funded by the HK SAR, has recognized the need of an innovative stair-climbing power wheelchair to meet such challenge and has provided financial and advanced technological support for the research and development of a smart stair-climbing wheelchair locally in Hong Kong. The purpose of this pilot study is to survey the need for and the possible effect of this stair-climbing wheelchair on people with walking disability.

Methods: A questionnaire of 11 questions (with 9 Yes/No questions and 2 open-ended questions to fill in the blanks) was given to participants who attended Rehab Power Day 2014 and saw the demonstration and personally experienced as a user riding the wheelchair up and down a staircase with irregular inclinations. Participants filled out and returned the questionnaires onsite.

Results: A total of 24 questionnaires were collected with most questions answered. More than 90% Yes were selected from the 9 Yes/No questions, indicating that participants saw the need of and liked to have and use this stair-climbing wheelchair and felt that they could be more independent and that the quality of living for people with walking disability could be improved.

Conclusion: This pilot survey strongly suggests the need of the all-terrain stair-climbing power wheelchair and that it may have positive physical and psychological effect on people with walking disability.

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Could Tai Chi retard ageing-associated cognitive and physical decline in the elderly?

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Background and purpose: Tai Chi is a mind-body-exercise emphasizing the use of the mind to control bodily movement. It is a moderate-intensity exercise involving slow and rhythmic movements. Therefore, it is suitable for people of all ages. With its nature of mind-body component, it is of interest to examine whether or not Tai Chi could delay age-associated deterioration in cognitive and physical function. Thus, this study aimed to determine if Tai Chi could retard age-related cognitive and physical decline and its potential mechanism.

Methods: Eleven healthy Tai Chi masters with more than 5 years’ experience of Tai Chi and 11 age- and sex-matched healthy individuals were recruited. Cognitive function was assessed by calculation task while physical function was assessed by symptom-limited ergometry test. Levels of oxy-haemoglobin (O2Hb) during these functional tasks were measured to evaluate the tissue oxygenation and extractability.

Results: Time for completing calculation task was similar in both groups (p = 0.42) with similar trend of changes in O2Hb (side × group: p = 0.80) demonstrated in both left and right prefrontal regions. Regarding the physical performance, no between-group differences were observed in peak Watts achieved at the end of ergometry test (p = 0.612). During the ergometry test, a trend of decreasing O2Hb was observed throughout the exercise phase followed by a marked increase during the active recovery phase (time effect: p < 0.01) with no time × group interaction observed.

Conclusion: These findings suggest that Tai Chi does not have a protective effect against age-associated decline in cognitive and physical performance or on tissue oxygenation during functional tasks.

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Influence of ageing on oxygen kinetics during functional tasks

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Background and purpose: Ageing associated decline in physical performance is well reported. Such decline increases the likelihood of functional impairment and associated disabilities. This cross-sectional study aimed to investigate the impact of ageing on oxygen kinetics and its association with functional performance.

Methods: Eleven healthy youngsters and eleven sex-matched elderly were recruited. Participants were asked to perform symptom-limited ergometry test to examine their aerobic capacity. Resting level of tissue oxygenation index and changes in oxy-haemoglobin (O2Hb) during ergometry of respiratory muscles and quadriceps were measured to determine the potential underlying mechanisms that may limit the functional performance.

Results: Elderly demonstrated a similar level of tissue oxygenation index (SmO2) in respiratory muscles (Elderly: 71.9%, Youngsters: 71.7%, p = 0.936) but a significantly lower level in quadriceps than youngsters (Elderly: 63.6%, Youngsters: 70.6%, p = 0.001). Regarding the aerobic capacity, elderly achieved a lowered maximal power by 20 Watts (p = 0.011). Throughout the exercise phase, both groups demonstrated a decreasing trend in O2Hb (time effect: p = 0.001) with significant time and group interaction (p = 0.002) and between-group difference (p = 0.001) in both quadriceps and respiratory muscles. Pearson’s correlation revealed that there was significant correlation between the changes in O2Hb in quadriceps with maximal power achieved (r = −0.47, p = 0.027) but not in respiratory muscles.

Conclusion: This study demonstrated that ageing has a detrimental effect on tissue oxygenation and extractability. It appears that the impact is more significant in skeletal muscles than in respiratory muscles, and that the changes could be one factor leading to the reduced functional capacity in elderly.

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Association of hip abductor strength with functional performance in patients after unilateral total knee arthroplasty: A longitudinal study

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Background and purpose: Residual functional deficits could persist in people with total knee arthroplasty (TKA). Investigating modifiable factors that contribute to functional performance in patients after TKA is clinically important. One such modifiable factor is lower extremity weakness. The quadriceps muscle strength has been extensively demonstrated to have a positive association with physical functions after TKA. However, the role of hip abductor muscle strength has not received much attention. The purpose of this study was to evaluate the association of hip abductor muscle strength with functional performance in patients after unilateral TKA.

Methods: Thirty-five participants underwent repeated quadriceps and hip abductor muscle strength testing and three functional performance measurements following 6-month after TKA. Hierarchical regression analysis was used to analyze the association of quadriceps and hip abductor muscle strength with the three functional performance measurements (Timed-Up-and-Go Test, 5-Chair Rise Test and Stair Ascend/Descend Test) at difference time intervals.

Results: Quadriceps muscle was significantly associated with performance on the Timed-Up-and-Go Test, 5-Chair Rise Test and Stair Ascend/Descend Test over and above that of covariates with R² ranging from 0.22 to 0.34. Hip abductor muscle strength was significantly associated with performance on the 5-Chair Rise Test and Stair Ascend/Descend Test over and above that of covariates and quadriceps muscle strength with R² ranging from 0.31 to 0.44.

Conclusion: Hip abductor muscle strength is related to functional outcomes more than quadriceps muscle strength. We should emphasize not only quadriceps muscle strengthening but also hip abductor muscle enhancement in the clinical pathway of perioperative rehabilitation regimens to enhance recovery.

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Community ambulation training programme for enhancing ability of elderly in safe outdoor ambulation

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Background and purpose: Active aging is highly recommended and the ability of outdoor ambulation is crucial in order for elderly to live actively. A unique training room, community ambulation training facility was set up at Tuen Mun Hospital. This facility provides an elderly-friendly environment where they can practise outdoor mobility training with mud, brick and concrete paths, kerbs, stairs, ramps, traveler and road crossing with traffic light management. A community ambulation training programme (CATP) was thus implemented to enhance the ability of elderly in safe outdoor mobility.
Clinical handover in physiotherapy enhanced safety and continuity of patient care for transfer from acute to rehabilitation hospitals

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Background and purpose: In modern medicine, the care of a single patient is often conducted by multiple healthcare professionals from more than one discipline. Effective clinical handover contributes to quality seamless healthcare and prevents unnecessary patient incidents. This clinical audit aimed to evaluate the effectiveness and compliance of the enhanced clinical-handover system in physiotherapy.

Methods: A retrospective content audit was conducted by convenient sampling of the physiotherapy records written by physiotherapists in acute hospital for patients who were transferred to two rehabilitation hospitals between 1 and 30 September 2014 in the Kowloon Central Cluster (KCC). Structured clinical handover process with clinical Handover Standards in Physiotherapy Department was implemented in 2012 in the three hospitals of KCC for safe continuity of physiotherapy management. Prior staff training and engagement was conducted. References were taken from the "Manual of Good Practices in Medical Records Management” by the Hospital Authority and the C-CEBAR (C-Contact, E-Expectation, B-Background, A-Assessment, R-Responsibilities) from the Australian Commission on Safety and Quality in Health Care.

Results: 740 physiotherapy records (about 6% of total annual patients transferred) were audited. Majority of the case mix were from medical specialty (64%), followed by orthopaedics (11%) and emergency medicine (10%). There was full compliance with all audit criteria except for “Expectations of receiving physiotherapist” and “Responsibilities & risk management” (above 90%). Information was legible and specific to the clinical situation. Patient alert was documented for follow-up. Areas for improvement were identified in documenting the detailed dosimetry of physiotherapy intervention, post-treatment response, revised problem list and planning for vulnerable or complex cases. There was no patient incident in all audited episodes.

Conclusion: The current handover is balanced between comprehensiveness and efficiency. It is effective in promoting communication, enhancing continuity and safety of care.

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Effects of combined transcranial direct current stimulation and physiotherapy for upper limb rehabilitation in patients with stroke: A controlled clinical trial

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Background and purpose: An upper limb rehabilitation programme utilizing transcranial direct current stimulation (tDCS) for stroke patients was developed in Tuen Mun Hospital. The objective of this study was to examine the effects of this programme using the Fugl-Meyer upper-extremity subscale (UE-FM).

Methods: Stroke patients with mild wrist and fingers control of Oxford Scale Grade 2 or above were recruited and assigned to the intervention or control group. For the intervention group, anodal stimulation by tDCS was conducted to the hand area of primary motor cortex of the affected hemisphere, while cathodal electrode was placed over the contralateral supraorbital area. Patient received 1mA tDCS for 20 minutes. 5 consecutive sessions of tDCS together with intensive physiotherapy upper limb training were given. For the control group, 5 consecutive sessions of intensive physiotherapy upper limb training were given. UE-FM was used as outcome evaluation. Wilcoxon Signed Ranks Test and Mann-Whitney U Test were used for statistical testing.

Results: 17 stroke patients (11 female and 6 male) were assigned to intervention (n = 10) and control (n = 7) group. Mean age was 68.9 ± 10.1 years and mean time between stroke onset and the first UE-FM assessment was 10.5 ± 4.8 days. For the intervention group, mean score of UE-FM significantly increased from 33.8 ± 9.2 to 50.3 ± 9.8 (Z = −2.81, p < 0.005). For the control group, mean score of UE-FM increased from 31.0 ± 10.1 to 41.3 ± 11.3 (Z = −2.375, p = 0.018). Between-group comparison of the changes in UE-FM scores from the baselines showed that the intervention group had greater improvement than the control group (16.5 ± 5.03 vs. 10.3 ± 5.55; U = 13, p = 0.033).

Conclusion: Findings of this study showed that combined tDCS and physiotherapy treatment enhanced upper limb motor functional recovery in stroke patients. tDCS could be an adjuvant therapy for upper limb rehabilitation in stroke patients.

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New multidisciplinary team approach for the management of patients with chronic lung disease

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Background and purpose: Pulmonary rehabilitation is effective for managing chronic obstructive pulmonary disease (COPD) and chronic lung disease (CLD). The multidisciplinary “CLD Patient Empowerment Program”, comprising physicians, physiotherapists and nurses, was established in September 2013 in Queen Elizabeth Hospital. The programme emphasizes disease self-management and home physical training. Patients attend education classes and physical training once bi-weekly for 12 weeks. This study aimed to evaluate the effectiveness of CLD Patient Empowerment Programme on functional outcomes and quality of life (QoL) in CLD patients.

Methods: This was a retrospective, pretest-posttest analysis. Patients were stratified by Combined Assessment of COPD and GOLD classification. BODE index was used to reflect the disease severity. Exercise capacity was estimated using sub-maximal exercise testing. QoL was assessed by St. George’s Respiratory Questionnaire (SGRQ-HK).

Results: Forty patients (male, 89%) with a mean age of 78.6 ± 3.2 years participated in the programme (9/2013 to 6/2015). 32 patients completed the programme. 82% had COPD or other CLD, and 18% had other CLD such as bronchiectasis. Subgroup analysis of COPD patients showed that 36% was classified as Group A: low risk—fewer symptoms; 24% as Group B: low risk—more symptoms; 28% as Group C: high risk—fewer symptoms; and 12% as Group D: high risk—more symptoms. Mean %Fev was 58.2 ± 33.7. The BODE index reduced by 0.6 (p = 0.138). The 6MDW improved by 26 m (p = 0.023) and the exercise capacity by 0.55MET (p = 0.039). The SGRQ-HK “Total” score was reduced by 4.2 units (p = 0.045).

Conclusion: This programme appears to be effective in improving functional outcomes and QoL in COPD and CLD patients. These results could have potential implications on healthcare utilization reduction.

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