



CAREhab - SRC 2020

Abstract E-book

Organised by

Part of CAREhab 2020, the 6th Singapore Rehabilitation
Conference is co-organised by



FOREWORD

The CAREhab-Singapore Rehabilitation Conference 2020 organising team has received more than 50 quality submissions from the medical community in preparation for the oral and poster presentation. The organisers would like to take this opportunity to thank all participants who have dedicated their time to showcase their latest research at the conference.

The organisers would also like to express their special gratitude to the esteemed judges who have dedicated their precious time in evaluating the research and deciding the winners for this session.

Prof Wang Wenru (National University Hospital, Singapore)

Prof Kwah Li Khim (Singapore Institute of Technology, Singapore)

Dr Tam Pui Kit (National University Hospital, Singapore)

We would also like to express our heartfelt congratulations to the following winners:

1. 1st Place – Taeim Yi

Submission: Comparison of the Forefoot Pressure – Relieving Effects of Foot Orthoses

Tae Im Yi¹, Eun Chae Lee²

¹Department of Rehabilitation Medicine, Yongin Severance Hospital, Yonsei University College of Medicine, Republic of Korea; ²Department of Rehabilitation Medicine, Bundang Jesaeng General Hospital, Republic of Korea

2. 2nd Place – Meredith Yeung

Submission: Establishing the Reference Value for ‘Timed Up – And – Go’ Test in Healthy Adults of Singapore

Yeung MTL¹, Tan RSM¹, Tan TC¹, Yap FSY¹

¹Health and Social Sciences Cluster, Singapore Institute of Technology

3. 3rd Place – Christopher Wee Keong Kuah

Submission: Development of Upper Body Gross Movement Measurement System for Telerehabilitation

Kuah CWK^{1,2}, Jatesiktat P², Lim GM³, Ang WT^{2,3}

KUAH CWK (1,2), JATESIKTAT P (2), LIM GM (3), ANG WT (2,3)

¹Centre for Advanced Rehabilitation Therapeutics, Tan Tock Seng Hospital Rehabilitation Centre, Singapore; ²Rehabilitation Research Institute of Singapore, Nanyang Technological University, Singapore; ³School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore

We look forward to meeting you again next year.

Sincerely,

Organising Team

CAREhab- Singapore Rehabilitation Conference 2020

Submission ID: 2019000033

Salutation: Dr

Profession: Doctor

Name: San San Tay

Phone numbers: 81231109

Department: Rehabilitation Medicine

Institution: Changi General Hospital

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

SUCCESS STORY OF A CASE OF ARTHROGRYPOSIS MULTIPLEX CONGENITA WITH RESTRICTIVE LUNG DISEASE WHO UNDERWENT PULMONARY REHABILITATION USING A PATIENT GUIDED SUSPENSION SYSTEM

Abstract Topic:

Advanced Rehabilitation Technologies

Authors:

TAY SS(1), VISPERAS C(2), ZAW EM(3), ABBAS ZA(4), IMRAN MN(5)

Department / Institution / Country:

- (1) Department of Rehabilitation Medicine, Changi General Hospital, Singapore
- (2) Department of Rehabilitation Medicine, Changi General Hospital, Singapore
- (3) Department of Rehabilitation Medicine, Changi General Hospital, Singapore
- (4) Department of Rehabilitation Medicine, Changi General Hospital, Singapore
- (5) Department of Respiratory & Critical Care Medicine, Changi General Hospital, Singapore

Aim(s):

We present a case report of a 31 year old female with arthrogryposis multiplex congenita who suffered from restrictive lung disease and who underwent pulmonary rehabilitation successfully with a robotic device.

Methodology:

This device falls into the category of a patient guided suspension system. The patient was admitted to the intensive care unit for pneumonia and type 2 respiratory failure. She could not be weaned off oxygen and was not able to ambulate more than 3 metres with assistance.

Results:

During the first session of training with the robotic device, she ambulated 162 metres. After 6 sessions she was weaned off oxygen and could walk independently.

Conclusion:

The use of patient guided suspension systems may be beneficial and should be explored in pulmonary rehabilitation.

Submission ID: 2019000044

Salutation: Prof

Profession: Doctor

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Country: Korea

Presentation Option: [presentation-option]

Abstract Title:

REGULATION OF GENE EXPRESSION AFTER THE STIMULATION COMBINED SCALP ACUPUNCTURE AND TRANSCRANIAL MAGNETIC IN MIDDLE CEREBRAL ARTERY OCCLUSION MICE

Abstract Topic:

Neurorehabilitation

Authors:

PARK HK(1), SONG MK(1), KIM WI(1), HAN JY(1)

Department / Institution / Country:

(1): Department of Physical & Rehabilitation Medicine, Chonnam National University Hospital & Medical School, Gwangju, Republic of Korea

Aim(s): Effect of combined stimulation of repetitive transcranial magnetic stimulation (rTMS) and scalp acupuncture stimulation (SAS) on middle cerebral artery occlusion (MCAO) mice has not been reported yet. Regulation of gene expression after combined stimulation remains unclear. The aim of this study was to investigate biomolecular mechanism involved in the effect of stimulation combined SAS and rTMS in MCAO mice by analyzing gene expression with RNA sequencing technology.

Methodology: Thirty-six C57BL/6J male mice of 8-week-old weighing 50~60 grams were used for this experiment. MCAO mouse was established with 60-min occlusion and subsequent reperfusion of middle cerebral artery. Experimental mice were randomly assigned to four groups (nine mice in each group): control group (no treatment), SAS group (10 minutes SAS), rTMS group (1Hz rTMS), and combined group (1Hz rTMS and SAS). Stimulation was performed from the 3rd day to the 7th day after induction of MCAO. All mice were sacrificed and brain tissues in motor area of MCAO lesion were taken. We analyzed their gene expression profiles using RNA sequencing technology.

Results: After stimulation, grip strength was stronger in SAS and rTMS group than that in control and combined group. NF κ B was the key up-regulated neurotrophin in the SAS group while Shc and p90RSK were key up-regulated neurotrophins in the rTMS group. However, CHK was down-regulated whereas p90RSK was up-regulated in the combined group based on RNA sequencing analysis.

Conclusion: Each stimulation method might be affected by different biomolecular mechanisms in neurogenesis. Combined stimulation may cause metaplasticity compared to single stimulation.

Submission ID: 2019000045

Salutation: Assoc Prof

Profession: Allied Health

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Institution: National Taiwan University of Sport

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title:

PSYCHOLOGICAL EFFECTS OF ELECTROSLEEP THERAPY IN AN ATHLETE WITH INSOMNIA

Abstract Topic:

Clinical Application & Research (Efficacy & Evidence)

Authors:

Chang WD(1), Tsou YA(2), Chen YY(1), Chen S(3)

Department / Institution / Country:

(1)Department of Sport Performance, National Taiwan University of Sport, Taiwan

(2)Department Otolaryngology, China Medical University Hospital, Taiwan

(3)Department of Physical Therapy, China Medical University, Taiwan.

Aim(s): Sleep problems often affect the training and spore performances of athletes. The cranial electrotherapy stimulation is one kind of electrosleep therapy and used to treat insomnia. The aim of the study is to demonstrate the psychological effects of electrosleep therapy in an athlete with insomnia.

Methodology: In this study, the Alpha-Stim electrotherapy stimulator (Alpha-Stim, Electromedical Products International, Inc, USA) was used for the athlete every day throughout 2 weeks. Before and after the electrosleep therapy, the heart rate variability (HRV) and Profile of Mood State (POMS) were used to assess the outcomes.

Results: A female boxer (age = 23 years old) had insomnia for 3 years, and the sleep problem occurred 4 times a week. The score of the Pittsburgh Sleep Quality Index (PSQI) was 11. In HRV analysis, the Standard Deviation of Normal to Normal (SDNN) decreased from 98.13 to 54.96 ms. Low frequency (LF) decreased from 73.24 % to 50.53%, but the high frequency (HF) increased from 26.76 % to 49.47 %. The ratio of LF and HF was improved to 1.02, approaching to 1. The fatigue (scores from 5 to 2) and anger (scores from 3 to 1) in POOMS were improved.

Conclusion: This case study demonstrated that the cranial electrotherapy stimulation could improve the activity of the parasympathetic nerve and the balance of the autonomic nervous system. The fatigue and anger of negative emotions were also improved after the cranial electrotherapy stimulation. The electrosleep therapy could be used to improve the psychological effects in athletes with insomnia.

Submission ID: 2019000053

Salutation: Dr

Profession: Doctor

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Institution: MOHH

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: Role of sonoelastography in the evaluation of post stroke spasticity.

Abstract Topic: Clinical Application & Research (Efficacy & Evidence)

Authors: Ng KG (1,2), Tan PL (2), Wee TC (2)

Department / Institution / Country: (1) Ministry of Health Holdings, Singapore;
(2) Department of Rehabilitation Medicine, Changi General Hospital, Singapore

Aim(s): To understand the role of sonoelastography in the evaluation of post stroke spasticity

Methodology: A systematic review of studies published from inception to September 2019 that analysed the use of sonoelastography in patients with post stroke spasticity was performed using PubMed database. The keywords used to perform the search were “stroke” AND “spasticity” AND “elastography”.

Results: A total of 12 articles were identified of which 11 were included in the final analysis. One was excluded after reviewing the abstract. Two prospective interventional studies with intramuscular botulinum toxin injection into biceps brachii muscle, 8 observational studies and 1 case report. Muscles being studied including biceps brachii muscle (6 studies), gastrocnemius muscle (3 studies) and forearm flexors (2 studies).

All studies demonstrated a significant increase in muscle stiffness for post-stroke spasticity as indicated by an increase in shear wave velocity (SWV), elasticity index and elasticity ratio of spastic muscle on ultrasound as compared to non-spastic muscle. Studies also showed that shear wave velocity, elasticity index and elasticity ratio on the paretic side correlated positively with modified Ashworth scale and modified Tardieu scale and negatively with motor function. For interventional studies, there is a significant differences in ultrasound elasticity parameters between pre- and postintervention period.

Intra-observer reliability of SWV and performing strain imaging in assessing muscle stiffness in individuals with chronic post stroke spasticity was good to excellent and good respectively. Inter-rater reliability for SWV measurements were classified as excellent.

Conclusion: Sonoelastography may have a role in the objective quantitative evaluation of post stroke spasticity pre and post intervention.

Submission ID: 2019000055a

Salutation: Dr

Profession: Doctor

Name: Kai Wen Elvina Tay

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: PREDICTORS OF RECOVERY FROM POST TRAUMATIC AMNESIA IN TRAUMATIC BRAIN INJURY PATIENTS- A RETROSPECTIVE COHORT STUDY

Abstract Topic: Neurorehabilitation

Authors: Tay KWE (1), Lim GH (3) and Chua SGK (2)

Department / Institution / Country: (1) Post Acute and Continuity Care, Jurong Community Hospital, National University Health System; (2) Department of Rehabilitation Medicine, Tan Tock Seng Hospital; (2) Clinical Research & Innovation Office, Tan Tock Seng Hospital

Aim(s): The primary objective was to determine associated factors that could influence emergence or non-emergence from PTA and its duration during inpatient TBI rehabilitation. The secondary objective was to study the impact of PTA outcome and duration on inpatient rehabilitation outcomes.

Methodology: A retrospective single-centre cohort study using electronic chart reviews was conducted over 3 years for moderate-severe TBI who were admitted to an inpatient rehabilitation hospital. Demographic, injury, clinical, functional and radiological data were collected. Admission and discharge Functional Independence Measure (FIM) and FIM gain and efficiency were the main outcome measures.

Results: 100 data samples were analysed and 77.0% (77) of the patients were Chinese, 76.0% (76) were male, median age of 60.5 years and 57.0% (57) had fall-related TBI. Admission Glasgow coma scale (GCS 13-15), age <55 years, epidural haemorrhage (EDH) and medical complications were independent predictors of PTA emergence. Patients with mild GCS scores were 4.8 times as likely to emerge from PTA as compared to those with severe GCS ($P<0.001$), while younger patients (age <55 years) were twice as likely to emerge from PTA as compared to patients 55 years and above ($P=0.04$). Patients with non-infection related medical complications were 0.7 time less likely to emerge from PTA ($P=0.001$) and patients with EDH were around twice as likely to emerge from PTA as those without EDH ($P=0.03$). Non-emergence from PTA was significantly associated with lower total discharge FIM score of around 24 points ($P<0.001$), while PTA duration of ≥ 90 days was associated with lower total discharge FIM score of around 44 points compared with those with PTA duration of <28 days ($P<0$).

Conclusion: This study suggests that admission GCS, age, presence of EDH and medical complications are potentially useful to help predict PTA outcomes. PTA emergence and duration correlates with discharge functional outcomes. This information can have potential implications on prognostication and resource allocation.

Submission ID: 2019000055b

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title:

ISOLATED TROCHLEAR NERVE PALSY IN POST TRAUMATIC BRAIN INJURY: INCIDENTAL DETECTION USING VESTIBULAR SCREENING TESTS

Abstract Topic:

Neurorehabilitation

Authors: Tay, KWE (1), Chua SGK (2)

Department / Institution / Country:

(1) Post Acute and Continuity Care, Jurong Community Hospital, National University Health System

(2) Department of Rehabilitation Medicine, Tan Tock Seng Hospital Rehabilitation Centre, Singapore

Aim(s): Isolated trochlear nerve injury (TNI) following traumatic brain injury (TBI) is uncommon. There are diagnostic challenges in the early detection of isolated TNI and there is currently no agreed screening tool for its diagnosis.

Methodology: We report a 30 year-old gentleman with severe TBI, who was detected to have diplopia during routine screening vestibular tests.

Results: A 30 year-old gentleman with severe TBI was first detected to have diplopia during routine screening vestibular tests. He was subsequently diagnosed to have isolated TNI following a positive Bielschowsky head tilt test. This was managed conservatively and his symptom of diplopia improved 5 months following head injury

Conclusion: Isolated trochlear nerve palsy can have subtle clinical findings and can be easily missed in patients with TBI. Early detection of cranial nerve palsies especially those which affect ocular nerve movement is important, because this can affect the patient's rehabilitation progress, functional independence and quality of life.

This case illustrates the incidental use of vestibular screening manoeuvres to provoke diplopia associated with isolated trochlear nerve palsy, which subsequently facilitated an early referral to ophthalmology for a definitive diagnosis which is distinct from non-specific vestibular ocular symptoms. Vestibular screening manoeuvres are easy to perform, safe and require minimal training. There is a need for further studies on screening tools for TNI following TBI.

Submission ID: 2019000058

Salutation: Dr

Profession: Others (please indicate) Postdoctoral researcher

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: UNDERSTANDING PATTERNS OF INTERLIMB JOINT COORDINATION DURING LOCOMOTION IN STROKE SURVIVORS

Abstract Toppic: Neurorehabilitation

Authors: Sidarta A. (1), Kwong W.H. (1), Liang P. (1), Chan P.Y. (1), Yap C.K. (1), Lim L.S. (1), Tan W.K. (1), Seow G. (1), Lim R. (1), Lie E. (1), Ang W.T. (1)

Department / Institution / Country: (1) Rehabilitation Research Institute of Singapore, Nanyang Technological University, 11 Mandalay Road #14-03, Clinical Sciences Building, Singapore 308232, Singapore

Aim(s): Interlimb joint coordination, which is important for locomotion, is altered in clinical populations such as stroke. In this study, we aim to understand changes in the joint coordination between affected and unaffected limbs using the vector coding technique. Specifically, we want to quantify the bilateral hip coordination.

Methodology: First, kinematic information of 8 healthy participants during locomotion was recorded using an optical motion capture system to provide a normative dataset. Bilateral hip joint trajectories in the sagittal plane were then constructed. Vector coding was subsequently performed to obtain the proportion of time in which the coordination was in-phase, out-phase, or led by either joint respectively. The kinematic information of 8 stroke survivors (> 6 months post-stroke) was extracted from an open database.

Results: The results show that the bilateral hip coordination in healthy adults was primarily out-phase in $64.3\% \pm 1.93$ of the time. In contrast, stroke survivors exhibit differences in the hip coordination with respect to the norm [2-way interaction, $F(3,56)=8.43$, $p<0.01$], with a great reduction in the out-phase patterns. SPM-1D analysis showed spatiotemporal differences from the norm. It was found that the affected hip joint significantly deviated from the norm between 40% – 55% of the gait cycle. Trajectories of the unaffected hip also varied from the norm presumably due to compensatory effects, but this on average did not reach statistical significance.

Conclusion: The current study demonstrates an analysis framework to examine interlimb joint coordination after stroke using a combination of vector coding and SPM-1D methods. Such a framework can be useful for objective assessments of joint coordination in clinical research that can be extended to other joints and other neuromuscular conditions.

Submission ID: 2019000059

Salutation: Dr

Profession: Doctor

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: EARLY INTRODUCTION OF TRIO HOME EXERCISE PROGRAM AS A TASK-SPECIFIC ACTIVITY FOR STROKE INPATIENT REHAB IN ADDITION TO REGULAR THERAPIES

Abstract Toppic: Others

Authors: EI MZ, TAY SS, Christine AV, Aye AK, Li QQ, Julian EM

Department / Institution / Country:

(1) Department of Rehabilitation Medicine, Changi General Hospital, Singapore

(2) Department of Nursing, Changi General Hospital, Singapore

Aim(s): Stroke is one of the major diagnoses for admission to inpatient rehabilitation but there is no stroke specific activity for them beside regular PT and OT. The project aims to promote the patients' self-awareness and use of the affected arm by task specific self-driven activities for at least 30 minutes per day during inpatient rehab stay including weekends and holidays.

Methodology: Among stroke patients admitted to CGH Rehab ward 64 between August and September of 2019, the candidates were selected by using the PREP Algorithm. Those with SAFE scores of at least 8/10; intact functional cognition, no mechanical injuries or musculoskeletal and skin problems were given one tool box with a booklet which contained specific instructions for activities. The time spent on activities were recorded by ward staffs.

Results: Out of total 60 patients admitted over 2 months (81% ischemic and 19% hemorrhage), 11 patients were included but 1 patient withdrew before completion. The median length of hospital stay was 13 days (min 6-max 53) and inpatient rehab stay was 10 days (min 5-max 43). The average time spent on the task specific activity was 27.49min per session and 20.75min per day rehab stay. 90.9% of the participants gave the feedback that the project was helpful for functional recovery and wanted to continue at home. 81.8% voted that the instructions were easy to understand and apply. The median motor FIM score difference among the participants was 9 (min 0-max 27) between the time of rehab admission and discharge. 45.45% were contacted after and all were compliant and actively following TRIO exercise.

Conclusion: A self-exercise program increased the amount of time and the intensity of a stroke rehabilitation program above regular therapy. In addition being initiated during the inpatient stay may help the patients to continue exercising post discharge.

Submission ID: 2019000060

Salutation: Assoc Prof

Profession: Doctor

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Department: Rehabilitation

Institution: Siriraj Hospital Mahidol University

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Country: Thailand

Presentation Option: [presentation-option]

Abstract Title:

EFFECTIVENESS OF A CHEST PHYSIOTHERAPY CARE MAP IN HOSPITALIZED PATIENTS

Abstract Topic:

Cardiac and Pulmonary Rehabilitation

Authors:

Thirapatarapong W(1), Sereearuno T(1), Rittayamai N(2), Lawansil S(1)

Department / Institution / Country:

(1) Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

(2) Division of Respiratory Diseases and Tuberculosis, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Aim(s):

To develop a chest physiotherapy care map and evaluate its efficacy to improve the appropriateness of chest PT prescription

Methodology:

Prospective, pre-post intervention trial was performed. Seventy-eight hospitalized patients who were consulted for chest PT were enrolled. Subjects were consecutively allocated into two groups of 39 patients. Group I was enrolled before the implementation of the chest PT map and Group II patients were selected after implementation. Chest PT prescription rates and duration were measured. Indications for chest PT prescription, length of hospital stay, adverse events and deaths were recorded.

Results:

After the care map was implemented, the chest PT prescription rate decreased from 56.4% to 33.3%, ($p=0.040$). The duration of conventional chest PT decreased from 4.5 (1-28) to 4 (2-9) days, ($p=0.582$). The mean cost of chest PT was reduced by 38.2%. In-hospital death and discharge rates were similar in both groups. No adverse events were identified.

Conclusion:

The Chest PT care map is an effective tool to reduce unnecessary chest PT prescriptions, lower costs, encourage self-care, and more effectively allocate therapist time.

Submission ID: 2019000071

Salutation: Mrs

Profession: Allied Health

Name: rola tout

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Department: physical therapy

Institution: saint joseph university

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Country: Lebanon

Presentation Option: [presentation-option]

Abstract Title:

ELECTROMYOGRAPHY OF SCALENE AND RECTUS ABDOMINIS DURING THE RESPIRATORY CYCLE IN HEALTHY SUBJECTS

Abstract Topic: Cardiac and Pulmonary Rehabilitation

Authors: ROLA TOUT, PhD candidate, MPT, PT

Department / Institution / Country: Saint Joseph University, Faculty of medicine

Aim(s):

Expose the electromyography and spirometry relationship and establish the chronology of the contraction of Scalene and Rectus abdominis which works together in synergy antagonism in physiological breathing

Methodology:

128 electromyographic tests were performed during the respiratory cycle on 43 healthy adults. EMG signals of Scalene, Rectus abdominis were recorded. The breathing was recorded by using a spirometer (vernier®).

Results:

The duration of the contraction of Scalene are superior to Rectus abdominis 82% p-value = 0.000058, the amplitude of Scalene is superior of Rectus abdominis, p-value = 0.000000073. 109 tests of Scalene contraction begin before that of Rectus abdominis (63.74%), p-value = 0.000012. RMS is $0.02 \pm 0.011 \mu\text{v}$ for Rectus abdominis and $0.04 \pm 0.021 \mu\text{v}$ for Scalene, p-value = 6.76591E-06. Duration of inspiration is $1.25 \text{ s} \pm 0.19$, the expiration is $1.04 \text{ s} \pm 0.19$. The mean frequency of Rectus abdominis is $54.19 \text{ Hz} \pm 6.35$, it is $57.21 \text{ Hz} \pm 7.08$ for Scalene, p-value is 9.84081E-08. The median frequency of Rectus abdominis is $51.05 \text{ Hz} \pm 6.51$, it is $52.72 \text{ Hz} \pm 6.94$ for Scalene, p-value is 0.0098. The muscle fatigue of Rectus abdominis decreased from 60.40 ± 0.45 to 19.98 ± 4.32 . For Scalene it decreased from 60.41 ± 0.4 to 23.52 ± 4.41 .

Conclusion:

There is a synergistic – antagonism relationship between Scalene and Rectus abdominis during respiration. Scalene is a main inspiratory muscle, its contraction is important in amplitude, duration and frequency. Both muscles are fatigable during the inspiratory cycle.

Submission ID: 2019000072

Salutation: Ms

Profession: Others (please indicate) PHYSIOTHERAPIST INTERN

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Country: India

Presentation Option: [presentation-option]

Abstract Title:

AN EFFECT OF STATIC STRETCHING AND PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION HOLD-RELAX STRETCH IN INCREASING FLEXIBILITY OF SHORTENED HAMSTRING MUSCLE IN SEDENTARY LIVING FEMALE POPULATION. A COMPARATIVE STUDY

Abstract Topic:

Others

Authors:

FIZA RAZA RIZVI (1), NILOFAR RASHEED (2)

Department / Institution / Country:

(1) DEPARTMENT OF PHYSIOTHERAPY, NOIDA INTERNATIONAL UNIVERSITY, GREATER NOIDA, INDIA

(2) DEPARTMENT OF PHYSIOTHERAPY, NOIDA INTERNATIONAL UNIVERSITY, GREATER NOIDA, INDIA

Aim(s):

The Study was designed to determine and compare either the static stretching (SS) or PNF Hold-Relax stretching technique have greater effect on improving hamstring muscle flexibility on sedentary living female population aged between 18 and 25 years.

Methodology:

In this study, 30 female population of aged between 18 and 25 years living sedentary lifestyle, who had shortened hamstring muscles were randomly categorized into two groups named as Group 1, Group 2.

Group 1 was tested for static stretching and group 2 was undertaken for PNF Hold-Relax stretch. Both the groups were tested for 5 days a week for consecutive 4 weeks. Hamstring muscle tightness was determined as Knee Extension Deficit (KED) using Active Knee Extension Test (AKET). To assess both groups, the motion range of knee extension was measured using full circle universal goniometer before and after the session. The measurement was taken at baseline and at the end of 1st, 2nd, 3rd and 4th week to test the effectiveness of stretching intervention. The subjects were recruited on the basis of Inclusion criteria and exclusion criteria. The inclusion criteria was Active knee extension test(AKET) of 20 degree or less, aged limited between 18-25 years. They did not have any neurological abnormality and previous injuries or severe lower back ache complaint from past 3 months.

Results:

Paired t-test of stretching shows that there was a significant improvement in the hamstring flexibility after static stretching intervention for right leg among sedentary living females aged between 18 and 25 years. Here, the t-value of week1 = -13.315 ($p < 0.05$), t-value of week2 = -20.971 ($p < 0.05$), t-value of week3 = -21.385 ($p < 0.05$), t-value of week4 = -23.869 ($p < 0.05$). Paired t-test of stretching group shows that there was significant improvement in hamstring flexibility after Hold-Relax for left leg among sedentary living females. The t-value of week1 = -17.486 ($p < 0.05$), t-value of week2 = -29.729 ($p < 0.05$), t-value of week3 = -34.544 ($p < 0.05$), t-value of week4 = -38.873 ($p < 0.05$). Independent t-test was used to compare between groups the result shows there was significant difference in hamstring flexibility when compared between static stretching and Hold-Relax of Pre and post-test measurements. The significant of t-value of week1 = -0.766 ($p > 0.05$), t-value of week2 = -2.493 ($p > 0.05$), t-value of week3 = -3.162 ($p < 0.05$), t-value of week4 = -4.842 ($p < 0.05$)

Conclusion:

The Study concluded that static stretching and PNF Hold-Relax stretching are significantly effective in improving hamstring muscle range of motion when compared from pre-test with post-test week 4th measurement. But on clinical determination Hold-relax revealed slightly greater effect than static stretch on increasing Hamstring flexibility.

Submission ID: 2019000075

Salutation: Dr

Profession: Allied Health

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

DISTRESS IN CANCER PATIENTS ATTENDING REHABILITATION IN THE COMMUNITY

Abstract Topic:

Others

Authors:

KUO A

Department / Institution / Country:

CANCER REHABILITATION SERVICES, SINGAPORE CANCER SOCIETY, SINGAPORE

Aim(s):

The aim of this study was to identify sources of distress that impacted cancer patients who were referred for rehabilitation in the community.

Methodology:

Participants were 430 cancer patients attending rehabilitation at Singapore Cancer Society between 2017 and 2018, who had rated their distress level and indicated problems related to their distress. Using the cross-sectional survey data, multivariate analyses were performed to examine the relationship between distress rating and problems identified controlling for demographics.

Results:

The most frequently reported problems include fatigue (53.7%), worry (52.3%), sleep (46%), neuropathy (45.7%), pain (43.2%), and memory (42.5%). Patients who were younger ($r = .22$) reported greater distress. Among problem list, finance ($r = .34$), work ($r = .28$) emotions (such as depression and worry, r ranging from .43 to .47), loss of interest in usual activities ($r = .42$), fatigue ($r = .30$) and sleep ($r = .30$) were more associated with distress, even after controlling for age. All results were statistically significant ($p < 0.001$).

Conclusion:

To help reduce distress in patients with cancer, rehabilitation in the community should provide comprehensive care and include services that address their emotional needs; offer financial counselling; enable especially those who are younger to return to work; decrease physical symptoms such as fatigue and pain; and improve quality of life not limited to sleep and participation.

Submission ID: 2019000077

Salutation: Ms

Profession: Students (please indicate programme) Department of Sport Performance

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Institution: National Taiwan University of Sport

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title:

Effects of Kinesio Taping on Pain and Muscle Strength Recovery in Delayed Onset Muscle Soreness

Abstract Topic: Pain

Authors:

SUN CY (1), HUNG BL (2), CHANG WD (1), ZHAO YD (1), CHEN YT (2)

Department / Institution / Country:

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(2) Department of Sport Medicine, China Medical University, Taiwan

Aim(s):

Delayed onset muscle soreness (DOMS) is a common skeletomuscular condition, and many treatments are used to improve the damaged muscle recovery, such as Kinesio taping (KT) application. But, it is lack of evidence to support the KT application on DOMS. So, the aim of this study was to investigate the effects of KT on pain and muscle strength for DOMS recovery.

Methodology:

Participants were recruited from a college, and randomly assigned into 2 groups (the crisscross weave KT application on quadriceps femoris was used in the experimental group; and non-taping was used in the control group. The high intensity interval training (HIIT) exercise, including split lunges into pulsing squats and interactive jump, was designed to induce DOMS of quadriceps femoris. The Visual analogue scale (VAS) and muscular dynamometer (MicroFET[®]3, Hoggan Scientific, LLC. , UT, USA) were used to assess the pain and muscle strength recovery after the exercise, respectively.

Results:

There were no significant differences on VAS and muscle strength before and after the exercise. In both groups, the DOMS symptoms were occurred after 24 h post exercise, and pain of DOMS was significantly decreased at 48 and 72 h post exercise ($p < 0.05$). But, no significant difference on VAS was found between the two groups. The muscle strength in the experimental group was higher than that in control group at 24 and 48 h post exercise ($p=0.035$; $p=0.009$).

Conclusion:

The crisscross weave KT application on quadriceps femoris had an effect of muscle strength recovery, but could not decrease the pain in DOMS.

Submission ID: 2019000081

Salutation: Dr

Profession: Doctor

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Country: Indonesia

Presentation Option: [presentation-option]

Abstract Title: GASTROCNEMIUS MUSCLE HISTOPATHOLOGY IN SPASTIC RATS

Abstract Topic: Others

Authors: Marina Indriasari (1), Ferial Hadipoetro (2), Bambang Pontjosoeryanto (3)

Department / Institution / Country:

(1)Rehabilitation Medicine Department, Medicare Hospital, Indonesia

(2)Rehabilitation Medicine Department, Muhamadiyah University, Indonesia

(3)Veterinary Faculty, Bogor Agricultural University, Indonesia

Aim(s):

This study uses a surgical procedure that is by excisional biopsy to determine the structure of skeletal muscles, especially the gastrocnemius muscle of spastic rats and to analyze the condition of gastrocnemius muscle experiencing spasticity.

Methodology:

This experimental study was carried out on 42 spastic rats which were divided into 6 groups with different oral doses of calcium that had been turned off. Gastrocnemius muscle tissue is taken from the left side of the subject's limbs. Staining gastrocnemius muscle tissue fibers using hematoxylin and eosin. Staining calcium stored in gastrocnemius muscle tissue using Alizerin red.

Results:

With hematoxylin-eosin staining obtained a picture of the core of muscle cells in each muscle cell. The cytoplasm or endoplasm of muscle cells appears pink. Analysis of the spastic state of the tissue found that the distance between the muscle fibers or sarcomeres was wider and the diameter of the muscle fibers or sarcomeres in the cross section appeared smaller. With Alizerin red staining calcium deposits in spastic muscle tissue are obtained. Calcium deposits appear purplish in blue. The results showed a correlation between the distance between muscle fibers and spasticity after the intervention ($p < 0.05$) and a significant correlation between spasticity after the intervention ($p = 0.008$) and changes in spasticity ($p = 0.015$) with Alizerin red staining.

Conclusion:

Hematoxylin-eosin staining can be used to determine the composition of muscle tissue and part of the cytoplasm in the gastrocnemius muscle that has spasticity and staining Alizerin red can be used to determine the presence of calcium deposits in muscle tissue that has spasticity.

Submission ID: 2019000083

Salutation: Mr

Profession: Allied Health

Name: SWEE HAO ALVIN LIM

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

FEASIBILITY AND EFFECTS OF ELECTRICAL STIMULATION FOR MANAGEMENT OF SHOULDER SUBLUXATION POST STROKE IN AN ACUTE HOSPITAL SETTING – A RETROSPECTIVE STUDY

Abstract Topic:

Neurorehabilitation

Authors:

LIM S.H.A

Department / Institution / Country:

Rehabilitation Department, Woodlands Health Campus, Singapore

Aim(s):

To examine the feasibility and effects of electrical stimulation (ES) for management of shoulder subluxation post stroke in an acute stroke unit in a local hospital setting.

Methodology:

A retrospective study was conducted at a local acute hospital. 8 subjects that were identified by Occupational Therapists to have shoulder subluxation post stroke and received ES as an intervention were included in this study. Data collected were number of days from experiencing shoulder subluxation to having first ES intervention, number of interventions received, measurement (in millimetric) between acromion and head of humerus and visual analogue scale (VAS) for pain score. Other data such as age, sex, cognitive abilities were also collected.

Results:

All 8 subjects started ES within 3 days after shoulder subluxation was identified by therapists. 5 subjects demonstrated either a decrease in shoulder subluxation or decrease in VAS pain score. The study also suggested that subjects with cognitive impairment post stroke may not a barrier of receiving ES and having positive result (decrease in millimetre in shoulder subluxation).

Conclusion:

This study raised the possibility of ES as an early intervention for shoulder subluxation and pain once they are identified in an acute stroke unit. Further studies are required to identify barriers which may prevent the implementation of ES in an acute hospital and the long-term effects of ES for this group of population.

Submission ID: 2019000084

Salutation: Dr

Profession: Doctor

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Country: Thailand

Presentation Option: [presentation-option]

Abstract Title: REGAINING 7 HANDS FUNCTIONS USING THE PHOENIX V.2 HAND PROSTHESIS WITH 12 LEPROSY PATIENTS, NONSOMBOON COLONY, THAILAND

Abstract Topic: Accessibility

Authors: Pariyasoot Intasuwan, James Quilty

Department / Institution / Country:

Department of Psychiatry and Prosthetics, Sirindhorn Hospital, Khon Kaen, Thailand

Aim(s):

The Mycobacterium M.leprae (Leprosy or Hansen's Disease) infection leads to multiple forms of hand deformities that ends in partial to full disability of hands, causing patients life-long suffering. By providing a recently designed new class of hand prosthetic devices to these patients, they can regain up to 7 hand functions that may lead to the recipients to increased independent living and more happiness. The primary aim is to study hand functions of Leprosy patients after using the Phoenix V.2 hand prosthesis with a secondary goal to further hand prosthesis development based on feedback.

Methodology:

A range of simple agility tests were administered to a group of 12 people who contracted Leprosy, 9 men and 3 women, while wearing the Phoenix V2 hand prosthesis, followed by Interviews and percentage analysis.

Results:

Among the 12 patients with Leprosy in the study, up to 7 Hands functions were regained using the Phoenix V2: 1. cylindrical grip, 2. spherical grip, 3. hook grip, 4. precision grip, 5. pinch grip, 6. lateral prehension, and 7. lumbrical grip. In the group of 12 there were 9 men and 3 women, ages between 66-92, averaging 77 Years old. The hand disabilities lasting 40-60 years by 4 types of hand deformity , all matched with this prosthesis after slight modifications to the size of device. The result of wearer using the Phoenix V2 led to increased independent daily living and more happiness of the patients.

Conclusion:

Applying Phoenix V.2 hand prosthesis gained patients with Leprosy 7 more Hand functions leading to increased independent daily living and greater self-esteem. Further prosthesis development under the patients requirements and needs and new material composition of devices will lead to a more effective prosthesis.

Submission ID: 2019000085a

Salutation: Mr

Profession: Students (please indicate programme) Department of Sport Performance

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title:

Exploring The Key Elements of Excellent Cyclists' Peak Experience and Excellent Performance

Abstract Topic:

Others

Authors:

CHU C (1), CHANG WD(1), HUNG BL(2)

Department / Institution / Country:

(1) Department of Sport Performance, Nation Taiwan University of Sport, Taiwan

(2) Department of Sports Medicine, China Medical University, Taiwan

Aim(s):

Cycling events in Taiwan are famous worldwide. In the competition, cyclists show perseverance to win the victory while the key is their personal quality and performance. The target of the research is to figure out and identify the essential points of cyclist's peak experience and performance to provide advice that cyclists can make adjustments before race competition.

Methodology:

Four outstanding domestic cyclists are invited to be the participants and half is male, the other half is female. The research is qualitative and we conducted an in-depth interview with the semi-structured outline. Besides, we recorded the entire process. After the interview, we made a literal transcript to code and analyze.

Results:

We consolidate four cyclist's mental status in their peak experience, including the confidence in domestic or foreign competition, fluency, tiredness, and excitement. The participants believe that the most important and common element to success is the coach's assistance and teammate's companionship with which they can perform well in the court.

Conclusion:

The participants of the research are four excellent cyclists and the purpose is to figure out the key elements that could influence cycling performance. It will be an important reference for training young sport players by the result of the study.

Submission ID: 20190000

Salutation: Mr

Profession: Allied Health

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

DEVELOPMENT OF UPPER BODY GROSS MOVEMENT MEASUREMENT SYSTEM FOR TELEREHABILITATION

Abstract Topic: Advanced Rehabilitation Technologies

Authors: KUAH CWK (1,2), JATESIKTAT P (2), LIM GM (3), ANG WT (2,3)

Department / Institution / Country: (1) Centre for Advanced Rehabilitation Therapeutics, Tan Tock Seng Hospital Rehabilitation Centre, Singapore; (2) Rehabilitation Research Institute of Singapore, Nanyang Technological University, Singapore; (3) School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore

Aim(s): To develop a portable and cost-effective movement sensing system with automated assessment capability to enhance feasibility and scalability of telerehabilitation. As trunk and upper limb (UL) movement anomalies are automatically detected and flagged, this will allow exercise session to be summarised into meaningful segments for further interventions.

Methodology: Development of the sensing system involves the use of a depth camera (Kinect V2) to capture movement data with wrist-worn motion sensors and sensorised objects to increase robustness of this setup. Machine learning is used to model the normal movements of healthy subjects and to identify movement patterns that are different from the pre-established normative data. This movement anomaly detection method is quantitatively evaluated with simulated anomalies from healthy subjects and qualitatively evaluated with 4 sets of arm movements from 14 post-stroke participants with Fugl Meyer UL Motor Assessment Score of 19-41 points for the Shoulder-Elbow component (out of total 42 points).

Results: Using the Vicon marker-based motion capture system as a gold standard, the developed sensing system reduces the position error of shoulder, elbow, and wrist by 25.9% and reduce the forearm orientation error by 80.3% on average over the default tracking of Kinect SDK 2.0. This improvement also leads to improved accuracy in anomaly detection. The anomaly detection on the developed sensing system has the average area under curve (AUC) of 0.9872 which is close to the marker-based system (average AUC of 0.9912). Qualitative evaluation on stroke survivors also shows that the system is not only able to detect the anomaly section of exercise but also generate insightful feedback.

Conclusion: This system has the potential to provide enhanced monitoring of physical performance and movement feedback for telerehabilitation. Development to extend such capability of markerless motion capture system to include hand-finger movements is ongoing.

Submission ID: 2019000086

Salutation: Ms

Profession: Nurse

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: THE EFFECTIVENESS OF A NURSE-LED HOME EXERCISE PROGRAM ON FALL PREVENTION AMONG COMMUNITY-DWELLING ELDERLY

Abstract Topic: Preventive Rehabilitation

Authors: CHUA YR (1), CHEW SM (2), CHIA JL (3), ABDUL RAHIM MN (1), KANNUSAMY P (3)

Department / Institution / Country: (1) Population Health and Integrated Care Office, Singapore General Hospital, Singapore; (2) Nursing Division, Singapore General Hospital, Singapore; (3) Alice Lee Centre for Nursing Studies, National University of Singapore, Singapore

Aim(s): To evaluate the effectiveness of a home-based exercise program rendered by community nurses on fall prevention among community-dwelling elderly

Methodology: A cluster-randomised trial design was adopted. A total of six Senior Activity Centers (SACs) were identified and randomized, with three sites assigned each to intervention group (IG) and control group (CG). Community-dwelling elderly aged 60 years and above who were identified as high-risk for falls by the community nurse were recruited. In addition to usual care, IG received teaching of an exercise program focused on balance and strength with a follow-up period of ten weeks to reinforce techniques and monitor compliance. CG received usual care, which focused mainly on chronic disease management and fall prevention education. Participants were evaluated after three months. Primary outcome measures were the proportion of elderly who fell at least once and the change in the Short Physical Performance Battery (SPPB) score. Secondary outcome measures included the fear of falling, measured by the modified Fall Efficacy Scale (mFES) and the occurrence of fall-related hospitalizations and Emergency Department (ED) visits.

Results: A total of 60 elderly (IG, n = 43; CG, n = 17) were recruited. Compliance of IG was low, majority (73.4%) achieved less than half of the recommended frequencies. 21.2% in IG and 18.8% in CG fell at least once but with insignificant statistical difference. No significant between-group difference was detected as well on all other outcomes, including number of elderly who had fall-related admission and ED visit, change of SPPB score and in change of mFES score.

Conclusion: Strategies to increase compliance are pivotal, such as provision of incentives and incorporating group-based exercises. Additionally, future research should adopt a RCT design, and if possible, to extend to a larger sample size.

Submission ID: 2019000092a

Salutation: Ms

Profession: Allied Health

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title: IMPROVING THE FEASIBILITY OF ORTHOTIC DESIGN AND SMARTPHONE KEYBOARD DESIGN DURING SMARTPHONE TEXTING FOR CLIENTS WITH THUMB MUSCULOSKELETAL DISCOMFORT

Abstract Topic: Assistive Technology

Authors: Chien-Hsiou Liu

Department / Institution / Country: Department of Occupational Therapy, Fu-Jen Catholic University, Taiwan

Aim(s): The number of smartphone users who complain musculoskeletal discomfort are growing due to intensive texting on smartphone. People frequently text with both thumbs. It forces the users' thumbs to adopt a repetitive and awkward posture. This research aimed to find the appropriate orthotic design and smartphone keyboard design for improving the muscular activity loading of thumb during a smartphone texting task.

Methodology: A series of 2x3x2x2 (Group x Orthosis x Keyboard Height on Smartphone (KH) x Keyboard Width on Smartphone (KW)) repeated experiments were designed. The between factor was Group, and the within factors were Orthosis, KH and KW. Eleven clients with thumb musculoskeletal discomfort were recruited as the experimental group, and 14 healthy adults were recruited as the control group. All subjects were randomly assigned to complete a smartphone texting task. The activities of four right thumb muscles (abductor pollicis longus (APL), extensor pollicis longus (EPL), extensor pollicis brevis (EPB), and flexor pollicis longus (FPL)) were measured simultaneously by surface electromyography to investigate the exertion condition. For analysis, 2x3x2x2 repeated ANOVAs were used.

Results: For the Group factor, the muscle activities of the EPL was lower in the experimental group than in the control group. For the KH factor, the muscle activity of EPL in standard keyboard was significant less than in heighten keyboard. The interaction in Orthosis factor and KW factor was found in the muscle activity of the FPL. The muscle activities of the FPL in centralized design was significant lower than in divided design for non-orthosis and immunized thumb metacarpophalangeal joint conditions.

Conclusion:

The findings of this study suggest that clients can choose standard design in KH and centralized design in KW to decrease EPL and FPL exertion when texting on smartphone.

Submission ID: 2019000092b

Salutation: Mr

Profession: Students (please indicate programme) Department of Sport Performance

Name: Yu-Dong Zhao

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Institution: National Taiwan University of Sport

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title: A study of low-level laser therapy pre-exercise on pain, hematology and mechanical properties in the fatigued muscle

Abstract Topic: Pain

Authors: Zhao YD (1), Wu JH (2), Hung BL (3), Zhang WD (1)

Department / Institution / Country:

(1) Department of Sport Performance, National Taiwan University of Sport, Taiwan

(2) Department of Biomedical Engineering, Ming Chuan University, Taiwan

(3) Department of Sport Medicine, China Medical University, Taiwan

Aim(s): The purpose of this study was examining the effects of pain, hematology test, and muscle assessment on fatigued muscle for low-level laser therapy (LLLT) before exercise.

Methodology: The 14 healthy volunteers were randomly divided to LLLT and placebo groups. In the laser group, 5 infrared laser clusters (iRestore Multi-channel Laser Therapy System; wavelength = 830nm, frequency = 10 Hz, output power = 30mW, and total dose = 315J) were applied on the quadriceps for 10 minutes before exercise. Sham laser clusters were used with the same treatment process in the placebo group. High-intensity intermittent-based exercise was used to cause the fatigue of quadriceps muscle. After the protocol, the visual analogue scale and hematology test, including blood lactate (BL), lactic dehydrogenase, creatine phosphokinase, and high sensitivity C-reactive protein, were assessed. The digital palpation device (Myoton-Pro) was used to assess the mechanical properties (i.e. stiffness, frequency, decrement, relaxation time, and creep) on the fatigued muscle. All assessment variables were compared in intra-group and inter-group. Sub-group analysis was also used to compare with low BL (BL < 3 mmol/L) and high BL (BL ≥ 3 mmol/L) group.

Results: There were no significant differences in all variables of the hematology test. In the post-exercise, significant differences in muscle creep of mechanical properties were found between high BL of the LLLT group and that of the placebo group ($p = 0.01$). We also found that the muscle tone in the subjects with high BL was statistically lower than that with low BL in the LLLT group ($p = 0.01$).

Conclusion: The effect of LLLT pre-exercise on pain and hematology test in fatigued muscle could not be proved. However, the changes in some mechanical properties of muscle tissue still represented, which could be discussed in future study.

Submission ID: 2019000095

Salutation: Ms

Profession: Allied Health

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title: PERFORMANCE OUTCOME OF MENTAL MODEL ESTABLISHMENT IN DERMOSKELETON FIELD APPLICATION

Abstract Topic: Assistive Technology

Authors: Lin PJ

Department / Institution / Country: Department of Exoskeleton, Wistron Medical Technology, Taiwan

Aim(s): Commercial exoskeletons have been widely introduced to healthcare professionals and individuals, who may benefit from those powered assistive devices. Plenty comments gathered from the users and some hindrances needed to conquer. One usability concern is that users, both clinicians and patients, may not have prior knowledge or experiences toward high-tech exoskeletons. Consequently, inadequate user performances were often discovered in the first fitting session. Current study aims to construct amicable learning procedures facilitating the wearer to establish mental model based on the designed features of the dermoskeleton, a sub-class of exoskeleton. Also, verifying the procedures via examine the first fitting performance of wearers.

Methodology: A qualitative feasibility field study adopted video clip analysis and questionnaire to collect the performance outcome of participants, who had functional mobility issue and did not violate any contraindications to wear the dermoskeleton.

Results: A total of 26 adults participated the field study, and one was eliminated due to incomplete data collection. Other 25 participants completed the pre-evaluation, onsite first fitting, post verbal-questionnaire. In the compulsory-tasks of fitting, one participant failed to consistently initiate stand-up task from knee-height chair at the end of session. In the locomotion-tasks of fitting, all participants could initiate walking with the powered assisted device with verbal cueing from the researcher. Participants revealed that they could feel the active assistance attempted to normalize their movement in the post verbal questionnaire. Moreover, 72% of participants view the device as a potential assist device to expand their mobility status.

Conclusion: The objective task performance and subjective participants feedback appear that logical instructions based on the design function of the dermoskeleton may promote the usability. In general, current feasibility study presents that establishing a mental model should be an essential factor in introducing innovative medical device. Nevertheless, further study is necessary to follow up and verify.

Submission ID: 2019000096

Salutation: Dr

Profession: Doctor

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Country: Australia

Presentation Option: [presentation-option]

Abstract Title: THE EPWORTH TRANSITIONAL LIVING CENTRE MODEL OF CARE

Abstract Topic: Ambulatory Service and Chronic (Long-term) Care

Authors: THANARAJAH P (1); OLVER J (2); BUCKMASTER J (1)

Department / Institution / Country: (1) (2) Department of Rehabilitation Medicine, Epworth HealthCare, Melbourne, Australia

Aim(s): Research supports the use of Transitional Living Centre (TLC) programs to maximise functional independence and community integration of individuals with Acquired Brain Injury (ABI).

The aim of the study is find out about the program outcomes of the Epworth TLC using the Community Integration Questionnaire (CIQ) and Mayo Portland Inventory on admission and discharge – these results will be presented at the conference.

The TLC program design and structure, intervention approaches and program staffing will also be shared.

Methodology: Admission and discharge outcome measures using the Mayo Portland Inventory and Community Integration Questionnaire (CIQ) will be tabulated using Microsoft excel and a statistician will be engaged for statistical analysis.

Staff at TLC will fill in admission and discharge outcome measure forms – CIQ and Mayo Portland Inventory for each patient.

Results: Preliminary results show that there is improvement in discharge measures using the CIQ and Mayo Portland for the patients.

Conclusion: The results support the research that TLC programs support patients and families with successful independent community living by maximising independent living skills further supporting that TLC programs are an important part of rehabilitation.

Submission ID: 2019000098a

Salutation: Dr

Profession: Doctor

Name: Kuan Geok Ng

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Institution: MOHH

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: Outcomes post inpatient rehabilitation.

Abstract Topic: Others

Authors: Ng KG (1,2), Young SHY (2), Nijanth M (1,2), Tan PT (3)

Department / Institution / Country: (1) Ministry of Health Holdings, Singapore; (2) Department of Rehabilitation Medicine, Changi General Hospital, Singapore; (3) Clinical Trial and Research Unit, Changi General Hospital

Aim(s): Primary goals of inpatient rehabilitation are to improve function and help patients transition back to the community. We aim to evaluate the functional gain and readmission of patients who underwent inpatient rehabilitation by looking at 1) functional improvement during and after discharge from the inpatient rehabilitation setting and 2) unscheduled readmissions within 30 days.

Methodology: Records of patients discharged from inpatient rehabilitation at a regional hospital during month of March 2019 were retrospectively reviewed. Functional independence measure (FIM) scores on admission, discharge, post discharge and unplanned readmission within 30 days were collected and analyzed.

Results: Of the 105 discharges, 87 had complete admission and discharge FIM for analysis. Fifteen out of 87 patients showed minimal clinical important difference of 22 or more points of FIM gain. Comparing median discharge to admission FIM showed a statistically significant improvement. Every FIM point gain is associated with an increased length of stay of 0.29 days. After adjusting for baseline, FIM on admission is a strong predictor of LOS as shown by prior studies. Of the 33 patients with outpatient FIM data, the median FIM at outpatient was better compared to discharge FIM and the difference is also statistically significant.

Post discharge fifteen (14.3%) patients had unplanned readmissions within 30 days. Majority due to unforeseen medical reasons, rest due to social issues. Debility has the highest readmission rate due to medical complexity. There was no statistically significant correlation between FIM gained and readmission rate.

Conclusion: Patients who underwent inpatient rehabilitation showed a statistically significant improvement in their function and continued to improve functionally post discharge. Medically complex patients have the highest risk of readmission post inpatient rehabilitation discharge. These indicators can be used as a quality tool and comparing outcomes from different rehabilitation settings.

Submission ID: 2019000098b

Salutation: Ms

Profession: Allied Health

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Department: Occupational Therapy

Institution: Genesis Early Intervention and Therapy Center

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Country: Indonesia

Presentation Option: [presentation-option]

Abstract Title: DEVELOPING HANDWRITING SKILLS WITH PERCEPTUAL MOTOR INTERVENTION : A CASE REPORT

Abstract Topic: Paediatrics

Authors: Joan Beatrix

Department / Institution / Country: Department of Occupational Therapy, Genesis Early Intervention and Therapy Center, Indonesia

Aim(s):

Writing plays important roles in growth and learning among the children. Many of ADHD children have poor handwriting skill and need special intervention. The aim of this study was to describe the progress of patient handwriting skills after getting perceptual motor intervention.

Methodology:

The 7th – year – old boy with ADHD get perceptual motor intervention such as jumping jacks, hopping, galloping, dribbling, salt writing, foam writing, climbing and cross crawl from June – August 2019. The evaluation was done by using assessment Test of Handwriting Skills-Revised (THS-R) and Beery Buctenica Visual Motor Integration Test (Beery VMI).

Results:

After get sixteen times therapy in eight weeks, there's improvement in his Beery VMI score in visual motor integration, visual perceptual and motor coordination categories from low to average. Writing speed improved, number of letters in 20 seconds increased from 8 letters to 14 letters. Case error, reversals letters and touching letters decreased, those area have a significant change from watch to no concerns categories. Overall THS-R score percentile rank increased from 30 % to 61 % it indicates the children scored as well as 61 % of the same aged children in the normative population after the intervention.

Conclusion:

Improvement in visual motor integration, visual perceptual, motor coordination and writing speed. Case error, reversals letters and touching letters decreased. The method is effective to develop patient handwriting skill.

Submission ID: 2019000104

Salutation: Mr

Profession: Allied Health

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Country: Malaysia

Presentation Option: [presentation-option]

Abstract Title: Comparison between hold- relax pectoral stretch and inspiratory muscle training on pulmonary function among frail elderly

Abstract Topic: Rehabilitation for Chronic Diseases

Authors: Mir IA (1), Lee TP (1), Jabbar MAR (2), Gan QF (3)

Department / Institution / Country: (1) Department of Physiotherapy, Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Malaysia; (2) Department of Population Medicine, Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Malaysia; (3) Department of Pre-clinical Sciences, Faculty of Medicine and Health Sciences, Universiti Tunku Abdul Rahman, Malaysia

Aim(s): To compare the effect of inspiratory muscle training (IMT) and hold-relax pectoral stretch (HRPS) on pulmonary function (FVC, FEV1 and FEV1/FVC) among frail elderly.

Methodology: 34 frail elderly were recruited and randomly divided into experimental group (n=17) who underwent IMT and control group (n=17) which received HRPS. Participants in HRPS were positioned in sitting, with shoulders abducted, elbows flexed and hands clasped behind their neck. They were instructed to contract the pectoralis major while manual resistance was applied to the contraction for 10 seconds. In IMT, participants were in semi-fowler's position with nose clipped and instructed to inhale through threshold inspiratory muscle trainer at a resistance of 30 cmH₂O. Both groups performed 3 sets of exercise in each session, 3 sessions/week on alternate days for 4 weeks consecutively. FVC, FEV1 and FEV1/FVC were assessed at baseline and 1-day post intervention.

Results: Mean age of HRPS group was 81.13 ± 6.22 and IMT group was 77.20 ± 9.33 . HRPS showed significant improvement only in FVC (mean difference -0.48 ± 0.65 , $p = 0.013$) compared to IMT which exhibited significant improvement in all the outcome variables (FVC mean difference -0.28 ± 0.45 , $p = 0.031$, FEV1 mean difference -0.30 ± 0.51 , $p = 0.037$, FEV1/FVC mean difference -14.18 ± 9.22 $p = 0.001$). Between groups analysis showed significant difference in FEV1/FVC scores (HRPS mean 38.00 ± 18.43 , IMT mean 51.53 ± 13.19 , $p = 0.003$) after intervention.

Conclusion: IMT seems to have beneficial effects on pulmonary function than HRPS in frail elderly. Thus, IMT shall be incorporated into the exercise regimen when focusing on improving the pulmonary function in this population.

Submission ID: 2019000105

Salutation: Assoc Prof

Profession: Allied Health

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Country: Taiwan

Presentation Option: [presentation-option]

Abstract Title: SHOULDER ASYMMETRY OF JOINT MOBILITY, MUSCLE STRENGTH AND MUSCULAR PROPERTY IN TABLE TENNIS PLAYERS: EFFECTS OF PERFORMANCE LEVEL

Abstract Topic: Musculoskeletal

Authors: CHEN S (1), LAI YL (1), CHANG WD (2)*, Lin TJ (3), WU SK (2)

Department / Institution / Country: (1) Department of Physical Therapy, China Medical University, Taiwan; (2) Department of Sport Performance, National Taiwan University of Sport, Taiwan; (3) Division of Rehabilitation Medicine, Da Chien General Hospital, Taiwan

Aim(s): Table tennis is a fast sport and demands a quick reaction. In responding to fast tempo during a competition, the players are practicing with relatively fixed posture that results in constant muscle contraction for one side, raising the risk of sports injury. This study was to understand the asymmetrical patterns of joint mobility, muscle strength, and muscular property in the shoulder joint for table tennis players of different performance levels.

Methodology: Thirty-nine collegiate table tennis players were recruited and divided into professional (n=23) and amateur (n=16) groups based on their performance level. The isometric muscle strength and passive range of motion for shoulder joint were measured by MicroFET3. The tested movements included internal rotation, external rotation, horizontal adduction, and horizontal abduction for both dominant and non-dominant sides. The muscular property of bilateral trapezius was detected by MyotonPRO, including tension, stiffness, elasticity, and relaxation. Bilateral asymmetry was defined as the differences between dominant and non-dominant sides.

Results: The age, gender, and body mass index were not statistically different ($p > .05$). In this study, we found that the amateur group has significantly greater bilateral asymmetry of joint mobility than the professional group in internal rotation ($p < .05$), showing the glenohumeral internal rotation deficit (GIRD) pattern. As to muscle strength, the bilateral asymmetry of the amateur group was significantly greater than that of the professional group in horizontal adduction ($p < .05$), implying muscle imbalance. Additionally, the amateur group revealed significantly inadequate muscular property provided by the evidence of greater asymmetry in tension, stiffness, and relaxation of the dominant shoulder ($p < .05$).

Conclusion: The GIRD pattern and the considerable bilateral asymmetry of muscle strength and muscular property were found in the amateur players. These asymmetries are strongly related to sports injuries. The table tennis players with low-performance level need to consider the influence of shoulder asymmetry to prevent further sports injuries.

Submission ID: 2019000106

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title: The diagnostic utility of musculoskeletal ultrasound to assist in the diagnosis of Snapping Pes Syndrome: A case report.

Abstract Topic: Musculoskeletal

Authors: Tan YL(1), Koh MH(2)

Department / Institution / Country: Department of Rehabilitation Medicine, Singapore General Hospital, Singapore

Aim(s): To illustrate the use of dynamic ultrasound to assist in the diagnosis of Snapping Pes Syndrome in a case report with left medial knee pain.

Methodology: A case report describing a 59-year old lady with left medulla infarct in 2014. She had near complete motor recovery to left upper and lower limbs after 6 months of rehabilitation. She had few episodes of fall from 2014 to 2016 but denies any left knee contusion. By mid-2017, she experienced increasing frequency of left medial knee pain associated with knee snap from active knee flexion to extension during functional ambulation. She sought alternative medicine as part of her treatment without conclusive diagnosis from mid-2017 to early 2019. She was eventually referred to physiatrist clinic where musculoskeletal ultrasound revealed snapping of left semitendinosus tendon from posterior to anterior aspect of the medial femoral condyle during repetitive knee flexion to extension. Appropriate analgesics and physiotherapy were commenced with improvement of knee pain and reduction in knee snapping frequency after 4 weeks.

Results: 2 ultrasound images of the transverse view over the distal femoral condyle are recorded in this case study from dynamic imaging. The first transverse image illustrated the initial position of semitendinosus tendon at full knee flexion. The second image illustrated the final position of semitendinosus tendon at full knee extension. The translocation of semitendinosus tendon from posterior to anterior aspect of left femoral condyle was clearly illustrated. With the visible snap on left knee flexion to extension and dynamic ultrasound scanning, a clinical diagnosis of left pes anserine syndrome from left semitendinosus snap was clinched.

Conclusion: This case report highlights the value of dynamic ultrasound to assist in accurate diagnosis in left painful knee snapping so as to direct appropriate clinical care.

Submission ID: 2019000108

Salutation: Assoc Prof

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Presentation Option: [presentation-option]

Abstract Title:

RELATIONSHIP BETWEEN ENERGY EXPENDITURE AND WALKING ENDURANCE POST INTENSIVE ROBOTIC EXOSKELETON GAIT TRAINING

Abstract Topic:

Advanced Rehabilitation Technologies

Authors:

Wee SK(1,2,3), Ho CY(1), Tan SL(1), Ong CH(1)

Department / Institution / Country:

(1) Rehabilitation Centre, Tan Tock Seng Hospital, Singapore.

(2) Centre for Advanced Rehabilitation Therapeutics (CART), Tan Tock Seng Hospital, Singapore.

(3) Singapore Institute of Technology (SIT), Singapore.

Aim(s):

Background:

Wearable robotic exoskeleton is an advanced rehabilitation technology that can provide individualised, high repetitions and high-intensity gait training. Hence, it has the potential to improve the cardiovascular fitness of the user from the intensive training.

Aim:

To evaluate the relationship between the energy expenditure of walking and the walking endurance post robotic exoskeleton training.

Methodology:

Eight inpatients at a tertiary rehabilitation centre underwent gait training using the Ekso robotic exoskeleton: 1 patient with spinal tumour, 1 spinal infection, 2 traumatic spinal cord injury, 1 traumatic brain injury and 3 stroke patients. The number of Ekso session ranged from 5 to 15 sessions. Energy expenditure of walking was evaluated using the Physiological Cost Index (PCI). The 6-minute walk test (6MWT) was used to capture the walking endurance. Both PCI and 6mWT were captured pre and post Ekso training. Spearman rank-order correlation coefficient was applied to analyse the relationship between the energy expenditure of walking and the walking endurance.

Results:

All the 8 patients demonstrated significant reduction in PCI ($p < 0.01$) and significant improvement in 6MWT ($p < 0.01$) post exoskeleton training. PCI demonstrated a moderately strong correlation ($r = -0.54$, $p < 0.05$) with walking endurance in patients who underwent intensive robotic exoskeleton training.

Conclusion:

Conclusion and clinical implications: Intensive gait training with robotic exoskeleton can lead to significant reduction in energy expenditure of walking. This change is possibly due to improved gait efficiency as patients coordinated better weight shifting and active movement of the lower limbs during the gait cycle. Hence, patients will have more energy reserve to walk further distance. This study illustrated moderately strong correlation between PCI and 6MWT; thus, suggesting that patients with a lower energy expenditure of walking post robotic exoskeleton training enabled patients to walk longer distance.

Submission ID: 2019000113

Salutation: Assoc Prof

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title: ENERGY EXPENDITURE OF WALKING AFTER INTENSIVE ROBOTIC EXOSKELETON GAIT TRAINING

Abstract Topic: Advanced Rehabilitation Technologies

Authors: Wee SK (1,2,3), Ho CY (1), Tan SL (1), Ong CH (1)

Department / Institution / Country: (1) Rehabilitation Centre, Tan Tock Seng Hospital, Singapore; (2) Centre for Advanced Rehabilitation Therapeutics (CART), Tan Tock Seng Hospital, Singapore; (3) Singapore Institute of Technology (SIT), Singapore.

Aim(s): Background: Wearable robotic exoskeleton is a promising new rehabilitation therapy that can provide individualised, high repetitions and high-intensity gait training. The robotic exoskeleton minimises users' abnormal posture and movement; and enable them to experience walking in a normal physiological gait pattern as part of motor relearning post neurological insults.

Aim: To evaluate the effect of intensive robotic exoskeleton gait training on the energy expenditure of walking.

Methodology: Sixteen inpatients at a tertiary rehabilitation centre underwent intensive gait training using the Ekso robotic exoskeleton: 1 patient with spinal tumour, 1 spinal infection, 2 traumatic spinal cord injury, 2 traumatic brain injury and 10 stroke patients. The number of Ekso session ranged from 5 to 15 sessions. The energy expenditure of walking was evaluated using the Physiological Cost Index (PCI). The PCI values were captured pre and post Ekso training. Paired t-test was used to analyse the pre-post PCI.

Results: Fifteen out of 16 patients demonstrated significant reduction ($p < 0.01$; reduction ranged from 2.7% – 90%) in PCI post exoskeleton training. Mean PCI pre Ekso was 2.21 beats/metre; mean PCI post Ekso was 0.99 beats/metre.

Conclusion: Intensive gait training with robotic exoskeleton can lead to significant reduction in energy expenditure of walking. This change is possibly due to improved gait efficiency as patients coordinated better weight shifting and active movement of the lower limbs during the gait cycle. Hence, patients will have more energy reserve for other activities. This study suggests the potential of such robotic technology in improving energy expenditure in neurological patients.

Submission ID: 2019000116

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title: EARLY MOBILIZATION AND REHABILITATION AFTER SPINAL CORD INJURY – CRITICAL CARE PERSPECTIVE

Abstract Topic: Others

Authors: LEONG BE KIM

Department / Institution / Country: Department of Rehabilitation Medicine, Sarawak General hospital, Malaysia

Aim(s): Case report of early mobilization and rehabilitation for a patient who sustained spinal cord injury which resulted in tetraplegia, neurogenic shock, autonomic dysfunctions and other medical complications.

Methodology: A spinal cord injury patient received acute resuscitation in emergency department and followed by spinal stabilization surgery with post-operative care at intensive care unit (ICU). In ICU, this patient was managed for persistent hypotension, ventilator dependent issue, optimal analgesic control, venous thromboembolism prophylaxis and nosocomial infection. Some of the rehabilitation medical issues in this patient include tracheostomy care, hyponatraemia, dysphagia, neurogenic bladder, neurogenic bowel and skin pressure injury. He had received active functional training to improve sitting tolerance, transfer technique, respiratory muscles strength and swallowing efforts. Patient achieved safe oral intake, decannulation of tracheostomy tube, good sitting tolerance up to 2 hours with 1 person assisted transfer technique prior to discharge from inpatient care. Psychosocial interventions were also done to ensure safe integration back to community.

Results: Scientific evidences have demonstrated benefits of early mobilization and rehabilitation in critical care patients. However this process is more complicated in spinal cord injury (SCI) patients due to multiple systems dysfunction. Early mobilization may be harmful and result in oxygen desaturation and hypotension in patients with spinal cord injuries. Therefore, the proper techniques should be emphasized to improve safety and feasibility of early mobilization in spinal cord injury patients. We had established functional training for patient, carer education, equipment prescription and home assessment to ensure suitable environment for discharge destination.

Conclusion: Assessment, medical care, functional training and psychosocial intervention are the core components of spinal rehabilitation management. Multidisciplinary approach in early mobilization and rehabilitation following spinal cord injury will improve the functional status and outcomes of patients.

Submission ID: 2019000126

Salutation: Assoc Prof

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title: ESTABLISHING THE REFERENCE VALUE FOR 'TIMED UP – AND – GO' TEST IN HEALTHY ADULTS OF SINGAPORE

Abstract Topic: Others

Authors: Yeung MTL (1), Tan RSM (1), Tan TC (1), Yap FSY (1)

Department / Institution / Country: (1) Health and Social Sciences Cluster, Singapore Institute of Technology

Aim(s):

This study aimed to establish the normative TUG references values for healthy adults in Singapore and examine the relationship between TUG and gender, age and BMI respectively.

Methodology:

621 participants, (ages 40-85 years) recruited from the community performed the TUG test. Subjects suitability was assessed via a brief medical history and vital sign measurements. TUG timing was taken for all subjects. Within (Age) group differences were calculated using 2-sample t-test. Between (age) group differences were calculated using one-way ANOVA.

Results:

Participants aged 40-49yr old did TUG faster by 2.158seconds compared to 70-79yr old(CI=0.95, p <0.001). Those aged 50-59 were faster compare to 70-79yr old by 1.848sec (CI= 0.95, p <0.001.) There is no significant difference between TUG timing for males and females regardless of age group. We found no correlation between BMI and TUG timing, however we generated equations to predict TUG timing based on BMI for age groups 50-59,60-69 and 70-79; p<0.001.

Conclusion:

This study provided TUG normative reference values for healthy Singaporean adults aged 40-85 years. BMI should be considered as a predictor of TUG timing.

Submission ID: 2019000127

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Profession: Resident

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Presentation Option: [presentation-option]

Abstract Title:

COMMUNITY RE-INTEGRATION IN AN INCOMPLETE LOW THORACAL SPINAL CORD INJURY DUE TO TUBERCULOUS SPONDYLITIS IN LOW SETTING REHABILITATION CARE: A CASE REPORT

Abstract Topic:

Neurorehabilitation

Authors:

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(2) Rehabilitation Unit, Hasan Sadikin Hospital, Bandung, Indonesia

Aim(s):

Learning Objectives: To describe the outpatient rehabilitation program in a low setting to optimise the functional activities on patient with spinal cord injury (SCI) due to tuberculous spondylitis to reintegrate in community.

Methodology:

Background: Many cases of SCI that we found in the rehabilitation department is because of Tuberculosis Spondylitis and has devastating consequences for the physical, social well-being of patients, and activity.

Results:

Finding and Procedure Details: Mrs I, 44 years old female was diagnosed with SCI AIS A Neurological Level (NL) Thoracal X with pressure injury grade 3 at the sacrum, neurogenic bowel and bladder with activity daily living, vocational and psycho-socio-economic disturbance. On May 2019 the patient was diagnosed with tuberculous spondylitis. On July 2019 the patient got antituberculosis drugs. The patient had posterior spinal stabilisation on 1st August 2019. The rehabilitation program was delayed up to 2 months after the surgery. These delayed treatments were because of psycho-socio-economic factors. The patient had low motivation and tended to immobilise, because of pain at her back and fear of moving, low of muscle and cardiopulmonary endurance and also spasticity. The patient had moderate depression and anxiety also mild stress. The patient got urinary tract infection and still using indwelling catheter. By providing intensive and comprehensive approaches, she underwent therapy series and finished the rehabilitation program. Six months after the rehabilitation program, her diagnosis becomes SCI AIS C NL Thoracal X. She already backs to vocational and reintegrates to the community.

Conclusion:

Conclusion: The patients had a good outcome, although it was some delay for medical and rehabilitation treatment. SCI caused tremendous social and participatory disruptions in the daily lives of those living with SCI. Community reintegration is a process that enhances a person's return home from the hospital by minimising such disruptions and facilitating access to community-based programs and existing resources.

Submission ID: 2019000132

Salutation: Mr

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title: DEVELOPMENT OF AN ACCESSIBLE CAMERA-BASED SYSTEM FOR MEASURING HAND JOINT RANGE OF MOTION

Abstract Topic: Advanced Rehabilitation Technologies

Authors: KUAH CWK(1,2); LIM GM(3); JATESIKTAT P(2); ANG WT(2,3)

Department / Institution / Country: (1) Centre for Advanced Rehabilitation Therapeutics, Tan Tock Seng Hospital Rehabilitation Centre, Singapore; (2) Rehabilitation Research Institute of Singapore, Nanyang Technological University, Singapore; (3) School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore

Aim(s): To develop an accessible low cost camera-based sensing system for automated measurement of dynamic hand movements and finger joints range of motion (ROM) to enhance telerehabilitation functionality. Current clinical practice is insufficient as a goniometer can only manage static angle measurement of a single joint at a time.

Methodology: Development of this system is based on advancing computer vision algorithms that could detect the hand joints and estimate the ROM from colour images captured by the camera. A single camera use is applied so as to eliminate the complexities of multiple synchronising cameras needed for 3-dimensional object measurement. In addition, to minimise measurement inaccuracies, the use of a plane mirror is required in order to reduce image occlusion problems due to orientation of the hand in space or during grasping and manipulation tasks.

Results: The output from the algorithm is compared with goniometer measurement which shows a deviation of up to 15 degrees for a single subject. Furthermore, measurement efficiency is increased significantly as it takes only less than 1 second for the system to process multiple joint angles versus extensive time required in conventional goniometer-based measurement that can only be performed on a single joint at a time.

Conclusion: The preliminary findings demonstrate the potential of using readily available colour camera with mirror setup to measure the hand joint ROM as it offers the advantage of ease and speed of use. Future works include testing with more subjects to evaluate the accuracy and reliability of the system, and potential system integration with a portable gross upper body measurement system and sensorized objects for an enhanced telerehabilitation system.

Submission ID: 2019000146

Salutation: Mr

Profession: Allied Health

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: AN INVESTIGATION INTO THE PREDICTIVE ABILITY OF CLINICAL OUTCOME MEASURES ON FUNCTIONAL OUTCOME AFTER INPATIENT STROKE REHABILITATION IN DIFFERENT SEVERITIES OF ISCHEMIC AND HAEMORRHAGIC STROKE

Abstract Topic: Neurorehabilitation

Authors: SIMON LAU WT (1), ADONIS A (2), DAVENPORT S (3)

Department/Institution/Country: (1) Rehab Therapy Services, Tan Tock Seng Hospital, Singapore; (2) Great Ormond Street Institute of Child Health, Physiotherapy Programmes, University College London, United Kingdom; (3) St Marys Hospital, Imperial College NHS Trust, United Kingdom

Aim(s): This study aimed to investigate whether specific outcome measures are predictive of functional outcome after stroke rehabilitation, in patients with different severities of ischemic and haemorrhagic stroke.

Methodology: A retrospective study was undertaken in a tertiary rehabilitation centre. 337 patients with stroke, admitted between January and December 2018, were assessed a range of OMs, including the Fugl-Meyer upper extremity assessment (FM-UE), the Fugl-Meyer lower extremity assessment (FM-LE), the Trunk impairment scale (TIS) and the Montreal cognitive assessment (MoCA). Functional outcome was measured through the Functional independence measure (FIM), and discharge location was recorded. Regression analysis determined the predictive values of clinical OMs on functional outcome, and discharge location.

Results: In patients with ischemic stroke, the FM-LE ($\beta=0.75$ $p<0.001$, 95% CI (0.45, 1.04)), the MoCA ($\beta=1.23$ $p<0.001$, 95% CI (1.0, 1.45)) and the TIS ($\beta=1.23$ $p<0.001$, 95% CI (1.0, 1.45)) were predictive of functional outcome. In patients with haemorrhagic stroke, the MoCA ($\beta=0.57$ $p=0.01$, 95% CI (0.14, 1.01)) and the TIS ($\beta=1.32$ $p=0.02$, 95% CI (0.52, 2.12)) were predictive of functional outcome. The most consistent OM that predicted functional outcome in different severities of ischemic and haemorrhagic stroke was the MoCA and the TIS, respectively. The FM-UE was predictive of home discharge in patients with ischemic stroke (OR 0.96 $p=0.02$, 95% CI (0.93, 0.99)).

Conclusion: The predictive information of OMs investigated within this study suggested the importance of cognition and trunk function on functional outcome post-stroke. Future studies are required to validate the predictive values in a large, prospective stroke cohort.

Submission ID: 2019000149

Salutation: Ms

Profession: Allied Health

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

FEASIBILITY AND IMPLEMENTATION OF TECHNOLOGY-BASED CIRCUIT TRAINING PROGRAM IN A REHABILITATION OUTPATIENT CLINIC

Abstract Topic:

Advanced Rehabilitation Technologies

Authors:

ZHUO HT, HUSSAIN S, MANDAWA A, AQUINO R

Department / Institution / Country:

Centre of Advanced Rehabilitation Therapeutics (CART), Tan Tock Seng Hospital Rehabilitation Centre, Singapore

Aim(s):

Circuit training (CT) is an efficacious way to deliver intensive and high repetitions of exercises through task-specific workstations in a group setting. The use of virtual reality (VR) and game-based technology for rehabilitation is a novel approach to facilitate exercise while promoting interaction and motivation. With the advances in rehabilitation practice incorporating VR and game-based technology, a CT program was developed. It is conducted by therapist-assistants (TA), which decreases staff requirements and at the same time provide intensive rehabilitation for patients.

Objective: To evaluate the feasibility of incorporating VR and game-based technology into a CT program.

Methodology:

The CT program was held 2x per week over 6 weeks for 1.5 hours. It consists of 5 stations (3 for lower limb and 2 for upper limb training), of 7 minutes each including warm-up, cool down and rest. The use of VR and game-based technology (Jintronix for lower limb higher balance, 3D Tutor/Rejoyce for upper limb strength, Hand Tutor for grasp) was incorporated in 2 stations. Each CT program had 5 patients, supervised by 2 TA.

Fugl-Meyer Upper Limb Assessment (FMA-UL), 6 Minutes Walk Test (6MWT), 10m Walk Test (10mWT) and Bergs Balance Scale (BBS) were administered at pre and post-CT. Where BBS is >54/56, Mini-Balance Evaluation Systems Test (Mini-BEST) was administered instead.

Results:

The use of technology was successfully implemented in 8 CT groups from 2015-2018. It aided the ease of prescription and progression of technology-based exercises and was well-received by patients.

A total of 49 patients were recruited with 3 drop-outs due to medical reasons [(n=46); Mean age: 60.9 years \pm 12.2; Male: 23 (50%), Female: 23 (50%); Stroke: 76.1%, Traumatic Brain Injury: 6.5%, Spinal Cord Injury: 8.7%, Others: 8.7%]. Minor improvements were observed for all outcome measures at pre and post-CT (Mean FMA-UL pre: 35.2 \pm 18.4 vs post: 37.3 \pm 18.9; Mean 6MWT pre: 216.7m \pm 90.1 vs post: 242.4m \pm 97.7; Mean 10mWT pre: 0.73m/s \pm 0.31 vs post: 0.81m/s \pm 0.34; Mean BBS pre: 44.8 \pm 8.2 vs post: 46.3 \pm 7.7; Mean Mini-BEST pre: 16.6 \pm 3.9 vs post: 17.9 \pm 3.7).

Conclusion:

Leveraging on VR and game-based technology for CT is a feasible approach to provide intensive rehabilitation that is fun and engaging. With this CT approach, it enables better healthcare workload management without increased utilization of resources.

Submission ID: 2019000150

Salutation: Ms

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title:

EFFECT OF INTENSIVE ROBOTIC EXOSKELETON GAIT TRAINING ON TRUNK CONTROL, BALANCE, GAIT SPEED AND ENDURANCE IN PATIENTS WITH NEUROLOGICAL CONDITIONS

Abstract Topic: Neurorehabilitation

Authors: Tan SL(1), Wee SK (1,2,3), Ho CY(1), Ong CH(1)

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(1) Rehabilitation Centre, Tan Tock Seng Hospital, Singapore.

(2) Centre for Advanced Rehabilitation Therapeutics (CART), Tan Tock Seng Hospital, Singapore.

(3) Singapore Institute of Technology (SIT), Singapore.

Aim(s):

To evaluate the effect of intensive robotic exoskeleton gait training on trunk control, balance and gait in patients with neurological conditions.

Methodology:

Patients with spinal tumour (n=1), spinal infection (n=1), traumatic spinal cord injury (n=2), traumatic brain injury (n=2) and stroke (n=8) undergone Ekso robotic training at a tertiary rehabilitation centre from May to October 2019. Trunk control and balance of patients were evaluated using the Trunk Impairment Scale (TIS) and Berg Balance Scale (BBS) respectively. Gait speed and endurance were assessed using the 10 metre Walk Test (10mWT) and 6-minute Walk test (6MWT) respectively. Wilcoxon Signed Rank Test was used to analyse the pre-post Ekso training results.

Results:

A total of 14 inpatients who met the inclusion criteria of robotic therapy completed a range of 5 to 15 Ekso training sessions. After Ekso training, there was a significant improvement in TIS (p=0.002 mean difference of 5.0, 95%CI (2.5, 7.5)), BBS (p=0.002 mean difference of 6.5, 95%CI (2.5, 17.0)), 10mWT (p=0.023 mean difference of -0.023, 95%CI (-0.05, -0.01)), and 6MWT (p=0.04 mean difference of 26.0, 95%CI (17.0, 35.0)).

Conclusion:

Intensive gait training with powered robotic exoskeleton can lead to significant improvement in trunk control, balance, gait speed and endurance. This study suggests the importance of such robotic technology in complementing conventional physiotherapy to optimise patient outcomes.

Submission ID: 2019000151

Salutation: Ms

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title: 6-MINUTE WALK TEST IN COMMUNITY- DWELLING OLDER ADULTS: CORRELATION WITH OTHER PHYSICAL TESTS

Abstract Topic: Others

Authors: MAH SM (1), TAY EL (1), LATIB A (2), HO CYJ (3), MUKHLIS H (3), NG YS (4), TAY L (5)

Department / Institution / Country: (1) Department of Physiotherapy, Sengkang General Hospital, Singapore; (2) SingHealth Office of Regional Health, SingHealth, Singapore; (3) Department of Medicine, Sengkang General Hospital, Singapore; (4) Department of Rehabilitation Medicine, Sengkang General Hospital, Singapore; (5) Department of General Medicine, Sengkang General Hospital, Singapore

Aim(s): 6-minute walk test (6MWT) is a useful assessment tool to determine exercise capacity in community-dwelling elderly. There has been evidence showing that 6MWT distance is correlated to health status in this population, and linked to impact of co-morbidities on the older person's endurance and reserve. There has been growing literature to suggest that 6MWT distance is closely related to older adults' general health, level of physical function and mobility. Through our community frailty screening programme, we hope to establish the correlation of 6MWT to other commonly used tests of physical function, and the strength of these associations. This will help us to develop a streamlined community-based physical screening program which could be easily administered by community workers.

Methodology: 638 older adults age 50 and above (514 women and 124 men) who participated in a community frailty screening programme were included in this study. Pearson's coefficient correlation was used to examine the correlation between the 6MWT distance and gait speed, timed up and go (TUG), 30 seconds chair rise and 5 times sit-to-stand (FTSTS).

Results: Correlation analysis indicated negative association between 6MWT distance (cardiorespiratory endurance) with TUG ($r = -0.601$, $p < 0.001$) and FTSTS ($r = -0.526$, $p < 0.001$). There was positive association with gait speed ($r = .582$, $p < 0.001$) and 30s chair rise ($r = 0.563$, $p < 0.001$).

Conclusion: A moderate correlation was observed between 6MWT with TUG, FTSTS, gait speed, and 30s chair rise test, in the community frailty screening programme. This suggests that physical tests of walking speed, mobility and balance, and lower limb power and strength, may possibly be used to estimate cardiovascular endurance in community-dwelling older adults. With further investigations, simpler physical tests may be used for community-based frailty and physical screenings.

Submission ID: 2019000152

Salutation: Ms

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title:

SINGLE TASK AND DUAL TASK WALKING SPEED IN COMMUNITY- DWELLING OLDER ADULTS:
INDEPENDENT ASSOCIATION WITH FRAILITY

Abstract Topic:

Others

Authors:

MAH SM (1), TAY EL (1), LATIB A (2), HO CYJ (3), MUKHLIS H (3), NG YS (4), TAY L (5).

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(4) Department of Rehabilitation Medicine, Sengkang General Hospital, Singapore

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Aim(s):

Frailty manifests as a decline in physical function in older adults. Timed Up and Go (TUG), Short Physical Performance Battery (SPPB), six-minute walk test and gait speed are a few of the commonly used physical tests included in frailty screening. Studies show that gait speed alone is associated with disability, falls, hospitalization, death and frailty among the elderly. However, the association of gait speed, and gait speed with dual task, with frailty, in the local context, remains unclear.

While there has been growing evidence that has suggested high predictive scores in gait speed alone, for sarcopenia and frailty, this study aims to further determine the associations of normal gait speed and gait speed with dual task (semantic and arithmetic) with frailty, through a community-based frailty screening programme.

Methodology:

668 older adults age 50 and above (514 women and 124 men) were included in this study. Logistic regression analysis was performed to test the strength of relationship between frailty status (robust or pre-frail/frail) and gait speed, both single and dual – arithmetic and semantic task.

Results:

A significant association was found between frailty status and single task gait speed ($p=0.022$), as well as arithmetic task gait speed ($p < 0.01$). However, there was no significant association between frailty status and semantic task gait speed ($p > 0.05$).

Conclusion:

Slow walking speed may contribute to the state of increased vulnerability and the associations between physical function and frailty in the population continues to be prevalent. The evidence of the associations between dual task (arithmetic) performance may be potentially targeted for physical therapy intervention for the reversal of frailty.

Submission ID: 2019000154

Salutation: Ms

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title: MOBILITY SCALE FOR ACUTE STROKE (MSAS) AS A PREDICTOR OF DISCHARGE DESTINATION IN AN ACUTE HOSPITAL SETTING IN SINGAPORE

Abstract Topic: Neurorehabilitation

Authors: MOHAMED NS(1), TSOU GYE(2), LATIB A(3)

Department / Institution / Country:

Department of Physiotherapy, Sengkang General Hospital, Singapore

Aim(s):

The Mobility Scale for Acute Stroke (MSAS) with a cut-off score of 26 has been validated in predicting patients' discharging back home in Western countries. This study aims to identify the likelihood of patients' discharged destination based on MSAS cut-off scores of 26 after an acute stroke in the local setting.

Methodology:

The MSAS was administered among eighty two acute stroke patients who were admitted to Sengkang General Hospital. From this pilot study, a chi-square test was used to analyse the association between MSAS discharge cut-off scores and discharge destination.

Results:

Out of eighty two patients, 52.4% (n=43) were discharged home, and 47.6% (n=39) were discharged to other facilities such as Community Hospital. MSAS discharge scores ranged from 5 to 36 (M=21.67, SD=10.09). A chi-square test was performed to examine the association between MSAS cut-off score of 26 and discharge destination. The association between the variables was significant ($\chi^2(2) = 18.46, p < .05$). Patients with admission MSAS scores above 26 were more likely to be discharged home.

Conclusion:

The MSAS appears to be a possible tool to assist in discharge planning after an acute stroke in an Asian setting. Patients with scores lower than 26 were more likely to have unmet rehabilitation needs. Thus, a more timely referral to allied health professions may assist in optimising rehabilitation and discharge planning. Future research should consider utilizing a larger sample size to determine the predictive validity of MSAS cut-off scores and discharge destination from acute hospital post-stroke in a local setting, and to assist in efficient allocation of resources for rehabilitation needs for patients post inpatients stay.

Submission ID: 2019000155

Salutation: Dr

Profession: Doctor

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title: NEUROGENIC FEVER AFTER SPINAL CORD INJURY: A CASE REPORT

Abstract Topic: Others

Authors: WS Teo (1); WL Lui (2), William Chan (3)

Department / Institution / Country:

Department of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore

Aim(s): The occurrence of fever after spinal cord injury (SCI) is common. We present our experience in the evaluation and management of an interesting patient with traumatic C5 tetraplegia who suffered from multiple episodes of fever during his admission.

Methodology: A case report

Results: The patient was a 66-year-old gentleman who sustained a traumatic C5 AIS A spinal cord injury after being hit by a falling tree branch. The MRI spine revealed cord oedema at C6-C7 level secondary to C6 lamina fractures. He underwent decompressive laminectomies C3-C7 and posterior cervical fusion from C3-C6. The transfer to a rehabilitation centre was delayed as a result of recurrent fever which prompted thorough evaluation and management. He had several episodes of fever and was started on empirical broad spectrum antibiotics each time. He did not have any localizing signs or symptoms of infection. Inflammatory markers were not elevated. His investigations including urine culture, blood culture, CT thorax, abdomen and pelvis, pulmonary angiogram, ultrasound doppler of lower limbs, were non-yielding. He did not have pain or swelling of his joints, raised alkaline phosphatase or radiographic evidence of heterotopic ossification. The fever persisted despite antipyretics and physical cooling methods. He was subsequently transferred to an air-conditioned ward where his temperature promptly lysed. As such, a diagnosis of neurogenic fever was made. He developed further episodes of fever subsequently. These were due to urinary tract infection and treatment with antibiotics resulted in lysis of the fever.

Conclusion: This case illustrates the importance of recognising the entity of neurogenic fever. This may avoid unnecessary use of broad spectrum antibiotics, extensive investigations and delayed transfers to rehabilitation units. Given the high incidence of hospital acquired infections in persons with SCI, new episodes of fever should prompt thorough clinical evaluation for pyogenic infections, which will respond to antibiotics, in patients with neurogenic fever.

Submission ID: 2019000156

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title:

AN OBSERVATIONAL STUDY TO ASSESS CARE-PROVIDER'S STRAIN, IN CARE- PROVISION FOR INWARD SPINAL CORD INJURY PATIENTS; A SINGLE TERTIARY-CARE SPINAL REHABILITATION CENTRE EXPERIENCE

Abstract Topic:

Others

Authors:

LKGNN Senarathne (1), KVAS Thilakarathne (2), SAC Subasinghe (3), UK Ranawaka (4), SMPD Munidasa (5), Mahesh B (6)

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- (3) Department of Rheumatology, Teaching Hospital Kandy, Sri Lanka
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- (5) Department of Rehabilitation Medicine Rheumatology and Rehabilitation Hospital Ragama, Sri Lanka
- (6) Department of Community Medicine, Ministry of Health, Sri Lanka

Aim(s):

Spinal cord injury (SCI) results in temporary or permanent change in motor, sensory and autonomic functions. Supportive care provision is a vital aspect of SCI management. Being primary care-providers of SCI patients contributes to care-provider burden and psychological distress. Therefore interventions must tailor for both care-recipients and care-providers. This study aims at assessing strain in care- provision for inward SCI patients in a tertiary-care Spinal Rehabilitation Center in Sri Lanka.

Methodology:

A descriptive cross sectional study was conducted among 58 care-providers of inward SCI patients in Rheumatology and Rehabilitation Hospital-Ragama. Care-provider's physical and psychological strain assessment was carried out using an interviewer administered questionnaire.

Results:

Care-recipients had a mean SCIM score of 20.21 (SD-10.63). 27.6%, 31.0%, 25.9% and 6.9% of them had an ASIA impairment scale of A, B, C and D respectively. 8.6% had a central cord syndrome. 72.4 % of care providers were males and mean age was 41.29 years (SD 16.63). 37.9% were immediate family members and 29.3% were close-relatives. Only 22.4% (n=13) were paid bystanders.

Physical strain, requirement for family adjustment and sleep disturbance were recorded in 56.9%, 56.2% and 49.3% of care- providers respectively. Post care- provision depressive symptoms were reported by 24 (41.4%), for which 6 had received treatment. 1 care- provider had suicidal thoughts. 25.8% (n=15) care- providers had pre-existing musculoskeletal condition and 2/3 reported worsening with care- provision. Care provision added a financial strain to 55.2%. There was no statistically significant association between SCIM score and age ($p=0.542$), sex ($p=0.641$), presence of depression ($p=0.517$), presence of family adjustment ($p=0.319$), physical strain ($p=0.123$).

Conclusion:

Care- provision has placed an additional physical, psychological and financial burden on care- providers. Clinical and subclinical depression is common in care- providers. Hence prevention of care-provider burnout should be part of the lifelong care of SCI patients.

Submission ID: 2019000157

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Profession: Resident

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Country: Indonesia

Presentation Option: [presentation-option]

Abstract Title: REHABILITATION OF AN INCOMPLETE CERVICAL SPINAL CORD INJURY OF ADOLESCENT WITH NEUROGENIC LOWER URINARY TRACT DYSFUNCTION AND FAMILY CONFLICT ISSUE IN LOW-RESOURCE SETTINGS: A CASE REPORT

Abstract Topic: Neurorehabilitation

Authors: Anisatusholihah (1), Ronald Pakasi (2) and Indriati Tobing (2)

Department / Institution / Country: (1) Physical Medicine and Rehabilitation Department, Faculty of Medicine, Padjadjaran University, Indonesia; (2) Rehabilitation Unit, Fatmawati Hospital, Jakarta, Indonesia

Aim(s): Aims: The purpose is to describe the inpatient rehabilitation program of an adolescent with spinal cord injury in low-resource settings.

Methodology: Background: An adolescent with disabilities in low-resource settings face unique challenges that imply rehabilitation program.

Results:

December 2018. Since that he felt weakness on all his extremities. He diagnosed with SCI AIS C NL C7 due trauma. For his bladder function, this patient has suprasacral lesions. The ice water test was positive, and there was nonleakage with a high detrusor pressure, this may indicate detrusor-sphincteric dyssynergia (DSD). On simple cystometry test, the result on filling phase was high pressure of detrusor (56-60 cmH₂O). Also, detrusor overactivity during filling cystometry and abnormal detrusor activity with post-void residual concluded overactivity of detrusor and most probably DSD. Abdomen ultrasound showed mild hydronephrosis bilateral and cystitis. Ureum and Creatinine were normal; therefore his renal function has to be preserved by promoting right voiding method. Intermittent catheterization is the preferred method of bladder emptying in this patient. Tizanidine was given as muscle relaxant. Psychological support was given for this patient due to family conflict issue. He plans to enter the paraplegic foundation training centre and continue his study. His future goal now is to be an athlete of paralympic games.

Conclusion: Conclusion: An adolescent with disabilities in low-resource settings need optimisation and comprehensive rehabilitation care.

Submission ID: 2019000158a

Salutation: Assoc Prof

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title:

Improvement of Crycopharyngeal Dysfunction after Balloon Dilatation

Abstract Topic:

Neurorehabilitation

Authors:

CHO KH(1), HAN EY(2), IM SH(3)

Department / Institution / Country:

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(3) Department and Research Institute of Rehabilitation Medicine, Severance Hospital, Yonsei University College of Medicine, Republic of Korea

Aim(s):

Cricopharyngeal dysfunction (CPD) has several treatment options such as botulinum toxin injection, balloon dilatation and myotomy of cricopharyngeus muscle (CPM). Balloon dilatation has several advantages as it is less invasive and easy to perform under videofluoroscopy guide. A few reports of balloon dilatation have demonstrated successful treatment effect of CPD, however none of the studies elucidated the mechanism of improvement. This study aims to reveal physiologic changes of CPD after videofluoroscopy-guided balloon dilatation by high resolution manometry (HRM), through a case report of a 44-year-old TBI patient who developed dysphagia with CPD, which was treated using videofluoroscopy-guided balloon dilatation.

Methodology:

A 44-year-old male developed dysphagia with CPD after large epidural hemorrhage in the left brain hemisphere concurrent with diffuse axonal injury. He was transferred to the department of rehabilitation medicine at 10 weeks after the traffic accident. Dysphagia with CPD was manifested on videofluoroscopy swallow study (VFSS) (Fig. 1.) and videofluoroscopy-guided balloon dilatation was conducted for the first time.

Repetitive dilatation procedures were performed at 1, 4, 7, 27 and 38 weeks after the first intervention and the successive physiological changes were observed using high resolution manometry (INSIGHT HRM; Sandhill Scientific Inc., High lands Ranch, Co, USA).

Results:

Collected data include ratio of normal shape of UES nadir, pressure and duration of UES nadir from HRM, and Rosenbeck penetration aspiration score (Rosenbeck PAS) from VFSS. After the first and second interventions, definite changes of UES nadir shape and pressure were noted, however no significant changes on HRM were observed from the consecutive third to sixth interventions. After the second intervention, aspiration was not observed. (PAS score changed from 8 to 3) In short, VFSS results correlated with the changes on HRM after first and second intervention.

Conclusion:

Videofluoroscopy-guided balloon dilatation intervention was successful in normalizing the abnormal UES opening pressure in a patient with CPD in long-term follow-up. This case report supports the early application of ballooning dilatation for CPD to be more effective in recent onset patients. In the future, study elucidating the physiology of therapeutic effect of balloon dilatation for CPD with more patients is needed.

Submission ID: 2019000158b

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title: Prosthesis Restoration for Amputee Rehabilitation Patients in Sarawak General Hospital

Abstract Topic: Orthopaedics & Protheses

Authors: Leong Be Kim(1), Low Wan Chia(1), Mohd Zakuan Bin Saperi(1)

Department / Institution / Country: (1) Department of Rehabilitation Medicine, Sarawak General Hospital

Aim(s): The purposes of this study is to review the success rate of prosthesis restoration in Sarawak General Hospital.

Methodology:

A cross sectional study with self-answered questionnaire was conducted from 15th September 2018 to 15th December 2018. Out of total 147 outpatients attended Rehabilitation Medicine Clinic, 67 patients were enrolled for participation in this study.

Results:

Our demographic data showed that majority of amputee patients (71.6%) were male and most of study population (59.7%) received education up to secondary level. Even though 77.6% were employed before amputation, unfortunately the employment rate dropped significantly to 17.9% post amputation. This higher unemployment rate is likely due to limitation in mobility function following amputation. 67.2% of study subjects had amputation done due to complications of diabetes mellitus and accident was accounted for 17.6% of amputation. This high incidence of non-traumatic amputation reflected huge burden of morbidity due to non-communicable diseases. Transtibial amputation was 62.7%, being the commonest amputation level whereas transfemoral amputation involved in 31.3% of study subjects with higher level of impairment. For the prosthesis restoration outcome, 42 out of 67 study subjects received their prosthesis, while many were waiting for their prosthesis restoration. Different aspects of prosthesis satisfaction were studied, including comfort, cosmetic, socket fitting, ease of use and weight. The prosthesis satisfaction for all different aspects were greater than 75%. In this study, 88.1% of prosthesis restoration achieved ambulation using prosthesis. . Among those with prosthesis restoration, half of our users worn their prosthesis for about 4-8 hours /day and a quarter were very active users with prosthesis use for more than 8 hours/day.

Conclusion: A very high proportion (88.1%) of our amputee rehabilitation patients had achieved ambulation with prosthesis after prosthesis restoration.

Submission ID: 2019000161

Salutation: Dr

Profession: Doctor

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Country: Australia

Presentation Option: [presentation-option]

Abstract Title:

11 YEAR-ANALYSIS OF REGIONAL VICTORIAN HOSPITAL AMPUTEE REHABILITATION OUTCOMES: AUSTRALASIAN REHABILITATION OUTCOME CENTRE DATA REVIEW.

Abstract Topic:

Orthopaedics & Prosthesis

Authors:

Jeddi MF (1), Muns L(2), Mckay,T(3), Jain V(4), Whitefort, KL(5) Budge M(6)

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- 6) Department of Geri and Rehabilitation Medicine Bendigo Health, Victoria Australia & Monash Medical School Australia

Aim(s):

Demographics show that in Australia there are 8000 lower limb amputation performed annually (1). There is significant paucity of data regarding amputees in regional Australia(2) This review aims to compare our data with the Australian national average as per the Australian Rehabilitation Outcome Centre data and attempt to document the domains that need improvement in bench-marked regional services. Australian Rehabilitation Outcome Centre database has developed tools to record the episodes of amputation across Australia from the participating centres and is able to demonstrate the trends in FIM changes over time.

Methodology:

Methods

A 11-year data review of Digital Medical Record and AROC data in a regional Victoria Hospital. The characteristics of the patients including the level of amputation and admission and discharge FIM scores were used for data analysis. The data set usually have two points in time recording and this should demonstrate the change over time during the acute admission period. Data analysis was done using MS Excel.

Results:**Results**

The data shows that the total number of patients admitted between 2007-2017; to our hospital with amputation were 258. Males were 197. Average LoS was 41.2 days with average admission FIM being 79.5 and average discharge FIM was recorded to be 94.4. The biggest change was seen in the admission and discharge FIM Motor scores. 202 patient had comorbidities and 132 patients had complications during admission impacting on the rehabilitation episode.

Conclusion:

Expected and actual LoS are 31 vs 41 days according to AROC projections. This difference needs further evaluation regarding the factors that may be modifiable. Further analysis to determine the factors that are responsible for the delay in LoS is required. The results may lead to development of research in various models of care and improvising services for this cohort

Submission ID: 2019000162

Salutation: Prof

Profession: Doctor

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Country: Korea

Presentation Option: [presentation-option]

Abstract Title:

Comparison of the Forefoot Pressure-Relieving Effects among Foot Insole.

Abstract Topic:

Musculoskeletal

Authors:

Tae Im Yi (1), Eun Chae Lee (2)

Department / Institution / Country:

(1) Department of Rehabilitation Medicine, Yongin Severance Hospital, Yonsei University College of Medicine, Republic of Korea

(2) Department of Rehabilitation Medicine, Bundang Jesaeng General Hospital, Republic of Korea

Aim(s):

Metatarsalgia is frequently treated with a metatarsal pad (MP) to offload the painful area. Sometimes clinical use of MPs is limited due to discomfort related inadequate position, thickness and so on. Insole thicknesses over 10mm were proved to reduce plantar pressure with a similar degree of MPs in previous studies. However, over 10mm thickness insole padded shoes may be too tight to wear in practice. The aim of this study was to compare the effect of a metatarsal pad and a 6mm soft plastazote(Plastazote®; Chicago, Justin Blair & Company) on plantar pressure of the forefoot.

Methodology:

We enrolled 16 asymptomatic participants (Table 1). Forefoot plantar pressure datas were recorded using with pedar-x®-in-shoe System during walking in three different conditions (i) no padding (Control group), (ii) a MP positioned just proximal to the metatarsal heads (MTHs) (Group 1) and (iii) a 6mm soft plastazote (Group 2) in a standardised shoe. We used anatomically-based masking protocol divided the forefoot into sub-areas (beneath (bMTHs) and distal to the MTHs (dMTHs)) as determined by the position of each metatarsal head. Also, participants rate the perceived insole comfort by visual analogue scale. We used Wilcoxon's signed-ranks for pressure properties differences between the three conditions. Data analyses involved use of SPSS v18.0 for Windows. $P < 0.05$ was considered statistically significant.

Results:

Forefoot peak pressure(PP) [kPa], and maximum force(MF) [N] in the dMTHs (PP ; $p = 0.008$, MF ; $p = 0.036$, respectively) and bMTHs (PP ; $p = 0.000$, MF ; $p = 0.002$, respectively) were reduced in group 1 and 2 compared to the control group (Table 2). This analysis revealed that a 6mm soft plastazote was significantly more effective than a metatarsal pad for reducing peak pressure and maximum force in the

dMTHs(PP ; $p = 0.005$,MP ; $p = 0.002$) and bMTHs(PP ; $p = 0.036$, MF ; $p = 0.642$). However, Contact area did not change significantly in the dMTHs and bMTHs. Insole comfort with a 6mm soft plastazote also revealed significant better than a metatarsal pad ($p = 0.000$) (Table 3).

Conclusion:

This is the study to investigate plantar pressure properties assessment focusing on anatomically based specific MTHs. This study reveals that the both metatarsal pad and 6mm soft plastazotes were effective for reducing forefoot pressures. In addition, the 6mm soft plastazotes are more effective and better tolerable to participants than metatarsal pad. Further research in forefoot pain patients is needed.

Submission ID: 2019000163

Salutation: Mr

Profession: Allied Health

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Country: Hong Kong

Presentation Option: [presentation-option]

Abstract Title:

OVERCOME KNEE OSTEOARTHRITIS: THINK POSITIVE AND STAY ACTIVE

Abstract Topic: Musculoskeletal

Authors:

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(3) Physiotherapy Department, David Trench Rehabilitation Centre, Queen Mary Hospital, Hong Kong

(4) Physiotherapy Department, Queen Mary Hospital, Hong Kong

(5) Physiotherapy Department, David Trench Rehabilitation Centre, Queen Mary Hospital, Hong Kong

Aim(s):

To evaluate the effectiveness of a six-week, integrated knee osteoarthritis program in an out-patient clinic

Methodology:

Knee Osteoarthritis is a leading cause of disability worldwide. Apart from physical impact to the elderly, it also imposes substantial indirect and intangible costs.

ESCAPE-pain exercise program originated from the United Kingdom which integrates self-management and coping strategies. Studies showed it improved physical function and lowered the healthcare cost.

Recognizing the increasing burden of osteoarthritis, the Physiotherapy Department of David Trench Rehabilitation Centre (Queen Mary Hospital) launched a new program which is adapted from the ESCAPE-pain.

The six-session program started in July 2019. Patient diagnosed with knee osteoarthritis and age \geq 55 years old was included. Participants attended a 2-hour session each week. Content of information embraced weight management, analgesic application, mental relaxation, flare up management and group exercise. To sustain the program through implementation of community rehabilitation, an exercise map with QR code displaying public sports resources in Hong Kong Island was designed. Facility details could be easily accessed by scanning relevant QR code.

Numerical Pain Rating Scale (NPRS), Knee Injury and Osteoarthritis Outcome Score(KOOS), Chinese Self-efficacy for Exercise(SEE-C), 30-second sit-to-stand test and patient satisfaction questionnaire were used for evaluation. Telephone follow-up was performed 1 month after completion of program.

Results:

Total of 74 patients joined the program, in which 56 participants completed from July to October in 2019. NPRS, KOOS, SEE-C and 30-second sit-to-stand test all showed significant improvement ($p < 0.005$). Patient satisfaction score was 79%. Participants appreciated clear map information and boosted their confidence in community training. Majority reported capable in self-management and maintained regular exercise during telephone follow-up.

Conclusion:

The low cost and community-based knee osteoarthritis program demonstrated marked improvement in physical function, pain intensity and exercise efficiency. For further study, treatment effect and exercise compliance would be examined after 1 year.

Submission ID: 2019000165

Salutation: Mr

Profession: Allied Health

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Presentation Option: [presentation-option]

Abstract Title:

MANAGING KNEE OSTEOARTHRITIS(OA) IN OUT-PATIENT SETTINGS: A STEPPED-CARE APPROACH

Abstract Topic:

Rehabilitation for Chronic Diseases

Authors:

LEE WWY(1), NGAI RMP(1), KO WWK(2), KWONG ASK(2), LAM PL(3), CHAN GNY(1)

Department / Institution / Country:

(1) Physiotherapy Department, David Trench Rehabilitation Centre, Hong Kong

(2) Department of Family Medicine & Primary Healthcare, Hong Kong West Cluster, Hospital Authority, Hong Kong

(3) Physiotherapy Department, Queen Mary Hospital, Hong Kong

Aim(s):

Twenty percent of the populations worldwide are affected by OA knee. Exercise education classes have been carried out under different service models, either in physiotherapist-led primary-care service in Nurse and Allied Health Clinic(PT-NAHC) under the Department of Family Medicine and Primary Healthcare, Hong Kong West Cluster or in physiotherapy out-patient setting(PT-OPD) in David Trench Rehabilitation Centre.

This study aims: (1) To evaluate the characteristics of patients in PT-NAHC & PT-OPD; (2) To evaluate the improvement of patients with different service models.

Methodology:

Patients with a diagnosis of OA knee were referred to physiotherapy service according to the severity of symptoms in PT-NAHC(mild symptoms) or PT-OPD(moderate symptoms). In PT-NAHC, patients were provided with a home-based self-empowerment program with two sessions of education, advice and exercise; In PT-OPD, a 4-session supervised group exercise program was offered with physiotherapy interventions provided in addition to education and exercise. Outcome measures included Knee injury and Osteoarthritis Outcome Score – Physical Function Shortform(KOOS-PS) and Numeric Global Rating of Change Scale(NGRCS). They were taken in the first session and in a one-month telephone follow-up in PT-NAHC and during the first and last sessions in PT-OPD.

Results:

545 patients attending the programs in PT-NAHC(n=50) & PT-OPD(n=495) were reviewed for 2 and 27

months respectively since 10/2016. Drop-out rates in both programs were below 10%. The baseline KOOS-PS score was higher in PT-NAHC(72.3, mild symptoms) and lower in PT-OPD(66.5, moderate symptoms)($p=0.001$). Mean KOOS-PS score improved from 72.3 to 83.3 in PT-NAHC($p<0.001$) and from 66.5 to 69.5 in PT-OPD($p<0.001$). Mean NGRCS after the program was 4.6 in PT-NAHC and 4.2 in PT-OPD.

Conclusion:

Patients showed significant improvements in both programs. They were adherent to the programs and confident in the self-management of the disease. Patients were referred to the appropriate care process in a cost-effective way under a stepped-care approach based on their severity scores.

Submission ID: 2019000166

Salutation: Dr

Profession: Doctor

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Country: Singapore

Presentation Option: [presentation-option]

Abstract Title:

COGNITIVE IMPAIRMENT RELATED TO BACLOFEN AFTER SPINAL CORD INJURY: A CASE REPORT

Abstract Topic: Musculoskeletal

Authors: WL Lui (1), W Chan (1)

Department / Institution / Country:

(1) Department of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore

Aim(s): Baclofen is commonly used for spasticity in the SCI population. We describe a patient who developed cognitive impairment with baclofen.

Methodology: A case report.

Results:

The patient was a 58 year old Chinese gentleman who sustained a traumatic T12 AIS C spinal cord injury in 1994. He was a technician and a national para-archer. He drove a car with vehicle modifications.

He was referred for lower limb spasticity in June 2017. Diagnostic nerve blocks showed improvement in knee flexor and extensor spasticity from MAS 4 to 1+. He was started on baclofen and increased to 30mg TDS over 5 months. Diazepam 1mg BD was initiated in Dec 2017.

In January 2018, he developed bacteraemia from an infected sacral wound which necessitated a prolonged hospitalisation of 6 months. This resulted in deconditioning and he required requires maximal assistance in transfers, dressing, toileting and bathing.

He underwent rehabilitation and was noted to have slow speech, poor memory and topographical orientation. His MOCA score was 18/30 with impairments in memory, attention, abstraction and orientation. Corroborative cognitive history revealed short term memory loss since December 2017. Diagnostic workup did not reveal any endocrine, metabolic, infective or intracranial cause.

Diazepam was discontinued but the MOCA score did not improve. Baclofen was then tailed off and 1 month later, the MOCA score improved to 27/30 with problems with delayed recall. Spasticity remained stable despite discontinuing baclofen.

On discharge, he only required supervision in ADLs and wheelchair mobility. His MOCA score was 29/30 1 month later and he subsequently returned to work.

Conclusion:

Baclofen is known to have cognitive side effects. In this patient, there was a temporal relationship between initiation of baclofen and the development of cognitive impairment. Tailing off baclofen also coincided with improved MOCA scores. It may be useful to screen for cognitive disturbances after starting baclofen.

Submission ID: 2019000167a

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title:

STUDY ON THE EFFECT OF PHYSICAL THERAPY ON LOW BACK PAIN; EXPERIENCE IN A TERTIARY CARE REHABILITATION FACILITY

Abstract Topic:

Musculoskeletal

Authors:

Adhikari S(1), Munidasa D(2), Ariyasinghe S(3), Bandara T(4)

Department / Institution / Country:

(1),(2),(3),(4)- Department of Rehabilitation Medicine, Rheumatology and Rehabilitation Hospital, Ragama, Sri Lanka

Aim(s):

To identify the degree of disability imposed by low back pain

To describe the effect of physical therapy modalities on low back pain

Methodology:

A descriptive study done among 32 patients who has attended the outpatient physical therapy programme which comprised of heat therapy, flexibility training and strengthening of back muscles. All patients were on paracetamol and a NSAID. The disability was assessed using Oswestry Low Back Pain Disability Questionnaire before and after the therapy. Student t test for two sample means was used to assess the significance of the difference in level of disability before and after the therapy

Results:

Majority of participants were females (92%), with the mean age of 48. Majority of patients (92%) had severe disability to cripple with the average scoring of 56% in Oswestry Low Back Pain Disability score. Following physical therapy the level of disability had improved to moderate level; average 25% which was statistically significant($p < 0.05$)

Conclusion:

Physical therapy has significant effect on improving the disability due to low back pain

Submission ID: 2019000167b

Salutation: Dr

Profession: Doctor

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Presentation Option: [presentation-option]

Abstract Title: PALLIATIVE REHABILITATION IN A PATIENT WITH CAUDA EQUINA SYNDROME FROM METASTATIC PELVIC CHONDROSARCOMA: A CASE REPORT

Abstract Topic: Others

Authors: SENG WPA (1), LAU JYS (2), LUI WL (3), CHAN WLW (4)

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Aim(s): Palliative rehabilitation aims to optimise physical function and emotional wellbeing and in doing so, maximises the quality of life for patients. We describe a patient who received palliative rehabilitation and had a positive outcome.

Methodology: Case report

Results: A 50 year old lady presented with right leg pain and weakness and was subsequently diagnosed with a locally advanced pelvic chondrosarcoma invading the lower back. An indwelling catheter was inserted for neurogenic bladder. She declined surgery (hindquarter amputation) and discharged to consult other institutions and seek alternative medicine. Her disease progressed three months later, when she re-presented with worsening back pain, cauda equina syndrome and pulmonary metastases. She was then given a course of palliative radiotherapy to the pelvic mass. Whilst under inpatient palliative care, she decided for admission to a nursing home indefinitely to avoid burdening her family.

Her mood and function continued to decline during her 1-month stay in the nursing home. She subsequently discharged herself to be hospitalised for inpatient rehabilitation, with the aim of returning home to reunite with her family. A rehab consultation was obtained, and she was transferred to a tertiary rehabilitation centre. Clear goals were set, in discussion with the patient: to reduce carer burden, maintain her independence as much as possible, and to mobilise with a wheelchair. All members of the inpatient rehabilitation team were involved: she received intensive rehabilitation and counselling, her nutrition was optimised, with continued palliation of her symptoms, equipment procurement and home modification. Her family also received caregiver training. Her chance at rehabilitation allowed her to reunite with her family, with home hospice follow-up.

Conclusion: Rehabilitation may retard functional decline and enhance the emotional well-being of palliative patients. This case illustrates how palliative and rehabilitation principles can overlap, with realistic goal-setting at the outset, to achieve best outcomes for the patient.

Submission ID: 2019000170b

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Presentation Option: [presentation-option]

Abstract Title: Learning Objectives: To know that there are some modification that we can give for environment and home based exercise to support independent Activity Daily Living (ADL) on a complete thoracic spinal tuberculosis patient with socioeconomic problems. Case report, pre and post interventional. Subject from DR. Hasan Sadikin Hospital, West Java, Indonesia.

Background: Many patient with spinal cord injury that we found in our Rehabilitation Outpatient Clinics, especially for complete thoracic spinal tuberculosis patient have socioeconomic problem that makes them difficult to have environmental modification and hospital based exercise to support independent ADL.

Finding and Procedure Details: Patient (Woman), 46 years old came to Rehabilitation Outpatient Clinic with chief complaint weakness on abdomen and lower extremities. She also couldn't do spontaneous defecation and urination. She can not turn her body to any side and maintain sitting. She used indwelling catheter and diapers. She had no fulltime care giver to help her do ADL and accompany her to do some exercises in the hospital. She was diagnosed with spondylitis tuberculosis on July 2018 and got spinal stabilization surgery by orthopaedic surgeon. From physical examination the motoric for both lower extremity was zero and the sensibility was impaired from level T6. We did home visit regularly. The environment modifications were a reclining bed, wheelchair with portable arm rest, sliding board, and wheelchair ramp. We also gave home base exercise using resistance bands, dumbbells, and a modified bed frame. The patient get tuberculosis treatment from internist. The Spinal Cord Independence Measurement (SCIM) was improved from 13 to 48 in 4 months.

Conclusion: The patient had improvement in ADL independency. Further environmental modification and home based exercises should be given by considering the improvement of impairment in the patient to do independent ADL and achieve a better Quality of Life (QoL).

Abstract Topic: Neurorehabilitation

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Aim(s): To know that there are some modification that we can give for environment and home based exercise to support independent Activity Daily Living (ADL) on a complete thoracic spinal tuberculosis patient with socioeconomic problems.

Methodology:

Case report

Results:

The Spinal Cord Independence Measurement (SCIM) was improved from 13 to 48 in 4 months.

Conclusion:

The patient had improvement in ADL independency. Further environmental modification and home based exercises should be given by considering the improvement of impairment in the patient to do independent ADL and achieve a better Quality of Life (QoL)

20190000180

FEASIBILITY AND IMPLEMENTATION OF TECHNOLOGY-BASED CIRCUIT TRAINING PROGRAM IN A REHABILITATION OUTPATIENT CLINIC

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Introduction

Circuit training (CT) is an efficacious way to deliver intensive and high repetitions of exercises through task-specific workstations in a group setting. The use of virtual reality (VR) and game-based technology for rehabilitation is a novel approach to facilitate exercise while promoting interaction and motivation. With the advances in rehabilitation practice incorporating VR and game-based technology, a CT program was developed. It is conducted by therapist-assistants (TA), which decreases staff requirements and at the same time provide intensive rehabilitation for patients.

Objective

To evaluate the feasibility of incorporating VR and game-based technology into a CT program.

Methods

The CT program was held 2x per week over 6 weeks for 1.5 hours. It consists of 5 stations (3 for lower limb and 2 for upper limb training), of 7 minutes each including warm-up, cool down and rest. The use of VR and game-based technology (Jintronix for lower limb higher balance, 3D Tutor/Rejoyce for upper limb strength, Hand Tutor for grasp) was incorporated in 2 stations. Each CT program had 5 patients, supervised by 2 TA.

Fugl-Meyer Upper Limb Assessment (FMA-UL), 6 Minutes Walk Test (6MWT), 10m Walk Test (10mWT) and Bergs Balance Scale (BBS) were administered at pre and post-CT. Where BBS is >54/56, Mini-Balance Evaluation Systems Test (Mini-BEST) was administered instead.

Results

The use of technology was successfully implemented in 8 CT groups from 2015-2018. It aided the ease of prescription and progression of technology-based exercises and was well-received by patients.

A total of 49 patients were recruited with 3 drop-outs due to medical reasons [(n=46); Mean age: 60.9 years \pm 12.2; Male: 23 (50%), Female: 23 (50%); Stroke: 76.1%, Traumatic Brain Injury: 6.5%, Spinal Cord Injury: 8.7%, Others: 8.7%]. Minor improvements were observed for all outcome measures at pre and post-CT (Mean FMA-UL pre: 35.2 \pm 18.4 vs post: 37.3 \pm 18.9; Mean 6MWT pre: 216.7m \pm 90.1 vs post: 242.4m \pm 97.7; Mean 10mWT pre: 0.73m/s \pm 0.31 vs post: 0.81m/s \pm 0.34; Mean BBS pre: 44.8 \pm 8.2 vs post: 46.3 \pm 7.7; Mean Mini-BEST pre: 16.6 \pm 3.9 vs post: 17.9 \pm 3.7).

Conclusion

Leveraging on VR and game-based technology for CT is a feasible approach to provide intensive rehabilitation that is fun and engaging. With this CT approach, it enables better healthcare workload management without increased utilization of resources.

LET'S EXERCISE – AN UPPER LIMB EXERCISE PROGRAM FOR REHABILITATION INPATIENTS

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Aim of study:

Currently, most patients admitted into Tan Tock Seng Hospital are seen by a physiotherapist and/or occupational therapist to determine functional capacity before discharge. Should there be functional impairments that affect safety at home, a short duration of inpatient rehabilitation is planned. Due to concerns including manpower, costs and safety, exercise requirements are often fulfilled only in the outpatient setting.

This quality initiative project was conceived with the intention of improving in a safe manner, the strength of inpatients undergoing rehabilitation, to increase amount of rehabilitation for more consistency with current exercise guidelines and also to encourage an active lifestyle.

Methodology:

A single arm, prospective interventional pilot study that took place from July 2019 – December 2019. Total of 30 patients were recruited for the study.

Patients were recruited from the orthopaedic rehabilitation team with majority having undergone lower limb joint replacements. Recruitment took place on day 1-2 of inpatient admission.

Upper limb resistance exercises via resistance bands were prescribed to supplement the lower limb exercises already implemented by the physiotherapy team. Exercises were performed by patients in their own free time by the bedside after their rehabilitation session for the day was over. The inpatient nursing and medical teams screened patients daily to ensure compliance and also for any discomfort faced after the exercises.

Grip strength was assessed prior to initiation of exercises via a digital dynamometer and again upon discharge.

Result: A total of 30 patients were recruited for this study. Their age ranged from between 37 to 79 years. They underwent variable number of exercise sessions ranging from 2 to 30. The median number of sessions undergone was 8. Only 10% (n=3) patients had at least 1 arm grip strength within normal range⁵. Median grip strength on the left hand was 19.95 before exercise and improved to 20.05 after exercise (p = 0.002). Median grip strength on the right hand was 23.20 before exercise and improved to 24.75 after exercise (p=0.004). There was no significant relationship noted between number of sessions and strength improvement in this population studied.

Out of the patients who underwent the upper limb exercise program, 1 patient had shoulder pain during the exercises.

Conclusion:

This study yielded positive results and shows there is significant grip strength improvement with an inpatient upper limb exercise program. It also suggests that majority (90%) of patients admitted for rehabilitation have below average grip strength at point of admission. There were several limitations. These include small study population, lack of a control group, variable number of exercise sessions. From an adverse effects point of view, there was only 1 patient who encountered shoulder pain following resistance exercises. Care was taken during the design of the exercise program to ensure

safety and minimize risk of falls. All the exercises planned were seated and with supervision by trained staff consisting of inpatient doctors and nurses.

Despite the abovementioned limitations, this study suggests there is significant improvement in grip strength for patients who undergo upper limb exercises during a short inpatient rehabilitation stay and it is safe for them to undergo exercise. In implementing an exercise program for inpatient rehabilitation patients, many factors need to be considered including safety precautions due to recent surgery, pain management, meeting exercise requirements. The psychosocial aspects and lack of confidence in patients are also considerable aspects since many have not been exercising for some time prior to their surgery. Apart from gains in grip strength and the possible benefits associated with this, imparting in patients the confidence to take upon themselves an exercise regimen and then being consistent with exercises are also important. Further larger scale studies to evaluate consistency of exercises and maintenance of physical improvements in the community would yield valuable insights into these questions.

About Singapore Rehabilitation Conference (SRC)

The 6th Singapore Rehabilitation Conference, co-organised with the Society of Rehabilitation Medicine (Singapore) (SRMS), is a huge component of CAREhab 2020. This is the largest general rehabilitation conference in the Southeast Asian Region, which brings together an interdisciplinary team of rehabilitation professionals, including physicians, nurses, physical therapists, occupational therapists, speech/language therapists, medical social workers, music therapists, academics, scientists and other allied health professionals. Expecting over 1000 rehab professionals and over 2000 total attendees joining us onsite, the 6th SRC-CAREhab 2020 serves as the unifying platform for professional growth and best practices showcase across institutions and regions.

SRC is organised by SRMS on a biannual basis and takes place in the beautiful city-state of Singapore.

About CAREhab 2020

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