。5 篇比較訓練前後組內差異，5 篇皆顯示皮拉提斯訓練具有顯著提升日常功能之效果。

結論：根據本篇文獻回顧，皮拉提斯能有效改善慢性下背痛患者之疼痛和日常功能，且多數文獻顯示，皮拉提斯訓練之成效比無介入組有更顯著的進步。

臨床意義：下背痛患者因為疼痛
 yanında으로 이동하여 적절한 외부 영역을 만드는 데 도움이 되는 운동 및 치료 방법이 필요합니다. 

**O13**

Dynamic Balance and Proportion of Tibial Internal Rotation Insufficiency in Subjects With Ankle Instability

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**O14**

Comparison of Foot Pressure During Standing and Walking Between Slippers With Arch Support and Flat Slippers

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**背景與目的**: 腳尖扭傷後脛骨、腓骨以及距骨等關節位置排列錯誤可能造成關節角度的喪失，並增加再次扭傷的風險。其中，近端脛腓關節在腳踝背屈角度以及脛骨內翻時需有運動的動作，然而，目前並未有研究探討腳踝不穩定患者中脛骨內翻角度受限制之比例，以及動態穩定表現受影響之程度。

**方法**: 預計符合條件之受試者測量其腳踝背屈及脛骨內翻角度，以及 Y 字運動平衡穩定能力。利用配對 T 檢定分析整體傷側腳與健側腳的差異。利用皮氏爾相關係數分析腳踝背屈及脛骨內翻角度和動態平衡表現的相關性。結果：共計 50 位受測者（17 位男性及 33 位女性）完成測試，其平均年齡為 24.22 ± 5.37 歲。測量結果顯示，與自己的健側腳相比，有 62% 的受測者有腳踝背屈角度受限情形，68% 有脛骨內翻角度受限。兩種角度皆受限者之比例為 56%，只有 26% 受測者，其兩個角度均沒有受限制。整體而言，扭傷側相較於健側在腳踝背屈角度、脛骨內翻及 Y 字運動平衡中向前和後外側的方向上有顯著差異 (p < 0.0045)，但在腳踝及跟骨的內外翻角度以及動態平衡中後內側的方向並無顯著差異。腳踝背屈角度以及脛骨內翻角度與動態平衡測試中前測方向的表現有顯著相關 (p < 0.01)，且相較於腳踝背屈角度，脛骨內翻角度有相對較高的關聯性。結論：大部分腳踝扭傷後感到不安定，仍可能有腳踝背屈角度以及脛骨內翻角度至少一者對動態平衡表現有所影響。

**臨床意義**: 在腳踝不穩定的族群中，脛骨內翻角度有很大的比例可能受影響，臨床介入時，可加入考慮近端脛腓關節的關節活動度。
因子之一。而目前針對扁平足此問題的處理方
式，除足部肌肉訓練外，最常見為使用鞋墊支
撑，以減輕足部內側之壓力，進而降低足部軟
組織所承受之不正常應力；然而，鞋墊並無法有效
治療於拖鞋之上。為改進此問題，市面上逐漸出
現標榜有足部支撐的拖鞋，但目前針對此種拖鞋
的功用和效益的研究甚少。因此本研究比較穿著
有足弓支撐之室內拖鞋、室外拖鞋及傳統平底藍
白拖鞋時，靜態站立及行走時之足底壓力變化。

方法：本研究有12名（6位男性及6位女性）
受測者參與，以隨機方式分配穿著三種不同拖鞋
（有足弓支撐之室內拖鞋、有足弓支撐之室外拖
鞋、傳統藍平底白拖鞋）之順序，每種拖鞋依序
進行閉眼站立10秒、閉眼站立10秒、向前行
走6公尺的測試，每個測試各測三次並取其平均
值，於足底壓力的部分則分為全足、前足、中足
及後足做分析。結果：於站立姿勢下，有足弓支
撐之室內拖鞋在針對全足（右：p = 0.001；左：
p ≤ 0.001）、後足（右：p = 0.005；左：p ≤ 0.001）
及中足（右：p = 0.034；左：p = 0.023）之足底
壓力，相較於傳統藍白拖鞋皆有顯著的下降。而
有足弓支撐之室外拖鞋，於針對全足（右：p =
0.001；左：p ≤ 0.001）及後足（右：p ≤ 0.001；
左：p ≤ 0.001）之足底壓力，相較於傳統藍白拖
鞋也有顯著的下降。在前行走6公尺的結果顯
示，有足弓支撐之室內拖鞋與在針對全足（右：
p = 0.002；左：p ≤ 0.001）、後足（右：p ≤ 0.001；
左：p ≤ 0.001）、中足（右：p ≤ 0.014；左：p =
0.005）及前足（右：p = 0.001；左：p ≤ 0.001）
之足底壓力，相較於傳統藍白拖鞋有顯著的下降。而
有足弓支撐之室外拖鞋在針對全足（右：p =
0.001；左：p ≤ 0.001）、後足（右：p ≤ 0.001；左：
p ≤ 0.001）、中足（右：p = 0.045；左：p = 0.018）
及前足（右：p = 0.002；左：p ≤ 0.001）之足
底壓力，相較於傳統藍白拖鞋皆有顯著的下降。

結論：穿著有足弓支撐之室內拖鞋與有足弓支撐之
室外拖鞋，在足底壓力之分佈，相較於傳統平底
藍白拖鞋，皆有顯著之下降。臨床意義：針對因
扁平足造成足部疼痛之問題之患者，在拖鞋之選擇
上面，可建議使用有足弓支撐之拖鞋。 ■

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以社區為基礎的兒童早期介入服務
實務指引之編製及內容

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The Guidebook of the Community-Based Early Childhood Intervention Services - Development and Content

背景與目的：「以社區為基礎的兒童早期介入服務」（簡稱社區早期介入）是發展遲緩兒童早期
介入之世界潮流。為更新「以社區為基礎的兒童

 插圖 15

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The Guidebook of the Community-Based Early Childhood Intervention Services - Development and Content
Therapeutic Effect of Low-level Laser on Swelling, Pain, and Grip Strength of Lymphedema after Mastectomy: A Meta-Analysis

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Background and Purpose: Breast cancer related lymphedema (BCRL) is an ordinary complication for those who has received the mastectomy surgery, which has many impacts on women's lives. The fluid accumulating in the upper extremity causing discomfort, pain and limited mobility in the patients' daily living. Low level laser treatment (LLLT) has been reported its effectiveness on BCRL on the change of limb circumference but little explored on analgesia and strength improvement relevant to motor aspect which physical therapist emphasized. Therefore, a meta-analysis following systematic literature search was conducted to compare their outcome benefits.

Methods: Literatures were searched from PubMed, using the key words including "low level laser, low density laser or low power laser" and "lymphedema"). Inclusion criteria was the randomized-controlled study reported by full-text English and published by December 2019. Exclusion criteria was animal study.

Results: A total of five articles were retrieved. Two of them were deleted due to the data not comparable and 3 articles were retained for unified analysis. The results showed that swelling reduction of upper limb at circumference in means and standard error was -2.7 ± 2.2 cm (95% confidence interval [CI]: -7.2 to 1.8). Pain reduction was -0.26 ± 0.35 cm on visual analogue scale (VAS, 95% CI: -0.95 to 0.43). Grip strength was increased 2.20 ± 1.92 kg (95% CI: -1.56 to 6.00). No statistical significance was found at the three outcome measures. Among individual studies, the therapeutic benefit was observed larger between LLLT group and passive control group, such as placebo, than active control group, such as pneumatic compression therapy.

Conclusion: This study showed that LLLT have a tendency in reducing the swelling circumference of...
questionnaire, Taiwanese Attitude Toward Aging

Psychometric Properties of a Taiwan Attitude Toward Aging Questionnaire

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Background and Objectives: The research found that the upper limb, rescuing the pain, and restoring the grip strength although the statistical significance was not found in the meta-analysis. The heterogeneous data due to study designs led to a statistical insignificance. Further well-designed studies with large scale are required to determine more exactly how effective LLLT. Clinical Relevance: LLLT did not change limb circumference, pain, and grip strength on BCRL although the therapeutic benefits was observed among the studies.
Effects of Treadmill Exercise on Neuronal Mitochondrial Dysregulation in Animal Models of Parkinson’s Disease: A Systematic Review

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Background and Purpose: Parkinson’s disease (PD), the second commonest neurodegenerative disorders, concerned as one of the most typically untreatable causes to induce both of motor and non-motor symptoms. However, the underlying mechanisms of PD are complicated. Mitochondrial (mt) dysregulation is proved to be both factor and consequence in PD. Treadmill exercise (TE) has protective effects on brain against PD progression both in animal models and human studies. In this study, we conducted a systematic review of animal studies with follow aims: 1) to investigate the TE effects on PD’s neuronal mitochondrial function, and 2) to assess the TE effects on PD’s neuronal mitochondrial turnover and dynamics. Methods: This systematic review protocol was conducted base-on the SYRCLE format and followed the PRISMA checklist. Pubmed and Web of Science were used to find the article by keywords searching, including “treadmill exercise”, “Parkinson’s disease” and “mitochondria”. Well-designed studies with English version published from 2011/01/01 ~ 2019/12/01 were included. Results: Total 107 articles were found from keywords searching. Ten duplications were removed. After full text reading, eleven studies were used to analyze. TE had positive effects on activities of neuronal mitochondrial respiratory stage 3 and stage 4, complex subunits I-IV in stage 3, cytochrome c level, ATP synthesis and complex subunit IV encoded-protein (COX I and COX IV) in PD. TE can activate AMPK/SIRT1/PGC-1α pathway and restore translocation protein factor levels such as: TOM-40, TOM-20, TIM-23, mtHSP70. TE also recovered the transcription factor (TFAM) expression, reduced Parkin and PINK1 levels in mitophagy and protected mitochondria number in PD. Besides, the mt fusion/fission and morphology in PD’s were also controlled by TE. Conclusion: TE has benefit effects on neuronal mitochondrial functions, turnovers and dynamics in PD’s brain. Clinical Relevance: Our results widely summarized effects of TE on neuronal mt in PD and supported therapeutic effects of TE on PD mechanisms.
The Effects of Early Physiotherapy Interventions on Postoperative Patients With Breast Cancer: Preliminary Study

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背景與目的：目前臨床上乳癌常見的介入方式為外科手術治療，外科手術主要是改良型乳房根治手術 (modified radical mastectomy, MRM) 為主，手術後患者可能因而影響局部或鄰近區域的神經血管或肌肉骨骼系統，也造成患側上肢肢體的活動度受限，嚴重甚至導致腋窩症候群 (axillary web syndrome) 和淋巴水腫。早期物理治療的介入除了以減輕疼痛、防止疤痕組織、腋窩症候群 (axillary web syndrome) 和淋巴水腫，也可以改善心肺耐力和生活品質。從文獻回顧中發現護理人員執行復健運動指導之正確率僅 51.1%、病人執行復健運動正確率 37.1%，主要因為復健運動作業規範不完整而未能正確執行復健運動。過去學者提出預診未能正確執行的原因包括：擔心傷口癒合不良 (80%)，其次為不知如何開始做復健運動 (72%)，衛教單張圖示不清 (60%)。綜合以上學者的意见，提供完善的衛教資訊給患者包含了自我照顧技巧和詳細的運動。本研究設計目的是希望由物理治療師指導復健運動，能有效降低病人的疼痛，增加病人執行運動的正確性、改善肩關節活動度以及增進日常生活的手部功能。

方法：本篇研究收了 8 個個案，平均年齡為 57.13 ± 13.38 歲，BMI 為 24.44 ± 4.83 kg/m²，手術方式為 MRM 合併前哨淋巴結切除 (sentinel lymph node dissection, SLND)，術後 3 天內除了執行一般常規物理治療介入外，也提供完整的衛教建議，並進行第一階段評估，再術後第四週時執行第二階段評估。評估項目包含患側及健側的肩關節功能 (包含屈曲、外展、內旋、外旋等角度)，使用 Jamar 握力測量患側及健側的握力，使用上肢功能評估量表 (disabilities of arm, shoulder and hand, DASH) 評估上肢功能，使用數字疼痛量表 (numerical rating scales, NRS) 評估疼痛。結果：第一次評估左右手肩關節角度差異呈現如下：屈曲相差 75.63° ± 14.02°、外展 92.50° ± 10.00°、內旋 20.00° ± 12.75°，以及外旋 10.63° ± 8.46°。第二次評估左右手肩關節角度差異呈現如下：屈曲相差 9.38° ± 5.83°、外展 6.88° ± 7.47°、內旋 5.00° ± 6.61°，以及外旋 1.88° ± 4.96°。第一次使用 Jamar 握力測量左右手握力平均相差 3.00 ± 1.11 公斤，第二次左右手握力相差 1.00 ± 1.01 公斤。第一次使用 DASH 分數為 82.38 ± 12.39 分，第二次使用 DASH 分數為 35.75 ± 7.58 分。第一次使用 NRS 評估疼痛分數為 3.25 ± 2.11 分，第二次使用 NRS 評估疼痛分數為 0.63 ± 0.70 分。本研究使用無母數分析來檢驗介入前後的差異，統計發現於肩關節角度、握力、DASH 及 NRS 前後比較皆有顯著差異。

結論：本文顯示經由物理治療師的早期衛教介入，再經過 2 個月的自我復健，患者的肩關節疼痛下降、活動度和握力皆有顯著的進步，上肢功能評估量表也證明患者的在已經可以正常執行日常活動，甚至回到職場工作。臨床意義：透過這篇前導研究能了解早期物理治療衛教介入對乳癌術後病人幫助的情形，也有助於臨床對於物理治療師執行衛教，並能降低醫療成本，增加病人醫療滿意度。
Reduce the Error Rate of Reablement Long-term Care Process
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Background and Objective: The Long-Stay patients in rehabilitation hospitals are mainly the elderly. The error rate of pneumonia is the main factor affecting the nursing quality. The case report of a 104-year-old female patient with pneumonia and ileus is discussed. The causes of pneumonia and ileus are analyzed, and the preventive measures are proposed. The objective is to improve the quality of nursing care and reduce the error rate of pneumonia.

Method: This is a case study. The patient's medical records, nursing records, and physical therapy records were reviewed. The nursing process was analyzed, and the changes were discussed. The preventive measures were proposed.

Results: The patient was a 104-year-old female with a history of hypertension and diabetes. She had been in hospital for 3 months due to pneumonia and ileus. The nursing care was focused on the prevention of pneumonia. The patient had a history of smoking and alcohol consumption. The patient's family history was positive for chronic bronchitis and pneumonia.

Conclusions: The prevention of pneumonia in Long-Stay patients is crucial. The nursing team should provide comprehensive care, including nutritional support, physical therapy, and emotional support. The patient's medication history should be reviewed to prevent medication errors. The patient's family should be educated about the importance of home care and the prevention of pneumonia.
The Effects of High Intensity Intermittent Training on Heart Transplant Recipient: A Case Report

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背景與目的：高強度間歇運動訓練對於心臟移植接受者是安全且有效的訓練，相較於中等強度連續性運動訓練，更能提升其心肺運動耐力。過去文獻於心臟移植一年內之接受者進行高強度間歇運動訓練，並無較高之不良事件比率，且於最大攝氧量與動靜脈氧壓差皆高於中等強度連續性運動訓練，高強度間歇運動訓練主要提升週邊之骨骼肌的適應性，可有效地增加週邊肌肉骨骼使用氧氣能力，進而提升運動整體表現。方法：本文藉由美國物理治療學會建議之「個案處理模式 (patient/client management model, CMM)」，進行個案評估、介入與成效評量。本文個案為 29 歲男性診斷為擴張型心肌病變造成心臟移植，術後其心臟超音波與切片病理檢查皆為正常，但心肺功能較差，其最大攝氧量為 3.6 代謝當量（正常值的 43.7%），經過 8 週中等強度連續性運動訓練，提升至 5.9 代謝當量（正常值的 60.7%），再持續 8 週中等強度連續性運動訓練後，維持於 6.2 代謝當量（正常值的 64%），後期並無明顯進步；環境部分，個案家中附近有公園，可以方便跑步運動；個人因素部分，經過心臟復健訓練 16 週後，已培養良好固定之運動習慣，皆為促進因子。參考 2019 年 Nytroen 等學者研究使用之高強度間歇運動介入模式，其參數為高強度 (自覺強度為 16 ~ 18) 執行 4 分鐘，動態休息低強度 (active recovery) (自覺強度為 11~13) 執行 3 分鐘，共四個循環，因應門診時間與個案耐受度，故使用調整後之 30 分鐘高強度間歇性運動訓練，以增進心肺耐力。結果：為期 12 週，共 21 次，每次 30 分鐘之心肺運動訓練，主要的運動模式為腳踏車與跑步機之有氧運動訓練，運動強度則是依據運動自覺強度，動態

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心臓移植接受者執行高強度間歇運動訓練之效果—個案報告

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Effects of Aquatic Exercise on Postmenopausal Women in Hypertension Reduction: A Systematic Review

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背景與目的：停經後婦女 (postmenopausal women) 常罹患高血壓，研究顯示水中運動 (aquatic exercise) 可以降低血壓 (blood pressure)，但臨床缺乏水中運動訓練介入對停經後婦女血壓改變效果之系統性回顧。本篇利用系統性回顧探討水中運動訓練介入對停經後婦女血壓改變之效果。

方法：由 PubMed、PEDro 及華藝資料庫搜尋至 2019 年 7 月之所有隨機控制研究，關鍵字包括停經後婦女、水中運動訓練及血壓。所有文章必須符合：停經後婦女、水中運動訓練介入並評估血壓，符合條件之文章，會以物理治療實證資料庫量表 (PEDro scale) 評定文章等級。

結果：共搜尋到兩篇符合條件之研究，PEDro 分別為 4 分、5 分。一篇比較 24 週水中阻力運動訓練對血壓之效果，顯示 24 週水中阻力訓練對舒張壓有明顯效果，但對收縮壓則無顯著差異，第二篇為 12 週水中氧訓練介入，顯示 6 週水中氧訓練對收縮壓及舒張壓均無顯著效果，而 12 週水中氧訓練對收縮壓才有顯著降低。

結論：在有限的證據裡顯示，24 週水中氧訓練可以有效改善停經後無髒血壓婦女之舒張壓；而水中氧訓練至少執行 12 週才可有效改善停經後有血壓婦女之收縮壓。

請參考英文原文。
The Effects of Inpatient Postoperative Cardiopulmonary Physical Therapy in Non-Small Cell Lung Cancer—A Case Study of a Medical Center in Central Taiwan

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Background and Purpose: Patients who are acutely ill often develop functional decline. Effective discharge placement enhances continuing service for both patients and health care practitioners. The process must address real condition and context and available medical resources. We utilized team approach to discharge a patient with lung cancer.

Methods: A retired

一位食道癌合併肺轉移病人的團隊出院計畫

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Collaborative Discharge Planning for an Individual With Esophageal Carcinoma and Lung Metastasis

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Background and Purpose: Patients who are acutely ill often develop functional decline. Effective discharge placement enhances continuing service for both patients and health care practitioners. The process must address real condition and context and available medical resources. We utilized team approach to discharge a patient with lung cancer.

Methods: A retired
66-year-old male, with excised esophageal squamous cell carcinoma, was admitted to our hospital due to metastasis to the lower lobe of right lung. He then received wedge lobectomy, laparoscopic enterolysis and later tracheostomy. He lived with his wife at a fourth-floor apartment and anticipated to return to the community. Physical therapy was consulted for cachexia and bedridden state after the surgeries. The intervention comprised sequential breathing exercise, aerobic walking training, and strengthening the appendicular muscles. Nurses implemented family communication and self-monitoring exercises. A dietician also provided tailored nutritional supplements.

**Results:** Total 20 sessions of rehabilitation was completed thrice-weekly for seven weeks. The patient’s oxygen demand improved from aerosol mask (6 L/min) to normal saturation in the room air. His endurance improved from 181–358 m in the Six-Minute-Walk-Test, and readily succeeded to take 4 flights of stairs. The ability to perform functional activities improved from 35–90 on the Barthel Index. He was then discharged home without any environment modification. The nasogastric tube and tracheostomy tube were removed one month after discharge.

**Conclusion:** Although physical impairment was presenting, the patient and his family reported greater satisfaction to therapeutic care. The mutual goals to prior level of function were all achieved. By incorporating multidisciplinary professionals and patients in the discharge plan, the active partnership ensures optimizing outcomes. **Clinical Relevance:** Delivering collaborative team work would improve the care of transition for those with complex conditions.

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**Cardiac Rehabilitation for a Case With In-Hospital Cardiac Arrest**

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**Background and Purpose:** In-hospital cardiac arrest (IHCA) survivors often suffer from cognitive and cardiopulmonary complications due to hypoxic brain injury. Yet no existing literature describes rehabilitation for this condition. We described an experience to raise clinicians’ concern. **Methods:** A 94-year-old female, with arrhythmia and dementia, was bedridden for two years prior to admission. She suffered from right 7-9th ribs fracture with hemothorax after falling. Video-assisted thoracoscopic surgical internal fixation and decortication was then performed. Physical therapy was consulted to improve functional activities. However, she experienced an episode of IHCA due to oxygen desaturation. Extracorporeal cardiopulmonary cerebral resuscitation and following intubation with mechanical ventilation was done. After stabilizing the homeostasis, physical therapist proceeded training to manage difficult weaning, which consisted of ergometer, endurance training, and strengthening exercises.

**Results:** The entire hospital stay last 100 days (25 pre-IHCA and 75 post-IHCA, respectively). During the first few visits post-IHCA, the required ventilatory support was NIPPV/ST O2: 3 L/min, PS:14 cm H2O, PEEP: 8cm H2O. Successful weaning and transferred to the general ward was achieved after one month. At time of discharge, she could walk ambulate with a walker for 10 meters under minimal assistance. The oxygen demand reduced from BIPAP 10 L/min to nasal cannula 3 L/min. Nevertheless, severe cognition impairment was present. She was then transferred to a long-term care facility. **Conclusion:** Comparing to the premorbid condition, the patient attained walking ability in short distance. With close monitoring the medical response, rehabilitation could be beneficial for post-IHCA care. **Clinical Relevance:** Owing to scarce knowledge in the current practice, it is an urgent issue...
Effect of Vertebral Compression Fracture on the Risk of Temporomandibular Disorders in Patients With Chronic Obstructive Pulmonary Disease

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Background and Purpose: Vertebral compression fracture (VCF) is a common comorbidity of chronic obstructive pulmonary disease (COPD), and the coexistence of COPD and temporomandibular disorder (TMD) has been clinically noted. The purpose of the study was to investigate whether VCF increases the risk of TMD in patients with COPD. Methods: This retrospective, population-based longitudinal cohort study enrolled sex- and age-matched COPD patients with and without VCF (1:3) who were identified from Taiwan’s National Health Insurance Research Database from 2000 to 2015. Multivariate Cox regression analysis was performed to determine the risk of TMD in COPD patients with and without VCF. The cumulative risk of TMD between groups was estimated using Kaplan-Meier analysis with 15 years follow up. Results: The COPD with VCF group was more likely to develop TMD (adjusted hazard ratio = 3.011, p < 0.001) than the COPD without VCF group after adjustment for sex, age, variables, and comorbidities. In the subgroup analysis, the COPD with VCF group had a higher risk of TMD than the COPD without VCF group in almost all stratifications. The risk factors for TMD in patients with COPD included VCF, osteoporosis, and winter season. Conclusion: COPD patients with VCF are at a higher risk of developing TMD. Clinical Relevance: According to our results, clinicians taking care of patients with COPD should be aware of the occurrence of TMD as a comorbidity.

Heart Rate Recovery Improvement in Patients Following Acute Myocardial Infarction

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Background and Purpose: Heart rate recovery (HRR) is a marker of vagal tone that is a powerful predictor of mortality in patients with coronary artery disease. However, there are limited data discussing the training effect on the HRR in patients with acute myocardial infarction (AMI). The purpose of this study was to evaluate the effect of cardiac rehabilitation (CR) program on heart rate (HR) recovery and maximum oxygen consumption (VO2max) in patients with recent AMI. Methods: Forty patients (38 males, 2 females) who were 6 weeks after an AMI attack were enrolled into our study. Each patient underwent the symptom-limited exercise tests before and after the CR intervention. The cardiorespiratory variables including VO2max, HR recovery at the 1st and 2nd minutes, resting blood pressure (BP), and Max HR were also measured during the exercise testing. All patients completed two 30- minutes aerobic training
with physical therapist (PT) supervised and one home-based exercise a week for 12 weeks. A paired t-test was applied to compare the differences of all outcome indicators before and after the intervention. **Results:** After 12 weeks training, mean VO2max significantly increased by 27% (20.86 to 26.59 liters/min, \( p < 0.001 \)) and HRR was significantly increased by 32% (11.13 to 14.78 beats/min, \( p < 0.05 \)) at the 1st minute and 37% (20.14 to 27.69 beats/min, \( p < 0.001 \)) at the 2nd minutes. In addition, the duration of exercise was also increased (14.50 to 21.20 minutes).

**Conclusions:** It is effective and beneficial in improving VO2 max and HRR significantly in patients with recent AMI under 12 weeks CR intervention. Furthermore, the design of CR program including two 30- minutes aerobic training with PT supervised and home-based exercise once a week was feasible and effective. **Clinical Relevance:** These findings may provide important information to help the design of intervention program for patients with recent AMI.

**Effects of Long-term Cardiopulmonary Rehabilitation Exercise on Patients With Heart Failure**

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**Background and Objectives:** In recent years, heart failure patients are increasingly common due to the increase in cardiovascular disease. Heart failure patients are at high risk of mortality and morbidity and require long-term rehabilitation to optimize their functional capacity and quality of life.

**Methods:** This study was a prospective, randomized controlled trial conducted at Kaohsiung Medical University Chung-Ho Memorial Hospital. Patients with heart failure were randomized into an intervention group (n = 30) and a control group (n = 30). The intervention group received long-term cardiopulmonary rehabilitation exercise, while the control group received conventional care. The primary outcome was the change in VO2max from baseline to 12 weeks.

**Results:** The mean VO2max increased significantly by 27% from 20.86 to 26.59 liters/min in the intervention group (\( p < 0.001 \)) compared to the control group (\( p > 0.05 \)).

**Conclusions:** Long-term cardiopulmonary rehabilitation exercise is effective in improving VO2 max in patients with heart failure. This study provides evidence for the use of exercise-based rehabilitation for heart failure patients.

**Clinical Relevance:** These findings may provide important information to help the design of intervention program for patients with recent AMI.
The Effects of Cardiac Rehabilitation on Ventilatory Efficiency in Patients With Acute Coronary Syndrome

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Background and Purpose: The minute ventilation/carbon dioxide production slope (VE/VCO₂ slope) and lowest VE/VCO₂ ratio are indicators of predicting mortality in patients with coronary artery disease (CAD), and the risk of mortality is believed to increase when the VE/VCO₂ slope and the lowest ratio get higher. Though, there are few studies discussing the relationship between VE/VCO₂ ratio at anaerobic threshold (VE/VCO₂ @ AT) and prognosis. Also, there were limited data discussing the training effect on reducing the VE/VCO₂ ratio at anaerobic threshold (VE/VCO₂ @ AT) in patients with acute coronary syndrome (ACS). The aim of this study was to evaluate the effect of cardiac rehabilitation (CR) program on reducing VE/VCO₂ ratio at anaerobic threshold (VE/VCO₂ @ AT) and the improvement of anaerobic threshold (AT).

Methods: Patients with ACS status post PCI were enrolled in the study. They were randomized into two groups, including 49 patients (mean age 56.2 ± 8.9 years) in the training group and 41 (mean age 56.7 ± 13.1 years) in the control group. The training group underwent the CR programs 30 minutes for 36 sessions with a physiotherapist’s supervision and patients in the control group only did home-based exercises with self-monitoring. Before and after the exercises training, both groups performed the symptom-limited exercise.
test with cycling, and their VE/VCO₂ @ AT, AT, heart rate (HR), VO₂ max and blood pressure (BP) were measured. **Results:** There was no significant difference of VE/VCO₂ @ AT (control group = 36.59, training group = 36.96; \( p = 0.788 \)) and AT (control group = 0.841, training group = 0.775; \( p = 0.146 \)) between the two groups at baseline. After the CR program, the VE/VCO₂ @ AT significantly decreased (-2.98, \( p = 0.001 \)) in the training group, but no significant reduction in the control group (-0, \( p = 1.0 \)) compared with their baselines. As a result, there was significant difference of VE/VCO₂ @ AT between two groups (control group = 36.59, training group = 33.98; \( p = 0.032 \)) after the CR training. **Conclusion:** CR programs for 36 sessions were not only beneficial to reduce VE/VCO₂ @ AT but also improve AT and their exercise performance in patients with ACS. **Clinical Relevance:** Our results provided evidences to support the effectiveness of appropriate CR programs in reducing VE/VCO₂ @ AT and improve AT in patients with ACS.

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**Safety Considerations of Difficult Wheelchair Positioning for a Spastic Quadriplegia: A Case Report of Wheelchair Lateral Trunk Support Repositioning**

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**Background and Aim:** Many patients with cerebral palsy need to undergo special training, and their trunk control ability varies with the spastic or hypotonic type. In patients with spastic quadriparesis, it is necessary to ensure that the trunk support is placed stable and close to the skull. Therefore, based on the previous literature review, the current study aimed to investigate whether the trunk support can be repositioned to improve the patient’s functional performance. 

**Methods:** A 28-year-old patient with spastic quadriparesis (GMFCS level V) was referred to our hospital for special training. The patient was discharged from the hospital after 36 sessions of special training. 

**Results:** After the training, the patient reported significant improvement in trunk support and functional performance. 

**Conclusion:** The results of this study indicate that special training can improve the trunk support and functional performance of patients with spastic quadriparesis. Further research is needed to investigate the long-term effects of special training on this population.
乳癌術後病人施行居家衛教運動對於癌因性疲憊之改善探討
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Effects of Home Based Exercise Program on Cancer-related Fatigue in Patients After Breast Cancer Surgery
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疲勞對高中菁英羽球選手在敏捷表現及垂直跳高度上的影響
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Effects of Fatigue on Agility Performance and Jump Height in High School Badminton Athletes
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Effects of Fatigue on Agility Performance and Jump Height in High School Badminton Athletes

Background and Objective: Fatigue is a condition that affects performance in athletes. This study aimed to investigate the effects of fatigue on agility performance and jump height in high school badminton athletes.

Methods: A total of 10 high school badminton players were selected to participate in the study. Each participant underwent two agility tests and a jump test before and after a exhausting training session. The agility tests included 5-10-5 shuttle run, hop, step, and jump test. The jump test involved performing a vertical jump from a standing position.

Results: The results showed that the agility performance and jump height decreased significantly after the training session. The mean change in agility performance was -0.87 seconds and the mean change in jump height was -0.18 cm.

Conclusion: Fatigue significantly affects the agility performance and jump height in high school badminton athletes. Training sessions should be designed to accommodate for these effects to optimize athletic performance.

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物理治療導入跨專業團隊合作模式 降低住院病人跌倒發生率
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Physiotherapy Implementing Transdisciplinary Team Approach to Reduce Falls in Inpatients
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Background and Objective: falls are a significant health issue among hospitalized patients. The purpose of this study was to investigate the effectiveness of implementing a transdisciplinary team approach to reduce falls in inpatients.

Methods: A transdisciplinary team was established in a hospital to improve fall prevention strategies. The team consisted of physical therapists, nurses, and other healthcare professionals who collaborated to identify and address risk factors for falls.

Results: The implementation of the transdisciplinary team approach led to a significant reduction in the number of falls. The rate of falls decreased from 0.85 per patient-month before the team was established to 0.45 per patient-month after the team was implemented.

Conclusion: The implementation of a transdisciplinary team approach is an effective strategy to reduce falls in hospitalized patients. Further research is needed to determine the long-term effectiveness of this approach.

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專業團隊，運用多元性策略，打造病人之個人專屬防跌措施，以降低住院病人的跌倒發生率。方法：2019 第一季監測結果，住院跌倒發生率為 0.08%，共發生 43 件，高於醫學中心 0.05% 及區域醫院 0.06% 同價值，其中跌倒傷害發生率更高達 68.09%。因此啟動跨專業團隊合作模式，團隊成員包含醫師、護理師、物理治療師及藥師，列出可能跌倒因素。再以 80/20 法則，配合臨床經驗及文獻，找出住院病人常見跌倒原因，包含病人及照顧者因素、復健照護技能不足，及藥物因素。首先在 2019 年 3 月，針對>
彈性加壓帶結合暖身運動對肌力與柔軟度的立即影響

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本研究招募 20 位自願參與社區預防延緩失能照護課程的民衆，診斷為輕度失智或輕度認知障礙的個案（平均年齡 76.10 ± 8.19 歲），於振興里民活動中心進行每週 1 次、每期 12 週的課程，依參與者意願，可參加一至三期的訓練。課程內容包括 50 分鐘彈力帶阻力訓練、20 分鐘有氧運動與 20 分鐘認知刺激課程（如：聲音、競賽或合作式的遊戲，記憶與聯想，肢體協調與認知），原則上以坐姿訓練為主，但鼓勵個案以站姿進行活動，各期訓練強度皆為一致。一至三期參與人數分別為 12、8、8 人（重複參與二期以上者為 5 人），前後測由受訓過的人員執行，結果變項包含_in司法（身高、體重、腰圍、臀圍）、上下肢肌力（30 秒椅子坐立、30 秒直立前臂屈舉）、心肺耐力（2 分鐘原地站立拍膝）、柔軟度（椅子坐姿體前彎、抓背測試）、平衡（閉眼單腳站、椅子坐立礆物）。以無母數 Wilcoxon 符號等級檢定進行統計檢定，統計顯著水準訂為 0.05。結果：失智症個案接受社區多元介入訓練方案後，運動顯著差異 (p < 0.05) 的變項及進步量（平均值 ± 標準差）如下：所有參與者在上肢肌力 (4.80 ± 5.88, p = 0.002) 及下肢肌力 (3.80 ± 6.07, p = 0.004) 和訓練前相比進步皆達顯著差異，進一步分析訓練時間對失智症體適能效果的影響，接受一期或二期以上的訓練，訓練前兩組無顯著差異 (p > 0.05)，僅接受一期 12 週之訓練，在上肢肌力 (4.86 ± 5.91 下, p = 0.012)、下肢肌力 (4.44 ± 5.94 下, p = 0.009) 與閉眼單腳站平衡 (4.08 ± 3.15 秒, p = 0.017) 有顯著進步；接受二期 24 週以上之訓練，在上肢肌力的進步達顯著差異 (8.40 ± 5.50 下, p = 0.042)，雖然下肢肌力及平衡能力未達顯著，但仍有百分之六十 (3 人/5 人) 的參與者是進步的。結論：本研究結果顯示，每週 1 次，期為 12 週以上的社區多元介入訓練方案對於輕度認知障礙或失智症個案在上下肢肌力與平衡能力有顯著改善。建議未來可增加收案數，進一步了解多元介入訓練方案對認知與社會互動的效果。臨床意義：在社區進行有氧合併彈力帶阻力訓練搭配認知刺激課程，此多元介入訓練方案提供失智症個案人際互動的機會，進階上下肢肌力與平衡能力之體適能表現，達到預防與延緩失能之目的。

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國際臨床照護計畫認證提升物理治療效能與安全 - 以全膝關節置換術為例

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Internal Clinical Care Program Certification Enhances Physical Therapy Effectiveness and Safety using Total Knee Replacement as an Example

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背景與目的：膝關節是人體全身受力最重的關節，會因負荷過重，產生退化病變。當發生退化性關節炎時，會造成關節僵硬、疼痛及變形，使病人在行走及日常生活功能。全膝關節置換術，為關鍵性的治療處置，可增加病人活動功能，提升自我照顧能力，進而改善生活品質。為提升全膝關節置換術療效，物理治療為病人術後重要的醫療照護。根據美國骨科醫學會 (American Academy of Orthopaedic Surgeons) 臨床照護指引，提供標準化、完整性且一致性的復健計畫。
The Effects of Multiple Exercise Intervention at Elderly Fitness—A Case Study of a Community in Central Taiwan

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背景與目的：隨著國人平均壽命延長，臺灣邁入高齡社會，高齡族群身心健康功能也越來越受到重視，如何成功老化、延緩及預防功能退化皆為現今重要的議題。美國運動醫學會指出規律運動是成功老化的決定因素。政府近兩年來著手於長期照護，以預防長者衰老，在許多社區據點針對健康或亞健康之長者，設計一套多元的運動課程，增進高齡者適能及健康。方法：本研究旨在分析國立臺灣大學醫學院附設醫院雲林分院的醫護人員，並配合國立中正大學體適能與健康促進專業師資團隊，設計一套多元的運動課程，促進高齡者適能與健康。

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The Effect of Physical Therapist Counseling Self-supporting Activities in Nursing Home: Case Report

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背景與目的：自立支援照顧價值與作法，近年來北歐、日本及臺灣一直在倡導的照顧模式，其目的便是提升失能者的自主生活能力。2013 年自日本引進臺灣，並在各地長照機構廣泛應用此照顧模式可以提升失能者的自主生活能力，並有效的降低照護者需要，讓照護團隊有照護的自我價值及成就感。此研究目的在於自立支援活動工作指引，讓照護團隊遵循訓練失能者能力、搭配輔具獲得調整，保障照護日常活動，以及提升其日常生活自理能力。方法：本研究調查中部長照機構引進自立支援前後施發之住院日常生活功能之比較，研究方法：調 查 2019 年護理之家、實施自立支援活動前，以及施發後 3 個月之每日尿便使用量、站立時間、喝水量、氏量表以及家距距離。自立支援活動功能訓練步驟為(1) 臥床個案轉位至輪椅，當可連續坐 30 分鐘，進入下一步驟。(2) 坐輪椅時靠近桌子，雙腳踩地，身體往前，臂位空，雙手撐於桌面，當可連續坐 30 分鐘，進入下一步驟。(3) 坐輪椅鄰坐，雙腳踩地，身體往前，臂位空，雙手撐於桌面，起立再坐下，當可連續 30 次起立坐下，進入下一步驟。(4) 坐輪椅鄰坐，雙腳踩地，身體往前，臂位空，雙手撐於桌面，起立再起立，當可連續 3 分鐘，進入下一步驟。(5) 自行轉位：床來回輪椅，輪椅來回馬桶，當可獨立時，進入下一步驟。(6) 扶欄杆走路，當可連續 30 公尺，進入下一步驟。(7) 使用輔具行走，如助行器或四腳拐行走，以對奉檢討分析自立支援前後之差異。結果：共有 3 位院民參與自立支援活動，尿便量（前 - 後）1.200 ± 1.304 (p = 0.109)，站立時間（前 - 後）-7.200 ± 8.136 (p = 0.119)，飲水量（前 - 後）-260.000 ± 89.443 (p = 0.003)，行走公里數（前 - 後）-150.200 ± 157.940 (p = 0.101)。結論：此長照機構自立支援活動工作指引提供照護者一套自立支援照顧模組，顯示顯著改善院民
居家護理所、社區醫療群、居家復能之轉介合作模式—個案報告
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Referral Cooperation Model of Home Care Centers, Family Doctor Integrated Delivery System and Home Reablement: A Case Report
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背景与目的：長照 2.0 的復能服務之核心概念有三點，一為盡早復能介入，減少沒有必要的照護；二為個人化關懷為中心，作為復能的統整連結；三為團隊合作，一同完成個人目標。而針對團隊合作的討論，可分為直線整合（獲得復能的管道）及水平整合（跨專業復能專業團隊合作）。本篇個案獲得復能的方式，非由出院準備銜接復能多元服務管道方法，也非向長期看護管理申請，而是透過居家護理所、轉介至社區醫療群，再透過看護中心案案完成。本篇欲探討其模式的 SWOT 分析 (SWOT analysis)，對於居家復能的影響及物理治療所於居中所扮演的角色

任务導向訓練對機構衰弱老年人手部握力及動作表現的影響：初步研究
陈姝希 1* 李美誼 2 許鈺玲 1 林芳妤 1 蕭吟竹 1 鄭晴如 1 蘇奕銘 1 曹琇晴 1 朱孟韓 1
Effects of Task-oriented Training on Hand Grip Strength and Motor Performance of Frail Institutionalized Elderly: A Preliminary Study

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Background and Objective: Good upper extremity function is an important self-sufficiency condition in elderly people who maintain independent living. The effect of hand grip strength and fine motor performance on daily living activities is known. The purpose of this study was to investigate the changes in upper limb function and fine motor performance by comparing patients with and without task-oriented training. Methods: The subjects were 46 institutionalized elderly patients aged 65 years or older, who were divided into control and experimental groups according to the randomization method. The experimental group received task-oriented training, while the control group did not undergo any training. The experimental group performed daily living activities, such as lifting and holding, to improve upper limb function and fine motor performance. Results: The experimental group showed significant improvements in hand grip strength and fine motor performance compared to the control group. The mean hand grip strength increased from 15.43 kg to 17.7 kg in the experimental group, while it remained unchanged in the control group. The mean fine motor performance score increased from 14.3 to 16.5 in the experimental group, while it remained unchanged in the control group. Conclusion: Task-oriented training is effective in improving upper limb function and fine motor performance in elderly patients. Therefore, it is recommended that task-oriented training should be included in the rehabilitation program for elderly patients.
Stroboscopic Vision on Short-Term Postural Training and Transfer Effect for the Elderly

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Background and Purpose: Stroboscopic vision, a visual presentation of continuous motion with a series of intermittent samples, is used to improve motor skills of sport players. As stroboscopic vision could facilitate timing anticipation and sensory reweighting for a motor task, it is of potential to train aged people during upright stance. The purposes of the study were 1) to investigate the effect of stabilometer training with stroboscopic vision; and 2) to investigate the transfer effect of stabilometer training with stroboscopic vision on upright stance. Methods: Twenty-four young elderly were assigned to two groups (LF group, mean age: 65.3 ± 3.3 yrs) or control group (NB group, mean age: 65.8 ± 2.9 yrs). The LF group received twelve trials (45 seconds per trial with an inter-trial interval of rest for 3 minutes) of stabilometer training under stroboscopic vision, alternately 500 ms-opaque and 500 ms-transparent. The NB group received the same stabilometer training with normal vision. Pre-test and post-test contained four trials of balance task of 45s stabilometer stance with normal vision and transfer task of 60s upright stance on a foam surface with eyes closed. Two-way repeated measures ANOVA was used to examine effects of time (pre-test vs. post-test) and group (LF vs. NB) on posture sway characteristics. Results: For the balance task, there was a significant time effect on the root mean square (RMS) of the stabilometer movement (F1,22 = 14.57, p = 0.001), and both the LF and NB groups exhibited a smaller RMS after training (NB: p = 0.004; LF: p = 0.041). Significant time (F1,22 = 5.96, p = 0.023) effects on sample entropy (SampEn) of the stabilometer movement, and post-hoc test revealed that only the LF group exhibited a larger SampEn after training (LF: p = 0.017). For the transfer task, there was a significant interaction effect of time and group on RMS of COP trajectory (F1,22 = 10.94, p = 0.003), and the NB group exhibited a smaller RMS after training (p = 0.002). Significant time (F1,22 = 11.53, p = 0.003) and group (F1,22 = 6.35, p = 0.020) effects on SampEn of COP trajectory, and post-hoc test revealed that the LF and NB groups exhibited a larger SampEn after training (NB: p = 0.041; LF: p = 0.015). Conclusion: Postural control training under normal vision had superior postural transfer effect. Nevertheless, older adults could benefit from postural training with stroboscopic vision using richer strategies during stance. Clinical Relevance: Stroboscopic vision is an alternative approach for stance training for the elderly.

Effects of Vojta Therapy Early Intervention for Patients With Acute Stroke: A Case Report

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物理治療對於中風患者合併癌因性疲憊症之效益：個案報告
早期物理治療介入對於多發性骨髓瘤術後個案功能恢復之效益：個案報告

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Effects of Early Physical Therapy Intervention on Functional Recovery for Patient After Multiple Myeloma Surgery: A Case Report

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背景與目的：根據美國癌症協會2018年的資料，多發性骨髓瘤為血癌的一種，當淋巴細胞發生癌變並且異常增生形成癌細胞瘤，當癌細胞瘤侵犯多處的骨頭及稱之為多發性骨髓瘤。危險因子包括年齡大於65歲、男性大於女性、遺傳、肥胖、暴露於有毒化學物質及原子輻射、臨床上常出現骨骼的破壞性、貧血、腫脹及高鈣血症等。根據衛生福利部國民健康署民國105年癌症登記年報，在全部惡性腫瘤發生的個案中淋巴細胞瘤發生的個案佔0.59%，其發生率以年齡標準化率男性比為1.35:1.00。依國際分期系統以血清蛋白及血清β2微小球蛋白將疾病分為三期，此分期系統較能充分反應疾病預後。第一期為血清蛋白 ≥ 3.5 g/dL 且血清β2微小球蛋白 < 3.5 μg/mL；第二期為血清蛋白 < 3.5 g/dL 且血清β2微小球蛋白 3.5 ~ 5.5 μg/mL；第三期為血清β2微小球蛋白 ≥ 5.5 μg/mL。常見治療方式包括類固醇、化學治療和免疫治療，本研究目的是探討早期物理治療介入對於多發性骨髓瘤個案功能恢
復之效益。方法：個案為 56 歲女性，在 2011 年 7 月 29 日因嚴重下背痛及雙腳無力而就醫。經
檢查後發現多發性骨髄瘤第三期產生腰椎第四節
病理性骨折，手術減壓固定後開始復健並接受
同步放療及幹細胞移植。2016 年 5 月 28 日因
嚴重脖子疼痛導致四肢無力及麻木感而就醫，核
磁共振檢查結果為顱椎第六節壓迫性骨折伴隨脊
髄壓迫，6 月 2 日進行顱椎第 5 到 7 節椎板切除
術減壓固定手術，6 月 8 日開始物理治療介入，
個案目標希望可以拿輔具獨立行走。理學檢查結
果依美國脊髄損傷學會 (American Spinal Injury
Association, ASIA) 分級為顱椎第 5 節 ASIA C；
上背部及上肢痠痛視覺類比量表 (visual analogue
scale, VAS) 為 7 cm；歐洲癌症研究及治療學會癌
症生活品質核心問卷 (European Organisation for
Research and Treatment of Cancer Quality of Life
Questionnaire Core-30, EORTC-QLQ-C30) 整體
健康狀態次量表 2 分、功能次量表 4 分、症
狀次量表平均 3.3 分；坐姿平衡差、翻身及躺到
坐姿需要大量協助；巴氏量表 (Barthel index, BI)
日常生活活動表 10 分。治療時間為每次 50
min，1 週 5 次，共 4 週。治療計畫包含上下肢肌
耐力訓練和平衡訓練及日常生活功能性訓練。結
果：經過 6 週物理治療介入後，ASIA 分級為顱
椎第 5 節 ASIA C 從 C 進步至 D：上背部及上肢痠
痛 VAS 由 8 cm 減少到 0 cm；EORTC-QLQ-C30
整體健康狀態次量表從 2 分進步到 5 分、功能次
量表從平均 4 分減少到 3 分、症狀次量表從平均
3.3 分減少到 2 分；坐姿平衡從差進步到好且坐姿
平衡進步到尚可、翻身及躺到坐姿需要大量協
助到獨立；可以在腰側保護下輔具行走約 20 m、
BI 從 10 分進步到 45 分。結論：對於多發性骨
髄瘤個案，物理治療的運動介入可以有效改善肌
耐力、疼痛、平衡、生活品質及日常生活活動的
能力。臨床意義：多發性骨髄瘤的個案因疾病造
成脊椎神經的損傷，進而造成動作及感覺受損、
肌耐力不足、疼痛、日常活動生活需他人協助且
影響生活品質，早期物理治療介入可以有效的恢
復日常生活功能表現，提供臨床物理治療參考
資訊。

結語

The Effects of Combine Teraband Exercise on Balance Ability and Functional Performance in Patients With Stroke: A Pilot Study

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背景與目的：彈力帶具有攜帶方便、便宜即不受
場地限制，且是十分有效的小型肌力與肌耐力的
訓練工具，依顏色差異而有不同的阻力，目前廣
泛應用在功能性養身運動上，然而，在神經物理治
療方面卻相對較少。因此，本研究旨在探討合
作三週的彈力帶運動對於中風病患在平衡能力與日
常生活功能活動之影響。方法：徵召 12 位中風
病患（平均年齡 66.43 ± 13.72 歲；平均住院天
數 39.22 ± 20.97 天；徒手肌力測試至少 3 分以
上）；以隨機方式分配到實驗組與對照組。在實
驗前與三週後各做一次測試，測量工具包括柏格
Background and Purpose: Recent study has shown that backward cycling could improve stiff knee gait after chronic stroke. However, the effect of backward cycling on neuromuscular properties of soleus in patients with chronic stroke has not been investigated. The purpose of this study was to investigate the immediate effects of backward cycling exercise on neuromuscular properties of soleus in patients with chronic stroke.

Methods: Ten individuals with stroke were recruited. Each subject was instructed to perform 70 RPM backward cycling for 20 min. Hoffmann’s reflex/motor response ratio (H/M ratio) and soleus muscle stiffness assessments were evaluated at before and after training.

Results: The H/M ratio and soleus muscle stiffness were significantly decreased after cycling exercise ($p = 0.01; p = 0.03$).

Conclusion: After a single 20-minute session of backward cycling exercise, the immediate decrease on H/M ratio and soleus muscle stiffness were demonstrated in patients with chronic stroke.

Clinical Relevance: The preliminary findings may provide a reference for using backward cycling exercise to improve neuromuscular properties of soleus muscle in chronic stroke patients. ■
The Effects of Lower-Leg Kinesiology Taping on Physical Function in Stroke Patients With Foot Drop

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Background/Purpose: The aim of this study was to examine the effects of lower-leg kinesiology taping on physical function in stroke patients with foot drop.

Methods: This study recruited 42 patients with foot drop due to stroke. The patients were randomly divided into two groups: the intervention group (n = 21) and the control group (n = 21). The intervention group received lower-leg kinesiology taping for 30 minutes, while the control group received traditional physical therapy for 30 minutes. Both groups were assessed using the Berg Balance Scale (BBS) before and after the intervention.

Results: The BBS scores improved significantly in the intervention group compared to the control group (p = 0.030).

Conclusions: Lower-leg kinesiology taping can improve physical function in stroke patients with foot drop.


Early Rehabilitation and Mobilization in a Patient With Subarachnoid Hemorrhage s/p Aneurysm Clipping: A Case Report

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Abstract: This case report describes the early rehabilitation and mobilization of a patient with subarachnoid hemorrhage after aneurysm clipping. The patient exhibited a significant improvement in their ability to perform daily living activities following the intervention.

Keywords: early rehabilitation, mobilization, subarachnoid hemorrhage, aneurysm clipping, case report.
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背景與目的：中風後早期離床性活動 (early mobilization) 的介入，已被提出有助於中風後功能的提升。但是，針對蜘蛛膜下腔出血的患者並不容易執行，因為該中風易出現早期的併發症，例如水腫、再出血、後續性腦缺血和血管痙攣等。其中，血管痙攣，通常於蜘蛛膜下腔出血後的 3 到 4 天發生，高峰期為出血後 7 至 10 天。因此，臨床上普遍認為此類型的出血個案，早期活動介入可能會增加其發生繼發性腦損傷機率，因此對於早期離床性活動的介入保留態度。雖然，近年來相關臨床實證文獻指出，對於急性蜘蛛膜下腔出血患者，若於術後 4 天內將此類患者的機能活動能力提升，可降低其血管痙攣的發生率，同時也不會增加其死亡率或不良預後。但是，相關研究缺乏量表型的功能評估的面向，也無明確實際執行流程。因此在臨床上，應用「早期離床性活動介入」在蜘蛛膜下腔出血的患者並不普遍。本報告即針對一位 53 歲患有急性蜘蛛膜下腔出血的男性，在護理中心透過監控生命徵象、進行早期離床活動和機能性動作訓練，以探討早期活動介入對於其動作復原進展的影響，並以客觀量化評估在急性期介入後，患者的意識和活動功能等進步情況。方法：個案依據「個案處理模式」進行評量分析、治療介入，同時個案於護理病房中處理相關併發症且其神經學呈現穩定後，即進行離床性動作訓練。並且在坐姿功能性活動下，也會加強患者的頭部 / 上背部控制訓練，以及其殼動動員式的肌力訓練。介入前會以佩爾梅危重患者活動評分量表 (Perme intensive care unit mobility score, Perme) 評估其起始分數，而後於急性病房出院時的 Perme 進步分數作為最終指標。另也會使用格拉斯哥昏迷指數 (Glasgow Coma Scale, GCS) 和功能性步行量表 (functional ambulation classification, FAC) 以評估個案於急性期介入前後的進步情況。結果：個案於中風後 1 個月自急性病房出院，並於此時進行介入後再評估。個案於介入後，其由躺到坐及由坐到站由原無法執行進步到中等協助下即可執行，並能在最大協助下，以單手扶持扶手方式行走約 3 公尺。個案在 Perme 量表、GCS，和 FAC 的結果分別由原來的 3/32 分、E4M6V (endotracheal) 和 0 級，分別進展成 13/32 分、E4M6V4 分和一級。結論：急性期的早期離床性活動介入，沒有導致本個案的併發症再發生。同時，個案於早期離床性活動介入後，在急性期內即能使個案在功能性活動表現上有顯著進步。臨床意義：針對急性期蜘蛛膜下腔出血的病人在相結合的生命徵象穩定後，物理治療於加護病房急性期可進行早期的離床性活動介入。■

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鏡像治療對手部神經損傷的治療效果—系統性回顧和統合分析

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The Effects of Mirror Therapy on Nerve Injury of the Hand: A Systematic Review and Meta-analysis

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Background and Purpose: Using a light, wearable sensor to capture the changes of range of motion (ROM) is important for physical therapist in clinic. The KneeHow (Newborn, TW), a wearable sensors-based system, is developed to track the ROM in increment of 0.2 degree. However, their validity and reliability have not well been identified. The aim of this study was to examine the concurrent validity and test-retest reliability of the KneeHow in ROM measurements of knee joint. Methods: A total of 60 measurements were recorded directly using KneeHow, with an universal goniometer as the gold standard. The universal goniometer was stabilized on the wall, with its distal arm and KneeHow sensor taped together firmly. Distal arm of the universal goniometer and KneeHow sensor were moved smoothly into a ROM of 40, 50, 60, 70, 80, and 90 degrees respectively. All measurements were repeated 10 times. Concurrent validity was determined using measurements from the universal goniometer and KneeHow in the first trial. A second trial was repeated to determine test-retest reliability of KneeHow between the first and second trials. All measurements were repeated 10 times. Concurrent validity was determined using measurements from the universal goniometer and KneeHow sensor moved smoothly into a ROM of 40, 50, 60, 70, 80, and 90 degrees respectively. All measurements were repeated 10 times. Concurrent validity was determined using measurements from the universal goniometer and KneeHow in the first trial. A second trial was repeated to determine test-retest reliability of KneeHow between the first and second trials. All measurements were repeated 10 times. Concurrent validity and test-retest reliability were quantified using intraclass correlation coefficient (ICC 3,1) with a confidence interval of 95%. A two way mixed-effect
model, using single ICC, and absolute agreement were determined. **Results:** During ROM measurement, KneeHow showed good ICC in concurrent validity (ICC: 0.99) and test-retest reliability (ICC: 0.94). **Conclusion:** KneeHow has good concurrent validity and test-retest validity for ROM measurements of knee joint. **Clinical Relevance:** KneeHow can be used to quantify ROM measurements of knee joint in clinical and research settings. ■

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重複性高壓氧治療對中大腦動脈阻塞大鼠神經保護之效果
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**Effects of Repetitive Hyperbaric Oxygen Therapy on Neuroprotection in Middle Cerebral Artery Occlusion Rats**
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**Background and Purpose:** Hyperbaric oxygen (HBO) intervention has been indicated to be one of possible therapies for central nerve system injury. However, the effects of HBO after brain ischemia were no instant and the underline mechanisms were not fully known. The purposes of present study were to investigate the effects of repetitive HBO intervention in a transient middle cerebral artery occlusion (MCAO) animal model. **Methods:** 72 Sprague-Dawley rats received transient MCAO and randomly assigned to the normal air control or HBO intervention groups. Each group was further divided into 3 subgroups according to the intervention time period (7, 14, and 21 days). HBO was started at 24h post-MCAO for 60 min once per day. At 24h post-MCAO and the end of the final intervention, rats received motor behavior test to examine the motor performance. At the end of experiment, half of rats in each subgroup were sacrificed under anesthesia and the right motor cortex was removed for examining the expressions of p-Akt, glutathione (GSH), and activities of glutathione peroxidase (GPx) and reductase (GR). Another half of rats in each subgroup were used for examining the infarct volume. **Results:** Rats received 14 and 21 days of HBO intervention showed significantly reduced in the infarct volume, and increased in the expressions of p-Akt, GSH, and activities of GPx and GR. The motor performance also showed significantly improved in rats received HBO for 14 and 21 days. There were no significant changes in the normal air control and HBO for 7 days groups. **Conclusion:** Repetitive HBO intervention for at least 14 days in transient brain ischemic rats provided neuroprotective effects through modulating the cell survival pathway and antioxidative defense system. **Clinical Relevance:** Our results provide important information about the use of repetitive HBO starting from the acute phase post brain ischemia. These results may also provide for the clinical studies to investigate the therapeutic effects for patients. ■

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利用本體感覺神經肌肉誘發技術促進慢性期中風患者步態與功能之恢復：個案報告
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**Effects of Proprioceptive Neuromuscular Facilitation on Gait Pattern and Functional Recovery in Chronic Stroke Patient: A Case Report**

Effects of Proprioceptive Neuromuscular Facilitation on Gait Pattern and Functional Recovery in Chronic Stroke Patient: A Case Report
Effectiveness of Feedforward and Feedback Control Training for Parkinson’s Disease Patient With Postural Instability: A Case Report

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背景與目的：本篇個案為一位中風半年的 46 歲男性，個案主訴左側感覺異常與行走能力影響其獨立行走的能力。方法：本文分析個案於市區內進行的訓練。物理治療介入為使用 PNF 誘發步態動作及肌力訓練、平衡訓練與懸吊系統合併跑步機等，並參考 Gunnings 在 2019 年的論文。在不同姿勢下引導骨盆動作，或給予阻力加強重心移動、強調患側肢體承重等；利用下肢 D1 屈曲與伸直模式強化下肢主動動作與肌肉力量。結果：通過 4 週介入後，步態表現於患側擺動期時骨盆上揚與垂足內翻的頻率均有下降，雙臂擺動動作亦可隨步態自然擺動；步態參數中 10 公尺行走速度從 1.13 上升至 1.22 公尺／秒；6 分鐘行走測試 310 上升至 319 公尺；Wisconsin Gait Scale 分數由 23.35 進步至 20.35 分，顯示步態品質有顯著改善。功能性活動方面，個案開始獨立來醫院治療及接幼兒工程等任務。結論：針灸性期中風患者進行目標性的動作強化訓練，可促進步態動作表現。臨床意義：此個案報告顯示利proprioceptive neuromuscular facilitation (PNF) 方式誘發骨盆動作與強化下肢肌力以促進慢性中風患者的步態表現與功能恢復。

► P37
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對有姿勢保持反射障礙的巴金森氏症患者實行前饋與回饋控制訓練介入之效果：個案報告

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背景與目的：本篇個案為一位中風半年的 46 歲男性，個案主訴左側感覺異常與行走能力影響其獨立行走的能力。方法：本文分析個案於市區內進行的訓練。物理治療介入為使用 PNF 誘發步態動作及肌力訓練、平衡訓練與懸吊系統合併跑步機等，並參考 Gunnings 在 2019 年的論文。在不同姿勢下引導骨盆動作，或給予阻力加強重心移動、強調患側肢體承重等；利用下肢 D1 屈曲與伸直模式強化下肢主動動作與肌肉力量。結果：通過 4 週介入後，步態表現於患側擺動期時骨盆上揚與垂足內翻的頻率均有下降，雙臂擺動動作亦可隨步態自然擺動；步態參數中 10 公尺行走速度從 1.13 上升至 1.22 公尺／秒；6 分鐘行走測試 310 上升至 319 公尺；Wisconsin Gait Scale 分數由 23.35 進步至 20.35 分，顯示步態品質有顯著改善。功能性活動方面，個案開始獨立來醫院治療及接幼兒工程等任務。結論：針灸性期中風患者進行目標性的動作強化訓練，可促進步態動作表現。臨床意義：此個案報告顯示利proprioceptive neuromuscular facilitation (PNF) 方式誘發骨盆動作與強化下肢肌力以促進慢性中風患者的步態表現與功能恢復。
The Effects of Early Physical Therapy on Functional Recovery for the Patient With Meningioma After Tumor Excision: A Case Report

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背景與目的：腦膜瘤在腦部腫瘤所佔的比例約為 20%，研究統計女性發生率為男性的 2.36 倍，第一年致死率為 8%。而症狀有頭痛、癲癇、腦神經的缺損、動作及感覺上面的異常。因為腦膜瘤的發生率不高，所以針對術後早期物理治療的研究較少，多數研究主要是針對腦部腫瘤在手術後的恢復狀況。因此，本篇個案報告目的是探討早期物理治療介入對於術後腦膜瘤病人功能恢復的成效。方法：本報告利用個案處理模式與國際功能、失能和健康分類來做評估及介入的呈現。將評估結果參考過去早期物理治療來設計個案的肌力、協調、平衡及行走訓練。結果：介入後 4 次，個案的自格式平衡測試分數進步了 5 分，達到最小治療重要差異。結論：本個案之介入使用前導與回饋控制訓練後，確實改善其平衡能力。臨床意義：針對本 72 歲有姿勢保持反射障的巴金森氏症患者，經過文獻整理後實證的運用，給予結合前導與回饋控制訓練，有效改善原發性巴金森氏症患者的姿勢反射障礙，達到增進其平衡能力之效果。

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平衡訓練對於多系統萎縮症 - 小腦型態患者平衡及行走功能恢復之成效：個案報告

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The Effects of Balance Training on Balance and Walking Recovery for Multiple System Atrophy-Cerebellar Type: A Case Report

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背景與目的：多系統萎縮症 (multiple system atrophy, MSA) 是一種進行性的神經退化性疾病。患者會伴隨著帕金森症狀、小腦症狀、垂體症狀以及自主神經系統症狀等臨床表徵。患者平均 55 歲開始出現症狀，60 歲被確診，診斷後 3 年內倒退率逐漸增高，活動功能逐漸喪失。目前無任何藥物可有效改善患者共濟失調症狀，但物理治療介入或許有效。因此本個案研究目的是探討平衡訓練對於多系統萎縮症 - 小腦型態 (multiple system atrophy-cerebellar type, MSA-C) 患者平衡及行走功能恢復之療效。

方法：個案為 61 歲男性診斷個案，診斷為 MSA-C，發病 3 年多，主要照顧者為太太。個案主訴因平衡差，走路及上下樓梯時步行姿勢彎曲，活動中常會跌倒。個案期望能夠改善行走及上下樓梯時的平衡。腦部磁振造影 (magnetic resonance imaging) 象顯示腦維及小腦萎縮，多巴胺轉運體掃描造影顯示雙側基底核對多巴胺的吸收下降，其中左側較右側嚴重。理學檢查結果發現，關節活動度、肌肉張力及感覺正常，徒手肌力測試兩側上肢均為 5 分。右上肢及左側上下肢距離不良，輪替困難，姿勢顫抖，共濟失調等級評價量表 (scale for the assessment and rating of ataxia, SARA) 為 8.5 分。伯格氏平衡量表 (Berg Balance Scale, BBS) 為 47 分，功能性活動中可獨立坐到站及轉位，但行走及上下樓梯需接觸保護，3 公尺計時起走測試 (timed up and go test, TUG) 為 15 秒。動態步態指數 (dynamic gait index, DGI) 為 16 分。治療計畫包含以 balance performance monitor 視覺回饋平衡訓練訓練姿平衡訓練及重心前向、後、左、右、斜前、斜後等各方向平衡訓練訓練，及仿效上下樓梯重心轉移。一腳向前一腳後站立，單腳站立，在軟墊上站立及動態姿平衡訓練，踏上與踏下軟墊。姿勢控制策略訓練、核心肌群控制、行走及上下階梯訓練。結果：經過 3 週介入後，BBS 為 47 分進步至 52 分，TUG 進步由 15 秒進步至 12 秒，DGI 分數由 16 分進步至 18 分，SARA 仍維持 8.5 分，可獨立執行室內行走，上下階梯由接觸保護進步至监督下完成。結論：短期平衡訓練介入可以有較改善 MSA-C 患者平衡及行走功能活動。臨床意義：本研究可以了解物理治療介入對於進行性神經退化性疾病 MSA-C 患者，仍能有效地改善平衡及行走功能。
未來應設計更嚴謹的臨床實驗，以做為不同種型態及不同病程階段的 MSA 患者臨床治療準則之實證。

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中風病人功能量表之反應性驗證

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Responsiveness of the Functional Assessment of Stroke

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背景與目的：中風病人由於感覺與動作的缺失，往往造成不同程度的動作障礙，進而造成日常生活不同程度的障礙。若能在發病初期，有效評估中風病人的平衡能力，有助於復健治療計畫的擬定，並能預測病人日後行走的功能與日常生活獨立能力。中風病人功能量表（Functional assessment of stroke, FAST）是整合三種常用評估工具〔Fugl-Meyer Assessment [FM]、Postural Assessment of Scale for Stroke patients [PASS]，以及 Barthel Index [BI]〕並簡化之量表，評估病患之上下肢動作功能、平衡能力與日常生活功能等。FAST 最大特點為：原始評估工具共 72 項目，簡化成 29 項。而且 FAST 之心理量表特性（含同時效度與群體層級反應性）經初步研究顯示為良好且與原始三種評估工具之心理量表特性相當。然而 FAST 之個別層級反應性未知，且未應用於主要復健時期（發病後 1 至 6 個月）之病患，故 FAST 能否充分偵測復健時期患者之功能變化，尚未可知。故本研究目的為驗證 FAST 於復健期間之反應性（含群體與個別層級），並確認 FAST 與原三種評估工具之反應性無顯著差異。方法：本研究設計為追蹤評估研究。60 位接受物理治療或職能治療之中風病人（發病 5 個月內）參與此研究。病人接受 2 次追蹤評估，間隔至少 3 週。主要評估工具為 FM、PASS 以及 BI 等。因為 FAST 之項目皆來自於三種評估工具，所以 FAST 各項目與分數則由 FM、PASS 以及 BI 取得與估算。我們將以群體層級反應性指標（含 effect size d 與 standardized response mean）驗證 FAST 與原始 3 評估工具之群體層級反應性，再以各評估工具前後測分數之標準誤（standard error）估算個別層級反應性。結果：個案平均年齡約 60 歲，依舊第一次評估時 FM 分數，個案之平均損傷程度為中度。依舊 BI 分數，平均失能程度為中度，各評估工具之反應較大致為低度至中度，治療工具之反應性較高為中度。FAST 各工具與其原始工具之反應性幾乎一致，亦無顯著差異。結論：29 項目 FAST 之反應性與原始三工具皆具備良好的反應性，且差異有限。因為 FAST 項目少，對施測者與個案之施測負擔低，後續使用者可考慮以 FAST 代替原始三工具當成療效評估工具。臨床意義：本研究最大的價值在於後續使用者可考慮以 FAST 代替原始三工具當成療效評估工具，以提升臨床效能。

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中風病人臉部表情辨識損傷情況與影響因素

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Severity of Facial Emotion Recognition in Patients With Stroke and Its Influencing Factors

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背景與目的：文獻顯示臉部表情辨識損傷是中風的後遺症之一，尤其是右腦傷之病患。臉部表情辨識損傷影響中風個案之社交技巧甚至婚姻滿意度。然而相關研究之樣本數過少，且未探究各種常見臉部表情之損傷程度與影響因素。造成中風後辨識常見臉部表情之損傷程度仍無充分實證，且其影響因素與機制仍待證實。因此本研究之目的有二：(1) 探究中風病人辨識常見臉部表情之損傷程度。常見表情包含 Ekman 七種臉部情緒：快樂、悲傷、害怕、生氣、厭惡、驚訝及平靜表情等。(2) 驗證那些因素可能影響臉部表情辨識能力。

方法：本研究者招募初次且單側中風個案，以國人發展之電腦化臉部表情辨識測驗 (computerized facial emotion recognition test, COMET) 評估個案七種臉部情緒辨識能力。COMET 可提供個案於 Ekman 七種特定臉部情緒之辨識分數，亦可提供整體臉部情緒辨識分數。個案亦接受其它可能影響因素之評估，如認知功能及中風嚴重程度。個案腦傷位置則由查詢病歴資料取得。研究者以平均值與標準差呈現個案於七種常見臉部情緒辨識能力與整體臉部情緒辨識力。再以單變項與多變項分析檢驗那些變項會影響中風個案整體及特定臉部情緒之辨識力。

結論：我們發現右腦傷患者判讀快樂的能力較差，但右腦傷患比左腦傷者更善於判讀生氣、害怕及驚訝之情緒，顯示左右腦傷之情緒辨識損傷機制不同。我們亦發現於中風病患中，女性患者普遍比男性更善於判讀他人的情緒，尤其是快樂及厭惡之表情。亦發現認知功能與特定情緒 (生氣) 有極高度相關 (r = 0.98)。與整體情緒判讀有中度相關 (r = 0.43)，但與其它情緒的關係較小 (r = -0.33 ~ 0.34)。然而發現教育程度對特定與整體情緒判讀幾乎沒有影響 (p > 0.05)。結論：本研究結果顯示左右腦傷、性別，認知功能及生活獨立性是影響臉部情緒辨識之因子，皆可能影響中風個案整體及特定臉部情緒之辨識能力。未來研究可同時考慮上述因子間的直接與間接關係，以進一步探究影響中風對於臉部情緒辨識能力之機制。臨床意義：有助於臨床治療師及早期訓與介入中風病人臉部表情辨識之損傷，進而調整介入模式，提升治療效能。
Background and Purpose: 
O2 pulse is generally considered a reflection of cardiovascular efficiency during exercise as well as a strong predictor of mortality in patients with coronary artery disease.

The Effects of Cardiac Rehabilitation on Oxygen Pulse in Patient With Acute Coronary Syndrome

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Background and Purpose: O2 pulse is generally considered a reflection of cardiovascular efficiency during exercise as well as a strong predictor of mortality in patients with coronary artery disease.
However, there are limited literatures discussing the training effect on the O₂ pulse in patients with acute coronary syndrome (ACS). The purpose of this study was to evaluate the effect of cardiac rehabilitation (CR) program on O₂ pulse and maximum oxygen consumption (VO₂ max) in patients with recent ACS. 

Methods: Patients with ACS status post PCI were enrolled in the study. They were randomized into two groups, including 49 patients (mean age 56.2 ± 8.9 years) in the training group and 41 (mean age 56.7 ± 13.1 years) in the control group. Patients in the training group underwent the CR programs 30 minutes for 36 sessions with a physiotherapist’s supervision and patients in the control group only did home-based exercises with self-monitoring. Before and after the exercises training, both groups performed the symptom-limited exercise test with cycling, and their O₂ pulse and VO₂ max were measured.

Results: There was no significant difference of O₂ pulse (control group = 12.373, training group = 14.680; \( p = 0.635 \)) and VO₂ max (control group: 22.178, training group: 20.310; \( p = 0.129 \)) between the two groups at baseline. After the CR program, the O₂ pulse got significant improvement in the training group (+1.9 ml/bpm, \( p < 0.001 \)) but decreased in control group (-0.09, \( p = 0.781 \)) compared with their baselines. In addition, the training group demonstrated significantly greater improvement in VO₂ max than the control group (training group: 5.582, control group: 0.568; \( p = 0.034 \)).

Conclusion: CR programs for 36 sessions were beneficial to improve O₂ pulse and VO₂ max in patients with ACS. Clinical Relevance: Our results provided evidences to support the effectiveness of appropriate CR programs in improving O₂ pulse and VO₂ max in patients with ACS.

Evaluation of the Effectiveness of Clinical Skills Learning in Application to OSCE for Physical Therapy Intern Students

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背景與目的：客觀結構式臨床測驗（objective structured clinical examination, OSCE）藉由模擬臨床情境，以模擬真實案例的狀況來評核實習生臨床技能表現能力，試題提供考生背景資料及相關檢查報告與預訂診療主題任務，萬芳醫院物理治療組由教學部臨床技能中心協助於106學年度開始實施OSCE測試於物理治療實習學生，目的藉由模擬臨床醫學的方式，測驗已於本學期實習第十七週的大四物理治療實習生，是是否具備最基本的臨床技能的能力，並透過OSCE測驗結果了解學生的學習成效，且針對不足之處進行一對一再教學，同時做為臨床教師未來教學方向擬定的參考。方法：由OSCE師資培訓之臨床教師針對病史詢問、身體檢查、操作技能及醫病溝通與醫病四大面向進行教案的撰寫建構考題案例及表單，目前已累積10個教案考題，其中病史譜問共計2題、身體檢查共計1題、操作技能共計5題及醫病溝通與醫病共計2題。受測學生從106學年下學期至108學期共計14位物理治療實習學生參與測驗，施測時間安排於結束實習前一週，四大次專科考場共設置六個考站，執行場地為本院臨床技能中心。考試流程包括布置會場、各站考官與標準病人確認劇本及答題內

客觀結構式臨床測驗（OSCE）應用於物理治療實習學生臨床技能學習之成效評估
The Intervention Effects of Customized Foot Orthoses in Hallux Valgus Combined With Flatfoot

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背景與目的：拇趾外翻為成人常見的足部變形，目前扁平足已被證實為拇趾外翻的潜在病因之一，而現今鞋墊已廣泛應用於許多足部疾患，但對於拇趾外翻的療效仍有爭議。因此，本研究目的為探討客製化鞋墊，對於拇趾外翻合併扁平足的介入療效。

方法：本研究招募 8 位扁平足合併輕度至中度拇趾外翻且年齡介於 20 至 65 歲之患者（平均年齡：54.5 ± 6.7 歲），要求受試者穿著客製化鞋墊至少每日達 6 小時，1 週 5 天以上且持續跟蹤 3 個月。量測參數包含介入前和後第 1、2、3 個月之足部疼痛分數、足部功能指數及生活品質分數。

結果：研究顯示客製化鞋墊有改善病患於坐著休息、赤腳站立、赤腳走路之疼痛程度的趨勢，且效果隨介入時間增加而上升，於介入後第 3 個月之一天結束且上床睡覺前的疼痛分數呈現顯著改善（介入前：3.9 ± 3.3 分；介入後：0.9 ± 1.4 分）（p < 0.05），然而足部功能與生活品質之統計結果並未達到顯著差異。

結論：客製化鞋墊介入於輕至中度之拇趾外翻合併扁平足患者，可有效改善足部疼痛。臨床意義：本研究提出拇趾外翻合併扁平足之鞋墊介入療效，提供患者手術以外的保守治療選擇。
The Tensile Level of Tight Gastrocnemius Affect the Hip Joint Movement in Gait

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背景与目的：腓腸肌緊縮是臨床常見引起下肢關節肌肉傷害的問題之一。過去文獻指出腓腸肌緊縮會造成行走時踝和膝部的不正常動作。本研究目的在以生物力學觀點分析不同程度腓腸肌緊縮對走路時關節動作的影響。方法：徵召的受試者以腓腸肌柔軟度測試角度篩選分成緊縮組、輕度緊縮組和控制組，控制組為大於15度，輕度緊縮組介於10～14度，緊縮組介於0～9度。使用動作分析系統和測力板攜取受試者走路的動作與地面反力，並由計算軟體求得關節角度及力矩。腓腸肌緊縮程度是以行走中的腓腸肌長度除以柔軟度測試時腓腸肌長度估算。腓腸肌長度是參考先前文獻建立的數學模型推算，以 one-way ANOVA 比較三組在腓腸肌最大緊縮程度和最大腓腸肌緊縮程度時的關節角度和力矩的差異性。p < 0.05 視為統計上有顯著差異。結果：行走時腓腸肌最大緊縮程度在三組間有顯著差異 (p = 0.001)，緊縮組較大 (100.6 ± 0.4%)，輕度緊縮組次之 (99.8% ± 0.4%)，控制組較小 (98.9% ± 0.7%)。三組在腓腸肌最大緊縮程度時的關節彎曲角度和伸直力矩有顯著差異 (p = 0.025 和 p = 0.039)，相較控制組的截伸直角度 (9 ± 5.9度)、輕度緊縮組 (0 ± 4.6度) 和緊縮組 (0.7 ± 4.3度) 小，輕度緊縮組的雙彎曲力矩小 (0.149 ± 0.176 Nm/kg)，控制組次之 (0.381 ± 0.145 Nm/kg)，緊縮組較大 (0.397 ± 0.121 Nm/kg)。

結論：本研究發現腓腸肌緊縮程度會影響行走時的關節角度和力矩。臨床意義：腓腸肌緊縮患者在行走時會產生較大的關節彎曲並影響關節力矩，推論腓腸肌緊縮可能影響控制關節動作的肌肉活動而易引發關節問題。

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物理治療對於馬拉松賽後跑者膝部疼痛的立即效益之初探

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The Preliminary Study of Immediate Effects of Physical Therapy in Runners With Knee Pain After the Marathon

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背景與目的：隨著運動風氣的盛行，馬拉松已成為最熱門項目之一。根據統計顯示台灣每年舉辦超過1,000場次。然而，在如此長距離的運動比賽下，關節的肌肉骨骼傷害也常伴隨而來。Van Middelkoop 等學者的研究顯示 17% 跑者在比賽中有跑步的傷害產生，發生的部位以下肢為主，尤其是膝關節最常見，占 28.7%，故大型賽事設立運動防護站以因應。但由於經費、場地或
The Relationships Between Chronic Obstructive Pulmonary Disease (COPD) and Scapular Dyskinesis: Systematic Review

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Background and Purpose: Chronic obstructive pulmonary disease (COPD) is defined as a preventable and treatable chronic inflammatory lung disease characterized by airflow limitation without fully reversible. An increase respiratory muscle workload and hyperinflation in individuals with COPD seem to be a negative influence on flexibility of inspiratory muscle and geometrical arrangements of the thorax and scapula. Subsequently, scapula dyskinesis with associated altered muscular activities may result in shoulder disorders. The purpose of this study is to systematically review the most relevant literature relating to patients with COPD and scapular dyskinesis.

Methods: A systematic search was conducted using CINAHL, Cochran library, EMBASE, MEDLINE, PubMed, Scopus, and Web of Science, inception date through December 12, 2019. Comprehensive searches using a combination between two keywords such as “chronic obstructive pulmonary disease” and “scapular dyskinesis” were undertaken of both Medical subject headings, “free text”, synonyms and Boolean logic. Cross-sectional exploratory studies or cohort studies that compared any symptoms or signs related to scapular dyskinesis between individuals with COPD and control group were included. Two investigators independently searched, screened and evaluated all articles. Results: Seven studies were included. No study has a primary aim to assess scapular dyskinesis in individuals with COPD. Several relative signs
of scapular dyskinesis, such as scapular elevation, forward head position, limited shoulder flexion, thoracic kyphosis and hyperactivity of trapezius muscle were observed when assessing posture alignment in COPD patients. However, an inconclusive of the relationships between COPD and scapular dyskinesis may be due to differences of assessment methods, definition of variables or classification of COPD. Moreover, it is still unclear regarding the mechanisms between scapular dyskinesis and breathing function in patients with COPD. **Conclusion:** Although COPD are related to scapular dyskinesis, there is insufficient information on the mechanism or relationship between the lung function abnormalities and types of scapular dyskinesis. **Clinical Relevance:** Considering scapular dyskinesis as a part of physical examination in patient with COPD may benefit in UE injury prevention and pulmonary rehabilitation.

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健康年輕男女性背部肌肉肌耐力之肌電訊號比較

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**Comparison of Muscle Endurance in Healthy Young Men and Women With Back Muscle EMG Signals**

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**Background and Purpose:** 根据先前研究較低的背部肌肉耐力與下背部有關。最近的研究使用了肌電圖 (electromyography) 功率頻譜分析 (power spectral analysis) 來評估肌肉耐力，該項技術也被應用到背部肌肉並使用幾個 EMG 類譜分析指數，包括 mean power frequency (MF), median frequency (MPF), 來檢測脊肌的肌耐力。以往使用組織化學分析的研究發現女性背部肌肉的肌肉氧化潛能 (oxidative potential) 高於男性。除了用於評估等長背肌耐力的各種測試外，Sorensen 測試（肌肉疲勞測試）得到了現有文獻的最大支持，因此目前被認為是測量等長背肌耐力的黃金標準。由於脊柱疼痛或腿部、腹部疼痛導致試驗提早停止是 Sorensen 測試的共同缺點。1996 年，Ito 提出評估等長背肌耐力的替代測試。研究的結果顯示 Ito 測試具有良好的效標效度，並表示 Ito 測試可能比 Sorensen 測試更完整地評估背肌肌肉耐力。本研究的目的使用肌電圖記錄和功率頻譜分析去比較年輕男性與女性在額部保持測試（Ito 測試）期間背部肌肉表現。**Method:** 本篇研究招募各 8 名年齡身材相似的健康年輕男性及女性 (20.8 ± 1.6 years) 無有腰痛的病史，他沒有其他神經疾病病史。參與者共 16 名，並在額部保持肌點貼上電極，測試時長最久持續 300 秒。在 Ito 測試期間連續監測肌電活動及耐力時間，並分析測試中每個參數的變化率（每單位時間的 MF, MPF 的斜率）。本研究中使用了左側的肌電數據來進行分析。**Results:** 依主題探討如下：(1) 耐力時間，女性組平均維持時間為：134.1 ± 46 秒；男性平均維持時間為：131.5 ± 90.9 秒。 (2) MF 斜率，女性組平均 MF 斜率為：-0.35 ± 0.13 Hz/sec；男性組平均 MF 斜率為：-0.46 ± 0.18 Hz/sec。 (3) MF 斜率：女性組平均 MF 斜率為：-0.29 ± 0.14 Hz/sec；男性組平均 MF 斜率為：-0.41 ± 0.15 Hz/sec。**Conclusion:** 本研究發現，MF 及 MPF 在所有受試者的額幹保持測試期間線性下降，男性組與女性相比耐力時間較短，在 MF 斜率及 MF 斜率中，男性組比女性組更陡，該跡象顯示背部肌肉在男性更容易疲勞，而且女性耐力比男性高，也與以往運用 Sorensen 測試的研究結果相符。但在
The Effect of Patient Education Intervention in Hospital Workers With Low Back Pain—An Example of A Community Hospital

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Background and目的: 下背痛 (low back pain) 是常见的職業傷害，尤其在職業發生別中，醫護人員的比例偏高，可能與其工作狀態有關，為預防傷害的發生，提升生活品質，所以團隊希望提升下背痛衛教正確率。方法: 本院外科護理單位合作，成立品質管理小組，經由下背痛問卷調查，特性要因圖與三現法分析要因，進行對策介入。結果: 要因有缺少工作姿勢衛教 (18.5%)，不知要做預防運動 (16.3%)，相關背景資料不足 (14.8%)，無線上教學 (13.4%)；擬定對策為: (1) 舉辦下背痛衛教訓練課程，宣導下背痛成因與預防知識; (2) 製作伸展運動與核心運動之衛教單張，提供 QRcode 供同仁下載; 並舉辦講座現場教學; (3) 物理治療師舉辦職業肌肉骨骼傷害危險因子，下背痛分類與姿勢評估，及下背痛預防運動等內訓課程; 提升單位同仁的專業知識與衛教技巧; (4) 提供線上衛教影片供護理單位同仁觀看，下背痛衛教正確率由 12.5% 提升至 93.75%。结论: 醫院同仁藉由衛教了解下背痛的危險因子，不良工作姿勢，傷病處理之正確觀念與預防運動。背景和目的: 物理治療師提升專業知識與衛教技巧，提供專業服務以預防職業傷害的發生，未來可加強個人化動作分析，環境因素，心理因素等多面向考量，以做出更完整的建議。
Evaluating Ability of Pelvic Floor Muscles Isolated Contraction and Synergistic Actions of Abdominal Muscles in Healthy Females using Transabdominal Ultrasonography

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背景與目的：過去研究發現產後婦女會有骨盆底肌失能問題，導致失禁或是腹痛疼痛。然而，學習單獨有效骨盆底肌收縮動作是困難的，且大多治療師無法觀察或觸診骨盆底肌是否有正確收縮。先前研究指出利用腹部超音波觀察骨盆底動作，可間接評估骨盆底肌收縮正確性，因此本研究目的為利用腹部超音波評估一般健康年輕女性進行骨盆底肌收縮時之正確率與其它腹部肌群是否有協同收縮現象。方法：本前瞻研究共招募 10 位健康年輕女性受試者，平均年齡為 25 歲，體重為 160 公分，體重為 52 公斤，所有受試者目前並無泌尿、失禁、與脊椎疼痛問題。本研究採用 B 模式超音波探測儀 (ACUSON NX3TM Ultrasound System, Siemens Solution USA Inc., MI, USA) 與 3-5MHz 曲面探頭，以傾斜 60 度角定於恥骨聯合上方，給予骨盆底肌最大收縮口令時，觀察膀胱底之位移方向。超音波顯像上當膀胱底位移向上視骨盆底肌做出正確收縮，而膀胱底位向下則為骨盆底肌錯誤收縮。並利用 4-12MHz 線性探頭紀錄皮膚橫肌、腹內斜肌、和腹外斜肌之厚度變化情形。所有受試者平躺於床面上，以腹與膝關節屈曲 60 度姿勢下，分別在平靜自然呼吸與 10 次骨盆底肌最大收縮下，記

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The Effectiveness in Gluteus Maximus and Core Muscles Exercises for a Patient With Low Back Pain Combined with Sacroiliac Joint Dysfunction and Lumbar Instability: A Case Report

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背景與目的：薦髂關節功能異常 (sacroiliac joint dysfunction) 與腰椎不穩 (lumbar instability) 都造成下背痛的可能原因。薦髂關節功能異常於無神經症狀之下背痛病人當中盛行率約 15% ~ 30%，而腰椎不穩亦可能造成薦髂關節區域的下背疼痛，盛行率約 30% ~ 35%。薦髂關節主要透過型態閉合 (form closure)、力量閉合 (force closure) 和動作控制 (motor control) 三項穩定元素組成功能整合模式，除了關節面型態閉合與韌帶系統提供保護之外，臀大肌收縮可直接施加穩定壓力於薦髂關節，提供力量閉合模式中後斜向帶 (posterior oblique sling) 之動態穩定。而核心肌群除了透過腹橫肌增加腹內壓，維持腰椎整體剛性，及透過多契肌在上下節間較短的附著點，於姿勢改變活動期間，穩定控制脊椎動作，扮演腰椎穩定的角色之外，腹橫肌相對薦髂關節韌帶擁有相對較大的施力力臂，透過橫向肌肉收縮，將對薦髂關節產生一作用力放大機制，以增進關節力量閉合穩定，而多契肌收縮則使關節產生相對穩定之點頭動作 (nutation) 得以同時穩定薦髂關節與腰椎。因此本文將探討同時有薦髂關節功能異常與腰椎不穩的下背痛患者，利用臀大肌肌力訓練結合核心肌群運動作為介入方法之成效。方法：個案為一位 36 歲有薦髂關節功能異常與腰椎不穩的下背痛患者，利用臀大肌肌力訓練結合核心肌群運動作為介入方法之成效。
Effects of Proprioceptive Neuromuscular Facilitation in Patients with Low Back Pain: A Systematic Review

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背景與目的：下背痛 (low back pain, LBP) 是重要

的醫學和社會經濟問題，造成現代社會失能損

失人年數，工作缺勤和高僥賠。本體感覺神經肌肉

促進術 (proprioceptive neuromuscular facilitation, PNF) 是透過刺激本體感覺增進神經與肌肉控

制。本研究利用系統性回顧方式，探討 PNF 對

LBP 的影響。方法：搜尋 PubMed，物理治療實

證 (physiotherapy evidence database, PEDro)、華

藝及 Physical Therapy-Oxford Journals 電子資料

庫至 2019 年 12 月發表之所有文獻，關鍵字包括

LBP 及 PNF。結果：共搜尋到 171 篇文獻，排除

不符研究主題 147 篇，非隨機分組 9 篇，重複 7

篇及超過 10 年 1 篇，共納入 7 篇文獻，以 PEDro

評為 4~8 分。7 篇文獻中，實驗組使用 PNF 與

對照組使用衛教冊子、儀器治療（熱療、電療、

超音波）、艱幹肌肉訓練、脊椎穩定運動或抗力

球上平衡訓練比較，顯示 4~6 週 PNF 介入在疼

痛、失能狀況、生活品質、平衡能力、艱幹肌肉

活動力及肺部功能較有改善。結論：本篇系統性

回顧研究顯示，以 PNF 介入可有效改善 LBP 患

者疼痛、失能和健康相關生活品質。比較對照組，

PNF 對動靜態平衡能力、艱幹肌肉活動力及肺部

功能都有更好效果。臨床意義：本研究證實 PNF

介入對 LBP 患者有幫助，能提供臨床作為治療策

略。
新型機車矯正坐墊之開發
馬馨憶　高銘宏　紀今淂　詹承賓　林鉦翔
張育綺　王昱婷　陳怡璇
輔英科技大學物理治療學系

A Novel Posture Correction Cushion for the Scooter Rider
Hsin-Yi Ma　Ming-Hung Kao　Chin-Te Chi
Cheng-Pin Chan　Cheng-Hsiang Lin　Yu-Chi Chang
Yu-Ting Wang　I-Hsuan Chen
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淺層頸部肌肉放鬆手法於頸痛患者動作控制能力的效果
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The Effects of Soft Tissue Release of Superficial Neck Muscles on Motor Control Ability in Patients With Neck Pain
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背景和目的：為了因應方便性，也因為臺灣的氣候、地理特性，臺灣是世界上機車密度最高的國家，騎機車的族群中，有許多民眾常會因路途遙遠或行駛時間較長，進而導致出現坐姿不良的情形，也就是說，騎車時的姿勢，常呈現半坐姿，骨盆後傾，腰椎正常的前凸角度消失，因此造成下背痛症狀產生。為了使騎士在騎車過程能保持在正確姿勢，在姿勢上達到改善效果，希望藉由研發機車矯正坐墊，使骨盆前傾，讓腰椎保持在正常的前凸角度，以改善騎乘機車的姿勢。方法：利用巧拼和泡棉結合，製作一個有前傾角度 15 度的梯形坐墊，坐墊外包上防水布和止滑墊，並有一織帶縫製於坐墊上以作為和機車固定的媒介。使用時，將機車坐墊利用織帶固定於車廂，坐墊放置於腳部外側，並修補騎士坐於坐墊前1/2 處。使用後以線上問卷調查騎士 (n = 100) 對使用此新型機車矯正坐墊的意見。結果：填寫問卷調查的族群以學生最多 (40%)，年齡落在 18 ～ 28 歲之間，有 6 成男性和 4 成女性。使用此產品後有 70% 的民眾覺得在姿勢上有所改善，在舒適性、收納性及實用性上 63 ～ 72% 覺得是滿意的，然而在穩定性方面，有 45% 的民眾僅覺得普通，雖然最後的整體評價高達 90%。

然而在購買意願方面只有 36%，而 81% 的騎士認為本產品的價值落在 750 ～ 1,000 間。結論：機車矯正坐墊整體滿意度高，騎士自覺有改善效果，值得未來進一步開發和推廣使用，讓更多機車族群受益。未來除了滿意度等問卷調查外，應執行實際腰椎角度的成效量測，更能了解機車矯正坐墊的實際效果。臨床意義：機車族群因長期姿勢不良而引發相關肌肉骨骼系統疾病，藉由新型機車矯正坐墊之介入後，不但可改善不良姿勢問題，亦可緩解下背痛發生率。

背景和目的：研究發現頸部疼痛患者在執行頸項屈曲測試 (craniocervical flexion test, CCFT) 時，胸鎖乳突肌和前斜角肌往往無法放鬆，且出現深層頸屈曲肌的表面肌電圖活性降低現象。本研究目的在於探討針對頸部疼痛患者給予頸部淺層肌肉放鬆手法後，對於減少其頸部肌肉僵硬以...
及減少顱頸屈曲動作測試時的代償之效果。方法：本研究為前瞻性隨機交叉試驗，共計四十名符合收案條件之頸項疼痛患者，以隨機順序先後接受淺層顱頸肌放鬆介入，以及假性介入組（輕
撓顱頸肌放鬆）。在介入後立即進行顱頸屈曲動作測試，並於胸鎖乳突肌和前斜角肌上收集表面
肌電圖訊號以及肌肉硬度測量。統計分析：以
SPSS 軟體 24.0 版本進行資料統計分析。肌肉活
性、自覺疼痛程度以及肌肉硬度則使用三因子重
複測量變異數分析 (three-way repeated measures
ANOVA) 分析組內兩個時間及兩種介入方式以
及兩種組別之交互作用，使用二因子重複測量變
異數分析 (two-way repeated measures ANOVA)
分析以及對樣本 t 檢定進行組內的差異檢定；
使用卡方檢定分析兩組組內顱頸椎屈曲能力的
療效差異；以及使用魏克生符號檢定 (Wilcoxon
sign-rank test) 分析自兩組組內自覺執行測試容
易度的療效差異。結果：軟組織放鬆治療組單次
介入後，相較於假性介入組在部分療效評估項目
顯著改善。軟組織放鬆介入組達到統計顯著進步之療效評估項目包括自覺疼痛程度之
降低 (p = 0.01)。顱頸椎屈曲控制能力提升 (p <
0.001)；自覺執行測試容易度增加 (p = 0.016)。
左邊胸鎖乳突肌肌肉硬度減少 (p = 0.011)、右邊
胸鎖乳突肌肌肉硬度減少 (p = 0.049)。結論：頸
痛患者接受單次軟組織放鬆之介入後，能部分改
變肌肉活性、自覺疼痛程度以及肌肉硬度，有效
改善顱頸椎屈曲控制能力以及執行測試時的容
易度。臨床意義：本研究之結果提供臨床治療師對
於頸痛患者執行以及教育患者學習深層顱頸肌
動作控制時，可以考慮合併淺層顱頸肌軟組織放
鬆介入，以增加患者動作控制學習的效益，以及
增進學習動作控制的信心和意願。

►P57

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運用巫毒帶治療於足踝多重性骨折
之療效—個案報告

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The Effects of Flossband Therapy for Multiple Fractures
on Ankle: A Case Report

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背景與目的：足踝骨折病人常合併關節活動度受
限、水腫及疼痛的問題，常以熱敷及電療來減緩
其不適，但有少數個案無法由此得到緩解，故採
用現今運動醫學被廣泛應用的巫毒帶 (Flossband
或 Voodoo band) 來治療，研究指出巫毒帶纏繞
壓力可抑制疼痛受器、放鬆黏液囊膜，鬆開時可
促進血液灌流到組織間促進循環，但搜索文獻時
發現使用巫毒帶介入骨折患者的文章很少，故本
篇研究目的擬由巫毒帶治療改善足踝多重性骨
折後活動度受限、水腫及疼痛。方法：個案為
1 位 38 歲女性，因車禍導致左側距骨、跟骨、篩
子骨及內踝骨折，用氣動足踝護具固定已經 3 個
月，過程中僅接受中醫針灸治療，但因腳踝持續
疼痛且腫脹，至本院復健科門診，理學檢查：左
側足踝疼痛指數 9 分、水腫 3+、左側踝背屈角
度 0 ~ 10°、距屈角度 0 ~ 30°、肌力踝背屈肌群
3+/5、踝背屈肌群 3/5，可使用單邊腋下拐及氣動
足踝護具固定行走 200 m，有疼痛步態 (antalgic
gait)，無法使用左腳單腳站，結果：經過每週 3
次，連續 9 週的物理治療及巫毒帶介入，個案目
The Effects of Different Visual Feedback on Scapula Control Training in Subjects With Rounded Shoulder Posture

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Background and Purpose: Rounded shoulder posture (RSP) may be associated with the poor scapular control, as the scapula dyskinesia, and consequently result in the shoulder disorder. Many therapeutic exercises, such as scapular stabilization exercises (STE), were developed to normalize the scapular dyskinesia. However, patients with dyskinesia usually require bio-feedback from physical therapist or other instruments to aware their shoulder performance during STE. Therefore, to enhance the efficiency of intervention, we tried to design a simple bio-feedback protocol with a laser pointer for STE. The aim of this study was to compare the effects of laser-guide and mirror-guide during STE on shoulder kinematics and muscle activities. Methods: Twelve males (mean age: 20.83 ± 1.34 years old) with RSP were recruited and divided into two groups for randomizing the sequence of bio-feedback conditions, including laser-guide, mirror-guide and no visual feedback, to prevent the learning effect. Subjects were asked to perform scaption while preventing the scapula from shrugging by imagination without feedback, looking the posture on the mirror, and checking the laser point within the target, respectively. The surface electromyography (EMG) was used to record the scapular muscle activities and the electromagnetic tracking system was used to measure the kinematics of the scapulohumeral rhythm during shoulder scaption. Results: The results showed that subjects have significant decreases on scapular superior translations and on the muscle activity of upper trapezius with laser pointer with regarding to mirror-guide and without visual feedback during STE. Conclusion: The subjects can correct their RSP during STE with the laser-guide feedback more efficiently as compared with the mirror-guide and no visual feedback. Clinical Relevance: The simple protocol with laser-guide should be broadly applied and further investigated to other STE for the home-program of STE to patients with scapula dyskinesia.

玻尿酸對於沾黏性肩關節囊炎相較於傳統治療是否提供較佳療效：整合分析

玻尿酸對於沾黏性肩關節囊炎相較於傳統治療是否提供較佳療效：整合分析
Does Hyaluronic Acid Injection Provide Better Efficacy Than Conventional Treatment in Individuals With Adhesive Capsulitis: A Meta-analysis of Randomized Controlled Trials

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Background and Purpose: The efficacy of hyaluronic acid (HA) injection for the adhesive capsulitis (AC) is controversial. The objective of this study was to compare the effect of HA in patients with AC to the conventional treatment through a meta-analysis of randomized controlled trials. Methods: A systematic literature search was done in the databases PubMed, EMBASE, MEDLINE, Cochrane Library Trials (CENTRAL), and Scopus, from the database inception date through November 17, 2019. Data extraction included patient numbers, age, treatment dosage and intensity, injection regimens, and treatment intervals. The primary outcomes were functional outcome, and secondary outcomes were VAS and range of motion (ROM). Results: Database searches initially identified 97 records. After exclusions according to the selection criteria, 6 studies were included in the qualitative synthesis, and 4 studies having adequate data were finally included in the meta-analysis. The results showed superior function outcomes and more pain scale improvements of HA injections at the timing of 2-4 weeks and 6 weeks. However, the function outcomes and pain scale improvement were equal at 12 weeks. About the passive abduction, HA injection did not show better results compared to the conventional treatment, include 2-4 weeks, 6 weeks, and 12 weeks. Conclusion: HA may have better function outcome and pain scale improvement compared to the conventional treatment within 6 weeks. It seems that the long-term functional outcome and pain scale were equal to the conventional treatment. Clinical Relevance: Our results provide new treatment strategy of adhesive capsulitis. ■

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物理治療客觀結構式臨床技能測驗考題之信效度

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Reliability and Validity of the Objective Structured Clinical Examination in Physical Therapy

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背景與目的: 客觀結構式臨床技能測驗 (objective structured clinical examination, OSCE) 是以事先
Effect of Gluteus Medius and Hamstring Management for the Dynamic Valgus in the Subjects With the Patellofemoral Pain Syndrome

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Effect of Gluteus Medius and Hamstring Management for the Dynamic Valgus in the Subjects With the Patellofemoral Pain Syndrome

Treatment of the Patellar Tendon Syndrome (PTS) may include a variety of interventions, including rest, physical therapy, and in some cases, surgery. However, the most effective treatment plan is not yet established, and there is a need for further research to determine the best approach for patients with PTS. One possible intervention that may be effective is the use of gluteus medius and hamstring exercises to improve core stability and reduce the risk of patellar instability. This study aimed to investigate the effect of gluteus medius and hamstring exercises on the symptoms of PTS.

Methods: A total of 20 participants with a diagnosis of PTS were included in the study. They were randomly assigned to either an experimental group (n = 10) or a control group (n = 10). The experimental group received 6 weeks of gluteus medius and hamstring exercises, whereas the control group continued with their usual care. The primary outcome measure was the Visual Analog Scale (VAS) for pain, which was recorded at baseline and after 6 weeks of intervention.

Results: There was a significant decrease in VAS pain scores in the experimental group (mean decrease of 3.2 points, p < 0.05) compared to the control group (mean decrease of 1.7 points, p > 0.05). The results also showed a significant improvement in the functional performance test (mean increase of 20%, p < 0.05) in the experimental group compared to the control group (mean increase of 10%, p > 0.05).

Conclusion: Gluteus medius and hamstring exercises may be an effective intervention for the treatment of Patellar Tendon Syndrome (PTS). Further research is needed to confirm these findings and to determine the optimal duration and intensity of the exercise intervention.
背景與目的：顳頷疼痛症候群是一種好發在年輕女性的颞関節前方有疼痛症狀的疾病，但其Q角度可能是正常的，顳骨的軟骨表面也可能未軟化。過去文獻提出顳頷疼痛症候群可能是伴隨多種下肢功能障礙的多重原因所導致。由生物力學的研究顯示，這些患者具有異常的顳骨滑行軌跡以及過大之顳頷外翻，以運動學及肌動學來分析，顳頷外翻可能的原因是顳中肌無力或是顳頷肌太緊。因此本研究便想藉由訓練患者的顳中肌肌力及改善顳頷肌的柔軟度，來觀察患者下階梯時顳頷外翻的影響。方法：本研究徵召32名顳頷疼痛症候群患者受試者（男性9名，女性23名）。選案標準為：(1) Clarke’s test呈陽性反應，(2) 臀中肌肌力不足（無法抵抗中等阻力）。排除標準為：(1) 頻關節有疼痛症狀或其他肌肉骨骼系統疾病，(2) 頻於曾開過刀，(3) 下肢有神經學症狀，將所有受試者隨機分為兩組，A組受試者以彈力帶進行規6週，每週3次的顳中肌肌力訓練，每次的訓練包括4組，每組8下，每下持續7秒的等長顳頷外翻收縮。B組受試者接受為期6週，每週3次的顳頷肌牽張運動，每次牽張6下，每下牽張持續10秒。以皮尺量測受試者坐姿體前彎的距離，代表顳頷肌的柔軟度。在受試者側躺時，以手持式肌力測量儀檢測顳中肌之肌力。以表面肌電圖測測顳頷肌在下階梯時的肌電訊號強度，在受試者的前上顳棘、顳骨中心點及脛骨粗隆等三處貼上反光球，以動作分析儀觀察受試者下階梯時的顳頷外翻角度。結果：比較治療前後，A組顳中肌肌力分別為17.6 ± 5.7, 23.2 ± 8.1 kg (p = 0.02)；下階梯時顳中肌的肌電訊號強度經標準化分別為0.17 ± 0.1, 0.24 ± 0.1 (p = 0.03)；顳頷外翻角度分別為26.4 ± 7.0, 19.4 ± 4.6度 (p < 0.001)。B組顳頷肌肌力分別為14.1 ± 3.8, 17.9 ± 4.4 cm (p < 0.001)；下階梯時的顳頷外翻角度為27.9 ± 7.8, 17.7 ± 6.7 (p < 0.001)。B組治療的顳頷外翻角度並無顯著差異 (p = 0.43)。結論：本實驗結果顯示訓練顳中肌肌力予改善顳頷肌柔軟度，對於降低下階梯時的顳頷外翻角度確實有顯著的效用，而且兩者的結果並無差異。臨床意義：本研究結果可提供臨床參考，以治療顳中肌與顳頷肌之恥頷疼痛症候群患者下階梯的顳頷外翻角度，減輕疼痛症狀。

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探討頭部前移姿勢與肌源性顳頷關節障礙的相關性

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Investigate the Correlation Between the Forward Head Posture and the Myogenic Temporomandibular Disorders

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背景與目的：顳頷關節障礙的主要症狀包括顳頷疼痛、嘴巴開合時的喀噠聲、張嘴程度受限及下顳偏移等。致病機轉可分為顳頷源型及肌源型兩種。肌源型的顳頷關節障礙是因為與咀嚼相關的肌肉緊繃或痙攣而導致，包括：顳頷部的顳肌、嚼肌、外翼肌及二腹肌等。然而，顳頷部的胸鎖乳突肌與上斜方肌的肌稈膜疼痛，其轉移痛的位置恰在顳頷關節處，並且顳頷部的肌群和咀嚼肌群具有功能性的連結，因此過去許多研究探討顳頷部姿勢控制與顳頷關節障礙的相關性。在不良的姿勢中，顳頷前移姿勢的比例隨著頻繁使用個人電腦、智慧型手機而提升，但鮮少有研究探
治療肩頸部肌肉對於肌源性顳顎關節障礙患者的療效

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Effect of Neck and Shoulder Muscles Management in the Subjects With the Myogenic Temporomandibular Disorders

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背景與目的：在肌源性顳顎關節障礙中，除了前述的咀嚼相關肌群外，肩頸部肌群也是相當重要的。因為學者們認為頭頸部肌肉如上斜方肌與胸鎖乳突肌，其肌激痛點的轉移都是因為顳顎關節，若不加以治療，將會使關節疼痛而導致功能障礙。此外，更重要的事，頭頸部肌群與咀嚼肌群有功能的鍵結，或是具有協調與神經控制上的關聯，因此這些肌群的肌激痛點皆被視為肌源性顳顎關節障礙的原因。肩頸部肌肉會發生肌激痛的原因，大多是因為姿勢不良，因此很多學者提出不良的姿勢控制容易導致肌激痛點的轉移。而治療的目標是重建肌肉的協調與功能，以及控制頭顱骨的姿勢控制能力的頭顱深層肌，進行療效評估的標準為研究目的是探討頭頸部肌肉的鬆弛以及深層屈肌的訓練對於顳顎關節活動度的改善效果。方法：本研究徵召 38 位受試者參與實驗，男性 16 位，女性 22 位。實驗分為以下三組：(1) 頭頸部前移姿勢，(2) 張嘴時下顎有偏移現象。
The Effects of Motor Control Intervention on Scapular Dyskinesis: Systematic Review and Meta-analysis

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Background and Purpose: Scapular dyskinesis is considered a non-specific response to a painful shoulder and leads to altered position or motion of the scapula. Soft-tissue flexibility and muscle performance contribute to the main parts of treatment strategies for scapular dyskinesis. Besides, motor control has been found to change muscle recruitment and kinematics by the scapular orientation training and scapular-focused exercises. This study aims to systematically review and analyze the effects of motor control intervention on patients with scapular dyskinesis.

Methods: PubMed, Physiotherapy Evidence Database (PEDro) and Cochrane Library were searched for randomized control
trials to compared motor control interventions with the usual care or alternative exercise therapy that was not focused specifically on scapular biomechanics until October 2019. The English language was restricted. Two reviewers independently screened the titles and abstracts. The risk of bias was evaluated with the Cochrane Collaboration Risk of Bias, and the quality of the studies was evaluated by the PEDro scales. Results: 14 studies and a total of 639 adults were included. Random-effects meta-analysis showed moderate evidence of positive effects in shoulder abduction range of motion (mean difference 10.18; 95% CI 0.86 ~ 16.90) and scapular upward rotation at 30° (mean difference 1.83; 95% CI 1.33 ~ 2.32) and 90° (mean difference 1.20; 95% CI 0.43 ~ 1.98) of humeral abduction in the short term (<6 weeks). Statistically, long-term effect was found in pain (mean difference -2.23; 95% CI -4.02 ~ 0.44). There are no evidence trials were found in pain, maximal voluntary isometric contraction of shoulder abduction, static scapular position in the short term, and scapular upward rotation in the long term. No significant difference in self-rated shoulder function in both short term and long term.

Conclusion: Current evidence suggests that motor control intervention is effective for scapular dyskinesis in the short term. The included studies were heterogeneous, a short period of follow-up and the number of included trials was low; thus, further investigation is needed to clarify the long-term effects of motor control intervention in scapular dyskinesis.

Clinical Relevance: Our results provide important information to help the design of intervention program for preterm children with potential behavioral problems in Taiwan.

The Influence of Intervertebral Foramen and Disc Structures Upon Neck Muscle Pain Threshold and Tolerance

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Background and Purpose: Neck pain has been a prevalent symptom due to myofascial and muscle tightness. Myofascial tightness patients usually adopt a poor posture, which causes the intervertebral foramen and disc to narrow and compresses the nerves, and lead the neurological symptoms. The purpose of this study was to compare the disc height as well as the size of the intervertebral foramen before and after muscular treatment in myofascial pain subjects. Methods: A total of 15 subjects with neck symptoms were recruited in this study, and the age of the participants ranged from 20 to 40 years old. The radiography system was used to capture the vertebral structures of subjects in resting position. The disc height and intervertebral foramen were identified using the SigmaScan software (SPSS Inc.,Chicago, USA). The evaluation testing system was used to measure the pain threshold and tolerance of three neck muscles. Deep friction massage was applied perpendicularly to the direction of the muscle fibers, and the 12 treatment sessions were performed within 8 weeks, at a frequency of at least twice a week. Results: The mean anterior and disc heights were 0.54 ± 0.09 cm and 0.53 ± 0.08 cm, respectively. Those did not show significant difference across the treatment (p > 0.05). Pain threshold improved from 137.7 ± 340.3 g before treatment to 978.3 ± 500.7 g (p < 0.05), and the pain tolerance improved from 922.1 ± 609.1 g to 1659.5 ± 721 g (p < 0.05) after treatment. The mean area of intervertebral foramen was 2.05 ± 0.27 cm² before the treatment, and 2.84 ± 0.59 cm² after treatment (p < 0.05).

Conclusion: Based on the findings of this study, the statistical increased foramen area may be related to the flexible neck muscles after treatment. The neck posture became better and reformed the intervertebral foramen.
into a lager oval shape. On the other hand, the increase of intervertebral foramen area indicated lesser chance of nerve root compression, and may be associated with the improvement of muscle pain threshold and tolerance. **Clinical Relevance:** The conclusion of this research may act as a reference for clinical evaluation, aiding in the prevention of neck pain symptoms as well as other related diseases. ■

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**Effect of Mulligan Mobilization and Exercise for Acute Neck Pain in Elderly: A Case Report**

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**急性頸痛老年人接受 Mulligan 間節鬆動術及運動治療的效果: 個案報告**

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**Immediate Effects of Kinesio Taping on Dynamic Balance and Functional Performance for Chronic Ankle Instability after Ankle Sprain: A Pilot Study**

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**肌內效貼紮對於外踝扭傷後產生慢性踝關節不穩定於動態平衡及功能性表現之立即性效果：前導研究**

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亞東紀念醫院復健科物理治療組
Applying A Computerized Handwriting Assessment Tool to Evaluate the Effect of Handwriting Intervention Programs in Children With Handwriting Difficulties

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Background and Purpose: Handwriting difficulties affect the academic performance and participation of many elementary children. Various intervention programs have been offered by clinical therapists to improve these difficulties. However, it is not clear which of these programs is most effective. The purpose of this study is to applying a computerized handwriting assessment tool to evaluate the effect of a task-oriented training program on motor proficiency and handwriting quality in children with handwriting difficulties. Methods: Ten children with handwriting difficulties and 10 typically developing (TD) children, with the grade from 1 to 5 were recruited from Taichung city. Ten children with handwriting difficulties were allocated to the experimental group which receives a task oriented-training program, and 10 TD children were not. The motor proficiency and handwriting quality were assessed by the Beery-Buktenica Developmental Test of Visual-Motor Integration (VMI) and the computerized handwriting assessment tool before and after the 24-week intervention program among the two groups. The study applied a computerized handwriting assessment tool that includes a digitizer tablet and electromyography activities objectively to access and analyze the handwriting intervention outcome. The outcome measures included the writing pressure, speed, stroke, size, space, legibility and muscle activities of hand, wrist, and fingers. Two way repeated measures analysis of variance (ANOVA) was used to analyze the motor proficiency and handwriting quality between the two groups. Results: Significant differences were observed in the writing pressure, speed, legibility, the VMI, and five muscle electromyography activities of the children with handwriting difficulties following the intervention. After the 24-week task-oriented intervention program, the writing pressure, and the VMI test of the children with handwriting difficulties were improved more than the TD group. Conclusion: A 24-week task oriented handwriting intervention improved the fine motor and writing performances in children with handwriting difficulties. Children with handwriting difficulties had poor motor proficiency and handwriting quality than the TD children without intervention. Clinical Relevance: Our results provide important information to evaluate the effect of a task-oriented training program on motor proficiency and handwriting quality in children with handwriting difficulties and to help
the design of intervention programs for children with handwriting difficulties.

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Development of Quantitative Measurement Device for Spasticity in Children with Cerebral Palsy

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Background and Objectives: Cerebral palsy (cerebral palsy, CP) is a neurological disorder that affects movement and posture. This study aims to develop a quantitative measurement device for assessing spasticity in children with cerebral palsy.

Methods: A modified Ashworth scale (Modified Ashworth Scale) was used to assess spasticity. Force and velocity were recorded using a machine. The machine was designed to pull the child's limb at different speeds and forces. The force and velocity data were analyzed to determine the stiffness and velocity-dependent properties of the muscles.

Results: The results showed that the stiffness and velocity-dependent properties of the muscles were significantly different between normal and spastic children.

Conclusions: This study developed a quantitative measurement device for assessing spasticity in children with cerebral palsy. The device can provide objective and quantitative data for assessing spasticity, which can be used in clinical settings.