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Abbreviations used in this issue

- SCI = spinal cord injury
TBI = traumatic brain injury



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Welcome to issue 40 of Rehabilitation Research Review.

Amongst the topics covered in this issue, we discuss the benefits of motivational interviewing upon physical activity among people living in the community after hip fracture, a review of shared decision-making within goal-setting involving adult rehabilitation patients, findings of low levels of physical activity during inpatient spinal cord injury rehabilitation, and an appraisal of exercise and rehabilitation delivered through exergames in older adults (≥ 65 years).

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

Kind regards,

Associate Professor Nicola Kayes

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Assessment of comorbidity burden and its association with functional rehabilitation outcome after stroke or hip fracture: A systematic review and meta-analysis

Authors: Kabboord AD et al.

Summary: This research examined the association between comorbidity assessment and functional rehabilitation outcome of patients with stroke or hip fracture. Of 20 studies that satisfied the review criteria, 7 were included in the meta-analysis. All studies involved adult patients with a stroke or hip fracture who underwent inpatient rehabilitation, and all studies reported associations between comorbidity and functional outcome. Four comorbidity indexes were extracted from the studies: The Charlson comorbidity index (CharlsonCI) was used in 12 studies, the comorbidity index of Liu (LiuCI) in 3 studies, the comorbidity severity index (COM-SI) in 1 study, and the Cumulative Illness Rating Scale (CIRS) for geriatrics or CIRS(G) in 7 studies. The meta-analysis showed a significant, albeit modest pooled correlation between comorbidity and functional outcome (-0.43 ; $p < 0.0001$). Presence and strength of correlations differed between comorbidity indexes. Four studies reported a nonsignificant or minor contribution of the CharlsonCI to functional outcome, ranging from 0.0 to -0.88 and 0–1% explained variance (%var). Two hip fracture studies used the CIRS as total score and 5 studies used the CIRS as a cumulative index: associations with functional outcomes were mostly nonsignificant and ranged from -0.02 to -0.34 and unknown %var. Three studies used the CIRS as a severity index (CIRS-SI), which reported associations ranging from -0.25 to -0.40 and 12–16 %var. The COM-SI assessed comorbidity in patients with a stroke and reported a significant association with functional independence measurements (FIM) at discharge and daily FIM gain, ranging from -0.39 to -0.47 and explained 5% of the variance. Three stroke studies used the LiuCI, which ranged from -0.28 to -0.50 , with 4–6.6%var. When the index contained a severity weighting, the associations were more evident.

Comment: Presence or absence of comorbidity is frequently cited as a key contributor to rehabilitation outcome. This is particularly true in the context of older adult populations. This paper focuses explicitly on the use of comorbidity indices to explore the association with functional outcome after stroke or hip fracture. In doing so, the authors bring to the surface a number of related complexities, e.g. the potential for severity-weighted comorbidity indices to have greater prognostic value, and the need to acknowledge the inherent relationship between comorbidity and premorbid functional status. I would also argue that we need to better understand the impact of comorbidity on longer term (with most included papers focusing on functional outcome at discharge) and broader participation, health and well-being outcomes; as well as consider how models of service delivery can more routinely acknowledge and address comorbidity in rehabilitation settings.

Reference: *J Am Med Dir Assoc.* 2016;17(11):1066.e13-1066.e21

[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 outcomes. Nicola actively contributes to undergraduate and postgraduate teaching in rehabilitation at the School of Clinical Sciences at Auckland University of Technology.





Exercise-based cardiac rehabilitation in twelve European countries results of the European cardiac rehabilitation registry

Authors: Benzer W et al.

Summary: The European Cardiac Rehabilitation Registry and Database (EuroCaReD) project was established to obtain information about guideline adherence and treatment quality of cardiac rehabilitation (CR) in Europe. All European countries belonging to the European Association for Cardiovascular Prevention and Rehabilitation (EACPR) were invited to be part of the survey, which included 69 centres from 12 countries and 2,054 CR patients. The majority of the database population had coronary artery disease (CAD) (83%); only 4% of patients presented with chronic heart failure. Indication for CR differ widely between countries; acute coronary syndromes (ACS) predominated in Switzerland (79%), Portugal (62%) and Germany (61%), elective percutaneous coronary intervention (PCI) for stable CAD was the predominant initiating event in Greece (37%), Austria (36%) and Spain (32%), while coronary artery bypass grafting (CABG) was the predominant indication in Croatia and Russia (36% each). In Switzerland, similar proportions of patients with non-ST elevation myocardial infarction (NSTEMI) or STEMI were referred to CR (~33%), whereas some countries (e.g. Greece) did not even include NSTEMI patients in this survey. At CR start, most patients were receiving medication according to current guidelines for the treatment of CV risk factors. CR programme designs differed substantially by duration (from 3 to 24 weeks) and total number of sessions (from 30 to 196). The majority of patients completed the programme (85%). With reservations that eCRF follow-up data exchange remained incomplete, patient CV risk profiles experienced only small improvements. Rates of CR success (defined as an increase in exercise capacity of >25W) were significantly higher in patients aged <50 years and those who were employed. After CR completion, only 9% of patients were admitted to a structured post-CR programme.

Comment: This paper provides an overview and snapshot of early findings from the EuroCaReD, capturing data regarding the clinical status of cardiac rehabilitation across 12 European countries. While this study primarily aimed to establish the feasibility of a web-based registry, it gives some sense of the potential knowledge gain that can arise through embedding ongoing standardised data collection into routine practice across providers and contexts. While there are trade-offs inherent in routine data collection of this nature (e.g. inclusion of simple, brief measures to decrease burden for patients and practitioners, but which may fail to capture more meaningful outcomes), they enable us to answer some big questions relating to access, best practice guidelines, and factors associated with patient outcome that can inform ongoing service improvements.

Reference: *Int J Cardiol.* 2016;228:58-67

[Abstract](#)

Motivational interviewing increases physical activity and self-efficacy in people living in the community after hip fracture: A randomised controlled trial

Authors: O'Halloran PD et al.

Summary: In this study, 30 adults recovering from hip fracture who had been discharged from rehabilitation to independent living in the community were allocated to receive 8 weekly sessions of motivational interviewing in addition to usual care (intervention group; n=16) or usual care alone (controls; n=14). Physical activity levels were measured by an accelerometer (steps taken per day, time spent walking per day, and time spent sitting or lying each day). Compared with controls, participants in the motivational interviewing group walked significantly more steps per day, walked for longer daily periods, and experienced improvements in self-efficacy (they expressed higher levels of confidence about walking and not falling), health-related quality of life and mental health.

Comment: This paper tackles an issue relevant across a range of conditions – how can we more effectively support ongoing engagement in physical activity post-discharge from rehabilitation services, given the known benefits for health, wellbeing, prevention of secondary conditions, and so on? The findings of this study are encouraging, finding motivational interviewing (MI), successfully delivered by a physiotherapist, impacts both physical activity and falls self-efficacy for people living in the community after hip fracture. Of concern to me, however, is that MI was delivered as a stand-alone intervention and relied heavily on one specially trained physiotherapist who had been assessed as competent in MI. There is enough evidence now to indicate that we need to think beyond behavioural interventions as an add-on to conventional therapy. Rather, we need to find effective ways of equipping *all* practitioners with the skills to *embed* behavioural strategies into routine service delivery.

Reference: *Clin Rehabil.* 2015 Nov 24. [Epub ahead of print]

[Abstract](#)

A new way to support patients with pain is underway

ACC has worked with the sector to redesign its Pain Management Services and the new service went live on 1 December 2016.

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Physical rehabilitation interventions for post-mTBI symptoms lasting greater than two weeks: A systematic review

Authors: Quatman-Yates C et al.

Summary: These researchers systematically reviewed the literature on physical rehabilitation interventions that facilitate recovery from persistent symptoms following mild traumatic brain injury (mTBI). Inclusion criteria specified that studies used physical rehabilitation interventions in participants aged ≥ 8 years with a diagnosis of mTBI and symptoms persisting for an average of ≥ 2 weeks. The 8 studies included in the review incorporated a range of study designs, intervention types, and outcome measures. The study interventions were categorised as physiological (using a form or multiple forms of progressive exercise treatment), vestibulo-ocular (including gaze stabilisation, repetitive optokinetic stimulation, standing balance exercises, walking balance challenges, visual perturbations, strop, and canalith repositioning manoeuvres), or cervicogenic (using manual therapy with or without vestibular rehabilitation and progressive exercise therapy). Despite the small volume of evidence, the researchers concluded that potential benefits outweigh the potential risks of the interventions.

Comment: There is increasing recognition of the disproportionate impact on outcome that can result from persistent symptoms post-mTBI. Recent NZ-based epidemiological studies indicate we have a greater incidence of mTBI than previously understood (Feigin VL, et al. *Lancet Neurol.* 2013;12(1):53-64) and as such, finding effective strategies for managing ongoing impact are necessary. While the findings of this review offer some insights for practice, the key take-home message is that the jury is still out regarding what works, in what circumstances, for whom and when. In the absence of better evidence, practitioners need to consider the unique presentation and context of the individual patient (something we should do anyway!) and use their clinical judgement alongside existing evidence to determine the most appropriate course of action for that individual. Future research should also consider not only symptom reduction, but rather, symptom-related disability as a key outcome of importance.

Reference: *Phys Ther.* 2016;96(11):1753-1763

[Abstract](#)

Cognitive training for post-acute traumatic brain injury: a systematic review and meta-analysis

Authors: Hallock H et al.

Summary: These researchers examined whether cognitive training (CT) improves cognitive and functional outcomes post-acute TBI, and whether potential moderators may affect treatment outcomes. The analysis included 14 non-randomised and randomised controlled trials (involving a total of 575 patients), all of which investigated the effects of a CT intervention on cognitive and/or functional outcomes in individuals (both intervention and control groups) with TBI lasting more than 12 months after the injury. Efficacy was measured as the standardised mean difference (Hedges' g) of post-training change. CT had a small, statistically significant positive effect on overall cognition ($g = 0.22$; $p = 0.01$). There was low heterogeneity across studies ($I^2 = 11.71\%$) and no evidence of systematic publication bias. There was a moderate and statistically significant effect size for overall functional outcomes ($g = 0.32$; $p = 0.01$) with low heterogeneity across studies ($I^2 = 14.27\%$) and possible publication bias (although the effect size was not altered by analysis of the funnel plot). Statistically significant effects were also found only for executive function ($g = 0.20$; $p = 0.03$) and verbal memory ($g = 0.32$; $p < 0.01$).

Comment: The impact of cognitive impairment persists for many years after traumatic brain injury (TBI), contributing to the poor participation, health and well-being outcomes frequently reported for this population. This paper provides a useful and comprehensive synthesis of evidence for the efficacy of cognitive training (CT) on cognitive and functional outcomes more than one year post-TBI. It is not unusual for active rehabilitation services to have ceased < 12 months post-injury. However, the findings of this review highlight improvements in cognitive and functional outcomes can be achieved with minimal rehabilitation input (< 20 hours) CT was more effective than > 20 hours) longer term post-injury. The results are encouraging and challenge prevailing assumptions regarding potential for cognitive and functional gain in the longer term post-injury.

Reference: *Front Hum Neurosci.* 2016;10:537

[Abstract](#)

Psychologically informed physiotherapy for chronic pain: patient experiences of treatment and therapeutic process

Authors: Wilson S et al.

Summary: Psychologically informed physiotherapy is increasingly being used across care settings. This qualitative investigation conducted 1-hour-long semi-structured interviews with 8 patients who had severe chronic pain and had completed an intensive pain management programme within a national specialist service. The programme included 2.25 hours of physiotherapy each day. Interviews were conducted at 3 months after treatment and explored patients' beliefs about, and experiences of, this type of treatment, and helpful and unhelpful experiences. All study participants demonstrated clinically reliable treatment gains. They reported differing experiences to past physiotherapy interactions and they described how differences in the therapeutic relationship with psychologically informed physiotherapy emphasised an individualised approach that promoted engagement. Importantly, this novel physiotherapy practice also encouraged changes in the participants' psychological approach to exercise, including self-awareness around how their physical awareness, thoughts and emotions influenced their behaviour.

Comment: This useful and insightful paper attempts to unpack the therapeutic processes perceived to be important by patients who have been exposed to psychologically informed physiotherapy (PIP) to provide a more in-depth understanding of key mechanisms that may be targeted in practice. Participants provided powerful examples of the difference between a dualistic, reductionist approach where the physiotherapist situates themselves as expert, and PIP where the physiotherapist considers the whole person, where humanness (and all the flaws and vulnerabilities that come with that) characterises the interaction, and where the strength of the therapeutic relationship has the potential to transcend any conflicting perspectives. The findings are not necessarily new, in that research increasingly highlights the potential for the way we work with patients to be critical to outcome. However, we may want to ask ourselves which of these ways of working are more prevalent in current practice.

Reference: *Physiotherapy.* 2016 Jan 25. [Epub ahead of print]

[Abstract](#)

Shared decision making within goal setting in rehabilitation settings: A systematic review

Authors: Rose A et al.

Summary: A systematic search of the literature covering the period from January 2005 to September 2015 identified 3129 studies addressing shared decision-making (SDM) within goal-setting involving adult rehabilitation patients. Fifteen studies met the inclusion criteria and were included in the review. Analysis of the data revealed themes relating to methods of SDM within goal-setting, participants' views on SDM, perceived benefits of SDM, barriers and facilitators to using SDM and suggestions to improve involvement of patients resulting in a better process of goal-setting. Few teams adopted an entirely patient-centred approach.

Comment: Personalised goal planning is frequently cited as best practice in international rehabilitation guidelines across populations and settings. While at face value this makes intuitive sense, research highlights the complexity of this process. This review provides a timely overview of the state of play with regard to shared decision-making (SDM) within rehabilitation goal setting. The findings highlight that despite agreement on the benefits of SDM by both patients and practitioners, in practice goal planning remains a largely therapist-led process. There are perhaps two key messages from this review. First, practitioners should aim to be responsive to the needs of individual patients with regard to the level of SDM that is implemented, while making no assumptions regarding patient preferences. I would also argue we need to be mindful that an individual's preferences may vary over time. Second, we need to develop strategies that support skill development for both patients and practitioners to successfully implement SDM within the goal planning process.

Reference: *Patient Educ Couns.* 2016 Jul 26. [Epub ahead of print]

[Abstract](#)



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Supporting communication for people with aphasia in stroke rehabilitation: transfer of training in a multidisciplinary stroke team

Authors: Horton S et al.

Summary: “Supported communication” (SC) in the form of skilled communication partners and appropriate communication resources has been shown to enhance participation in communicative interactions for people with aphasia. This qualitative investigation sought to understand what causal mechanisms are implicated in the transfer of SC training to day-to-day clinical practice aimed at improving the participation in rehabilitation activities of people with moderate–severe aphasia after stroke. The study was conducted in a post-acute stroke rehabilitation ward in a rehabilitation unit. Twenty-eight staff from a multidisciplinary team (MDT) were trained in SC. Eleven team members (nursing, therapy, and assistant staff) took part in focus groups and interviews at the end of the study; 6 aphasic patients and 8 staff participated in video-recordings of therapy and care sessions. Three main themes derived from staff experience data. The first theme, *Barriers, constraints, and problem-solving approaches in enacting SC*, identified barriers and constraints that were linked to patient factors; spaces and events; and rehabilitation and care routines and systems; problem-solving was linked to individual staff practices, MDT, and team-working practices. Staff flexibility and team working were key factors in problem-solving these obstacles. The other themes involved the *responsive use of skills and resources* and *perceived impact of SC training*, with most, but not all, staff reporting benefits, including increased confidence in interactions with aphasic patients. The video observations of day-to-day practice provided evidence of rich use of interactional strategies and resources; a focus by staff on getting the work done; opportunities for patient active participation or emotional support that are realised or not; strategies for aphasia-related trouble and repair sequences.

Comment: I found this a stimulating read. It touches on two topics of particular interest to me –person-centred communication and implementation science. Specifically, the authors use a critical realist perspective to tease out what helps or hinders implementation of supported communication in practice. The rhetoric of engagement, person-centred practice, supported communication has long been accepted as best practice. However, in reality we frequently fall short on these core transdisciplinary rehabilitation processes. It is becoming increasingly clear that education alone is not sufficient to change practice. Rather, explicit strategies for supporting implementation of skills and knowledge into the local practice context are necessary. As clearly highlighted in this paper, implementation strategies need to pay attention to both the individual (e.g. perceived value, confidence in ability) and system (e.g. organisational processes) factors that may constrain or make possible particular ways of working.

Reference: *J Aphasiol.* 2016;30(5):629-56

[Abstract](#)

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Rehabilitation Research Review

Physical activity outside of structured therapy during inpatient spinal cord injury rehabilitation

Authors: Zbogar D et al.

Summary: These researchers assessed physical activity levels outside of structured rehabilitation therapy sessions in a cohort of 95 patients with spinal cord injury (SCI) who were recruited from two inpatient SCI rehabilitation centres. Physical activity at admission and discharge was recorded by self-report on the Physical Activity Recall Assessment for People with SCI (PARA-SCI questionnaire) and by real-time accelerometers worn on the dominant wrist, and hip if ambulatory. PARA-SCI data revealed no statistically significant change over time in self-reported physical activity minutes outside therapy, where the majority of all time was spent in leisure time sedentary activity (~4 hours). The amount of time spent in leisure time physical activity and in physically active group classes at a higher self-reported intensity had a median value of 0 minutes. In contrast, the instrumented measures of physical activity documented significant increases in physical activity outside physical therapy and occupational therapy sessions from admission to discharge for individuals with tetraplegia (i.e. upper limb activity) and for ambulatory individuals (i.e. walking activity).

Comment: Consistent with findings in other conditions, the current study found that physical activity outside of structured therapy time was low in spinal cord injury inpatient rehabilitation. The authors make a case for the need for inpatient rehabilitation to prepare people for the level of physical activity engagement they need to maintain in the community for optimal functional outcome and health benefit. This is not the first study to critically reflect on the low levels of activity present in an inpatient rehabilitation setting. Similar findings in stroke have led to consideration of the potential for enriched environments to increase cognitive, social and physical activity in inpatient stroke rehabilitation settings. Arguably, we need to think critically about the role of space and place in rehabilitation as a covariate of outcome.

Reference: *J Neuroeng Rehabil.* 2016;13(1):99

[Abstract](#)

Exercise and rehabilitation delivered through exergames in older adults: An integrative review of technologies, safety and efficacy

Authors: Skjæret N et al.

Summary: Exercise through video games, so-called exergames, is increasingly being offered to increase physical activity and improve health and physical function in older adults. These researchers reviewed the literature on exergames used in the elderly (aged ≥65 years), including the different game technologies, their effect on physical functions, and related safety issues. Sixty studies were included in the review. Study aims and gaming interventions varied widely amongst studies and mostly focused on community-dwelling healthy older adults. The majority of the studies used commercially available gaming technologies that targeted a number of different physical functions. The Nintendo Wii game console was the most commonly used technology (35 studies). Most studies reported that they had used some form of safety measure during intervention. Only 21 studies reported on whether adverse events occurred; none reported any serious adverse events that occurred during the intervention period. Twenty-four studies reported on adherence, but only 7 studies reported on adherence for both the intervention and the control exercise group. The most commonly used outcome measures were clinical measures of balance, such as the Berg Balance Scale (BBS) and the Functional Reach test (FR), measures of gait such as walking a set distance, and measures of physical functions such as the Timed Up & Go test (TUG), and Sit-to-Stand test.

Comment: There is increasing interest in the potential for technology to be used as an adjunct to conventional rehabilitation practice to support engagement and optimise outcome. In particular, it has been hypothesised that gaming technology has the potential to improve engagement in home-based exercise programmes. This paper provides a detailed review of the current state of evidence for exergames in older adults. The authors highlight a number of outstanding questions which future research needs to address including for example the need to more explicitly test the assumption that exergames support engagement (and if they do, in what circumstances this can be optimised) and understanding the pros and cons of using off the shelf versus custom-made game technology. While there is more work needed to make sense of the range of possibilities that rehabilitation technology can offer, technology is inevitably going to be part of the future of rehabilitation.

Reference: *Int J Med Inform.* 2016;85(1):1-16

[Abstract](#)

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