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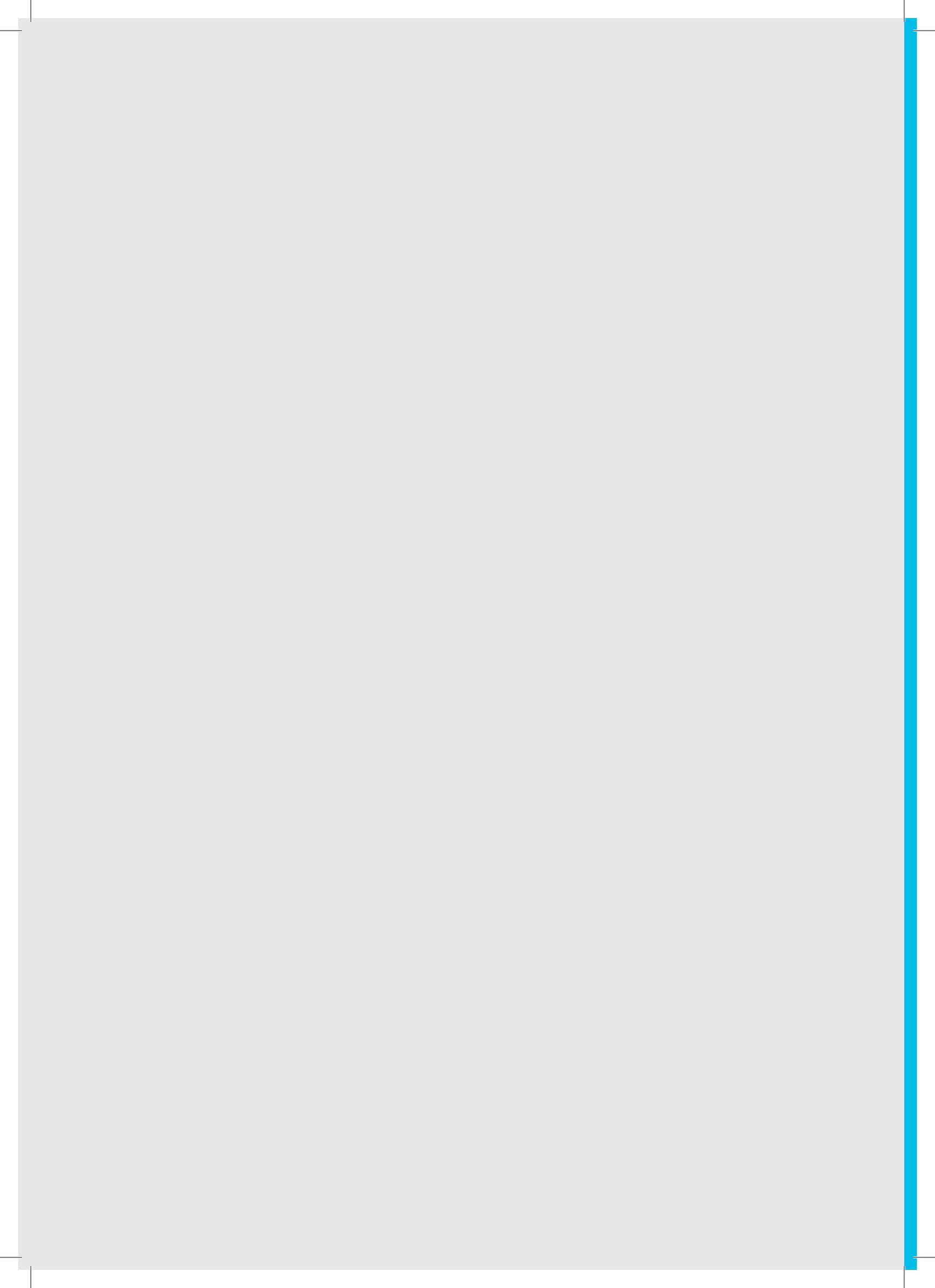
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PHYSIOTHERAPY NEW ZEALAND
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A new code of ethics: reflecting professional concerns

Physiotherapists in New Zealand now have a new code of ethics as of the end of 2011. The new code, initiated by Physiotherapy New Zealand (PNZ, previously the New Zealand Society of Physiotherapists) and the New Zealand Physiotherapy Board, now means there is one ethical standard for all physiotherapists. The new code of ethics developed out of a desire of these two organisations to develop a code of ethics that reflected the actual ethical concerns experienced by physiotherapists in order for it to provide effective guidance for physiotherapy practice, and a code that sets standards that can be used as a yardstick against which to measure a physiotherapist's actions.

On review, the previous code contained confusing terminology which created uncertainty for physiotherapists who were unsure of their obligations. There were also inconsistencies regarding the level of detail, with some areas approached broadly and other areas containing very specific detail. There was also a lack of attention to a number of areas which, through anecdote, were the source of ethical concern for many practitioners in everyday clinical practice. The nature of the practice of physical therapy had also significantly changed, meaning that current ethical concerns were not being adequately addressed in the previous code.

While it might be argued that codes can be self-serving, a code of ethics serves a number of important purposes. A code can effectively promote the norms and values of the profession; it sets out expectations; it can shield practitioners against the pressure to act in an unprofessional manner; and it can help to facilitate professional communities. (Anderson 2009, Pellegrino 2001, Swisher and Hiller 2010). To meet these aims a code must be clear and accessible, easily interpreted, and compatible with existing codes and laws governing the practice of physiotherapy in New Zealand.

The process of writing a new code of ethics provided an opportunity to examine similar codes written for other health professions in NZ (including medicine, nursing and occupational therapy), as well as existing codes for physiotherapists internationally. In order to be relevant and gain widespread acceptance by practitioners the new code of ethics must also resonate with contemporary practice and the ethical concerns of physiotherapy practitioners. In taking on the task of writing a new code an appropriate methodology was needed to ascertain practitioner's views.

As physiotherapy practice has become increasingly specialised, experiences across the range of areas of clinical practice will differ. In order to gather information from the diverse range of physiotherapy practice, 17 focus groups were formed. Most of these were recruited via PNZ Special Interest Groups (SIGs), but other focus groups included, Tae Ora Tinana, Heads of Schools, Physiotherapy Board members and senior undergraduate physiotherapy students. Focus groups were considered to be a good method for people to share their experiences and to hear the views of others, which stimulates further discussion and reflection (Krueger 2000). Ethics approval for the process was obtained from the *University of Otago Human Ethics Committee* in 2010.

Once the research work with the focus groups was completed, it was essential that the ethical concerns raised were effectively

expressed in the new code. To this end, discussions were transcribed and analyses for themes. Some of the key themes identified included: resource issues; clinical relationships; safety/competency and accountability; support for physiotherapists; and student specific issues (Anderson and Bowyer 2012).

Each of these concerns was incorporated into statements within the code. Legal advice was then sought from Professor Nicola Peart of the Law Faculty of the University of Otago. Professor Peart and I wrote a commentary to go alongside the code, allowing for ease of interpretation by practitioners.

Once the draft code (and commentary) was written it was submitted to and agreed upon by the PNZ Ethics Committee and the Physiotherapy Board. The code was then sent out to all registered physiotherapists and other key stakeholders in order to gather input from the wider community. Stakeholders were identified as groups that had an interest in the practice of physiotherapy in NZ such as DHBs, the Health and Disability Commission, other government departments and regulatory authorities. Patient input was directly sought by asking for comment and feedback from a number of patient interest groups (e.g. the Arthritis Foundation). Detailed feedback was provided from physiotherapists and stakeholders and many changes to the draft were made. The final code (and commentary) was approved by the Board and PNZ, and adopted at the end of 2011.

There are some significant additions to the new code. These changes include: acknowledgement of the wider public health role of the physiotherapist; the need for high standards and integrity when dealing with patients, funders, referrers and others; the responsibility to establish professional boundaries, and maintain personal wellbeing to safeguard both the patient and the physiotherapist.

A code that is based on the shared concerns of the professional group is more likely to embody concepts that are compatible with the group ethos. This is likely to result in wider acceptance and use of the final document. Because physiotherapy practice is constantly evolving and embedded in a dynamic health care context the new code should be subject to regular review.

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The role of physiotherapy in the prevention of industrial accidents

L Ring, NZRP, DipPhysEd, (LCC)[†]

In 1964, New Zealand had 57,918 industrial accidents of which approximately 15,000, or over 25%, were sprains and strains, entirely due to incorrect lifting procedures (NZ Dept of Statistics, 1964). The direct cost to New Zealand was in the region of £3 million and indirectly about £9 million, and this for only a small country. In England, last year, the cost was more than £356 million, so it is obviously a world-wide problem and, perhaps, part of the price being paid for progress.

The productive time lost in any given year is equal to the permanent withdrawal of more than 8,000 people from the labour force. Many of these are skilled workers, which the country can ill afford to lose. The ever-increasing industrial tempo is being matched with an equal relentless rise in the industrial accident rate.

It is, of course, not confined to industry, although this is the real purpose of this discussion, but it is also a social problem, being the occupational hazard of any physical activity that involves the action of bending the spine. The housewife making beds, the young mother lifting her baby, the weekend gardener, as well as industrial workers, are all facing the hazards of suffering an acute and often permanently disabling back strain.

The physiotherapist today, through training in kinesiology and experience in the treatment of industrial accident cases, is in an important strategic position to prevent and modify this futile drain in manpower and money, and also to prevent and modify the suffering and pain it produces.

Lifting and carrying are among the activities that subject the body to its greatest strain. In 50% to 60% of the injuries, the cause is degenerative in nature, ie, the consequence of aging and excessive wear and tear on skeletal and muscular tissue. After all, it is not only our faces that reflect our age despite the fact that it may not be quite so apparent in our joints and muscles.

Since the levers of the human body are adapted for range, speed and precision of movement rather than for weight handling, it is not surprising that the incidence of injuries attributed to lifting is extremely high. Although injuries occur involving all joints and muscles, I am particularly concerned with the spinal column, since it participates in every movement either by direct lifting or static holding. Damage to the spine is the primary injury in some 50% of the compensable accidents of industrial handling; it is the secondary injury in a further 25% of the incapacitating strains and sprains. It is the key to the whole problem of cause and prevention in the high rate of industrial accidents.

With a leverage ratio of 1 to 8 in the average man, the weight of the trunk alone at a lifting angle of 30° throws a strain of something like 350 lb on the lumbar discs (CHS Geneva, 1962). Even picking up a piece of paper from the floor involves a 90° angle in this area, and is equal to a pressure strain of 1,000 lb on the lumbar discs. It becomes very obvious, therefore, that the often heard remark, "But I didn't lift any thing very heavy," is far from fact. In lifting the weight of the trunk alone one has performed quite a feat.

The idea that lifting is a natural movement which does not need to be learned is completely fallacious. Children learn by imitation. The young apprentice learns, almost subliminally, lifting techniques which are often entirely wrong but, nevertheless, are perpetuated.

What are the essential principles in correct lifting? There are five key factors: (1) Straight or erect back; (2) chin tucked in; (3) elbows into side; (4) palmar grip; and (5) proper foot position (Guthrie, 1963).

It is generally agreed by orthopaedic surgeons and physical medicine specialists that lifting should be done not only with a straight back but preferably with an erect back. Floyd and Silver (1951) state that, with the spine in the erect or neutral position, the erector spinae muscles show minimal activity, but that, as soon as movement begins, they contract strongly. These findings indicate that, in the upright or neutral position, the body weight is transmitted through the bony vertebrate and the intervertebral discs, ie, the spine is stabilized and the muscles relaxed. This is understandable, for in the erect position the diarthrodial joints are locked. Their supporting structures, as well as the weak posterior common ligament with which the relatively loose fibres of the posterior portion of the annulus fibrosus blend, are not subject to the same degree of tension as when the back is bent. Therefore, trauma due to minor degrees of derangement of the inter vertebral discs and diarthrodial joints resulting from degenerative changes, and triggered by incorrect lifting, are much less likely to occur (Guthrie, 1963).

The position of the feet is of vital importance. They should be a comfortable distance apart with one foot slightly in front of the other. This ensures that the centre of gravity during the lift passes through a point between the feet. It provides for better balance and for protection in the case of a slip. Should the operator intend to move with the object to the right or left, the foot nearer that direction should be first turned to point that way. This prevents turning on a fixed foot after picking up an object and thus placing a rotation strain on the discs or knee joint.

Contrast this with untrained lifting procedure where a worker, tending to think only of the immediate problem, stands with his feet near each other, his legs straight and his back bent. In taking weight he is clearly off balance. The neutral axis passes through the posterior third of the vertebral and disc area. The

* The *Journal* is grateful to the author and to the organizers of the Congress of the World Confederation for Physical Therapy held in Melbourne in May, 1967, for permission to reprint this paper.

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compression effort is thus distributed unevenly over the anterior two-thirds of the disc area while the posterior third and back muscles are subjected to tensile stresses.

However, it is not the object of this discussion to go deeply into the pathology of disc lesions or the techniques of lifting the problem now is how can the physiotherapist change this depressing picture.

SCHOOL EDUCATION PROGRAMME

The physiotherapist can, by obtaining the co-operation of the school physical education teacher, influence the syllabus so that at sixth-form level it includes instruction in the handling of various objects to bring out the correct principles of lifting. This is the best place to begin education of this kind and is essential if lifting correctly is to become a reflex action pattern that will follow through in industry or the home. At the risk of being thought a heretic, I believe it to be much more important than teaching rugby or basketball in schools. Or need this be the alternative?

It can be argued that the school training programme is not the physiotherapist's field but surely these appalling statistics are everybody's problem. Help is needed from all authoritative sources and I have found the school staff only too willing to co-operate.

APPRENTICES

Correct lifting techniques relevant to the particular trade should be part of every apprentice training programme. During this critical period, many adolescents begin the minor trauma that will later lead, through lowered resistance in the discs, to early degeneration and limited function.

These are, indeed, the formative industrial years. Bad habits picked up, will remain forever. In New Zealand, all apprentice courses now include lectures on industrial safety by National Safety Council lecturers. Unfortunately, this is done only by local consent and I think the time has come when it should be written into the apprentice's terms of contract and rigidly adhered to as part of his syllabus.

FOREMEN'S AND WORKERS' SEMINARS

The physiotherapist can organize lectures to foremen, supervisors and groups of workers involved in lifting operations, explaining in elementary terms the anatomy and physiology of muscular and skeletal structures. Also, simple mechanics of the spine and correct lifting techniques can be taught. These methods have been in operation in industry for some time now. The response has been extremely good from both management and workers, and a consequent reduction in the accident figures of the firms represented has been shown.

INDUSTRY

Here, the physiotherapist, in co-operation with his National Safety Council and the industry's own safety officers, can advise on correct job placement. This is a vital responsibility.

As sporting contests show, short, intense contests of speed and strength are won by competitors between the ages of 15 and 25 years. On the other hand, the winners of endurance contests include persons in their forties and, where experience and routine play a special part, even their fifties and sixties (CHS Geneva, 1962). Conditions are similar in working life. In most occupations, older workers can be employed to advantage since their reduced physical performance is offset by greater experience, powers of endurance and more rational methods of work. Older workers, however, are at a decided disadvantage in occupations where straightforward strength and speed are the decisive factors.

By making himself familiar with industrial working conditions, the physiotherapist can advise the movement, if necessary, of a worker to some other job which requires similar skills with less strain in the same factory.

He can lay down ideal anatomical considerations for heavy lifting work (short stocky types are best suited for heavy lifting operations) or the weight lifting limits for specific jobs. He can analyse lifting problems producing abnormally high accident figures and advise modifications such as lifting platforms, lowering stacks of goods or minimizing static holding situations. He must seek out his National Safety Council, or its equivalent, and play a part in its work and development. If such an organization does not exist, he should stir up a local consciousness that will create such a body. There are ample precedents for this and a mountain of literature available. Everything must have a beginning.

The lifting habits of a community cannot be changed overnight, but, with determination and common sense, a practical answer can be provided to a very real problem in industry today.

To recapitulate, the industrial accident figures continue to rise, with tremendous cost and tremendous waste in money and manpower. Many accidents are the result of faulty lifting techniques. The physiotherapist's role in the prevention of industrial accidents is, therefore, to train the population in correct lifting techniques, to advise industry on job placing, analyse accident causes, and to see accident potentials.

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Commentary

Len Ring was a leader in the field of Occupational Health Physiotherapy in New Zealand. The occupational health field has changed somewhat since he wrote this article in 1967. This was prior to introduction of no fault accident compensation legislation administered by the Accident Compensation Commission (ACC) in New Zealand in 1974. Work related injuries however (in particular those attributed to the low back), still continue to rise in both number and cost. In 2010-2011 the cost to ACC of new soft tissue injuries sustained in an industrial work place and attributed to lifting or carrying was \$30,822,093. Fifty four per cent of industrial soft tissue injury claims attributed to lifting or carrying in 2010-2011 were for the back or spine (ACC 2012).

Len strongly advocated for physiotherapy involvement in injury prevention. Physiotherapists have taken up this challenge. Physiotherapy New Zealand now has an Occupational Health Special Interest Group with 310 members. Physiotherapists assist with prevention of a wide range of injuries and no longer have a role in just providing lifting and back care advice and training. Unfortunately, funding for physiotherapy services and health and safety legislation requirements has meant that physiotherapists' work in prevention is more often within industry, often in response to a problem rather than in the context of schools and apprentice training schemes as Len had proposed.

Len's injury prevention advice is based on his premise that bending the spine is a hazard and that by bending the person risks suffering an "acute and often permanently disabling back strain". He advocates a rigid erect straight back when lifting. His back injury prevention principles focus on technique though he also suggests advice about job placement and workplace design.

Many factors have now been identified that contribute to back injury and poor technique is only one of these (ACC 2006). Research into low back pain has highlighted that non-physical factors contribute to back pain and psychosocial factors are linked with progression to disability (Nicholas et al 2011). Reliance on changing technique alone has not proven to be an effective injury prevention strategy (Verbeek et al 2011). Physiotherapists now adopt a multifactorial approach to back injury prevention in line with current evidence.

In summary, Len Ring was a leader in the occupational health physiotherapy field in New Zealand. He encouraged physiotherapists to use their skills in the industrial setting. Physiotherapists now have an important role and a strong presence in work related injury prevention and rehabilitation. It is a challenge for us to further embrace potential opportunities in primary prevention.

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Head, heart and hands: Creating mindful dialogues in community-based physiotherapy

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ABSTRACT

The relationship that develops between a physiotherapist and the client's family/care team in community-based healthcare is complex and needs to be managed with subtlety and care, not only for the client's wellbeing, but also for the professional and personal involvement of the physiotherapist. Hermeneutic phenomenology was used to explore the lived experience of relationships that developed between five participating physiotherapists and their 'family care teams' (involving five clients, eight family members and five carers). Analysis of qualitative data arising from semi-structured interviews and a focus group revealed that these physiotherapeutic relationships evolved as the clients, families and carers allowed their therapists to learn about them. Complex ways of making meaning were interpreted by the participants, involving advanced usages of language, such as poetic expression and metaphor. The place of mindful and responsive interpersonal connection within evolving physiotherapy relationships is under-appreciated. The physiotherapists used complex and innovative forms of interaction to enhance communication with their clients. Deeper understanding of these issues within physiotherapeutic interactions could contribute towards the development of composite relationship-treatment approaches to physiotherapy practice and the development of enhanced therapeutic relationship skills in undergraduate and continuing physiotherapy education.

Tasker D, Loftus S, Higgs J (2012): Head, heart and hands: Creating mindful dialogues in community-based physiotherapy. New Zealand Journal of Physiotherapy 40(1) 5-12.

Keywords: qualitative, hermeneutic phenomenology, community-based physiotherapy, relationship-centred, responsiveness, mindfulness.

INTRODUCTION

In this paper, we argue that the relationship that develops between a therapist and a client requiring longer term therapy in home settings is complex and needs to be managed with care and subtlety. The importance of this issue was emphasised in the description by a physiotherapy student of the emotional response he felt on witnessing the immensity and difficulty of the life situations faced by people with chronic and complex health problems in our community, and the positive effect that well-planned physiotherapeutic interventions could have on a client's quality of life on many levels (Blayney, personal communication, 2008). The student's response highlights both the hidden nature of the personal health care problems faced by a significant number of people in our community and the importance of the personal engagement that occurs when a physiotherapist 'comes to call'. The purpose of this paper is to summarise a qualitative research project that set out to explore the complexity of these relationships between community physiotherapists, their clients and the families and carers of those clients. The research project's focus was delineated by the following research questions:

1. How do community based physiotherapists interpret relationship-centred care within the dynamic and ongoing therapeutic relationships they develop with clients, their families and carers?
2. How do clients, their families and carers, interpret and manage these ongoing relationships with community based physiotherapists?

Lying within the interpretive paradigm, this research project concentrated on people involved in real world activities and relationships, increasing the visibility of that world. The focus in this project was on the relationship between the community-based physiotherapist, the client, the family and the carers involved in chronic and complex health care (the 'family care team') in New South Wales, Australia.

If the aim of rehabilitation is to work collaboratively with patients to maximise their integration into the community, then we propose that the research agenda needs to address the lived experiences of patients within and outside the physiotherapy setting. (Gibson and Martin 2003 p.350)

Hermeneutic phenomenology was selected as the overarching methodology for this project. Phenomenology is the study of lived experience or the 'lifeworld' (van Manen 1990). It is experience of the world as lived by a person, not reality as something separate from that person (Valle et al 1989). Hermeneutics has been described as '... a reflective practice of unmasking hidden meanings beneath apparent ones' (Kearney 1991 p.277, as quoted in Crotty 2003). The combination of phenomenology and hermeneutics allows for a deep study of lived experience, as interpreted by the participants.

Literature Review

Since the 1990s, 'evidence-based practice' and its principles have been increasingly promoted within the physiotherapy literature (Schreiber and Stern 2005). While it is generally accepted that physiotherapists should centre their attention on the promotion of the clients' comfort and function in terms of body posture and movement, physiotherapists may be tempted to focus exclusively on physicality and its measures as this provides a good fit with evidence-based practice. In health care, with increasing demands for accountability, physiotherapists are under pressure to practise in ways that are seen to be objectively and measurably effective. They may, therefore, perceive that paying attention to clients' social and emotional needs might imply the use of merely passive clinical treatments in a world where only active physical treatments should be used for physiotherapy (Wallin et al 2008).

A more holistic understanding of health and disability is needed to assist people with complex health care needs, whose presentations may fall outside the available research evidence (Jones et al 2006). A narrow physical focus may neglect the value of a more patient-centred approach where individual context and meaning play a decisive role in the therapeutic relationship, especially for people living at home with chronic and complex health issues. Many physiotherapists utilise professional 'craft' knowledge, which draws on the therapist's subjective interpretation of the situation, in contrast with evidence-based knowledge, which relies on more explicit and objective propositions (Higgs et al 2004). There is a need to accept and integrate an increased awareness of such professional craft knowledge, particularly within the area of community-based physiotherapy practice, where therapists depend on a wider range of skills and knowledge than has been traditionally claimed for physiotherapy (Heckman and Cott 2005).

Emotional and social aspects of a person's life need to be fully integrated into the physiotherapy approach if people are to be assisted to achieve outcomes that promote a client's overall well being (French and Sim 2004). In a study regarding expert physiotherapists, Jensen et al (2000) reported that a person-centred approach, which included the use of good listening skills by the therapist, allows an increased understanding to develop of the social and psychological context of the patient's world, rather than just focusing on physical diagnosis. Patient outcomes can be improved when patient circumstances and preferences are taken into account (Jones 2004). Person-centred approaches towards the physiotherapeutic process necessarily involve full exploration of the agendas of all involved stakeholders (Brown et al 1986) to develop a mutual understanding of the problems, priorities and goal setting (Brown et al 1989). In this study, stakeholders included clients, family members and carers. Berwick (2009) proposes that

In most circumstances, people would, and should be able to, amend the subject - "patient-centered care"- to include the experience of family and loved ones of their choosing: patient- and family-centered care (p. 560).

Over the past decade or two, there has been an increase in the amount of private consultative physiotherapy work done with people, who live at home but suffer chronic and complex health care problems (Struber 2003). Struber noted that the emphasis in physiotherapy is increasingly focusing on community access, continuity of care and integration of services, rather than hands-on treatment. Assisting people with health care needs to remain in their own homes is desirable for many people in our community and may contribute to coping with the increasing problems of our ageing society. However, the situation of visiting a client in their home on a long-term basis needs to be better understood if this aim is to be achieved.

Recently, concern has also been expressed regarding the issue of power imbalances occurring between the therapist and their client (Edwards et al 2010). Efforts to impose a rigidly constructed therapy model upon clients can be seen as problematic; especially in the light of professional time constraints and the altered power balance (Heckman and Cott 2005). Person-centred health care approaches have been seen as a means to address this problem (Edwards et al 2010).

The term 'patient-centred healthcare' may also be known as 'person-centredness' or 'relationship-centred care'. It involves the development of reciprocal, interpersonal relationships between health professionals and patients, to assist with collaboration in efforts to improve health (Australian Commission on Safety and Quality in Health Care 2010). The community-based physiotherapist is presented with the need to relate to, and co-operate with, the client's way of living and being, if they are going to be able to contribute effectively to the development of that person's wellbeing. This requires subtlety and flexibility and an acute sensitivity to the intimacy of these clinical interactions.

Our intimacy with patients is based predominantly on listening to what they tell us, and our trustworthiness toward them is demonstrated in the seriousness and duty with which we listen to what they entrust to us... (Charon 2006 p.53)

METHODS

Participant Selection

This research involved one to three interviews with members of five family care teams (see Table 1 for details of the composition of each family care team). The primary criterion for inclusion of participants was the requirement that the participants should be participating in an ongoing process of community-based physiotherapy with a physiotherapist in private practice or a not-for-profit organization. This decision was made in the interests of accessing longer-term physiotherapeutic relationships.

Five community-based physiotherapy participants were randomly selected from the Yellow pages and practitioner information provided by the Australian Physiotherapy Association. These participants were chosen from a spread of geographical areas across the state of NSW from the Blue Mountains to the coast, in order to gain a variety of different community perspectives and a ratio of male to female therapist participants was chosen

Table 1: Participant profiles of 'family care team' members

Client	Client's age range	Family care team members interviewed	Living arrangements	Client's health issues
JACK	20's	- Mother - Father - Carer - Female Physiotherapist: (25 years community experience, 32 years total physiotherapy experience)	- Home - Family care - Paid care.	Severe acquired brain injury
JENNY	30's	- Mother - Father - Carers x 2 - Male Physiotherapist: (19 years community experience)	- Group home - Day programme - Family visits	Severe developmental disability
DENNY	30's	- Carer - Male Physiotherapist: (7 years community experience)	- Home - Paid care	Spinal cord injury and acquired brain injury
ERIN	50's	- Husband - Female Physiotherapist: (7 years community experience, 24 years total physiotherapy experience)	- Home - Family care - Paid care	Severe acquired brain injury
ERIC	90's	- Wife - Daughter - Female Physiotherapist: (29 years community experience, 50 years total physiotherapy experience)	- Home - Family care	Dementia with mobility problems

to be similar to that of the total physiotherapist population. Clients with a variety of medical conditions were selected from within the active client-bases of the above five physiotherapists. The participating physiotherapists were given examples of possible types of health conditions and carer setups, which might be useful for the research project and the therapist then suggested some possible family care teams who may fit these guidelines without being adversely affected by the research process. Exclusion of family care team participants occurred for ethical reasons where it was felt that potential participants might be vulnerable to intrusion by the research process.

The clients participating in this project had different chronic healthcare issues involving significant movement difficulties. Further complexity was presented by the way these clients were able to communicate. In some cases, the participating clients had communication and short-term memory difficulties. This was accommodated within the interview process to allow as full an interview experience as possible.

Eight family and five carer participants were selected from across the practices of the five physiotherapists, on the basis of their willingness to participate and their availability. In some situations, families requested to have the interview conducted together with the client, rather than individually. This occurred particularly in situations where cognition or communication for the client was difficult. In the same way that a person-centred approach ideally respects the wishes and vulnerability of the people receiving physiotherapy attention, it was considered that any research process into this social phenomenon should provide the same detailed and respectful care (McCormack 2003).

Research procedures

Ethics

Ethical approval for this research was gained from the Ethics in Human Research Committee, Charles Sturt University, New South Wales, Australia (Protocol no: 2008/175). In the case of a client participant being unable to give informed consent,

their legal guardian determined these issues and signed on their behalf (Graneheim 2001). Client and information anonymity and confidentiality were carefully maintained and pseudonyms are used in the findings.

‘Bridling’ prior knowledge and experience

The first author is a community-based physiotherapist with a particular history and understanding of the world, which must necessarily affect the research process. In such practitioner-research, it was felt necessary to articulate something of those experiences early in the process so that the researcher could be consciously aware of any bias that might affect the research project. As Van Manen (1990) argued, “If we simply try to forget or ignore what we already “know”, we might find that the presupposition persistently creeps back into our reflections” (p. 47).

Prior to conducting the interviews, a cameo auto-ethnography for the first author/primary researcher was prepared to more clearly explore their person/therapist/researcher aspects. The first author also participated in two interview-like dialogues with an experienced research colleague. A reflective diary was used to document these reflections, along with the development of the research project. Rather than attempting to ‘bracket’ prior knowledge and viewpoints (Husserl, 1963), it was considered to be more congruent with the chosen methodology of hermeneutic phenomenology, to adopt Dahlberg and Dahlberg’s (2004) alternative term of ‘bridling’ one’s pre-knowledge. They describe ‘bridling’ in terms of the researcher’s attitude of reflection inhabiting an intimate stance in relation to the research phenomenon but allowing space for consideration of that same phenomenon. The researcher applies “the same sensitivity and open attitude towards the phenomenon and its meaning, as the horse riders of the Spanish riding school practice, when they bridle their horses and make them dance” (Dahlberg and Dahlberg 2004 p 272). There is an implicit note of ‘respect given’. In this way, prejudices were acknowledged, with the likelihood that any interpretations were more likely to be open and transparent.

Data collection

A general interview guide assisted the flow of initial interviews. Guiding questions covered topic areas about background, the first physiotherapy meeting, how the attending community-based physiotherapist interacted with the client and the family care team and development of the physiotherapeutic relationship.

One to three, hour-long, semi-structured home-based interviews were held with participants and/or family care team groups, as requested by particular families. The use of semi-structured interviews for this project encouraged the participants to express themselves more freely by asking questions in an unstructured style (Minichiello, 1995). After the individual and group interviews were completed, the participating physiotherapists were also brought together for an hour-long focus group to further discuss emerging themes from the interviews. The recorded interviews and focus group voice files were transcribed verbatim by a typing agency, familiar with the required confidentiality. All the transcripts were subjected to close reading and interpretation and data was organised with the assistance of N-Vivo software.

Data analysis

Qualitative research uses an inductive process to generate ideas from the data, in direct contrast to the deductive process of knowledge generation of quantitative research, which “begins with the idea and uses the data” to test a constructed hypothesis (Holloway 1997, as quoted in Thorne 2000). The philosophy underlining qualitative processes of data analysis emphasises a reflective and reflexive process prior to, during and after data collection. Initially, “chunks of data’ were named in terms of the metaphoric and poetic content of the phrases within them and using the words within those phrases for coding labels. Careful identification of these thematic networks (Astride-Stirling 2001) moved the organisation of themes from ‘basic’ to ‘organising’ and finally to the deduction of ‘global’ themes (See Table 2: Findings and meanings analysed from the data).

Table 2: Findings and meanings analysed from the data.

Mindfulness	Dialogue	Responsiveness
Home-based healthcare is ‘work’.	Emotional connection assists the therapist:	Therapists use composite forms of interaction, for example:
The therapist needs to blend in with the family care team.	- To connect and resonate with family care team members	- Letting the conversation flow whilst mentally highlighting issues of concern and waiting for important issues to emerge.
Family carers try to work as teams.	- To identify an individual’s meaning	- Creating conversation for clients with no speech and little voluntary movement to create a rich sensory experience for the client.
Relationship-centred healthcare evolves.	- To promote and advocate well being for clients and carers.	

Enhancing trustworthiness and credibility

Throughout this research project, we were guided by Guba’s four criteria of credibility, transferability, dependability and confirmability to assess trustworthiness in qualitative inquiry (Guba 1981). These criteria while paying respect to the history and place of quantitative research have been developed specifically for the qualitative paradigm of research. A variety of overlapping research methods were used to provide dependable findings, including interviews, focus groups and reflective journaling by the researcher. Honesty and depth of information was encouraged by gradually developing trust and confidence between the researcher and participants. Member checking was conducted informally by checking the themes discovered in first interviews in later interviews with the concerned participants. Findings of the project were ‘thickly’ described, allowing the reader to understand the phenomenon being studied. By using a ‘phenomenological nod’ of agreement to confirm that

resonance, readers will be able to compare elements of the findings with their own experience.

FINDINGS

The research findings revealed that therapeutic relationships are highly complex phenomena. The physiotherapists were particularly mindful and sensitive to the human dimension of their clients and families, taking care not to fall back into a strictly biomedical approach. They adopted an open attitude towards their clients and family care teams that demonstrated respect for the individuality of the people involved and a willingness to cope with ongoing complexity, accepting that there can be no final interpretation of the issues being faced.

Home-based healthcare is 'work'

Different members of the family care team reported that they have to work at the relationship with their therapist and each other, feeling that such effort is important to the outcome of the therapy. Clients, families and carers perceived the health care process at home as their 'work', whether they were paid or unpaid.

Oh it's a form of work, there's no question. It is work for me because it's something I've got to do. It must be done, you know (Eric's wife, Marie).

Home-based health care provides an example of the integration of paid and voluntary workers in a workplace. In this situation, the home functionally becomes a workplace. For the physiotherapist, this raises issues regarding occupational health and safety for carers as well as the usual concerns for client and family safety and wellbeing. For the family, their home is becoming a workplace for visiting health carers and they may be asked to change the way they live in order to accommodate the workplace needs of those healthcare workers.

Blending in

Families and carers were quite definite about their need for therapists to blend in with the family care team. Home-based healthcare is a difficult, complex and exhausting caring 'job' that extends through day and night. The provision of healthcare by visiting healthcare workers can be intrusive.

Monday, the nurse will come,
Tuesday, yes, the girl to clean will come,
Wednesday, yes, the nurse,
Thursday (big sigh)... nobody,
Friday, yes the nurse will come and your life, you know,
people coming in and out for our good.
Have to get out of bed, quick, quick, because you've got to be ready, then they might not come for another hour or two yet, but still, you've got to be prepared in case (Eric's wife, Gwen).

Carers and families reported that they appreciated the therapist's ability to quietly blend in with the family's situation and routine. It assisted them to relax, trust and interact with the physiotherapy process. One family carer described the experienced therapist's ability to blend in; *She just fits in, that's all I can say she just fits in (Eric's daughter, Marie).*

Such blending into a client's situation contrasts with physiotherapy conducted in more institutional settings where

patients and health professionals frequently perceive healthcare as being centred on the requirements of the healthcare system (Titchen 1998). 'Blending in' seemed to allow these therapists to retain more humane qualities, in order to promote the level of communication needed for home-based styles of healthcare interaction. The physiotherapists in this study also reported that they took part in a variety of non-clinical activities as part of their interaction with their clients and their families, for example, joining in with a daily ritual activity like a quiz or crossword puzzle or offering to post a letter on the way to another appointment.

Relationship-centred physiotherapy care within the home evolves

Relationship-centred care within the home was enacted by all the participants and *evolved* as people allowed their therapists to learn about them within their home and community. Families spoke of their appreciation of the human side of the relationship they formed with their physiotherapist:

It's personal, your life is personal.

You've got to have a bit of a relationship before you can get very far but it starts that way, showing that you're interested to know what's happened and interested in how it might effect now.

She just took an interest and so genuine you know. ... Yes, from the outset, she was really interested in me,

I don't mean me, but in the person

(Comments by Marie, an elderly woman looking after her husband, Eric at home).

... You kind of get to know their social situation and you get to know some of their personal quirks and beliefs and some of the things that are really important to them and then it kind of just evolves (Denny's therapist, Adam).

Most of the care provided to clients at home happens when the physiotherapist is not there. Physiotherapists can only know about these events if the client, family and carers confide in them. Trust is required.

Emotional connection is important

An emotional connection within the developing physiotherapeutic relationship was considered by all participants to be important for trust in the relationship to be developed and maintained. One client said; *She cares about me as a person (Erin).*

Emotional connection assisted the therapists to find words, which:

- Connected and resonated with their listeners
- Identified the meaning that people ascribed to clinical interactions
- Promoted and advocated well being for clients and their carers.

It could possibly be said that the physiotherapist has to 'feel their way' through the clinical conversation in order to achieve these aims within the human relationships that they develop with all the members of the family care teams.

'The fellow traveller'

There was a strong sense of journey in many accounts that enabled several participants to make sense of the ongoing relationship. One therapist described the notion of being or feeling like a fellow traveller:

There's always the poignant reminders of how life used to be and what life is now; the photos on the wall, seeing them in their home, the struggle of it all, the loss of it all. I never devalue that. I never ignore that. You're travelling that road with them (Jack's therapist, Karen).

Heckman and Cott (2005) also described 'the homecare journey as an opportunity to liberate people from their physical, social and environmental restrictions' (p 278) and noted that this is different for each person.

The physiotherapist 'being there' mattered to families. Participants spoke of the difficult times that they had experienced and the presence of their attending physiotherapist through those times, giving hope to the client and their family.

Jack has been through some, I won't say horrendous, probably horrendous for us but necessary for Jack. Jack was in calipers from his hip to his foot (Comment from Jack's mother).

The physio gives you hope, that not only Jack's life could improve but also ours, because the more mobility Jack gets, the better off we all are. We're not picking him up and carrying him into the bedroom or the toilet. (Comment from Jack's father).

'Sacred space'

Emotional connection assisted therapists to identify the meaning that people ascribed to clinical interactions. All the participants perceived that therapy presented an intrusion into the home, even though it may be a necessary one. One therapist poetically described the home as sacred space:

Going into someone's own space is very different. This is their private domain. This is sacred space for them. This is the area they have always been able to escape to and now we are taking therapy into that area (Jack's therapist, Karen).

Within the physiotherapy literature, Heckman and Cott (2005) described this process from the physiotherapist's perspective as 'entering a world different from that in which they had been trained' (p. 277). From the client and family members' point of view it may be viewed rather as 'you have entered my world' or even 'you have intruded into my place and my space', even if that client and family requested the visit. The physiotherapists in the focus group all recognised that they had to *always remember why I am here* (Jack's therapist, Karen). This awareness seemed to also be related to the accountability that the therapists felt towards the health system generally, as well as to the client and their family. However, the mindful awareness of being a 'visitor' in someone else's home clearly contributed to that recognition.

'The glorified visitor'

Emotional connection assists the therapist to promote and advocate well being for clients and their carers. Carers and families have to cope with difficult situations and sometimes seemingly unreasonable demands from clients. All carers and families reported that the therapist played a significant role in the modelling of caring behaviours to family care team members. The therapist in the role of 'guest' and 'visitor' may be seen as a gentle and considerate person who can provide mentoring for family care team members. Subtlety is required to play out such a delicate role. One therapist described himself as a glorified visitor:

Look I'm in a glorified position, I go there, and I do something he really likes doing, physical stuff and walking. I'm there for an hour and he likes my role in his care, so he's probably nicer to me than to his carers. I do like to stick up for the carers. When he's being unreasonable I'll say "Look, it's probably not that fair to have a go at them (Denny's therapist, Adam).

In such a situation the physiotherapist is clearly doing more than simply providing physical therapy. There is clearly a more holistic caring role being enacted in this situation and setting. Certainly, many families and carers spoke of the caring qualities of their physiotherapists.

Relationship-treatment approaches to practice

The physiotherapists were attentive and responsive at different levels within the communication process. This involved the customising of interaction for the client's, the family's and the carer's needs and abilities. The physiotherapists used complex and innovative forms of interaction to enhance communication and interaction with their clients. Examples of this include:

- Letting the conversation flow whilst mentally highlighting issues of concern and connection to the therapeutic process or while waiting for important issues to emerge;
If a person thinks that she's being listened to, that helps, no matter what the subject is and being the focus of their attention, that helps because other little side things will be noticed while you're focused on the person doing something. Yes, it's just being the focus of attention I suppose (Eric's wife, Gwen).
- Creating conversation for clients with no speech and little voluntary movement and supplementing this 'virtual interaction' with physical and visual cues to create a rich sensory experience for the client;

In a situation when they can't respond, I ask any question that I would ask you, you know, how are you, what did you have for dinner, did you have visitors today? I try to explain what the plan is, what's going to happen and where we're going and how long it's going to take. I also try to make physical contact, using voice and touch. I try to keep an eye on her face because her face will tell me how things are going. I try to make eye contact or she will look in the direction where sounds are coming from. Sometime she'll turn her head when the carer and I talk. I don't talk to staff about her. I have a conversation with Jenny and I keep eye contact with Jenny but I listen to what the carers say while I try to maintain the conversation with Jenny (Jenny's therapist, John).

Such interpersonal engagement promoted improvement of the client's wellbeing and reassured and supported carers and family. It can also assist to build the integrity of the therapist's ethical standing and morale within their job and their community.

DISCUSSION

The focus of this project explored the complex relationships that develop between the stakeholders directly involved in community-based healthcare. Within this research, the term, family care team was used to organise the interview processes but also viewed the participants within client-centred care groups. Clinically, health professionals, when talking to family and carers, in an effort to acknowledge their care and effort,

often use the term “the team” colloquially. We argue that we need to take that notion more seriously and incorporate it into the basic fabric of our thinking as health professionals.

The use of the term ‘family care team’ may assist in promoting the acceptance and integration of ‘outside’ carers and health professionals into the family home by the client and their family. It describes the efforts made towards co-ordination of the prodigious efforts required for home-styled healthcare, carried out away from the easier sources of materials and services provided in hospitals and health centres. Clients and families face difficult challenges when they have to deal with the day-to-day intrusiveness of complex healthcare problems into their home setting (Strauss and Corbin 1988).

There is a strong argument for including the processes of home-based healthcare within our more general definitions of *work*.

Unless we include the views and voices of clients and unpaid carers and broaden the concept of the healthcare workplace to include communities and homes, we may miss many problems and their solutions (Ward 2007, p. 104).

Sennett (1998) proposed that legible work contributes to a person’s character and Frank (2002) proposed that the use of this concept should be extended to people within illness processes. Families dealing with complex healthcare needs appear to motivate each other and organise their lives to accommodate and deal with a great complexity of issues, appointments and different healthcare professionals. Their entire lives and those of all the other members of that family, and sometimes friends as well, can be totally absorbed by these processes in a manner similar to the way that more conventional paid work absorbs the time and energy of people.

When reflecting on the question of how we practise physiotherapy, it is important to realise that interaction between therapist and clients, carers and family members occurs reciprocally and con-jointly (Ek 1990). Being with someone in a quiet thoughtful way, listening to hear their story without judgement, waiting for (interpersonal) signals to show (therapists) a way to proceed; all these activities have elements of mindful waiting and responsiveness.

‘Mindfulness’ is often represented as a characteristic of meditation, incorporating an ability to stay ‘in the present moment’. In this research project, we have also used the term ‘mindfulness’ to refer particularly to the sensitive ‘taking care of’ and ‘taking responsibility for’ how an interpersonal interaction proceeds. This attitude requires an ongoing awareness of ‘how things really are’ for the person that they are assisting. It also requires the therapist to be ‘present’ and focused on the other person throughout their interaction.

The word, ‘responsive’ can be used within health care discourses in different ways. The use of the word ‘responsive’ within this paper does not refer to ‘responding to an issue’ but rather indicates a deepening of the interpersonal relationship between the physiotherapist, the client and their family care team, to more truly collaborate with them in the provision of physiotherapy care. Such responsive processes were identified as being dependent on the physiotherapists’ ability to combine their own inner reflective dialogue and relational dialogue with other members of the family care team.

In this way, physiotherapists can be key members of both family care teams and externally located medical health care teams and rehabilitation teams. From their transient and ‘guest’ position within the family care team, the physiotherapists in this study provided mentoring and guidance to the members of that family care team and acted as a point of connection between the client’s family care team and other health professionals, for example the local doctor or community health nurse.

This research project has focused on privately funded, home-based physiotherapy for people with significant ongoing healthcare issues. This may limit the application of the findings to other contexts of physiotherapy, for example, publicly funded home-based physiotherapy. However, that limitation may be tested by the responses of clinical physiotherapist readers as they process the findings in this paper. Future efforts to research the perceptions of stakeholders in physiotherapeutic relationships can increase our understanding of physiotherapeutic relationships.

CONCLUSION

It is important to think about how we practise as well as what we practise. Such reflective thinking and the reflexive action that can follow may have implications for ourselves as people as well as therapists, and can assist us to develop satisfying work lives with our clients and their families. Creating mindful dialogues with and from within practice situations involves the use of our heads, hearts and hands. It is person-centred care. It is also relationship-centred care. Responsiveness and mindfulness are very necessary components of that physiotherapy care.

KEY POINTS

- The families and carers in this project viewed themselves as carrying out part of the rehabilitation and health care programme in the home environment and the therapist needed to make a conscious effort to blend into this setting.
- For the participants in this study, relationship-centred care within the home was enacted and evolved as the clients and their carers allowed their therapists to learn about them within their home and community.
- The participants reported that emotional connection assisted the therapist to connect and resonate with their clients and carers, to identify the meaning that people ascribe to clinical interactions and to promote and advocate for the wellbeing for clients and their carers.
- The physiotherapists used various relationship-treatment approaches to customise mindful and responsive dialogues for and with their clients and family care teams.
- The mindful dialogue approach to therapeutic relationships and care reflected in this project has relevance across professional relationships.

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An exploration of the concept of using the Nintendo Wii for balance training in patients with paraplegia

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ABSTRACT

The objective of this study was to explore whether a patient with a high level and one with a low level of paraplegia could interact successfully with the boxing programme on the Nintendo Wii and whether there would be improvements in their seated functional reach distance when this activity replaced their regular balance training activities. Two participants with spinal cord injuries classified as ASIA A and neurological levels T4 and T12 were trained twice per week for six weeks with the boxing programme on the Wii sport disc. This complemented their regular strength training activities, which were done in fully supported positions (prone, supine or supported sitting). Both participants were able to engage fully in the game with no falls. They both indicated that they enjoyed the interaction. The participant with the T4 injury was unable to reach forward at the start of the training but at the end, he obtained a reach distance of 6.78 cm. The participant with the T12 injury had an initial reach of 8.38 cm and a final reach of 16.94 cm. The boxing game on the Nintendo Wii appears to be a feasible balance training tool for use in the management of patients with both high and low levels of spinal cord injury. The movements that occurred during training were very similar to those that are emphasised with traditional balance exercises. Further investigation with proper controls is required to determine the effectiveness of this type of intervention.

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Keywords: virtual reality, functional reach, balance, spinal cord injury

INTRODUCTION

The incidence of traumatic spinal cord injuries for Western Europe, Australia and North America has been found to range from 15 to 39 per million, with the major cause being collisions involving four-wheeled motor vehicles (Cripps et al 2011).

Regaining good-seated balance is important for patients with paraplegia so as to become independent in all transfers and activities of daily living. Early in the rehabilitation process, physiotherapists work on a range of activities, which challenge the patient to maintain an upright posture when the centre of gravity is displaced outside the base of support.

Virtual reality training is a dynamic form of exercise, which allows the users to interact with displayed images, move and manipulate virtual objects, and perform other actions in a way that engenders a feeling of actual presence and immerses their senses in the simulated environment (Kizony et al 2005). This type of training holds significant potential for improving sitting balance in patients with spinal cord injuries in a more interactive and engaging fashion compared to traditional methods.

Betker et al (2007) showed that the use of a centre of pressure controlled video game led to a decrease in falls in two patients with paraplegia and a patient with a traumatic brain injury. The system required the patients to shift their weight until their centre of pressure was aligned with a specific target. This resulted in a reduction in falls and all participants indicated that the exercises were more fun than other balance exercises performed during the rehabilitation process. Kizony et al (2005) explored the use of another virtual reality system on balance in patients with paraplegia during the early rehabilitation period. Participants were engaged in three different gaming activities,

all of which encouraged shifting of the centre of gravity outside the base of support. Participants all showed an improvement in response time; however, the correlation between their functional reach scores and virtual reality performance was moderate. All participants indicated a high degree of enjoyment and presence in the virtual environment.

Even though there is limited research related to use of virtual reality systems in spinal cord rehabilitation, studies investigating the use of virtual reality training in other adult and paediatric neurological conditions have shown significant positive improvements on a range of physical outcomes including posture, balance, locomotion, and upper and lower extremity function (Braynton et al 2006, Brusch et al 2010, Chen et al 2007, Jack et al 2001, Merians et al 2002, Reid and Campbell 2006, Saposnik et al 2010, Sveistrup et al 2003, Viau et al 2004, You et al 2005). In addition to the changes in physical function one study showed virtual reality induced cortical reorganization in patients with stroke (You et al 2005). Improvements in visual-perceptual and spatial function have also been reported (Akhutina et al 2003, Deutsch et al 2008).

Patient motivation is not a fully understood concept in rehabilitation; however, it is thought to be an important contributor to patient outcome (MacLean 2000). Patients with traumatic brain injury who participated in a virtual reality based balance exercise programme expressed a greater degree of enjoyment, more confidence in their functional abilities, a greater degree of awareness of their balance, and more improved self esteem compared to those who participated in an activity based programme (Thornton et al 2005). Children with Spina Bifida, who participated in an ergometry programme augmented with a video game system, indicated that the task

was more enjoyable and provided greater motivation to exercise than regular arm ergometry (Widman et al 2006). Most of the studies reviewed previously also indicated that patients expressed enjoyment of the activity when engaged in virtual training environments.

Much of the research conducted to date has utilized systems that are relatively expensive for individual purchase and for treatment facilities in developing countries. Studies utilizing low cost commercial gaming systems have produced positive results (Deutsch et al 2008, Joo et al 2010). The Nintendo Wii® (Nintendo, Redmond, Washington) is one such device, which offers a wide range of physical activities. Many of the games can easily be played from a seated position and if utilized properly can encourage significant shifting of the trunk to the limits of stability. This study explored whether a patient with a high level (T4) and one with low level (T12) of paraplegia could interact successfully with the boxing programme on the Nintendo Wii and whether there would be improvements in their seated balance. The boxing game on the Wii sport disc was utilized for training since it could be done in sitting and it allowed for active interaction with the gaming software and hardware whilst maintaining balance and coordination, observing cues, adjusting to the situation, and responding to feedback on performance as indicated by the outcome of the matches.

METHODS

A pilot pretest posttest study was conducted at the physiotherapy department of the Sir John Golding Rehabilitation Centre in Kingston, Jamaica after ethical approval was obtained from relevant committees. Training was conducted in a gym setting and the participant with the T12 injury was placed in an unsupported sitting position on a large treatment bed with feet resting flat on the floor. The participant with the T4 injury was placed in a similar position, however a backboard which provided support at an eighty-degree angle from the bed was placed approximately 7.6 cm behind him so he could easily lean back when he needed to rest. A gait belt was placed around the pelvis and a therapist was positioned behind the participants to prevent possible falls resulting from a loss of balance while playing. For additional safety, thick cushions were placed all around the participants. The Nintendo Wii system was connected to a Dell multimedia projector and images were projected onto a large screen that was placed approximately 1.8 metres in front of the participants.

Participants

The first two patients admitted to the rehabilitation facility who met the following criteria were included: had a spinal cord injury at the level of T2 or lower with American Spinal Association (ASIA) Scale classification A to D, was medically stable, had been attending physiotherapy for at least four weeks, and signed an ethically approved informed consent form for participation in the study. Patients with orthopaedic impairments that could hinder upper extremity function were excluded.

The first participant was a 19 year old male who sustained a gunshot wound to the cervical spine. Diagnostic imaging showed a compression fracture at T2 He spent four weeks at an acute care facility after which he was placed on a waiting list for rehabilitation and was discharged to his home environment. While at home, he had no physical therapy treatment. Four

months later, he was admitted to the rehabilitation centre where he began his physiotherapy treatment. On admission to the rehabilitation centre, he was classified as ASIA A. His neurological level was T2, with partial preservation of sensation up to T4. His total motor score was 50/100, total pin prick score was 40/112, and total light touch score 44/112.

Participant 2 was a 27 year old male who had sustained gunshot injuries to the left side of the neck and thorax. Diagnostic imaging showed damage to the colon and pancreas in addition to fractures of the T10 and T12 vertebrae. He was managed in an acute care facility for five months, after which he was discharged from hospital. Two months later he was admitted to the rehabilitation centre. On admission to rehabilitation, he was classified as a complete spinal cord injury (ASIA A). His neurological level was T12. His total motor score was 50/100 and his sensory score was 76/112 for both pin prick and light touch. Neither participant had problems with pain or muscle spasm during the training period.

Procedure

The modified functional reach test described by Lynch et al (1998) was used to assess seated balance. The instrument has been shown to have good test-retest reliability in patients with spinal cord injuries (Lynch et al 1998). Participants sat on a narrow treatment bed with 5.08 cm of clearance between the popliteal fossa and the bed. The hips, knees, and ankles were positioned in ninety degrees of flexion, and a backboard was used to support the spine such that the trunk was at an eighty-degree angle from the bed. This backboard also allowed the participants to rest their trunk between trials. A levelled yardstick was attached horizontally to a wall at the height of the participant's acromion. The dominant arm was used as the reaching arm and the ulnar styloid was used as the anatomical landmark to measure reach. The participants were allowed to use the non reaching upper extremity for counterbalance only (no weight bearing or holding on was allowed). They were instructed to raise their dominant arm to ninety degrees, reach as far forward as they could without losing their balance and then return to the start position with their back against the backboard. The reach distance was recorded. Participants were monitored and guarded for safety at all times. The trial was repeated if they required assistance to return to the backboard. Each participant was given two practice trials following which three test trials were conducted. The mean of these three trials were recorded as the initial reach score. After six weeks of training the reach test was repeated. Testing was done by an independent therapist.

Following the baseline assessments participants were familiarised with the use of the Nintendo Wii and testing was done to determine the level of training at which they should start and whether any external assistance was required. The next day training began. Training sessions lasted for forty-five minutes and two sessions were conducted per week for a total of six weeks. Patients were engaged in other upper body strength and endurance training activities; however, these were all done in supported positions (prone, supine, and supported sitting). The training on the Nintendo Wii replaced all balance activities that were part of their routine training. Both participants trained at the beginner's level for the entire duration of the programme.

RESULTS

Both participants were able to interact successfully with the programme and there were no occurrences of falls during the training. Participant 1 (T4 injury) was very cautious while playing the game. Both participants indicated that they enjoyed the training programme. It was noted that participant 2 (T12 level) was more enthusiastic and engaged in the game as opposed to participant 1. On further questioning, he indicated that he liked boxing whereas participant 1 had no interest in the sport. Both participants had a mild degree of soreness in the shoulder muscles from the training, but this was no different from the normal degree of soreness that occurs when engaging in a new level of physical activity. This soreness resolved completely by the fourth session.

Participant 1 (T4 injury) was unable to reach forward at the start of the training but at the end he obtained a reach distance of 6.78 cm. Participant 2 (T12 injury) had an initial reach of 8.38 cm and a final reach score of 16.94 cm.

DISCUSSION

A spinal cord injury results in significant impairment of the proprioceptive input from the joints and this combined with varying degrees of muscle paralysis lead to patients having to develop other methods for maintaining balance. The Nintendo Wii boxing game was a completely new stimuli and training environment for both participants in this study. The system provided both visual and auditory feedback and in addition, there was the added component of drive to win the matches. These factors possibly contributed to the improvements seen in the participants.

It was not surprising that the participant with the higher level injury was more cautious during play since his core muscles were non functional and therefore his stability limits would have been more constrained. Data from Lynch et al (1998) showed that participants with T1 to T4 paraplegia have significantly lower functional reach scores than those with a T10 to T12 injury when measured at one month into their rehabilitation programme.

At the start of this study, the participants had already completed one month of rehabilitation; however, it was noted that their reach distances were outside of the range reported by Lynch et al (1998) (14.7 - 22.9 cm; mean 22.9 cm SD 5.6 cm for participants T10 to T12) and (7.6 - 21.3 cm; mean 15.5 cm SD 4.3 cm for participants T1 to T4). At the end of training the reach distance for participant 2 was within the range recorded by Lynch et al; however, the values for participant 1 remained slightly outside of this range. Even though both studies recorded data for participants who were one month into their rehabilitation programme, it was unclear how long post injury measurements were done in the study by Lynch et al.

The participants in this study were five and seven months post injury. Neither participant had any rehabilitation treatment during the waiting period for admission to the rehabilitation centre; therefore, generalised deconditioning could explain why their baseline values were outside the range reported by Lynch et al (1998). Participant 1 was not particularly interested in boxing and it was noted that the effort he put into the game was much less than participant 2. This together with the higher level of his injury could account for the lower degree of improvement with training. Even though the concept of patient

motivation is not well understood, it does have an impact on rehabilitation outcomes (MacLean et al 2000).

It is not certain what proportion of the improvements in balance was due to the regular strength training programme as opposed to the training on the Nintendo Wii; however, studies have shown that in order to improve balance, treatment activities need to be task specific (Buchner et al 1997, Dean and Shepherd 1997, Schlicht et al 2001). Strength training of the lower limbs in elderly populations did not improve standing balance (Buchner et al 1997, Schlicht et al 2001). In patients with stroke, significant improvements in seated balance occurred when activities were task specific and involved reaching outside of the base of support. Reaching activities that involved no shifting of the base of support led to zero improvements in sitting balance (Dean and Shepherd 1997). In order to improve balance, treatment activities must focus on displacing the centre of gravity and this was done with the use of the boxing game on the Nintendo Wii. All strength training activities in this study were done with the patients in fully supported positions and did not require any shifting outside the base of support.

Clinicians must continually challenge themselves to develop innovative treatment techniques that will result in high compliance, but will also be effective in developing patients' neuromuscular capabilities. Patients become bored with stereotyped routines and once they have particular levels of functioning, the drive to continue begins to decrease. Both participants in this study were highly compliant with the training. One participant liked boxing and it was noted that he was a lot more engaged in the programme than the other participant. This indicates the importance of considering patients' interest when selecting treatment activities. There are a wide range of games for the Nintendo Wii and it would be useful to explore the use of patient selected games on balance. From this study, it was noted that both patients were constantly moving and reacting in a manner that would have challenged their balance systems indicating that the use of the Nintendo Wii could be added to current balance training activities.

Neither of the patients in this study had previous exposure to playing computer games and even though this was not a focus of the study, it was noted that they were both rapidly able to learn to navigate the system with no assistance from the therapist. An added advantage of the Nintendo Wii is that it can allow for multiple users to interact and compete with one another at the same time. With the growing demand to improve patient function in the shortest time possible and reduce length of stay in inpatient facilities, this system could be explored as an option for group training in inpatient settings, community based interventions, and patient self-treatment.

A primary goal of therapy is to facilitate maximal return to function through various means. The results of this pilot study suggests that the boxing game on the Nintendo Wii is a feasible balance training tool for patients with spinal cord injuries; however, well controlled clinical trials need to be conducted to determine whether it is an effective balance training tool. Future studies should also consider the impact on functional outcomes and self-efficacy, and include an objective means of assessing enjoyment.

CONCLUSION

The Nintendo Wii boxing game is feasible for use as a balance training tool in patients with high and low levels of paraplegia, but its effectiveness needs to be investigated.

KEYPOINTS

- Patients with both high and low levels of paraplegia are able to interact successfully with the boxing programme on the Nintendo Wii.
- The Nintendo Wii appears to have the potential to be a useful tool for seated balance training in the patients with spinal cord injuries.
- There is a need for clinical trials to be conducted to determine whether the boxing game on the Nintendo Wii is an effective balance training tool in the early rehabilitation phase for patients with paraplegia.

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Exploring physiotherapists' emotion work in private practice

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ABSTRACT

Emotion aspects of physiotherapy work were explored with in-depth interviewing of ten experienced physiotherapists in private practice in New Zealand to meet the following three research objectives: (1) to identify the range of emotions felt, (2) to identify emotional themes in context, and (3) to identify self-management techniques. Emotions were mapped onto Larson and Diener's (1992) circumplex model of affect and scenarios reviewed for evidence of Bolton and Boyd's (2005) schemata of emotion work. Presentational and philanthropic forms of emotion work were identified. Caring (philanthropy) motivated the physiotherapists to build their patient relationships. No pecuniary emotion work was found. Findings showed that social and technical scenarios produced highly activated emotions, which sustained the physiotherapists in their role. A wide range of negative emotions were found; this may be indicative of increased risk of workplace stress. Surprisingly, there was no evidence of pleasant unactivated emotions; emotions that were expected given the experience and skill mastery of the participants.

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Key Words: Emotion work; emotions; patient relationship; caring; stress.

INTRODUCTION

The work of physiotherapists, like all health professionals, has physical, intellectual and emotional aspects. Within physiotherapy research and practice, the emphasis has been almost completely on the intellectual and physical aspects of the job; that is, on the knowledge needed to understand how the body works and responds to treatment, and to the physical skills required to manipulate the body of the patient. The other aspect of their job, the emotional component, is rarely, if ever, acknowledged. The research presented here aims to open up this area for further exploration and debate by the physiotherapy profession.

In this study, we use two concepts: 'emotion' and 'emotion work'. Emotions are complex psychophysiological experiences associated with a wide variety of factors including environment, behaviour and personality. There is no definitive taxonomy of emotions, but in this study, we used the understanding of emotions developed by Finemann (2003). Emotion work is the effort a person exerts to change their own emotions into an appropriate situational response (Miller 2007), called an emotional display. For instance, an exhausted nurse may be feeling angry following patient demand but will nevertheless smile and act serenely towards the patient thereby displaying an appropriate emotion for her or his role. This emotional display can be mobilised through the nurse's proficiency with surface or deep acting (Hochschild 2003). Acting describes the process by which the nurse acts out her role appropriately in a social situation. Four reasons have been proposed as to why people engage in emotion work: money (pecuniary), social acceptance (presentational), caring (philanthropic) and organisational rules (prescriptive) (Bolton and Boyd 2005). Emotion work may be loosely or tightly regulated by employers, or self-regulated through professional judgment in conjunction with organisational and customer expectations (Ekman 1973, Hochschild 2003).

Research confirms that health professionals manage their emotions in order to be effective in their roles. Exploration into emotion work has been conducted in nursing and mental health (Lewis 2005, Lopez 2006, Miller 2007, Theodosius 2008), massage therapy (Blau et al 2010), osteopathy (Harter and Krohn 2001), counselling (Kahn 1990, Lent 2010), and paramedic work (Boyle 2005). Professions and professionals differ in how they manage their emotions, but they all engage in emotion work, and manage emotions as part of everyday practice. For instance, nurses have been found to 'gift' emotions above their role requirement (philanthropic work) but they also often simply display appropriate emotions to satisfy rules and guidelines (prescriptive work), as in the above example (Lewis 2005).

The purpose of this research was to explore the emotional dimensions of physiotherapists' work. In order to achieve this, three research objectives (RO) were identified:

RO 1) To identify the range of emotions physiotherapists feel as they conduct their work with patients.

RO 2) To identify contexts within which characteristic emotions (identified in RO1 above) are performed.

RO 3) To identify self-management techniques physiotherapists use to manage their emotions.

METHODS

Emotions and emotion work have not previously been researched in the physiotherapy profession, although the topic is well studied in other disciplines. This exploratory study used existing conceptual categories of emotions and emotion work to recognise patterns in physiotherapists' experiences.

A semi-structured interview format was chosen to allow structured exploration of a previously unresearched population (Morse 2011). We wished physiotherapists to speak freely and

frankly about their work, but within a format designed to elicit relevant information to answer the research aims and objectives. Thus, the interview schedule was designed to allow participants to freely describe how they went about their working days, focusing specifically on their emotions and how they managed them. Participants were invited to describe their work; firstly they were asked about a typical working day; then to specifically talk about how they go about developing a relationship with patients and how this makes them feel; then to discuss what they like and do not like about their work. Because we were interested in the emotion work of physiotherapists, our focus was on their therapeutic relationship with patients. The interview schedule we used is attached (Appendix 1).

Ten private practice physiotherapists working in the Auckland area were purposefully sampled. All participants had a minimum of five years physiotherapy experience to allow sufficient reflection on the non-technical aspects of their role. The sample number of ten is slightly larger than many studies in this field, further enhancing the generation of rich data.

The study was conducted with full approval from the Massey University Human Ethics Committee. The primary researcher was an experienced physiotherapist having worked for 18 years in private practice. All interviews were recorded and transcribed with each research objective analysed according to the criteria set out below.

ANALYSIS OF RESEARCH OBJECTIVES

Research Objective One (RO1)

RO1 was achieved by analysing transcripts using content analysis to identify words signifying emotion and then mapping them onto Larsen and Diener's (1992) circumplex model, which provides graphical representation of ranges of emotions. The model enables contrasts to be seen between emotions in two-dimensional space. Dimensions of activation and pleasantness form the axis of the circle. Emotions are mapped along the circumference of a circle relative to their pleasant/activation degree.

This study used the definition of emotion proposed by Finemann as the outward display of subjective inner feeling (Finemann 2003). Emotion words were identified and then assigned into an emotional category based on Larson and Diener's (1992) model. For example, "I feel disappointed when..." was categorised as 'disappointed'. All emotional words used by participants were easily categorised as they corresponded directly with the words used by Larsen and Diener (1992) in their original model. Using Finemann's (2003) broad definition of emotions, all mentions of emotions were noted and allocated into 33 emotional categories. Emotion words arose directly from the respondents themselves and were directly mapped onto Larsen and Diener's (1992) circumplex model. The circumplex model only represents the range of emotions experienced, it does not represent intensity or frequency of emotions. Nevertheless, this process clearly showed that unactivated pleasant feelings such as calmness and serenity were never felt by physiotherapists in our sample. Emotion words are shown in Table 1.

Research Objectives Two and Three (RO2 and RO3)

RO2 was to identify contexts within which characteristic emotions (identified in RO1) are performed. Further analysis

Table 1: Participant Emotions and Larsen, Diener and Lucas' (2002) Affect Categories

Emotions felt by Physiotherapists (strongest emotion at top of each category)	Larsen, Diener and Lucas' (2002) Affect Categories
Stimulated	
Excited	
Inspired	
Interested	
Hopeful	
Good	
Happy	
Satisfied	
Proud	
Worthy	
Confident	
Belonging	
None	
Drained	Unactivated Pleasant
Tired	
Exhausted	
Unappreciated	
Inadequate	
Disheartened	
Disappointed	
Resigned	
Rejected	
Unconfident	
Frightened	Unactivated Unpleasant
Angry	
Intimidated	
Resentful	
Annoyed	
Pressured	

contextualised emotions so that they could be more fully understood in relation to the patient relationship and other scenarios. We placed the therapeutic relationship at the centre of our study because we already know that quality therapeutic alliances facilitate patient compliance, and patient participation can predict treatment success (Safran and Muran 2000). The importance of relationships to health outcomes is fundamental to patient-centred medicine, which places patients' emotional and physical needs and life issues at the centre of treatment plans (Stewart 2001, Miller 2007, Øien et al 2011).

It was decided that the use of mini-scenarios was appropriate to contextualise emotional patterns. Developing mini-scenarios is a type of thematic analysis (Braun and Clarke 2006). Thematic analysis is widely used in psychological and other research, mainly because of its flexibility, but as with quantitative and other forms of text-based research, credibility, transparency and reasonableness are the criteria for perceived research quality. How mini-scenarios are arrived at can be a difficult step to understand conceptually because researchers do rely to an extent on intuition to perceive patterns between trigger events. Analysis involves identifying groups of emotions that seem to occur in similar situations. The primary interviewer's physiotherapy experience was vitally important in this case because she made initial 'sense' of feelings in contexts; that is, she could empathise with physiotherapists, which helped her make 'sense' of their experiences. Empathy is always tempered by self-reflection in qualitative processes, and so any assumptions that are made are always scrutinised to minimise the risk of overly-identifying with the feelings of other physiotherapists, or allowing personal feelings to structure others' feelings. Also, the two researchers discussed the themes with one another in order to minimise bias. After numerous readings and discussions of the transcripts, meaning started to emerge. From initial patterns a list of possible scenarios was developed. These initial themes were then grouped into four basic mini-scenarios, or themes. These scenarios were not independent of each other, but they did have characteristics that enabled meaning to be made of the emotions felt in the contexts described. A full description of this type of analytic process is provided by Braun and Clarke (2006).

RO3 was to identify self-management techniques physiotherapists use to manage their emotions. RO3 was achieved by noting during the RO2 analysis phase the emotional self-management techniques physiotherapists used.

RESULTS

General Description of Participants and Work Practices

The youngest participant was 37 years, the oldest 59 years, with the average age being 44 years. The clinical experience of the practitioners ranged from 6 to 33 years, with an average of 17.1 years; six owned the clinic they worked in and four were contractors. Six participants worked more than 40 hours per week.

The four final scenarios (or themes) identified were: social relationships, technical skills, professional development, and health structure limitations.

Findings - RO1

Participants' emotion words were charted onto Larsen and Diener's (1992) circumplex model. Emotion words were positioned onto the circumference in the positions defined by Larson and Diener (1992) and refined by Larson et al (2002). The level of activation can be seen as the level of arousal the emotional state presents and the level of pleasantness or unpleasantness is simply how agreeable the emotion was to the respondent. The three main findings from analyses of RO1 were: (1) physiotherapy participants felt a wide range of emotions while they conducted their work; (2) pleasant/inactive emotions (such as calm and contentment) were absent; and (3)

the negative emotions were mentioned twice as often as the positive emotions.

Findings - RO2 and RO3

Illustrating emotions on a circumplex model enabled an overview of the physiotherapists' emotions. Thematic analysis suggested specific scenarios consistently related to certain emotions. Scenarios did overlap, for example, the social and technical scenarios, so we have discussed them below in relation to their primary themes. The following section summarises each scenario with illustrative quotes from interviewees, and indicates some of the self-management strategies used.

Technical

The technical aspect of the physiotherapists' roles provided the most activated emotions across the board. Helping patients achieve life-changing outcomes through the therapists' application of knowledge and skills activated interest, stimulation and excitement for all ten therapists. On the model formulated by Larsen et al (2002), emotions associated with successful patient outcomes were pleasant emotions with variance into activation.

However, somewhat paradoxically, the physiotherapists also said that their technical skills were automatic, and they perceived this aspect of their work as undemanding in comparison to therapeutic communication.

"The technical skills are automatic, they come without much effort. It is more about the relationship... Gaining trust is vital or what you do technically will be a total waste of time." (Therapist 4)

"That is where the energy goes, in the client relationship." (Therapist 3)

"I do like to know about people or it would be dry, like a technician. Once you understand people's personalities you can see who you have to soft-talk to, or hard-talk to, and see how you can work better with them." (Therapist 9)

Therapists consistently said that the relationship aspect of their role was central to the technical success of their physical interventions; that is, the relationship skill of 'reading' the client was crucial to successful patient outcomes. In these instances, presentational emotion work was evident.

Receiving patient affirmation validated the physiotherapists' sense of pride.

"You think, wow, I did make a difference to that person's life. I do attribute to it to myself because they say I turned their life around." (Therapist 4)

Not all emotions associated with technical issues were positive. Non-compliance and poor outcomes affected professional confidence. Tiredness when outcomes were not achieved was also evident, especially with rehabilitation work. Frequently these emotions were strongly worded.

"It's draining on me when they disappoint me." (Therapist 3)

"You really get to know what life is like for them and their barriers... the rehab time is much more patient centred." (Therapist 4)

"... hugely emotional." (Therapist 4)

"The bad ones tend to live with you. I think I could be more hard-hearted and efficient but I am too conscientious for that." (Therapist 2)

In these instances, philanthropic emotion work was strongly evident. Feelings of disappointment however, were discarded quickly.

"There are far more positives in my day so the next person who walks in is more than likely going to be someone who is lovely, who appreciates what I do." (Therapist 5)

Social

The second inter-related theme, the social, profoundly influenced the physiotherapists' emotions, both positively and negatively. Social factors relating to the patient relationship were central to all ten physiotherapists who reported satisfaction, self-worth and belonging because of their work with people. Pleasant feelings were also mentioned about other types of social configurations such as collaborations with colleagues.

"It is a great satisfaction in my work that we can sit around a table with a shared vision... about physiotherapy in that people have understood what I was trying to communicate and have wanted to share it." (Therapist 7)

Being part of a local community provided a strong sense of self worth and satisfaction.

Belonging to the community, supporting the local school; that is what I like to do." (Therapist 5)

"I love the sense of community... not only in the clinic but in the supermarkets. I love that belonging." (Therapist 9)

Meeting new people was stimulating for all participants, with euphoria reported:

"I try not to come down off the high of seeing patients; the paperwork interrupts that." (Therapist 6)

Interviewees also felt negative emotions about their relationships with wider communities. Several interviewees expressed frustration and disappointment for an apparent professional devaluation:

"I think as a profession we have really undervalued ourselves." (Therapist 7)

Others mentioned, to avoid being judged they preferred not to introduce themselves as physiotherapists. Difficult emotions such as these were managed by something within their control; returning their focus to treating the patient. In other words, presentational emotion work was performed.

Other negative emotions arose when patients were non-adherent or doubting of the therapist's ability. Pressure to meet high expectations was the primary source of tiredness, fatigue, feeling drained and exhaustion:

"Sometimes I go to work and think I don't know if I can give. I just say I am a little bit slow today." (Therapist 6)

Patients who appear distant also precipitated feelings of inadequacy or tiredness.

"The more I was trying to help her the more I got knocked back a bit. I felt like I was trying to dig a hole and the dirt was falling back in." (Therapist 1)

Fatigue and inadequacy lie close to the unactivated unpleasant dimension in Larsen and Diener's model (1992).

Ways of coping included identifying communication barriers and trying to overcome them, and by 'gifting' time and service, or 'digging deep' to access a well of philanthropy and regain a sense of meaning. Others simply respected the patient distance; employing presentational emotion work:

"I don't feel we have to be warm and fuzzy. If they don't want to engage that's fine." (Therapist 7)

"If I am treating someone who is not so open emotionally and try to get that connection, then it will be a big mismatch." (Therapist 6)

"You get people that are terribly private that do not appreciate enquiry. You have to have the sense to tell whether they want to tell you things." (Therapist 10)

Patients who some therapists found 'challenging' were a source of satisfaction for others. For instance, Therapist 4, in contrast to her partner (another physiotherapist), enjoyed working with more complex patients:

"My partner would hate to do this sort of work (chronic rehabilitation), as he likes to treat someone quickly and get them back to their sport. He doesn't really enjoy the emotional side of a relationship so it suits him not to do this sort of work."

Some participants admitted they did not like some patients. Emotions in this regard varied from fear and aversion to ambivalence, emotions that the therapists masked and presented more appropriately:

"I don't like everyone I treat so I pretend to like them. I am good at acting, especially when pretending to like someone that I don't like or I won't get anywhere with them." (Therapist 4)

"I feel like a chameleon, morphing into whatever is needed." (Therapist 9)

Six therapists employed acting to manage their emotions.

The physiotherapists said, out of respect for patient's time, they kept conversation completely patient-focused when working with patients, although occasionally they shared some personal information.

"They have to feel like they are the only pebble on the beach." (Therapist 10)

"There is a boundary that I don't want to share. It comes from a necessity to preserve myself." (Therapist 7)

If the physiotherapists were uncomfortable with topics brought up by their patient they actively neutralised the conversation, for instance, feigned indifference. Two therapists, who felt that professional boundaries deterred them from sharing personal information, reported being less drained as a result. Other strategies used by the physiotherapists to mitigate negative emotions brought about by the social aspects of their jobs were to seek collegial and family support. There was no evidence to suggest employers exerted norms for emotional displays on the four participants that were employed in our sample.

Professional

Learning new skills inspired, stimulated and satisfied all ten therapists. Confidence and self-worth were derived from skill mastery, experience and professional recognition. All positive

emotions in the professional category were activated and pleasant. Additionally participants typically commented:

"I am more realistic about what I can do and am trying to be happy doing a good enough job. Whereas 10 years ago I wanted to do the best all the time, now I am happy that what I am doing is my best and that is good enough." (Therapist 2)

Arguably this comment signifies resignation; however, we believe it demonstrated a pacing of effort by the therapist to allow continuance in their role long term. Experience appeared to enable a sense of maturity and self-confidence in interviewees' skills and abilities.

Structural

Structural factors intrinsic to the job itself - autonomy, variety, and flexibility, precipitated emotions such as stimulation, excitement and interest. Emotions in this category were more highly activated, used to mobilise and sustain therapists through their negative periods. In this study, structural scenarios presented physiotherapists with the majority of negative emotions. Negative emotions such as frustration arose directly from tensions between serving the patient and funder requirements.

"We often see ourselves as an advocate for the patient and we are obligated to ensure that the process is successful but the process itself is seldom successful and it is limiting." (Therapist 7)

"The relationship with ACC has changed and that has been frustrating. They are now suspicious and judgmental of physiotherapy. I am starting to feel threatened." (Therapist 9).

Other therapists reported they felt fatigued due to funder demands, and felt policy changes had devalued their profession.

"I just think it is all turned upside down; it should be getting easier not harder... If the trend continues to deteriorate I am asking myself: Will I be able to continue?" (Therapist 9)

Additional administrative tasks associated with these requirements were an additional source of frustration as it took time away from patients. A large degree of effort was apparent in the presentational emotion work required to manage the negative emotions evident in these scenarios.

DISCUSSION

Findings showed that emotions are integral to the work performed by private practice physiotherapists. These emotions are complex, sometimes contradictory, and there are individual differences. The preponderance of negative emotions mapped on the circumplex model does not mean that the physiotherapists are negative about their work; merely that there was a greater variety of negative emotion words used than positive ones. Mann and Cowburn (2005) argue an increased variety of emotions is positively correlated with increased daily stress levels, so the wide variety of emotions we found may be indicative of stress risk. Stress may also come from reported unactivated states like fatigue and depression, which lie close to the un-activated unpleasant axis of the circumplex model. If these emotions are found in workplaces, they are indicative of emotional exhaustion and work place stress (Maslach 1982, Blau et al 2010). Another concern was the lack of un-activated pleasant emotions, like calmness, found amongst participants. It

would be hoped these emotions would be increasingly present with skill mastery and experience.

Findings were presented according to the four themes of technical, social, professional and structural contexts. These themes demonstrate two of Bolton and Boyd's (2003) categories of emotion work: presentational and philanthropic. Technical scenarios show that skill mastery was a major source of activated pleasant emotions. When negative emotions were mentioned in technical scenarios they were attributed to patient non co-operation. Presentational and philanthropic emotion work were employed to overcome these emotions. This finding is consistent with Maslach's (1982) argument that patients who do not follow advice require more emotion work. Consequently, therapists' successes were tied to the quality of their therapeutic relationship, as well as their technical skills.

Social scenarios revealed the widest range of emotions and a large range of management techniques. All therapists reported satisfaction, self-worth and belonging because of their work with patients, colleagues and the community. Philanthropic examples of emotion work were evident. Complex clients were a source of tension and negative emotions like frustration but contradictorily, satisfaction also. This latter observation confirms Do Bonfim and Geudes Gondim's (2009) findings that positive effects can be felt even in a challenging and demanding environment. Although the physiotherapy participants enjoyed the autonomy and flexibility they had in their jobs, they also reported tensions between their desire to serve patients and funding regimes that enforced structures they felt detracted from their primary focus. Presentational emotion work was employed in these instances.

The professional scenarios highlight presentational emotion work was necessary, though emotions were largely pleasant and activated. Interviewees felt positively about learning opportunities and professional skill mastery. The structural theme showed highly activated emotions sustaining therapists through the more difficult presentational emotion work on negative emotions arising from conflicting funder and patient requirements.

No participants in this study suggested money was a motivation for their emotion work; pecuniary emotion work was not evident:

"If it was about the money I would be working in a different way. It is the satisfaction I get from helping people with my skills." (Therapist 3)

"I don't look at the numbers; I am more about what we did for those people today." (Therapist 9)

Philanthropy (caring) was clearly both a direct and indirect motivation across all themes. Therapists actively sought to understand their clients' motivations in order to break down psychological and physical barriers hindering them from healing.

"One of the skills we learnt is to deliver the information in such a way that the obstacles for taking the concept further are analysed" (Therapist 7)

"I get involved with a patient and give them the time needed" (Therapist 10)

Caring not only guides treatment choices (Greenfield 2006) but also motivates therapists to continue with complex patients in

difficult circumstances. Greenfield et al (2008) have shown that an emotional connection draws physiotherapists to continue to work with a patient even when rehabilitation goals have been met.

The therapists used presentational emotion techniques on a daily basis. They managed negative emotions mainly with surface acting, sometimes through deep acting or distancing techniques. The physiotherapists were aware of the limits of using acting techniques, being cognisant of the risks of faking emotion and destroying trust. Surface acting tended to occur in the regular clinic appointments, and deep acting when working with rehabilitation clients. Sampled physiotherapists reported that the emotion work done with these complex rehabilitation clients required more effort and could be more draining, hence the need to work (act) more consistently.

By using philanthropic and presentational methods, the therapists controlled their levels of engagement. There was minimal evidence of prescriptive emotion work and no pecuniary emotion work was reported. In some respects, there are similarities in these findings to nurses who also perform philanthropic emotion (Lewis 2005) but the physiotherapists we talked to carried out presentational rather than prescriptive emotion work. This result can be possibly explained by the smaller organisational size and level of autonomy that the physiotherapists had in comparison to nurses who tend to work in larger organisations.

The physiotherapists used acting and distancing techniques to manage their emotions. Additionally they sought collegial support and professional development opportunities. With distancing the therapists detached themselves from strong opinion during conversations, respected patients' privacy and restricted the sharing of personal information. Blau et al (2010) noted emotional displays were similarly managed with other types of demanding clients. The skill of distancing is a learnt one, also used by experienced nurses (Mazhindu 2003). Distance can be achieved through actively moving onto the next client, or envisaging the emotion exit with the patient. Experience enables therapists to develop their own methods of escaping negative feelings:

"Having worked for so long you do understand this game of not taking it seriously, not taking it home." (Therapist 9)

"Walking the dog which is not demanding of my time or knowledge." (Therapist 5)

Collegial support was sought and utilised to avoid exhaustion and to share negative emotions, particularly in the structural and technical categories. The physiotherapists in our sample worked in small organisations, and without access to collegial support, they may have been more vulnerable. Mancini and Lawson (2009) showed that mental health workers devoid of peer support tended towards emotional exhaustion, stress and burnout, causing an increasingly high turnover in their role.

In 2010, 28% of physiotherapists considered leaving the profession (Physiotherapy New Zealand Workforce Survey 2010). Although the exact reasons for this finding are unknown, we argue that more research about how physiotherapists feel about their work is required to help mitigate this problem. Research is required to explore whether workplace stress is evident, whether emotion work differs with experience, gender or location, and whether those exiting the profession do so in relation

to emotion work factors. The public sector may also present different findings. It would also be helpful to map the frequency of specific positive and negative emotions in order to determine their significance.

CONCLUSION

Nicholls et al (2009) reminded the physiotherapy profession that healthcare models must include psychological, social, economic and cultural dimensions. This research aimed to explore the emotion work dimension of the physiotherapy profession, both for the benefit of the patient relationship and the provider.

This study underlines the importance of emotions and emotion work to physiotherapists in private practice. Presentational and philanthropic emotion work is evident as physiotherapists manage negative emotions arising during their work whilst building the fundamental patient relationship. Alarming, the wide range of reported negative emotions may be indicative of workplace stress. Positive emotions were predominantly highly activated and these appeared to sustain the physiotherapists in their role. Philanthropic caring motivated the physiotherapists. Surprisingly unactivated pleasant emotions such as calmness were not found, despite the depth of experience and purported skill mastery of the participants.

KEY POINTS

- Private practice physiotherapists in this study performed presentational and philanthropic emotion work.
- Highly activated positive emotions arising from technical and social aspects of the role sustained the physiotherapists.
- The wide range of negative emotions experienced by participants highlighted the risk of workplace stress.
- Further research is recommended to examine emotions and the use of emotion work in physiotherapy practice.

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Appendix 1: Interview Schedule

General Introduction: I am interested in learning more about the emotion work that we do in our job. By emotion work I mean how we manage the emotions that we have at work, such as nervousness, pride, happiness and sadness. I would like your comments on some questions that I have. There is no right or wrong answer. This is more of a discussion so that I can learn about your thoughts.

1. Can you choose a day that was fairly typical for you and tell me about what you did? [Choose a day that was very recent such as yesterday].
 - a. What did you like about the day?
 - b. What things stirred up positive emotions for you, [such as pride or relief]?
 - c. Can you tell me what it was that might have triggered that?
 - d. How did you manage that emotion, did you share it with someone or forget about it and move on?
 - e. What did you dislike about the day?
 - f. What stirred up negative emotions, [such as fear or anger]?
 - g. How did you cope with this? [For example, did you bottle it up, talk about it with someone or reflect on it privately?]
 - h. Did the emotion change during the day or afterwards?
2. Let's talk about your clinical work, your time spent treating patients.
 - a. What do you talk about with your patients?
 - b. What things do you do to create a good relationship with your patients?
 - c. What do you do to engage patients in their rehabilitation?
 - d. When do you share your feelings with your patients and when do you not?
 - e. What stops you sharing how you feel with patients?
3. Tell me about a time, or times, when you have disliked your job.
 - a. What was it about that you found difficult?
 - b. What emotion/s did that give you?
 - c. What did you do to enable yourself to carry on with your day?
 - d. What stopped you giving up on that task?
4. Tell me about a time, or times, where you enjoyed your job.
 - a. What was it that you enjoyed about that?
 - b. What emotion/s did you feel?
 - c. What did you do with that, [did you share it with colleagues, ignore it for example]?
 - d. Has the way you feel about the job changed since you first started? In what way?

Closing: Do you have anything else to add that would help me understand your experience of the emotion side of your work?

Practical challenges and limitations using the Oswestry Disability Low Back Pain Questionnaire in a private practice setting in New Zealand. A clinical audit.

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ABSTRACT

The Oswestry Disability Low Back Pain Questionnaire (ODQ) is a validated outcome measure responsive to chronic low back pain. In New Zealand, a proportion of private practitioners use this disease specific outcome measure. This clinical audit of a solo physiotherapy practice treating patients with chronic low back pain sought to outline the challenges and limitations of maintaining and interpreting the ODQ. Over a period of 9 years and 447 patients, 225(52.9%) completed the ODQ at discharge and 127(29.9%) at follow up of 2 months. Analysis of individual categories revealed smaller change scores in those with the highest baseline scores, i.e.; lifting, sitting and activities. Delay to treatment >3 months reduced change scores and increased treatment numbers ($p=0.001$).

Outcomes showed improvement of between 53% and 79% at discharge, which was maintained at follow-up. Minimal detectable change was calculated to be 11% but the absence of appropriate data to calculate a Minimal Important Clinical Difference (MICD) was a limitation. Collecting and maintaining outcome statistics impacts on the interpretation of the measure. Poor questionnaire return rate and administrative errors also reduced the validity of the data.

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Key Words: Oswestry Disability Low Back Pain Questionnaire, Chronic Low Back Pain

INTRODUCTION

Outcome measures are recognised as a valuable tool when assessing response to intervention, yet little is known about the practical challenges involved in their collection and interpretation within private physiotherapy practice in New Zealand. Research usually requires a team effort in a university-funded setting (Dworkin et al 2005, Fairbank et al 2005, Stratford et al 1994, Wessels et al 2006) but over the last two decades there has been increased pressure by funders on individual physiotherapists to substantiate the effects of clinical treatment using outcome measures. The first experience in New Zealand of this was during the late 1990's with multiple funders for injury treatment and a perception that funding would be dependent on outcomes. As recently as 2009, the Accident Compensation Corporation (ACC) mandated the use of outcome measures, namely, the Visual Analogue Score and the Patient Specific Functional Scale (ACC News 2009), which must be submitted when requesting further treatment funding. However, there are significant limitations regarding what the outcome measure tells us because of confounding influences, for example, psycho-social factors. Selecting a treatment based on evidence from randomised controlled trials is the gold standard, but in clinical practice, there may not be such evidence to draw on. Thus using outcome measures, as a clinical audit to gauge response to treatment, becomes the only available alternative (Herbert et al 2005).

This is a study of a private solo practice specialising in the treatment of chronic non-specific low back pain, between the years of 2001 and 2009, during which the Oswestry Disability Low Back Pain Questionnaire (ODQ) was used as an outcome measure (Fairbanks et al 1980). The ODQ was chosen over the Roland Morris Disability Questionnaire, because it was considered to capture more thoroughly the parameters of interest to both

therapist and patient (Beattie and Maher 1997). This is an internationally recognised outcome measure used by some New Zealand physiotherapists (Copeland et al 2008) and has been validated for reliability and responsiveness for chronic back pain (Bombardier 2000, Campbell et al 2006, Chartered Society of Physiotherapy 2004, Deyo 1988, Frost et al 2008).

The ODQ has 10 questions, each broken into 6 levels of severity (0-5). Possible total scores range from 0 for no disability to 50 for the greatest disability. The total score is multiplied by 2 and divided by 100 to provide a percentage score. Question categories include personal care, lifting, sitting, standing, walking tolerance, social activity, travel, sex and pain severity. Fairbank et al (1980), the original developers of the ODQ, devised an arbitrary scale of disability: 0-20% minimal disability, 20-40% moderate, 40-60% severe, 60-80% crippled and 80-100% bed bound or exaggeration, thereby giving the therapist a benchmark for severity. To assess significant change in treatment, researchers have recommended a mean score improvement of 4-6 points or, alternatively, calculating the Minimal Detectable Change (MDC) (Chartered Society of Physiotherapy 2004, Davidson and Keating 2002). An improvement of 10.5 percentage points (range 4-17) is recommended for the Oswestry scale to be 95% confident that meaningful change has occurred (Davidson and Keating 2002). In the UK, a 10 percentage point improvement is accepted as significant change (Chartered Society of Physiotherapy 2004).

The treatment provided at this practice is focused on functional movement patterns. The patient is educated in recognising patterns of spine behaviour that cause pain and how to use efficient, balanced, pain free movement. Education is provided in conjunction with specific stabilisation exercise, manual treatment including myofascial release techniques, mobilisation/manipulation and balance/proprioceptive exercise when required.

The purpose of this paper is to elucidate the practical challenges of collecting data in the private practice context and to analyse how this can affect clinical decision making.

METHOD

In this study patients were included from 2001-2009 using the ODQ (version 2) (Chartered Society of Physiotherapy 2004). Each patient was given an ODQ form to complete 10 minutes prior to their initial treatment. In 2008, this process was adjusted to reduce the problem of late arrival of the patients, such that the ODQ was mailed to the patient, so it could be completed prior to their appointment. The second Questionnaire was completed at discharge, or soon after by letter, and the third questionnaire was completed by mail follow up at two months post discharge. The patient was sent the questionnaire with an explanatory letter and a stamped addressed return envelope.

In this study, 'chronic low back pain' is defined as pain persisting longer than 3 months as stated in the NZ Acute Low Back Pain Guidelines, (ACC 2001, Bogduk 2004) and 'interval' as the time period from injury to first treatment at this clinic. Clarification on the ethics of this study was sought from the Health and Disability Ethics Committee who confirmed a review was not required for this audit (NTY/11/EXP/069). However, informed patient consent was obtained.

DATA ANALYSIS

Data were collected using the Peak Software "Physio Office" Programme, which was uniquely configured to allow for collection and export of data to a relational database. Statistical analysis was undertaken using Statistica version 5.1. Chi squared analysis or students t test were used for discrete or continuous variables respectively. Significance was set at a p value of less than 0.05 (2-tailed). Anova was used for the multiple variables.

RESULTS

The number of patients treated with an initial diagnosis of low back pain who participated in the ODQ study was 447. This comprised 50% of the total number of patients (880) treated with low back pain over this period in the practice. The mean age of patients included in the ODQ study was 42.9 years and 61% were female. The reasons why patients were not included were: incorrect data entry resulting in failure to capture statistics (33%), declined to participate (11%), and incorrect diagnosis (6%)

The 'interval' ranged from 5 weeks to 10 years and 70% of patients were classified as chronic, with 34% having symptoms for more than 1 year. There was a significant difference in the number of treatments required by patients presenting less than 3 months post injury compared to those presenting greater than 3 months post injury (6.1 SD4.6 versus 7.2 SD4.7, respectively, p=0.001) (Table 1).

Table 1: Treatment numbers across total low back pain population

Average Number of Treatments	6.8 (SD 4.7)
Patients <3/12 from date of injury	6.1 (SD 4.6) **
Patients >3/12 from date of injury	7.2 (SD 4.7)
Mean Time from Date of Injury to First Treatment (Interval) (yrs)	2.2 (SD 4.8)

** p= 0.001 Patients <3/12 post injury versus >3/12 post injury

The ODQ was administered on three occasions; 225 patients (52.9%) completed a form at discharge and 127 (29.9 %) completed the third and final follow up questionnaire.

Neither age nor sex influenced completion of the ODQ data at discharge or at follow up (Figure 1). However, increasing delay in presentation to first treatment resulted in reduced return rates of the questionnaire (p<0.01) (Figure 2). Thus 127 patients comprised the group that underwent further detailed analysis.

Figure 1: Non Return of Questionnaires by Age

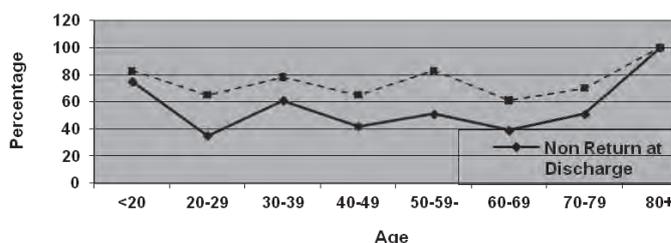
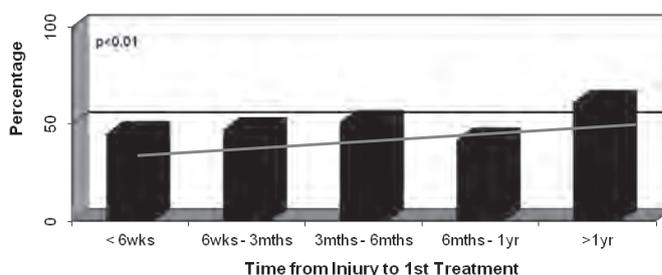


Figure 2: Non Return of Questionnaires by Interval

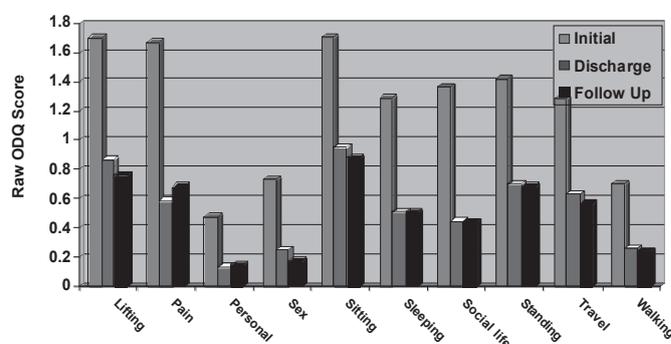


ODQ RESULTS

The total initial ODQ score was 24.5%, the total discharge score was 10%, and the total follow-up score was 10%. Improvement in total score from baseline to discharge was 42.5% and from baseline to follow-up was 42.8%. The average baseline raw score across all categories was 1.25 (SD1.0) (24.5% SD20%). This places patients in the moderately disabled category as classified by Fairbanks (1980).

Three records (2.3%) showed symptoms had worsened at discharge and remained the same at follow up. The improvement from baseline to discharge was significant across all categories (p<0.001) and was maintained at the 8 week follow up period (Figure 3).

Figure 3: ODQ Results by category



The mean improvement for those patients who completed all three questionnaires was 5.5. The MDC in this population was lower due to the moderately low average baseline score (24.5%)

and was calculated to be 5.5 (See Appendix 1) (Davidson and Keating 2002).

INDIVIDUAL CATEGORY ASSESSMENT

Figure 3 shows the response in the individual categories and the scores at initial assessment (baseline), discharge and follow-up but these include scores equal to zero. In order to assess the impact of treatment on those individual categories that had been the predominant complaint initially, data were re-analysed using categories with a baseline score greater than or equal to 1. At baseline, the categories most disabling to the patient were lifting, sitting, standing, pain and social activities. These categories improved by 57%, 53%, 56%, 58% and 69%, respectively. Greatest improvement from baseline to follow up occurred in sex (79%), personal (77%), and walking (71%) (Table 2).

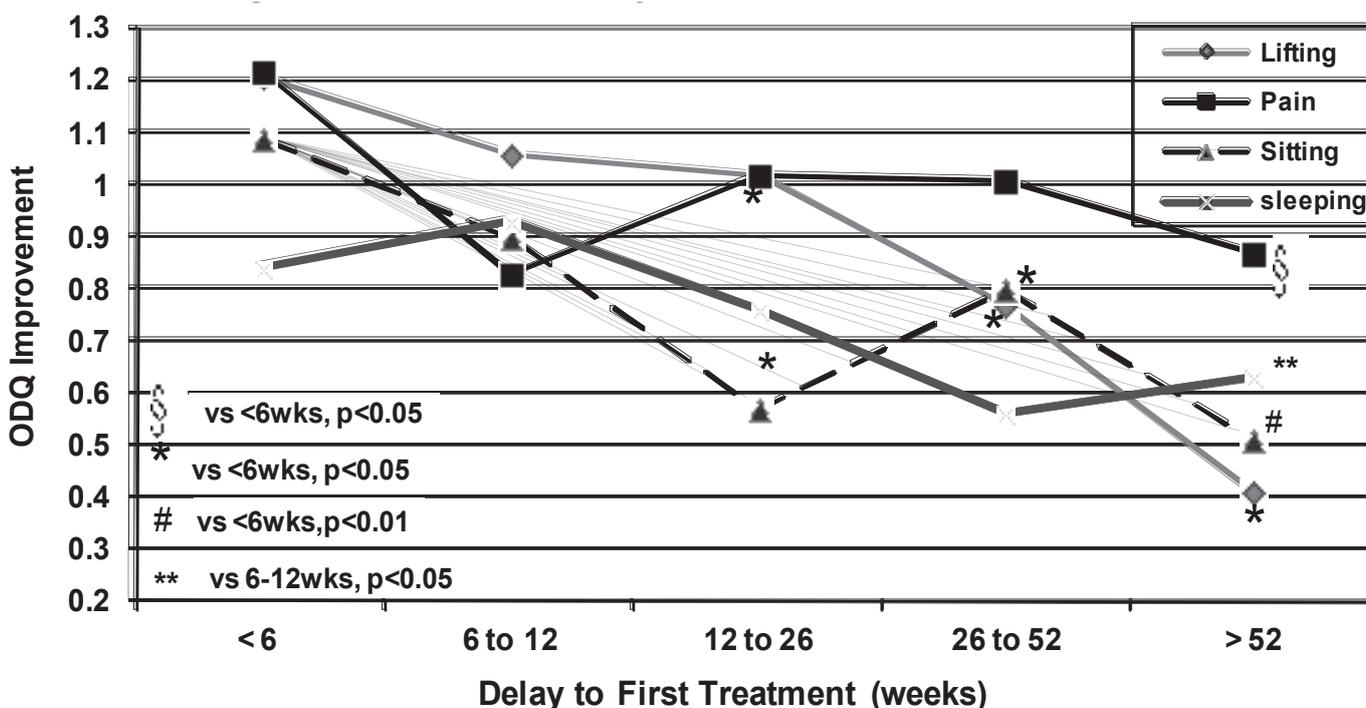
Table 2: Average Scores by individual category (n=127)

Category	Lift	Pain	Personal	Sex	Sitting	Sleep	Social	Standing	Travel	Walk
Baseline Score	2.0	1.7	1.2	1.6	2.1	1.4	1.9	1.7	1.6	1.6
Follow Up Score	0.9	0.7	0.3	0.3	1.0	0.6	0.5	0.8	0.6	0.4
Improvement (%) (SD)	57 (26)	58 (19)	77 (18)	79 (22)	53 (22)	58 (17)	69 (20)	56 (22)	60 (20)	71 (18)

INJURY CHRONICITY AND OUTCOMES

Delays to initial treatment impacted the overall ability to improve the ODQ score at discharge ($p=0.013$ for overall trend). This was most apparent in the areas of sitting, lifting, pain and sleeping (Figure 4).

Figure 4: Impact of Delay to Treatment on ODQ Outcomes



DISCUSSION

The most significant findings of this study were that delay between injury and treatment affected treatment numbers and

outcome scores and was associated with reduced compliance in return of the questionnaires.

Collecting data in a private practice setting without the aid of research facilities or staff presents administrative and financial challenges and in this case required extra staff to be employed. The greatest difficulty was collecting data at discharge (52.9% questionnaire return rate) and follow up (29.9%). This potentially selects out those patients with favourable outcomes and limits interpretation of results. In a comparative study at the La Trobe University Physiotherapy School, 51% of the initial 207 participants returned the follow up questionnaire at 6 weeks following discharge (Davidson and Keating 2002). Varying periods of follow up between 1 week and 2 years are used in research (Fairbank et al 2005, Fritz et al 2001, Hagg et al 2002, Hagg et al 2003, Walsh et al 2003). Although the follow up questionnaire was scheduled to occur at 8 weeks, in actuality this varied up to 16 weeks, depending on the workload of the administrative person.

Questionnaire return rate also appeared to be influenced by injury 'interval' (Figure 2) and may have impacted on the accuracy of the outcome measure due to patient recall (Hagg et al 2002, Kamper et al 2009). The scores at discharge and follow up; however, were remarkably similar, suggesting that the improvement in those who did return the questionnaires was

the direct influence of the therapist for improved accuracy and reproducibility (Kendal 1997).

INTERPRETING THE SCORE

Calculations are unique to each population studied (Beaton 2000). Davidson and Keating (2002), in their study of 106 low back pain ambulatory patients receiving physiotherapy, found the Minimal Detectable Change (MDC) value to be 10.5% at minimum and up to 15% when the baseline scores were higher. It is recognised that the less disabled the population the lower the MDC value (Beaton 2000, Stratford et al 1998). Our study has shown a value of 5.5 in this population (or 11%), consistent with the lower level of baseline disability. This score was met at discharge and maintained at follow up. However, a significant MDC value does not necessarily mean the change was clinically relevant and important to patients (Beaton 2000, Stratford et al 1998). This necessitated the calculation of the Minimal Important Clinical Difference (MICD), which has been defined as the 'smallest change that is important to patients' (Fritz 2001, Lauridson et al 2006, Stratford et al 1998). Calculating the MICD requires a gold standard question in the form of a global questionnaire to allow calculation of sensitivity and specificity (Lauridson et al 2006, Riddle et al 1998, Stratford et al 1998, Walsh et al 2003). A simultaneous global questionnaire was not administered in this study. Due to these limitations, no absolute conclusions can be drawn regarding the efficacy of the treatment provided in this study.

The ODQ has generally been scored across all questions, however this study looked at the results in each individual question in order to target specific patient needs. Hagg et al (2003, p. 13) state that "individual items of a multi item outcome measure cannot be expected to change to the same magnitude". The overall score may dilute a significant improvement in the presenting complaint if there was minimal change in other less relevant areas.

Reviewing the individual category scores demonstrated that the greater the baseline score, the smaller the change score, which is consistent with other studies indicating that areas most affected by chronic pain were most resistant to change (Table 4) (Beaton 2000, Hagg et al 2003). Treatment plans were directly affected by the baseline scores and treatment was targeted to improve functional techniques, particularly in the areas of lifting, sitting, social activities and standing posture. One way of improving the applicability of the score to the individual patient might be to allow the patient to weight the individual categories according to their significance for that patient, as has been implemented in the Lower Limb Task Questionnaire (McNair et al 2007). Applying an MICD calculation to individual categories may further improve relevance. With further research in this area, a standardised mechanism of calculating change could be developed.

IMPACT OF DELAY TO TREATMENT

The 'interval' affected the overall scores revealing that the greater the time between injury and treatment the harder it was to make a difference. Correspondingly, there was an increase in the number of treatments required for those with pain of over 3 months duration. This is in line with other studies showing earlier intervention (within 3 months), improves outcomes with fewer treatments (CAHE 2009) and is endorsed in the Acute Low Back Pain Guidelines (ACC 2001). This was also evident in the individual functional categories of lifting, sitting and sleeping (Figure 4).

CONCLUSION

The practical challenge of collecting and maintaining outcome statistics impacts on the interpretation of the measure. Poor questionnaire return rate and administrative errors reduced the validity of the data. Improving the return rate of questionnaires remains a significant challenge in private practice and this requires more resources in the form of increased time allocation, staffing and finance. Analysing and interpreting outcomes in this clinical audit altered the procedures of administration at this practice and a global measure has now been included. Despite the limitations outlined, this study does support the benefit of earlier intervention for back complaints both in reducing the number of treatments required, and thus cost involved, and improving the magnitude of symptom relief gained.

Centralising and standardising the outcome measure assessment for the country would reduce the individual costs by clinicians and provide a more robust medium for auditing private practice treatment in New Zealand.

KEY POINTS

- Collecting and maintaining an outcome measure database in private practice presents administrative challenges which impact on the outcome measure's validity.
- Delay of treatment effects treatment numbers, outcome measure scores, and return of outcome measure forms.
- Calculating a significant improvement is unique to the patient population and requires the addition of a global questionnaire to enable calculation of an MICD.

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Appendix 1: Calculating the Minimal Detectable Change

The Minimal Detectable Change (90% CI of the error associated with the repeated measurements) for this population was calculated using the formulas described by Davidson and Keating (2002) and Beaton(2000):

$$SEM = SD_{ave} \sqrt{(1-R)} = 1.0\sqrt{(1-0.84)} = 0.4$$

Where SD was the average standard deviation of the scores initially and R is the test re-test reliability co-efficient. The reliability co-efficient was not calculated directly from the population in this study as there was no concurrent global questionnaire to use for this calculation. The reliability co-efficient value of 0.84 was therefore chosen from the Davidson et al (2002) study as the population and time frames were similar to the present study. The error associated with three measurements was calculated with the following formula:

$$SEM_{repeat} = \sqrt{3} \times SEM = 3.4$$

The 95% CI (the MDC) was calculated by multiplying the result by 1.64 (the tabled z value). MDC value = 5.5

(This z value is sometimes changed by researchers and the alternative z value of 1.96 used (Hagg et al 2003) giving an alternative MDC calculation of 6.6.)

Exercise: 'Friend or Foe' for people with multiple sclerosis who experience fatigue?

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ABSTRACT

Self-reported fatigue is a complex, multifactorial symptom frequently experienced by people with multiple sclerosis (MS). There is growing evidence that regular participation in exercise activities might result in better physiological fitness and perceived health in this population; however, many people with MS-related fatigue are anxious about exercising. Measurement of self-efficacy coupled with intervention strategies to increase levels of self-efficacy might help to lessen anxiety and improve exercise confidence for people with MS.

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Key words: Multiple sclerosis, fatigue, exercise, self-efficacy, confidence

Self-reported fatigue is a complex and multifactorial symptom; poorly understood, yet frequently experienced as a disabling symptom in many chronic conditions including multiple sclerosis (MS) (Braley and Chervin 2010). For people with MS, self-reported fatigue is described as "A subjective lack of physical and/or mental energy that is perceived by the individual or caregiver to interfere with usual and desired activities" (Multiple Sclerosis Council for Clinical Practice Guidelines 1998, p2). It is thought that many chronic conditions such as Parkinson's disease, rheumatoid arthritis and MS share some of the contributory causes of self-reported fatigue (such as poor sleep quality and mood disorders); however, it appears that each condition might have a unique pathophysiological trigger (Smith and Hale 2007). In MS, this trigger is thought to be a compensatory increase in central nervous system activity in response to delayed axonal conduction (Braley and Chervin 2010). The energy demands of this process cannot easily be met as the MS brain demonstrates a reduced ability to utilise glucose (Roelcke et al 1997). This energy imbalance coupled with slowing of damaged axonal conduction in response to heat have, in the past, given rise to the seemingly sensible solution of 'doing less' and 'resting more' (Petajan and White 1999). Unfortunately, this well-meaning advice became widespread before research categorically demonstrated that people with relapsing remitting MS could expect a reasonably normal lifespan and that inactivity over a lifetime with MS could result in the development of other chronic conditions such as type II diabetes and cardiovascular disease (Slawta et al 2003).

The aim of this commentary is to briefly summarise both quantitative and qualitative evidence for the effects of exercise on fatigue in MS and to propose that evaluation, measurement, and intervention strategies for self-efficacy might assist both the person with MS considering exercise and the health care provider in the facilitation of exercise-related behaviour changes.

In 1996, Jack Petajan and colleagues published a seminal randomised controlled trial (RCT) which demonstrated that people with MS who exercised on stationary cycles several times per week became fitter without any significant increase in self-

reported fatigue compared to a non-exercising control group. Furthermore, although non-significant, the authors reported a trend towards reduced fatigue in the exercising group (Petajan et al 1996). Several studies over the last 25 years have demonstrated similar results and subsequent reviews have made cautious recommendations about the potential health benefits of exercise such as increased strength and cardiovascular fitness, reduced fatigue, and increased quality of life for people with MS (Andreasen et al 2011, Rietberg et al 2005). These reviews also recommend further research to establish optimal exercise dose for this population.

In addition to the regular health benefits to be gained from exercise participation, exciting preliminary evidence from recent animal-based studies suggests that exercise might also play a crucial role in the brain health of MS including neuro-regenerative, neuro-protective and neuro-adaptive contributions (White and Castellano 2008). Furthermore, a recent review tentatively suggested that people with MS who are physically fit might perform better cognitively than those who are not physically fit (Motl 2011). There is currently no evidence that exercise induces relapse in the remitting relapsing form of MS. However, despite mounting evidence for the benefits of regular exercise for this population with no adverse effect on self-reported fatigue, people with MS continue to find exercise participation daunting, in no small part due to their fatigue experiences and fear of what fatigue might mean in terms of disease progression (Kayes et al 2010). In order to answer the question of how fatigue influences exercise participation, it is necessary to take an in-depth look at fatigue and exercise experiences for people with MS.

Research investigating the lived experiences of fatigue in people with MS has described how the complex, individualistic, invisible and unpredictable nature of perceived fatigue can easily overwhelm the person with MS (Flensner et al 2003). In a more recent study, more specifically exploring fatigue and exercise experiences in this population, participants have described fatigue experiences as 'possession', a state in which they feel that fatigue has total control over the individual (Smith et al 2009). On a theoretical continuum of perceived

control, these authors associated 'possession' with individuals having a low or 'no' sense of perceived control over fatigue. Participants who perceived a low sense of control over fatigue appeared to experience more negative exercise outcomes than those who experienced a strong sense of perceived control. It was hypothesised that a sense of perceived control played an important role in perceived exercise outcomes and that health care providers should possibly employ strategies to improve or maintain this sense of control when recommending or facilitating exercise participation.

Strategies which might foster an improvement in perceived control over fatigue include recognition and facilitation of the complex choices involved in exercise participation and active listening and observational skills during assessment and intervention. Research in this area found that choice influenced the level of perceived control in women who participated in a variety of community-based exercise activities (Smith et al 2011). Furthermore, those choices were complex, involving type, frequency, intensity, and meaning of exercise. The more that these exercise choices resulted in positive outcomes, the more the women felt in control of their fatigue. For example, most participants recognised that there would be both 'costs' and 'benefits' of every exercise choice. If they were 'satisfied with trade-offs' between the costs and benefits, then they experienced more perceived control over fatigue.

In the latter two studies, participants frequently referred to health care provider attitudes and encounters which influenced confidence in their ability to safely exercise with fatigue, a finding supported strongly in other literature investigating the experiences of people living with chronic conditions (Thorne et al 2004). Subsequent research into the beliefs and opinions of health care providers revealed that the poorly understood nature of MS-related fatigue could lead to feelings of interdisciplinary conflict particularly between health care providers who focused on holistic energy management and those who prioritised physical fitness as a key management strategy for this population (Smith et al 2010). Several health care provider participants in this study suggested that patients were able to detect this conflict resulting in loss of confidence in behaviour change (such as taking up a new exercise activity). A second finding from this study was that confidence to recommend and prescribe exercise was low amongst health professionals, particularly with lack of scientific understanding of fatigue. Several health care provider participants found that careful observation of patients during exercise, and active listening to fatigue descriptions guided more successful exercise prescription experiences. Occasionally, health care provider recommendations based on these 'subjective' strategies did not reflect recommendations based on experimental research findings, for example, health professionals described patients who experienced greater perceived health benefits when exercising only once per week instead of most days week (as recommended by the American College of Sports Medicine (Haskell et al 2007). In order to facilitate on going exercise participation, it might be necessary initially for health care providers to foster enjoyment and confidence with shorter, less frequent exercise sessions rather than to aim for a regime based on current recommendations. As the person with MS gains more confidence it might be possible to focus more on frequency and intensity of exercise required to increase physiological fitness.

From this series of studies it appeared that control, choice, and confidence (for both people with MS and health care providers) were three constructs that might influence perceived enjoyment of exercise and might possibly therefore also influence long term engagement in higher levels of physical activity. Sustained physical activity is important to prevent the onset of other long term conditions associated with inactivity.

It seems sensible to suggest that control, choice and confidence are related to the concept of self-efficacy: "beliefs in ones capabilities to organize and execute the courses of action required to produce given attainments" (Bandura 1997, p3), in other words, confidence in your ability to achieve a particular goal. Bandura proposed four sources of self-efficacy: mastery experiences, vicarious experience (modelling), physiological feedback, and verbal persuasion (Jones and Riazi 2011).

Physiotherapists will recognise examples of all these sources of self-efficacy in clinical practice. For example, mastery of a certain activity such as treadmill training could be achieved through a series of small tasks which might start with the use of a harness with minimal body weight support and gradually be reduced to treadmill walking with handrail support only. Achievable, incremental steps were described as important factors for people with MS attempting to take up new forms of exercise (Smith et al 2011 under review). Vicarious experience involves comparison and 'modelling' to persons perceived as being at a similar level or experiencing the same problems. This suggests that peer support might be useful for PwMS considering exercise; however, physiotherapists should carefully consider group dynamics if providing group exercise classes for the following reasons: firstly because a "one size fits all" approach has been described as a negative aspect of encounters with health care providers (Smith et al 2011), and secondly, because verbal persuasion, another source of self-efficacy, might influence self-efficacy both negatively and positively. It has been suggested that supportive family members are a potential source of self-efficacy through verbal persuasion as long as the patient perceives that they have been successful in a given task (Jones and Riazi 2011); however, Bandura cautions that persuasion pertaining to unrealistic goals can further undermine the confidence of an individual (Bandura 1997).

Physiological feedback influences self-efficacy when individuals form beliefs about how certain tasks make them feel both physically and emotionally. This has been demonstrated in a study when participants with MS-related fatigue exercised in eight-week physiotherapy led exercise programme. Those participants who felt a strong sense of perceived control over their fatigue experienced better psychological and physical feelings following exercise than those participants who did not feel in control of their fatigue. These feelings in turn reinforced level of perceived control (Smith et al 2009).

Preliminary evidence supports the link between self-efficacy and level of engagement in physical activity. Individuals who received a efficacy-enhanced exercise programme (n=13) showed significantly higher levels of enjoyment and adherence to exercise than the control group who received the same exercise programme but without an efficacy enhanced approach (n=13) (McAuley et al 2007). Furthermore, in a study which examined links between participation in physical activity and quality of life in people with MS (n=292), Motl et al (2009) demonstrated that physical activity participation had a stronger link with better

perceived quality of life in people with MS who had higher self-efficacy and lower levels of fatigue (Motl et al 2009).

In view of these findings, physiotherapists might consider using measurement tools to assess self-efficacy and if low self-efficacy is identified, introduce strategies to promote higher levels of self-efficacy in patients with MS wishing to increase their physical activity. Measures of self-efficacy can be roughly divided into condition-specific and task-specific scales. Two condition-specific measures have been developed for people with MS: the Multiple Sclerosis Self-efficacy Scale (MSSS) (Rigby et al 2003) and the Multiple Sclerosis Self-Efficacy Scale (MSSE) (Schwartz et al 1996). It could be argued that the MSSS is the most applicable self-efficacy scale for people with MS as it was developed from 'the ground up' following in-depth consultation with individuals who have MS whereas the MSSE was modified from an earlier arthritis self-efficacy scale. However, in a recent study designed to promote increased levels physical activity, MS participants found that items on the MSSS (condition-based) did not necessarily reflect the increase in confidence to exercise that they experienced following the intervention (Smith et al 2011 under review). As this study focused upon exercise participation and, as levels of self-efficacy are task specific, self-efficacy results might have reached significance if an exercise specific scale such as the Self-Efficacy Exercise scale (Resnick and Jenkins 2000) rather than a condition-based self-efficacy measure had been used.

The Self-Efficacy Exercise scale (SEE) is a task-related self-efficacy scale (the task being exercise) (Resnick and Jenkins 2000). Originally developed in sedentary adult and older populations, this scale has been used recently to explore relationships between physical activity, self-efficacy and quality of life in people with MS (Motl et al 2009). The SEE has been further adapted in order to increase relevance in a spinal cord injury population (Spinal Cord Injury Self Efficacy Scale–ESES) (Kroll et al 2007). The ESES has been used to determine correlations between exercising and non-exercising participants (n=93) and exercise self-efficacy. In this postal survey, participants who were classified as exercising scored significantly higher on the ESES than those classified as non-exercising (Stroud et al 2009). This scale however may require further modification for people with MS. For example, in order to increase the relevance of this measure, items that recognise the impact of heat sensitivity, a potential barrier to exercise in this population might be warranted. In summary, no current self-efficacy scale will capture all dimensions of self-efficacy and physiotherapists need to choose judiciously with regards to the context of self-efficacy under examination.

One strategy purported to increase levels of self-efficacy is motivational interviewing (MI). Originally developed as a counselling strategy for drug and alcohol rehabilitation, a modified form of this approach is increasingly being employed in many areas of health care in order to facilitate behavioural changes such as lifestyle changes and symptom management (Rollnick et al 2008). Motivational interviewing comprises a range of communication techniques designed to elicit an individual's intrinsic motivation to change health behaviours. Currently, there is little robust evidence for this intervention predominantly due to the wide variations in populations, contexts, and outcome measures employed in research to date (Knight et al 2006). Despite lack of strong evidence, health care

providers are finding MI a useful tool to promote increased levels of engagement in physical activity. Shandon and Hillsdon (2007) provide an insightful hypothetical example of how MI can be used in a musculoskeletal setting. They illustrate particularly how MI might elicit intrinsic (the patient's own) facilitators for overcoming fear of chronic low back pain in order to exercise (Shannon and Hillsdon 2007). People with MS experience fatigue, amongst other multiple symptoms and perceptions, as a major barrier to exercise (Stroud et al 2009) and it is possible that MI might assist in overcoming fear of fatigue and increasing confidence to exercise in this population.

In conclusion, there is now compelling evidence that regular exercise participation will result in better strength, cardiovascular fitness, perceived health-related quality of life and reduced levels of fatigue for people with MS. There is no doubt that in terms of proven health benefits, exercise is a friend to people living with MS-related fatigue. Furthermore, neurophysiological studies are demonstrating exciting possibilities regarding the role of exercise in brain repair and health. Exercise however is still perceived by many living with MS as something to be feared. Engaging people in enjoyable, health-promoting and sustainable exercise habits is an on-going challenge for most health care providers. Evaluation of self-efficacy and, strategies to promote self-efficacy might prove rewarding tools for both patient and therapist and change perceptions of exercise from foe to friend.

KEY POINTS

- Despite proven perceived and physiological health benefits of exercise for people with MS, many individuals with this condition are anxious about exercising predominantly because of fatigue.
- Perceived control over fatigue appears to result in more positive exercise experiences.
- For exercise-related interventions and research, physiotherapists might consider self-efficacy scales related to exercise more useful than condition based self efficacy scales.
- Motivational Interviewing might be a useful intervention for increasing levels of self-efficacy in people with MS-related fatigue; however, there is currently little evidence for the effectiveness of this strategy.

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The Honorary Editorial Committee thanks the people listed below for their willingness and dedication in reviewing manuscripts submitted to the New Zealand Journal of Physiotherapy in 2011:

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Abstracts from the Southern Physiotherapy Symposium 6, held in Queenstown on 5th - 6th November 2011, organised by the Otago Branch of Physiotherapy New Zealand.

Physiotherapy management of people with spinal cord injuries: the essentials

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The primary aim of physiotherapy for people with SCI is to help individuals attain optimal levels of independence with mobility and activities of daily living. There are five steps involved in planning and implementing an appropriate physiotherapy programme regardless of a patient's stage of rehabilitation. They are: assessing impairments, activity limitations and participation restrictions; setting goals; identifying key problems amenable to physiotherapy; administering treatments; and measuring outcomes. Often the most difficult step for physiotherapists not familiar with SCI is setting goals. This is difficult because it requires an understanding of what patients can be expected to achieve. This of course varies depending on a number of factors but most importantly on neurological status. Identifying key problems amenable to physiotherapy can also be a challenging step for physiotherapists inexperienced in SCI. It requires an understanding of the evidence base for different therapeutic approaches. The best evidence about appropriate treatments comes from randomised controlled trials and systematic reviews. We are still in the early stages of building high-quality evidence but there is reasonable evidence to support the use of physiotherapy to treat 6 key impairments. These are: lack of strength; lack of dexterity and skill; poor respiratory function; limited cardiovascular fitness; restricted range of motion; and pain. There is also emerging evidence to support new and novel therapeutic approaches which include the use of robotics. However, as we move forwards it will be important to ascertain the cost-effectiveness of new interventions before advocating for their widespread rollout to the public.

Experiences of hospital based physiotherapists involved in conducting their own research project.

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We aimed to explore the experiences of hospital based physiotherapists as they engaged in academic research, using a participatory action research (PAR) approach. In recent decades the need for research has become more prominent in the physiotherapy profession; however, few clinical physiotherapists conduct research. In this study a PAR approach was used to stimulate clinical physiotherapists to work together in groups on their own research projects for one year. A qualitative case study design underpinned by a pragmatic paradigm was used. Data were collected from three different sources: semi-structured in-depth interviews, reflections within the PAR groups, and field notes. These qualitative data were analysed and triangulated using a thematic approach. Twenty-five of the 32 registered physiotherapists working in one rehabilitation hospital consented to participate (mean age: 38 years (standard deviation of 11 years)). Fourteen of the 25 physiotherapists became involved in one of the three PAR projects (n=3, 8, 3). Thematic analysis revealed three factors as influencing the experience of these clinical physiotherapists: 1) positive relationships between colleagues and management; 2) transparent structure and roles; and 3) positive perceptions and attitudes of clinicians in the group towards research. Despite the small sample size and the use of one hospital, the results indicate that clinical physiotherapists, working collaboratively, can successfully conduct research. If the physiotherapy profession wants to become more research active, it could adopt a PAR approach to increase the research capacity of clinical physiotherapists and thereby increase the evidence for clinical practice.

Postural responses in traumatic and dysvascular transtibial amputees: A pilot investigation

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The purpose of this study was to objectively investigate and compare postural responses under normal and altered sensory environmental conditions in traumatic and dysvascular amputees. Six traumatic and six dysvascular community-dwelling amputees (age > 60 years) completed three trials of the 6 Sensory Organisation Test (SOT) conditions on the NeuroCom Smart Equitest®. The six SOT conditions were standing with: eyes open on stable platform and surround; eyes closed on stable platform and surround; eyes open on stable platform and movable surround; eyes open on movable platform and stable surround; eyes closed on movable platform and stable surround; eyes open on movable platform and surround. Variables of interest were: equilibrium score (ES), a percentage measure of balance performance; strategy score (SS), a percentage measure of the trend in strategy employed; and composite score (CS), an overall weighted average of the equilibrium scores of all 6 conditions. A significant difference (Mann-Whitney U, $p < 0.05$) was observed between traumatic and dysvascular amputees in the SSs of conditions 2 (90.1 SD 7.3; 78.5 SD 10.3), 4 (85.6 SD 4.8; 78.1 SD 4.3) and 6 (75.5 SD 7.7; 62.4 SD 9.6) whereas no statistical difference was observed for other SSs, ESs (6 conditions) and CS. Postural strategies (SS) employed by dysvascular amputees are different from their traumatically injured counterparts when the visual/somatosensory input are challenged. Clinically, these results indicate the need for tailored balance rehabilitation protocols for dysvascular amputees rather than assuming all lower limb amputees have equivalent balance ability. Discrepancies in balance performance may persist beyond the early rehabilitation phase.

Research informed practice: Therapeutic exercise for cervical disorders

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Neck pain disorders are variously associated with changes in the neuromuscular system of the cervical and axio-scapular regions, including re-organization of motor control strategies. There is evidence of reduced activity in the deep cervical muscles associated with heightened activity in the superficial muscles, increased co-activation of the neck flexors and extensors, altered feedforward and feedback responses. The neck muscles also lose strength and become more fatigable. Research informs

the need for a comprehensive examination of neuromuscular function of the neck pain patient. Research also informs a multimodal exercise program in rehabilitation, addressing altered muscle behaviours with motor relearning programs and strength and endurance training. Questions that now require concerted attention are dosage of exercise and endpoint of rehabilitation. Most clinical trials use self reported changes in pain/disability as the primary outcome, but pain relief does not provide any certainty that optimal muscle function has been restored. The course of neck pain is characterized by recurrent episodes over a lifetime. These factors suggest that attention of both clinicians and researchers alike should focus not only on pain relief but on prevention of recurrence. Firstly, more work is needed to determine what dosage of exercise is required to restore normal muscle function and secondly, evidence is required that restoring and maintaining normal muscle function impacts positively on recurrence rate. If evidence is provided, translational research is required to change the ethos of clinical trialists, clinicians, patients and health insurers to prevention of recurrences as a primary outcome together with relief of pain/disability.

Is dual-task performance a useful measure for the assessment of a sports-related concussion? A systematic review and meta-analysis

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There is a growing interest in the field of Physiotherapy in the understanding of a person's ability to perform two tasks simultaneously. Termed dual-task (DT) performance, this skill represents the ability to perform a cognitive task while executing a motor task such as walking. The purpose of this study was to review the literature, and conduct a meta-analysis if appropriate, on the use of the DT paradigm in the assessment of persons with a concussion. Electronic databases (Scopus, PsycINFO, MEDLINE, CINAHL, AMED, SPORTDiscus, Web of Science, and PubMed) were searched in April 2011 by combining search terms related to concussion and DT. The methodological quality of the studies was assessed using the modified Downs and Black scale. Raw mean differences (MD; 95% CIs) were calculated and DT deficits were pooled using a random effects model for the meta-analysis. From the 514 identified studies, 10 met the inclusion criteria. The meta-analysis demonstrated that DT performance deficits were detected ($p < 0.05$) in the concussed group for gait velocity (GV) (MD=-0.133; -0.197, -0.069) and medial-lateral sway of the centre of mass (ML-ROM) (MD=0.007; 0.002, 0.011), but not in the non-concussed group; GV (MD=-0.048; -0.101, 0.006), ML-ROM (MD=0.002; -0.001, 0.005). The results of this study indicate that GV and ML-ROM are sensitive measures of DT related changes in concussed persons and should be further explored as part of a comprehensive assessment of persons with a sports related concussion.

Physiotherapy for patients following coronary artery bypass graft (CABG) surgery: Limited uptake of evidence into practice

Filbay SR, Hayes K and Holland AE (2011) *Physiotherapy for patients following coronary artery bypass graft (CABG) surgery: Limited uptake of evidence into practice. Physiotherapy Theory and Practice* [Epub ahead of print, DOI: 10.3109/09593985.2011.582231] (Abstract prepared by E Dianne Body)

Aim

To identify current physiotherapy interventions in use in Australia and New Zealand for patients who had undergone uncomplicated CABG surgery and to evaluate these practices to determine if they are supported by current evidence. The results were compared to an earlier similar study (Tucker et al 1996) to see if the uptake of evidence-based practice had increased.

Introduction

Research indicates physiotherapy interventions that have no benefit following uncomplicated CABG surgery include treatment during the intubation period, deep breathing exercises (DBE), percussion, incentive spirometry, intermittent positive pressure breathing and continuous positive airway pressure. Techniques shown to be of benefit include positive expiratory pressure (PEP), early and progressive mobilisation and walking training. Upper limb and thoracic range of movement exercises have shown some benefits but results are inconsistent across trials. Tucker et al (1996) found that 94% of respondents reported using DBEs despite evidence suggesting the technique did not improve outcomes in uncomplicated patients. References to seven studies since then support these findings.

Methods

A prospective survey in the form of a questionnaire was sent to senior cardiothoracic physiotherapists in every hospital in Australia and New Zealand that performs CABG surgery. The questions were based on a 2009 literature review by the authors and structured to approximate the survey carried out by Tucker et al (1996) to allow comparison. The questionnaire related to techniques of treatment, factors influencing choice of treatment and level of experience of respondents.

Results

A total of 53 surveys were included in the analysis; 25 were from public hospitals, 27 from private hospitals and one from a physiotherapist who worked in both settings. Ten surveys were returned from New Zealand. The majority of respondents (38) had been in the workforce for longer than six years.

Responses from 36 physiotherapists (68%) indicated that all CABG patients were assessed and treated. Fifteen reported assessing all patients but only treating if indicated. Most patients were seen once a day but 36% were seen twice daily in the early stages; patients were seen on the first postoperative day by 96% of physiotherapists. Physiotherapists in three hospitals treated uncomplicated intubated patients and one performed manual and ventilator hyperinflation prior to extubation.

All hospitals included walking as a postoperative treatment, generally implemented by physiotherapists. Assessment of patients' safety on stairs was undertaken in 96% of hospitals, and was always carried out by physiotherapists. Home exercise programmes, upper limb and trunk exercises were prescribed by most physiotherapists. Clinical care pathways were used by 91%. Physiotherapists' experience was perceived as the most influential factor in determining postoperative management and respondents with a postgraduate degree were less likely to use breathing and coughing techniques ($p = 0.045$). When asked to identify specific literature that related to post-CABG physiotherapy intervention, 63% could name at least one paper with articles on DBE being the most common.

Conclusion

Knowledge of current literature does not ensure that recommendations are carried into clinical practice. Research findings indicate that DBE and incentive spirometry provide no benefit over early and progressive mobilisation following uncomplicated CABG surgery. Despite this evidence, 77% of physiotherapists use DBE with their patients and 40% use incentive spirometry. The results indicate a need to facilitate evidence-based treatment into physiotherapy management.

Commentary

This paper raises awareness of the apparently limited uptake of evidence into practice by physiotherapists who have knowledge of pertinent cardiothoracic research. Contemporary evidence indicates that prophylactic chest physiotherapy makes little difference to patient outcomes (Reeve and Ewan 2005). The challenge is in predicting which patients will develop a clinically significant postoperative pulmonary complication (PPC), as there is no reliable tool that can be applied at the preoperative assessment.

The abstract, introduction and research references refer to physiotherapy interventions following uncomplicated CABG surgery, as does the questionnaire and findings published by Tucker et al (1996). However, the paper does not define "uncomplicated" but does give some examples of PPCs. As such, while the surgery may have been considered uncomplicated, some patients may have comorbidities or develop complications after the surgery, with the PPC following cardiac surgery reported as 7.5% (Stiller et al 1994). The questionnaire includes the words "routine" or "routinely" five times and these descriptors appear in the paper eleven times, in the context of routine patients or routinely providing an intervention. This is cause for unease as patients should be assessed and treated according to clinical reasoning based on findings, not according to a routine.

The aspect of physiotherapy intervention that research has shown to be of greatest benefit is early and progressive mobilisation and walking. Walking more often and for longer periods helps patients to achieve functional milestones more quickly, cope better with walking after discharge and have greater satisfaction with their treatment than patients who walk less. When patients mobilise their ventilation perfusion match is optimised, tidal volume will increase and respiratory rate will rise. Therefore, it is logical that mobilising is an effective method of ensuring deep, effective breathing. The paper also reports that PEP therapy using a blow bottle device reduces atelectasis and improves respiratory function compared to controls performing DBE or controls not treated. Physiotherapists may provide more effective treatment by replacing incentive spirometers with PEP devices.

The authors acknowledge limitations to this study. The questionnaire had undergone only limited pilot testing. Information that could be compared to that of Tucker et al (1996) was sought but a different survey instrument used. Only the most senior cardiorespiratory physiotherapist in each institution was invited to participate which may not have provided a true reflection of practice at the hospital.

Education was not specifically mentioned in the questionnaire. An important component of physiotherapy management is motivating and encouraging the patient to make healthy lifestyle choices and providing acceptable suggestions for ongoing exercise and rehabilitation. It is

vital to progress physiotherapy methods based on evidence-based practice but the value of practice-based evidence should not be underestimated.

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Dip Phty, PG Cert Clin Tchg, PG Cert Cardiac Rehab.

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Does the region of pain influence the presence of sensorimotor disturbances in neck pain disorders?

Treleaven J, Clamaron-Cheers C and Jull G (2011) Does the region of pain influence the presence of sensorimotor disturbances in neck pain disorders? *Manual Therapy* 16: 636-640. (Abstract prepared by Ricky Bell)

Objective

To determine whether sensorimotor impairment was greater in individuals suffering pain from the upper cervical spine compared to the lower cervical region, while factoring in the presence or absence of trauma.

Methods

Sixty-four participants aged between 18 and 55 years with persistent neck pain (traumatic or insidious onset) of greater than three months duration, and a Neck Disability Index (NDI) score of at least 10/100 were recruited from a University Whiplash Research Unit. Based on clinical examination, participants were divided into four groups: upper (n=21) or lower (n=15) cervical region, non-traumatic; and upper (n=13) or lower (n=15) cervical region, traumatic. Measures such as NDI, smooth pursuit neck torsion (SPNT; evaluation of eye movement while following a moving laser light), cervical joint position error (JPE; measure of blindfolded participants neck reposition sense following extension and rotation), and balance tests performed in narrow stance (eyes open and eyes closed) were compared between groups.

Results:

Significantly smaller deficits ($p < 0.03$) were evident in the lower region non-traumatic group in SPNT, and when measured against both trauma groups, less total energy of sway was evident on the eyes open balance tests ($p < 0.05$). Significantly larger deficits ($p < 0.04$) in JPE were only demonstrable in the upper region traumatic group after rotation to the right when measured against both lower groups. A post-hoc analysis with NDI as a co-variate demonstrated significant differences ($p < 0.05$) between both non-traumatic groups in SPNT and both trauma groups for JPE rotation right; no differences were seen for balance tests.

Conclusions

Participants with non-traumatic lower cervical region pain generally showed less sensorimotor impairment. However, there were no significant differences in balance and JPE measures between both non-traumatic groups. Similarly, there were no significant differences in any of the sensorimotor tests between the upper non-traumatic group and both trauma groups. In conclusion, despite anatomical and physiological evidence to imply that cervical afferents from the upper cervical region make a greater contribution to sensorimotor control than the lower cervical region the proposition that upper cervical region pain generates greater dysfunction cannot be verified.

Commentary

This research is the first to ascertain whether any differences exist in impairments of eye movement control, joint position sense or balance in individuals with a disorder clinically attributable to the upper cervical region compared to those with a disorder to the lower cervical region.

Although conducted by a respected group of researchers, the findings of this study were not categorical and contrast to previous beliefs about increased sensorimotor deficits in the cervical spine when trauma is involved (Field et al 2008, Sjölander et al 2008). Nonetheless, it still contributes to the knowledge base and body of evidence with regard to sensorimotor function in the cervical spine.

The authors readily identify that the hypothesis being investigated may be more of a theoretical rather than clinical concept, as it was difficult to identify individuals with discreet upper or lower cervical spine disorders (meaning that the number of participants in each group was smaller than anticipated). As is the case for the majority of neck pain patients, particularly when trauma is involved, pain is often generated from multiple sources confined not only within the upper or lower cervical spines but also other regional structures. Subsequently, although the methodology of this study was of sound quality, it was inadequately powered which may have limited the ability to identify certain trends and comprehensively answer the research question.

Current research and clinical experience suggests that altered sensorimotor function in the cervical spine might be a significant contributing or maintaining factor in some patients with neck pain, regardless of the aetiology of symptoms. It could be advocated that assessment and management of abnormal cervical somatosensory input and sensorimotor control in neck pain patients is an integral part of the rehabilitative process as it is in lower limb proprioceptive retraining following an ankle or knee injury (Treleaven 2008). In the research arena it is sometimes easier to detect a difference than it is to explain it, hence questions of mechanism, as is the case with altered sensorimotor function in the cervical spine, is more difficult to interpret. Subsequently, the findings of this study and previous research suggest that the key components contributing to sensorimotor disturbances and persisting pain states in the cervical spine may be processes involved with the pain system and centrally mediated mechanisms rather than structural anomalies or peripheral processes (Field et al 2008).

From a practical perspective, with the exception of the balance measures, the sensorimotor tests used in this study are not readily reproducible or accessible in a typical clinical setting. Nevertheless, although low in the hierarchy of evidence, a previous single case study by one of the authors showed some positive results utilising more clinically applicable methods based purely on a tailored sensorimotor control programme (Treleaven 2010). This suggests that sensorimotor retraining protocols need not be exhaustive or technical to be efficacious and can be used with those patients who present with persisting neck pain without the need for expensive apparatus.

In summary, although the results of this study were not definitive, sensorimotor testing and re-training may have relevance in the management of those with persisting neck pain and play a role in reducing the incidence of ongoing pain and dysfunction. As is the case with most musculoskeletal presentations, cervical pain is a multifactorial event involving many different systems and it is the clinician's role to determine the main causative or maintaining factor. Hopefully this study will stimulate further research in this area in order to improve the management strategies of this common problem.

Ricky Bell (Ngā Puhi, Ngāti Hine), PGDipPhysio, BPhy
Bodyhealth Physiotherapy, Northland; Masters Student, University of Otago

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The ECG Workbook (2nd Ed)

*Angela Rowlands, Andrew Sargent, 2011, M & K publishing
ISBN number: 978-1-905539-77-2. Softcover UK £25*

M & K are a UK based company who have been leading the field in professional healthcare development and education for over 16 years. They offer short courses and have recently established a growing catalogue of books. The books provide evidence based, value for money texts for healthcare professionals including physiotherapists.

The ECG workbook is a well designed book with easily accessible information on how to interpret ECGs. This little book is a gem which would be readily suitable for those physiotherapists working in acute and critical care who need to be able to readily interpret ECGs. Whilst the core of the text focuses primarily on the interpretation of 12 lead ECGs, the principles of examining the ECG rhythm strip are presented at the beginning of the text and are readily applicable to the 3 or 5 lead ECGs more often used by physiotherapists.

Chapters 1 – 6 focus on the basics of ECG interpretation such as the electrical conduction of the heart, developing a systematic approach to rhythm strip analysis. This includes chapters on and common arrhythmias and ectopics and extrasystoles. These chapters should suffice for the junior physiotherapist who requires a working knowledge of cardiac arrhythmias for their day to day clinical practice.

Chapters 7 – 12 focus on the interpretation of the 12 lead ECG which will be of use to those physiotherapists working in coronary care units and cardiac rehabilitation. The additional diagnostic information to be gained by the 12 lead ECG is presented, followed by a chapter on axis deviation, chamber enlargement and bundle branch blocks. Especially useful for cardiorespiratory physiotherapists are the chapters that cover the changes seen with the different types and locations of myocardial injury, ischemia and infarction.

To enhance learning, self assessment activities follow every chapter. 'Remember boxes' and plenty of useful diagrams enhance the user friendliness of the text. High quality simulated and real patient ECG recordings are used frequently throughout the text and add ease and value to the interpretation. The text size is similar to that of a 12 lead ECG making the interpretation of the strips seem real.

I would strongly recommend that inpatient physiotherapy departments and therapists engaging in outpatient cardiac rehabilitation have access to this text. It is highly readable, the information contained within it is easily accessible and, for all grades of physiotherapist it is simple and easy to understand.

*Julie Reeve, PhD, MSc, Grad Dip Phys
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Lippincott's Illustrated Review of Neuroscience

*Claudia Krebs, Joanne Weinberg, Elizabeth Akesson.
Wolters Kluwer/Lippincott Williams & Wilkins, 2011.
ISBN:9781605473178. North American Edition. Softcover, 444
pages. RRP: \$55.95*

This is the latest title in the series of Lippincott's Illustrated Review books. There is a companion website which once logged onto will allow you to read the full text online and have access to an interactive online test. The online test consists of the same set of questions and answers as there are in the book.

The book is not directed at or specific to physiotherapy, rather it is aimed at all medical health professionals. It provides a detailed and up-to-date overview of neurophysiology and neuroanatomy relating to the human body. There are many simple and easy to read illustrations throughout the book which are aided by good explanations in the text.

The book initially reviews the neurophysiology of the central, peripheral and visceral nervous systems, the spinal cord, brainstem and ascending sensory and descending motor tracks. It then goes into more specific subjects of control of eye movements, innervations of the head and neck and hearing and balance. The neuroanatomy is detailed and describes the cerebral cortex, the thalamus, the visual system, basal ganglia and the cerebellum. Finally the book links it all together with the integration of the motor control, hypothalamus and limbic system, smell, taste and pain. At regular points throughout the book there are also highlighted sections linking what you have just read in the text with its relevant clinical application. This not only kept my interest but gave me a better understanding of why the core text is applicable to me in the medical setting.

Each chapter is set up in the same way giving good bullet points and bold typing the key words to break up the topics. At the end of chapter there is a concise summary and a series of questions/answers designed to test your knowledge of what you have just read. The questions are a useful exercise as they try and pick important points from the chapter and also apply it into a scenario that could happen in the clinical setting.

Neuroscience is not the most easily digested subject to plough through. However, the book is laid out in clear chapters which make it a more manageable subject and not as daunting as some neuroscience texts can be. The book would provide a good foundation or resource text for either the under or post graduate physiotherapist wanting to brush up on or study in more depth their neuroscience.

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Physiotherapy & Occupational Therapy for People with Cerebral Palsy

Karen Dodd, Christine Imms, Nicholas Taylor (Eds). Publisher, Mac Keith Press, 2010. ISBN: 978-1-898683-68-1. Soft cover, 256 pages. RRP: \$67.99 (\$49.99 on special).

This book is a practical resource for physiotherapists and occupational therapists who work with children and adults with cerebral palsy and their families. It would also be useful for therapy and medical students, paediatricians, general practitioners and other health professionals who work with people with cerebral palsy and their families. It is a text intended for therapists but one which takes a broad big picture view, and is problem based. It does not get bogged down in detailed therapy jargon or biomechanical analysis but instead covers a wide range of considerations – and includes references for those seeking further detail on a specific topic. Medical journal reviews have recommended the book as useful for paediatricians or other specialists who might be prescribing an unfamiliar intervention for the first time.

Part 1 (the first four chapters) provides the background to the clinical reasoning approach that informs the whole text, as well as an overview of therapeutic interventions and a chapter entitled “Understanding the family’s perspective”. The subsequent chapters (Part 2-4) use case studies to present clinical situations that therapists will encounter in the course of their work with individuals with cerebral palsy – as infants, pre-schoolers, school aged and adolescents, and as adults. There is a general discussion of some specific interventions (such as modified constraint induced therapy, the role of botulinum toxin-A and strength training among others) again discussed around a case study. I liked the functional, case based approach. The appendix is useful and includes a summary of assessment tools which I found really helpful (good for including in reports).

The themes emphasized throughout the book are the use of the clinical reasoning approach of the intervention process model, the International Classification of Functioning, Disability and Health as a framework to help therapists inform patient and family decision-making, family-centred approaches in developing and implementing therapeutic strategies, and multidisciplinary team work. From the perspective of a physiotherapist the book has a nice balance of Occupational Therapy and Physiotherapy input. There are a wide range of contributors (mainly Australia based) and several “big names” (Professor Kerr Graham and Dr Margaret Mayston). Potential criticisms may include that coverage may err on the side of breadth over depth. However I found that the balance was appropriate given the goals of the text and where I wanted more detail there was appropriate referencing. There is a very brief mention of cultural considerations (p 36).

In summary: a book well worth having around. It would be an excellent book to have on hand for new comers to a paediatric service (therapists and medical students, new registrars or consultants). As an “intermediate level” therapist I found reading the book taught me some things I didn’t know; reminded me of many things I know a bit about but don’t do fully, well enough or frequently enough; and also confirmed

some things for me. I think it would have something for everyone. I would recommend that hospital libraries or services have a copy on hand for staff. It is not a detailed manual for therapy (and nor could it be in 256 pages) but it is certainly a well-written, cleverly constructed and considered presentation of some aspects of our amorphous field.

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Whangarei

Treat Your Own Shoulder

Robin McKenzie, Grant Watson, Robert Lindsay. Spinal Publications New Zealand Ltd, Raumatī Beach, NZ 2009. Softcover. ISBN: 978-0-9582692-5-4. RRP: NZ\$27.00

‘Treat Your Own Shoulder’ is the 3rd book in the ‘Treat Your Own...’ series written by Robin McKenzie. ‘Treat Your Own Shoulder’ continues the self-management principals of ‘Treat Your Own Neck’ and ‘Treat Your Own Back’, based on the philosophy of McKenzie and the principles of Mechanical Diagnosis and Therapy.

The target market is for people who have suffered from recurrent or chronic shoulder pain or limited shoulder function due to loss of mobility. It would also however be extremely useful to any musculoskeletal clinician who assesses and treats shoulder injuries as the ‘educational’ component and emphasis on posture and the effects of posture on the shoulder girdle is very well worded and potentially extremely valuable.

The 1st chapter gives an introduction to the complexity of a shoulder complaint and ensures that the information contained in the book is suitable and appropriate to the reader. It allows the reader to ascertain whether their shoulder pain originates from the shoulder region and provides differentiation from the cervical spine as a source of possible pain by the use of several easy tests that the reader can perform on themselves. It also allows the reader to establish whether they can ‘treat themselves’ independent of a practitioner or whether they may require more specialised treatment from a McKenzie practitioner.

The 2nd chapter describes the anatomy and function of the shoulder girdle and educates the reader on ‘mechanical pain’ and tissue damage. This leads in to the 3rd chapter which discusses the common causes of shoulder pain with specific reference to the effect of posture on the shoulder girdle and the importance of maintaining a good posture to alleviate the stresses on the shoulder joint. This chapter gives sound information on how to prevent shoulder pain from the various postures that one may adopt in normal daily life and situations.

Chapters 4 -6 detail specific exercise programmes and provides clear instruction and guidelines on how to apply the exercises and the expected responses from the exercise programme. It includes concise guidelines on when to progress the exercises and how to prevent recurrences of shoulder pain.

The book is well written and should be easily understood by the lay person. It does not use medical terminology or jargon in any detail and makes good use of photo’s and diagrams. It is a practical book with plenty of insightful and useful information

as well as tips for the shoulder pain sufferer to assist them with activities of daily living.

An encouraging aspect of the book is that there is mention in several parts of the book that the reader should seek further assessment if their symptoms are not responding as anticipated and therefore ensures the safety of a lay-person attempting to self-manage their complaint. The book provides the reader with the tools, both from the educational perspective as well as the exercise programme component, to self-manage their complaint without the requirement of any exercise apparatus and thus is both achievable as well as being inexpensive.

I would certainly recommend this book to people suffering from shoulder pain and also I believe the educational component and practical advice contained in the book would allow this book to be a useful tool for musculoskeletal clinicians as well.

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Functional Movement Development Across the Life Span (3rd Edition)

*Donna J, Cech and Suanne "Tink" Martin. Contributors:
Susan V and Timothy Hank. Published 2012, Elsevier Saunders,
USA. ISBN 978-1.4160-4978-4. Soft cover book RRP \$117*

The overall purpose of the book is to allow readers to understand normal development of body structures and functions, across the life span from birth to aged adults. The book emphasizes normal development looking at the sequences of physical, social-emotional, and psychological development. The authors then link normal development to clinical implementations and the functional outcome of these, in areas like locomotion and prehension. This third edition continues to be aimed at Physiotherapy and Occupational therapy students but will benefit practitioners alike.

In the first unit the authors make detailed reference to the International Classification of Function, Disability & Health (ICF) keeping readers focussed on function and participation. There are details on the historical and recent theories of motor development leaving the reader with a sound knowledge base.

The second unit focuses on body systems contributing to functional movement including skeletal, muscle, cardiovascular and pulmonary, nervous and sensory systems. There is a chapter dedicated to each system, complete with an overview of the system and changes throughout the life span.

The third unit is a comprehensive review of Functional Movement Outcomes. The authors look firstly at vital functions including homeostasis and the endocrine system. This is followed by posture and balance, locomotion, prehension and general health and fitness. All of these areas are linked back to normal development.

The book is well written and structured in a logical manner. There are four contributors but the book is written in a consistent way. It is easy to either read straight through as a resource or the chapters are organised to enable a

reader to source a specific topic. The index is thorough and comprehensive.

Throughout the book the authors have noted 'Objectives' for the reader at the beginning of the chapter which are met with the reading. The chapter is briefly summarized at the end, which would serve as a useful reminder. References are numerous, up to date and relevant. They are from a variety of sources. Further reading relating to the chapter is then given to stimulate the reader.

Diagrams, photos and tables are frequent throughout. They are of good quality and provide summaries of information or accentuate the understanding of the text. There is reference to clinical implications in each chapter. These provide the reader with a relevant clinical point to further enhance the assimilation of information. Examples of the clinical implications include Osteoporosis Prevention, Hypertension: An Issue for Children and Adults, Assessment of Balance, and Fall Prevention.

This text would be a valuable resource for undergraduates, providing them with a comprehensive overview of functional movement from birth through to aged adults. It has enough information, references and further reading to also act as a refresher and resource for practising therapists. It has a particularly detailed child development section which would be beneficial for those in paediatrics. For physiotherapists who are from an earlier training period this book reinforces participation and function to assist us to further focus on functional goals. I can also see this text being used as an educational tool for physiotherapists who work with other professionals eg teachers, SLTs and therapy assistants.

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A list of research relevant to physiotherapy by New Zealand physiotherapists (and other researchers) published in international journals

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