

Rehabilitation Research Review™

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Issue 37 – 2016

In this issue:

- > *Inpatient stroke therapy*
- > *Play-based interventions beneficial in adult-acquired brain injury*
- > *Alternative models of cardiac rehabilitation*
- > *Considering early rehabilitation programmes in a hospital unit*
- > *Comparing exercise programmes in stroke survivors*
- > *Effective interventions for motor impairments after stroke*
- > *Vigorous exercise: neuroprotective in Parkinson's disease?*
- > *Rehabilitation improves cognition in Huntington's disease*
- > *Home telehealth in HF or COPD patients*
- > *Occupational-based therapy helps hand injury rehabilitation*

Abbreviations used in this issue

COPD = chronic obstructive pulmonary disease
ES = effect size
HF = heart failure
RCT = randomised controlled trial



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Rehabilitation Counsellors are tertiary qualified allied health professionals who work with individuals with disability, injury or social disadvantage, along with their families, organisations and other health professionals, to deliver work, life and career solutions. The core skills and expertise of Rehabilitation Counsellors include: vocational assessment, job placement support, and career development; rehabilitation and return-to-work services; workplace disability prevention and management.

Welcome to issue 37 of Rehabilitation Research Review.

We are very appreciative of Paula Kersten's contribution to the review over the past year. For our next issue, we look forward to welcoming Richard Siegert as our new reviewer. In the meantime, Nicola Kayes and William Levack have kindly provided expert commentary for this month.

Researchers from Italy report that structured physical activity programmes combined with therapeutic patient education are superior to treatment as usual in chronic stroke survivors. The benefits are that they are able to maintain and improve activities of daily living, reduce falls and they have less need of rehabilitation treatments than their counterparts given treatment as usual.

Another study selected for this issue describes increasing grey matter volume and enhanced cognitive function (verbal learning and memory) after 9 months of multidisciplinary rehabilitation in patients with manifest Huntington's disease. Although this was a small study, the findings are intriguing, as they indicate neuroplasticity in Huntington's disease, which may be amenable to multidisciplinary rehabilitation.

Research Review is ten!! The first ever issues of Research Review were delivered to inboxes in February 2006. Fast forward ten years and we now publish 48 regular reviews to which there are over 160,000 subscriptions. We're grateful to each and every one of you for your support and are looking forward to even bigger and better things over the coming years.

I hope that you find the research in this issue useful in your practice and I welcome your comments and feedback. Kind regards,

Dr Chris Tofield

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Factors shaping the delivery of acute inpatient stroke therapy: a narrative synthesis

Authors: Taylor E et al.

Summary: This systematic search of the qualitative literature analysed data from 31 studies investigating the factors shaping delivery of acute inpatient stroke therapy (i.e. occupational therapy, physiotherapy, and speech and language therapy). Study methodologies included focus groups, interviews, observational studies and case studies. Participants included therapists, other members of the multidisciplinary team, patients and carers. Using narrative synthesis, the study researchers identified five themes: the need for a therapeutic environment; therapeutic approaches; power and decision-making; therapy work behind the scenes; and the role of teamwork in creating a therapeutic environment. The data analysis also identified that delivery of therapy is mediated by differing conceptions of the nature of therapy and the role of therapists, as well as individual and professional responses to opportunities and constraints of therapy delivery.

Comment (NK): The premise of this paper is that the delivery of healthcare is shaped by structure and process, and therefore that a critical examination of structures and processes that underpin practice can help to elucidate both what they make possible and what they constrain in health care delivery. Using structure-process-outcome as a framework for critically examining rehabilitation practice was first introduced to me by Kath McPherson some years ago now, drawing from the work of Avedis Donabedian on evaluating quality in healthcare. I have always found it a particularly useful framework and this paper provides a good example. This narrative synthesis of qualitative studies provides a particularly insightful analysis of conceptual, individual and professional factors that shape the delivery of acute inpatient stroke therapy.

Reference: *J Rehabil Med.* 2015;47(2):107-19

[Abstract](#)

Independent commentary by Associate Professor Nicola Kayes.

Associate Professor Nicola Kayes is Director of the Centre for Person Centred Research at Auckland University of Technology. Nicola has a background in health psychology and as such her research predominantly explores the intersection between health psychology and rehabilitation. She is interested in exploring the role of the rehabilitation practitioner and their way of working as an influencing factor in rehabilitation and whether shifting practice and the way we work with people can optimise rehabilitation outcome. Nicola actively contributes to undergraduate and postgraduate teaching in rehabilitation in the School of Clinical Sciences at Auckland University of Technology.





Play-based interventions improve physical function for people with adult-acquired brain injury: A systematic review and meta-analysis of randomised controlled trials

Authors: Saywell N et al.

Summary: This systematic review and meta-analysis assessed data from 30 randomised controlled trials (RCTs) that compared the effectiveness of play-based interventions with that of traditional therapy in the rehabilitation of adults with adult-acquired brain injury. Under the GRADE scoring system, 13 of the studies were considered to be of high quality clinical evidence and 17 of moderate quality. Twenty-seven studies involved post-stroke patients and three included adults with traumatic brain injury. Outcomes on the Fugl-Meyer Assessment of motor recovery revealed that in dose-matched studies of play-based interventions, play-based interventions had significant effects on independence (Effect size [ES] = 0.6) and physical performance (ES = 0.43) as compared to traditional therapy. For non-dose matched studies, play-based interventions were significantly more effective at improving balance (ES = 0.76) compared with traditional therapy. In all studies that measured participant enjoyment, play-based therapy was rated as more enjoyable than traditional therapy.

Comment (NK): Play-based interventions, and in particular gaming technology, have been growing in popularity as an adjunct to conventional therapy. This meta-analysis provides a timely snapshot of the existing evidence regarding the effectiveness of play-based interventions in acquired brain injury, reporting encouraging results. However, a key assumption underpinning many play-based interventions is that by their very nature they increase enjoyment and therefore engagement in therapy activities. Interestingly only four of the 30 studies in this review included a measure of enjoyment to test this assumption. As such, it is difficult to say with any certainty whether enjoyment is indeed a key mechanism of action. There is more work to be done to critically examine the role that play-based approaches have in increasing engagement in therapy activities, particularly in the long term, and if so, what the critical components of the intervention are that support engagement.

Reference: *Clin Rehabil.* 2016 Feb 11. [Epub ahead of print]

[Abstract](#)



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Time spent reading this publication has been approved for CNE by The College of Nurses Aotearoa (NZ) for RNs and NPs. For more information on how to claim CNE hours please [CLICK HERE](#)

Alternative models of cardiac rehabilitation: a systematic review

Authors: Clark RA et al.

Summary: It is well recognised that traditional, hospital-based cardiac rehabilitation programmes for patients with acute coronary syndrome improve survival, quality of life, functional status, and cardiovascular risk profile, and also reduce hospital readmissions and psychological disorders. However, these models also present significant barriers to access, including cost and accessibility. In recent years, numerous alternative models have been developed that strive to overcome these barriers. This review examined the effectiveness of these alternative models, using evidence from 83 articles describing interventions in the following broad categories of alternative models of care: multifactorial individualised telehealth, internet-based, telehealth focused on exercise, telehealth focused on recovery, community- or home-based, and complementary therapies. Of all models that were scrutinised, only the community-based and telehealth-based individualised and multifactorial models for cardiac rehabilitation proved to be as the traditional hospital-based strategies for delivering effective cardiac rehabilitation. The article suggests that local healthcare systems integrate alternative models of cardiac rehabilitation, such as brief telehealth interventions tailored to individual's risk factor profiles as well as community- or home-based programmes, so that patients can choose whichever programmes best fit their needs, risk factor profile, and preferences.

Comment (NK): The benefits of cardiac rehabilitation have long been recognised. However, limited accessibility and low uptake continue to be problematic, particularly for some high risk populations. As a result, there is increasing interest in the development and testing of alternate modes of delivery to improve reach and engagement. While there is more work to be done to explore effectiveness of alternate models for indigenous and remote populations, the findings of this review highlight alternate models can be as effective as hospital-based approaches. Importantly, alternate models appeared most effective when they were brief, individualised, promoted choice and autonomy, and were tailored to local context. This is consistent with a growing body of research which calls for a person-centred approach to self-management; tailored to the needs, preferences and unique context of the individual.

Reference: *Eur J Prev Cardiol.* 2015;22(1):35-74

[Abstract](#)



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Implementing and sustaining an early rehabilitation program in a medical intensive care unit: A qualitative analysis

Authors: Eakin MN et al.

Summary: This qualitative investigation was conducted at the Johns Hopkins Hospital Medical Intensive Care Unit. Twenty of the staff and faculty involved in the Unit's early rehabilitation programme participated in semi-structured interviews, which were evaluated by the Consolidated Framework of Implementation Research Theory. The study researchers explored the factors considered important by a multidisciplinary team when seeking to implement and sustain early rehabilitation programmes. Four major constructs emerged: (1) necessary components, (2) implementation strategies, (3) perceived barriers, and (4) positive outcomes. All participants reported that staff buy-in was necessary, while 90% reported that it was helpful to have a multidisciplinary team with good communication among team members. The most common barrier reported was increased staff workload (80%). All participants considered improved patient outcomes to be an important benefit, and 95% reported improved job satisfaction.

Comment (NK): This paper offers important insight into the factors perceived to be critical to successful implementation of early rehabilitation in a medical intensive care unit (ICU). Research has reported it can take 17 years or more for research to find its way into real world practice. Uptake of early rehabilitation in the ICU is an excellent example where practice is lagging behind the evidence. A key theme running through the findings of this paper was the importance of having a culture for change. For example staff buy-in, shared responsibility across the multidisciplinary team, opinion leaders and discipline champions advocating for change, and structural supports were all critical to successful implementation. Following that, observing first-hand the benefits of change appeared important for sustainability. The findings of this study may be relevant across a range of settings and highlight the need for active strategies to support implementation activities.

Reference: *J Crit Care.* 2015;30(4):698-704

[Abstract](#)

Effectiveness of adaptive physical activity combined with therapeutic patient education in stroke survivors at twelve months: a non-randomized parallel group study

Authors: Calugi S et al.

Summary: This investigation recruited adult stroke survivors after discharge from two Italian Physical Medicine and Rehabilitation Units at 3–18 months after the stroke event. All participants had mild-to-moderate hemiparesis, could walk 25 m independently and did not require physical therapy. The study compared two interventions: an adaptive physical activity (APA) community-based exercise programme combined with therapeutic patient education (TPE), consisting of 16 bi-weekly sessions of APA and 3 TPE sessions conducted in local gymnasiums over one year (n=126), which was compared with 12 months of treatment as usual (TAU: control group; n=103). Twelve-month outcomes included the Modified Barthel Index, the Caregiver Strain Index, SF-12 health-related quality of life, medical complications and health services use. At 12 months, the ability to perform daily living activities, assessed using the Modified Barthel Index, was decreased with TAU and improved with APA-TPE. Both groups experienced significant improvements in the physical and mental components of quality of life. The APA-TPE intervention was associated with a lower risk of fractures (OR 0.09; 95% CI, 0.01 to 0.79) and a reduced need for rehabilitation treatments (OR 0.24; 95% CI, 0.08 to 0.77) compared with the TAU group. There was no between-group difference in regard to caregiver burden.

Comment (NK): The intervention reported in this paper hopes to tackle an issue relevant to stroke, but shared by a number of other long-term neurological conditions. Despite the known benefits of physical activity post-stroke for managing the ongoing impact of neurological impairment and for secondary prevention, levels of physical activity remain disproportionately low. As such, interventions which support sustained engagement in physical activity have the potential to reduce stroke burden. This study reports findings from the 12-month follow-up of a relatively modest, low-cost intervention combining adaptive physical activity (APA) with patient education. The APA component was delivered by gym instructors in local community gyms. While there are some limitations in study design (e.g. non-randomised, experimental and control not matched on exposure), the findings of this study are encouraging and may have important implications for managing the long-term impact of chronic stroke.

Reference: *Eur J Phys Rehabil Med.* 2016;52(1):72-80

[Abstract](#)

Effectiveness of interventions to improve occupational performance of people with motor impairments after stroke: an evidence-based review

Authors: Nilsen DM et al.

Summary: This review included 149 studies of interventions for motor impairments after stroke and was conducted as part of the American Occupational Therapy Association's Evidence-Based Practice Project. It identified a variety of interventions that effectively improve occupational performance after stroke. Repetitive task practice, constraint-induced or modified constraint-induced movement therapy, strengthening and exercise, mental practice, virtual reality, mirror therapy, and action observation were all found to improve upper-extremity function, balance and mobility, and/or activity and participation. Commonalities among several of the effective interventions include the use of goal-directed, individualised tasks that promote frequent repetitions of task-related or task-specific movements.

Comment (WL): While described as an evidence-based review, this publication is really a scoping exercise – reporting on how many studies appear to have been conducted on various topics related to occupational therapy interventions for motor impairments after stroke. The review stops short of clearly reporting on whether findings related to specific interventions were statistically significant or not and what effect sizes (if any) were achieved. The authors themselves identified that the review would have benefited from assessment of risk of bias when weighting findings from individual studies and from meta-analysis of outcome data resulting from specific interventions. The result of these limitations is that the reported positive findings in the abstract and conclusion are only very loosely supported by the underlying review method.

Reference: *Am J Occup Ther.* 2015;69(1):6901180030p1-9

[Abstract](#)

Intensive rehabilitation treatment in early Parkinson's disease: a randomized pilot study with a 2-year follow-up

Authors: Frazzitta G et al.

Summary: This study randomised 40 newly diagnosed patients with Parkinson's disease (PD) to rasagiline treatment alone (control group) or in combination with intensive exercise, delivered as two 28-day multidisciplinary intensive rehabilitation treatments (conducted initially at study entry and then 1 year later) (MIRT group). Study participants were assessed at baseline and every 6 months thereafter over a 2-year period, using the Unified Parkinson's Disease Rating Scale Section II (UPDRS II), UPDRS III, 6-minute walking test (6MWT), Timed Up-and-Go test (TUG); PD Disability Scale (PDDS), and l-dopa equivalents. At the 2-year follow-up visit, UPDRS II, UPDRS III, TUG, and PDDS scores were significantly improved from baseline (all $p < 0.03$) in the MIRT group, whereas there were no changes amongst controls. l-dopa equivalent dosages were significantly increased from baseline only in the control group ($p = 0.0015$), with significantly fewer patients in this cohort remaining on monotherapy at 1 year, 18 months and 2 years (20% at each visit) compared with 40% of patients at the 6-month visit. In contrast, all patients in the MIRT group were still receiving rasagiline monotherapy at 6 months and 1 year; the proportions declined to 89% at 18 months and 75% at 2 years.

Comment (WL): The novelty of this paper is in the selection of its participants. All participants in this study had a first-time diagnosis of Parkinson's disease and all were receiving the same medical treatment. This minimised the impact of variability in medication and severity of disease when assessing the potentially protective effect of early intensive therapy. Unfortunately, due to the very small sample size, the 25% drop out rate of participants, and differences between the treatment and control groups at the beginning of the trial, the conclusions from this study can only be considered tentative at best. One other practical consideration is the cost of the intervention, which involved a two-month elective inpatient admission comprised of three hours of intensive therapy daily! Reproductions of this study with larger populations are required to evaluate whether this intervention is worth the expense.

Reference: *Neurorehabil Neural Repair.* 2015;29(2):123-31

[Abstract](#)



The effect of multidisciplinary rehabilitation on brain structure and cognition in Huntington's disease: an exploratory study

Authors: Cruickshank TM et al.

Summary: These researchers sought to determine the effects of multidisciplinary rehabilitation on attenuating grey matter loss and associated declines in cognitive function in manifest Huntington's disease. They explain that multidisciplinary rehabilitation, comprising motor and cognitive intervention, has been shown to positively impact on functional capacity, depression, quality of life and some aspects of cognition in individuals with Huntington's disease. Fifteen participants with manifest Huntington's disease were recruited into a multidisciplinary rehabilitation intervention lasting 9 months. The intervention consisted of once-weekly supervised clinical exercise, thrice-weekly self-directed home-based exercise and fortnightly occupational therapy. Structural magnetic resonance images and validated cognitive measures were obtained at baseline and after 9 months. Participants were highly adherent to the supervised clinical programme and occupational therapy sessions (84.2% and 79.2%, respectively) and moderately adherent to the home-based programme (58.6%). At 9 months, significant increases from baseline were observed in grey matter volume in the right caudate and bilaterally in the dorsolateral prefrontal cortex. Volumetric increases in grey matter were accompanied by significant improvements in verbal learning and memory (Hopkins Verbal Learning-Test). Increased grey matter volume in the dorsolateral prefrontal cortex was significantly associated with preserved performance in verbal learning and memory.

Comment (WL): Producing evidence to support interventions for rare health conditions like Huntington's disease is highly difficult. Well-conducted RCTs are almost impossible because of the difficulties with finding sufficient numbers of people to conduct such a study. The consequence is that researchers can end up neglecting rare diseases as a subject of their research. This study provides some speculative evidence of a possible link between rehabilitation (mostly physiotherapy and occupational therapy), neuroplasticity, and perhaps some maintenance in aspects of cognitive function. Studies like this, however, have to be interpreted cautiously. Finding statistically significant differences can be a bit of a treasure hunt if enough statistical tests are carried out – and may be more reflective of random 'noise' in the data than any real clinical effect. While an RCT is not likely to be doable, the results from this study would be strengthened by reproduction of the method with a new sample of people with Huntington's disease.

Reference: *Brain Behav.* 2015;5(2):e00312

[Abstract](#)

Home telehealth uptake and continued use among heart failure and chronic obstructive pulmonary disease patients: A systematic review

Authors: Gorst SL et al.

Summary: Home telehealth involves the remote delivery of health-related services via information and communication technologies between a patient and healthcare professionals, to assist in the monitoring and management of a patient's health condition. These UK-based researchers systematically reviewed the literature for studies describing the rates of uptake, refusal, and abandonment of home telehealth by patients aged ≥ 18 years with heart failure or chronic obstructive pulmonary disease, and factors that determine whether patients do or do not accept and continue to use telehealth. Thirty-seven studies were included in the review. Of the studies that reported rates of refusal and/or withdrawal, 32% of patients who were offered telehealth refused and 20% of participants who did accept later abandoned telehealth. Patient barriers to health were reported in 17 studies. Seven individual barriers were recorded, including: technical problems, believing telehealth to be unnecessary, preference for in-person care, technology anxiety, difficulty remembering to interact with system, need for technical support, and finding telehealth to be a repetitive process. Patient facilitators were reported in 29 studies, which recorded 9 individual facilitators: improved self-care, increased access to healthcare, improved health knowledge, ease of use, peace of mind, convenience, effective health management, appreciation of telehealth nurses, and believing telehealth to be as good as or better than in-person care.

Comment (WL): There are many barriers to uptake of rehabilitation interventions of known effectiveness. One common barrier is the method of delivery. For instance, often rehabilitation services require patients to come to a specific hospital to participate in the intervention, usually at times set to suit the health professionals rather than the patients. The idea of using information technology to increase access to existing health services is therefore very attractive. However, this is an emerging area of practice, and knowledge is still being gathered about how these types of services can be best organised to meet the needs of patients. This excellent review provides a timely summary of the current state of play regarding aspects of telehealth for people with chronic heart or lung disease.

Reference: *Ann Behav Med.* 2014;48(3):323-36

[Abstract](#)

Disclaimer: This publication is not intended as a replacement for regular medical education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

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Integration of occupation based intervention in hand injury rehabilitation: A randomized controlled trial

Authors: Che Daud AZ et al.

Summary: This article describes the benefits of integrating occupational-based interventions into hand injury rehabilitation. The study was conducted at the Kuala Lumpur General Hospital (KLGH), Malaysia, and involved 46 adults with hand injuries who were randomly allocated to either a combination of Occupation Based Intervention and Therapeutic Exercise (OBI+TE group) or to Therapeutic Exercise alone (TE group) for 10 weeks. Upon completion of the programmes, mean improvements from baseline were significantly greater in the OBE+TE group as compared with the TE group for Disabilities of the Arm, Shoulder, and Hand (DASH) score (TE = 18.64 vs OBI + TE = 9.50; $p=0.02$), total active motion score (TE = 1035.85 vs OBI + TE = 1203.65; $p=0.01$), neuropathic pain score (TE = 2.90 vs OBI + TE = 1.05; $p=0.02$), Canadian Occupational Performance Measure (COPM) score (TE = 7.62 vs OBI + TE = 9.53; $p<0.001$), and COPM satisfaction score (TE = 7.60 vs OBI + TE = 9.49; $p<0.001$).

Comment (WL): It is great when researchers go out of their way to rigorously examine aspects of practice that are otherwise easily assumed to be true without testing. It is even better when the research actually supports those assumptions! This study provides good evidence that patients benefit from having occupational-based interventions in addition to clinic-based therapy activities when recovering from traumatic hand injuries. One of the benefits of occupation-based interventions is that they are low cost – employing equipment that is immediately available to patients in their work or home. In this age of increasingly expensive robotics and virtual reality, it's nice to find the basics of 'old school' rehabilitation still have a major part to play.

Reference: *J Hand Ther.* 2016;29(1):30-40

[Abstract](#)

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Independent commentary by Dr William Levack



Dr William Levack is the Associate Dean of Research for the Wellington campus of the University of Otago, and a Senior Lecturer with the Rehabilitation Teaching and Research Unit – a specialist provider of distance-taught postgraduate qualifications in rehabilitation for health professionals run by the Department of Medicine, University of Otago Wellington. A physiotherapist by training, Dr Levack has a wide range of research interests including goal setting and teamwork practices, patient engagement in rehabilitation, self-management of therapy, ethics and person-centred care. He is co-editor of the 2015 textbook: "Rehabilitation Goal Setting: Theory, Practice, and Evidence".