The aim of this study was to explore therapists' opinions about the rehabilitation approaches that they perceived contributed to positive outcomes for people with acquired brain injury in community-based rehabilitation settings in order to develop a set of practice principles for clinicians working in this area. Semi-structured interviews were conducted with eight Australian and three British therapists, with a mean of 5.2 years' experience of working with people with acquired brain injury in community-based rehabilitation settings. The interviews were analysed thematically. A summary of the themes was presented to a larger group of acquired brain injury service providers (n = 35) for validation.

The participants emphasised the importance of environmental factors, such as collaboration with and inclusion of others in rehabilitation, especially those in the person's support network. Strategy use, client-centred goal setting, the provision of education and the development of a therapeutic relationship were identified as facilitators in community-based rehabilitation. Problems with self-awareness and motivation, drug and alcohol use, and behavioural difficulties were commonly identified barriers to optimal outcomes. The key practice principles derived from the findings were the need for community-based rehabilitation for people with acquired brain injury to be (1) environment focused and contextually appropriate, (2) collaborative and (3) goal directed and client centred.

Achieving Optimal Functional Outcomes in Community-Based Rehabilitation following Acquired Brain Injury: a Qualitative Investigation of Therapists' Perspectives

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Introduction

Acquired brain injury (ABI) results in significant economic and social costs, including medical and rehabilitation costs, ongoing care costs and loss of work. Costs to individuals and families are also high, and include stress

associated with loss of income, changes in roles and carer burden (Ponsford et al 1995a). A primary cause of ABI is trauma, which most commonly affects people aged between 19 and 25 years who are establishing independence in their relationships, work and living situation (Morton and Wehman 1995, O'Connor 2002).

The ultimate goal of rehabilitation after ABI is to enable individuals to return to their roles and to be involved in activities in the community as near as possible to pre-injury levels of participation (Willer et al 1994). People with ABI commonly experience ongoing functional difficulties in the home, community and workplace environments (Ponsford et al 1995a), with reduced social interaction and social isolation (Morton and Wehman 1995, Fleming et al 1997). Changes following ABI are often pervasive and the individual and his or her family frequently require ongoing support (Kreutzer et al 1992). Given that functional status after post-acute rehabilitation and discharge from hospital often falls short of pre-injury functioning, rehabilitation in the community usually involves considerable support and intervention from a multidisciplinary team,

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including occupational therapists. Given the significant and long-term impact of ABI, there is a need to establish the most effective manner in which to provide community-based rehabilitation (CBR) to achieve optimal outcomes for people with ABI and their families.

In planning this investigation, the authors were developing an intervention protocol to be clinically trialled with people with ABI in the community. As a review of the literature did not yield guidelines that were specific enough for this purpose, the authors sought to consult with experts in the delivery of CBR programmes to people with ABI in order to develop a set of practice principles.

Overview of the literature

A recently published Cochrane review investigating the effectiveness of multidisciplinary rehabilitation for people of working age with ABI indicates that intensive rehabilitation is effective and that people with continued needs and goals following discharge from inpatient rehabilitation should have access to outpatient rehabilitation or CBR (Turner-Stokes et al 2005). However, the review concluded that there is a need for further investigation of the effectiveness of interventions within the overall rehabilitation programme (Turner-Stokes et al 2005).

To date, some publications have indicated the efficacy of, or described, specific rehabilitation interventions relevant to people with ABI. These include interventions to address cognitive impairments (Katz 1998, Boman et al 2004), rehabilitation for people with memory impairment (Ownsworth and McFarland 1999, Fleming et al 2005) and home and community-based exercise programmes (Monger et al 2002, Leroux 2005), as well as domiciliary occupational therapy (Gilbertson and Langhorne 2000). The findings of such studies can guide discipline-specific rehabilitation practices to address certain ABI-related impairments and disabilities, delivered in inpatient and community settings. However, at present there are few practice principles to inform the overall rehabilitation process in addressing the long-term 'participation' needs of a person with ABI living in the community.

One exception, which sought to provide broader rehabilitation principles, is the 'Whatever It Takes' model, which was proposed by Willer and Corrigan (1994). This model outlined a set of 10 practical principles for the achievement of community integration for individuals with ABI from the authors' perspectives. Similarly, authors of texts on ABI rehabilitation have provided guidelines for practice in community settings based on the authors' experience (Ponsford et al 1995b). However, a more systematic and theory-driven investigation of expert opinion regarding practical approaches to CBR and the factors perceived as relevant to achieving optimal outcomes for people with ABI has not yet been conducted.

Theoretical models

Occupational therapy models recognise a person's occupational performance to be a product of the interrelationship between the person, the task that he or she is performing (or occupation) and the environment (American Occupational Therapy Association 1994, Law et al 1996, Chapparo and Ranka 1997). Hence, occupational therapists working in a rehabilitation setting use these theoretical models as a basis for assessing, problem solving and implementing a rehabilitation plan to enhance a person's occupational performance. For example, at the person level, to enhance a person's participation in shopping a therapist may work on strength and balance in order that the person may walk around the shops, reach for and lift the groceries. At the occupation level, an analysis of the shopping task may enable the therapist to break the task into steps and, in considering this, grade and adapt the task to the person's abilities to achieve a goal. At the environment level, something about the environment may need to be considered or altered to achieve the goal of shopping, such as access to lifts or transport. The Person-Environment-Occupation (PEO) model (Law et al 1996) is one such occupational therapy model, and was used as a basis for this investigation because it asserts that occupational performance is a transactive process between the person, the environment and the occupation or tasks undertaken.

The present study aimed to develop a set of practice principles to guide the rehabilitation of people with ABI living in the community by:

1. Exploring the opinions of therapists with regard to the rehabilitation approaches that they use and perceive as most effective in CBR practice with people with ABI
2. Exploring factors that they perceived facilitated or impeded the achievement of optimal outcomes for this client group
3. Using the PEO model constructs of 'person', 'occupation' and 'environment' to categorise interventions identified by the participants.

Method

Qualitative methods involving in-depth interviews (Stein and Cutler 2000) were used to explore the experiences and opinions of the therapists who work with people with ABI in home and community settings.

Participants

Before the study commenced, the project was granted ethical clearance by the Princess Alexandra Hospital Research Ethics Committee and the University of Queensland Behavioural and Social Sciences Ethical Review Committee. Gatekeeper approval was given by the selected organisations in Australia and England. Written informed consent was obtained from each participant.

Therapists from different professions who worked with individuals with ABI in CBR were chosen as the participants for this study for a number of reasons. First, occupational therapists and other service providers are involved in providing rehabilitation to people with ABI in their homes and in the community (Rogers et al 1997, Koch et al 1998, Boman et al 2004). Second, therapists working in home settings can observe how clients respond to interventions provided at home, and those with experience of both hospital and home-based rehabilitation can report on and compare the benefits and disadvantages of assessment and intervention across settings. Third, the inclusion of various therapists led to a more multidisciplinary perspective. This is important given that CBR is often delivered by multidisciplinary teams where workers may take on rehabilitation coordinator roles as well as use discipline-specific skills.

Participants were recruited using purposive sampling (Patton 1990) and were included if they had a minimum of 3 years' experience in delivering rehabilitation to clients with ABI, currently worked in organisations delivering CBR services to people with ABI and had a qualification in a therapy profession. Purposive sampling ensured that participants varied in their professional qualifications and were drawn from organisations providing case management services, work rehabilitation programmes and multidisciplinary rehabilitation programmes to people with ABI in the community. This enabled the opinions and experiences of people from differing professions and with experience of working within different service delivery models to be represented.

CBR organisations were selected, based on the professional networks of the authors. The authors, through their professional networks and experiences of working in London and Australia, were aware that providing in-home multidisciplinary rehabilitation services was an established practice in London compared with Brisbane, Australia. Therefore, CBR organisations in inner London were selected because they provided multidisciplinary rehabilitation services to people with ABI in their home environment. The CBR organisations in Brisbane, Australia, were selected because they provided case management and vocational rehabilitation services in the community. The centres were also widely acknowledged as delivering best practice services. Managers of selected services were contacted and asked to identify suitable staff for interview.

To verify the findings, a group of health professionals employed across the service spectrum (that is, support agencies, insurance companies, and hospital and community-based therapy services), which included nurses, social workers, speech and language therapists, physiotherapists, occupational therapists and psychologists, took part in a 'verification workshop'. This took place at a monthly meeting of the Brain Injury Network in South-East Queensland.

Data collection

In-depth interviews were used to explore the experiences and opinions of the participants. A semi-structured interview

format with open-ended questions (see Appendix 1) was used to ensure consistency across interviews whilst allowing participants freedom to raise issues not related directly to the interview questions (Britten 1995). The PEO model was used to guide the interview questions. Interview questions explored how the factors represented by the PEO model were utilised in practice by the therapists in their CBR programmes. Although the interview questions were based on the PEO model, generic language was used and practical examples were given to supplement occupational therapy terminology. The interview questions were also designed to investigate participants' opinions regarding barriers to performance as well as to draw out practice examples of the interaction between person, environment and occupation in ABI rehabilitation.

The interview was initially trialled with a colleague and modified in response to feedback on the clarity of the questions. Interviews were undertaken in the participants' workplaces for all Australian participants and telephone interviews were conducted with the London participants. Interviews took one hour on average and were audiotaped. The same researcher (ED) interviewed all participants and transcribed the data verbatim.

Data analysis

Thematic analysis and synthesis of interview transcripts was undertaken to identify salient themes and patterns emerging across interviews (Patton 1990). Initial coding of the interviews was completed on hard copy transcripts. Colleague checks were completed for one interview transcript (Mason 2002, Patton 2002). In order to establish a reliable coding system, three researchers independently coded the entire transcript, then met to compare findings and reach a consensus, ensuring reliable interpretation of the text. The first author then completed the coding process for all transcripts.

The interview data were entered and organised using N-vivo qualitative data analysis software (Gibbs 2002). The data were coded into 40 categories or nodes. Node coding reports were printed and reviewed by the coder. The categories were reviewed and defined and grouped into eight higher order categories. A written summary was produced reflecting the common themes identified, based on the frequency with which concepts were evident in the transcripts and the qualitative 'strength' with which they were described by the participants. The summary was returned to the initial 11 participants for comment and verification.

Summary data and findings were then presented for service provider feedback to the 35 therapy and related professionals in a verification workshop. At the workshop, the participants were presented with the key themes and asked to comment on each, indicating any statements that they disagreed with or agreed with, whether any issues were omitted and what points should be emphasised. An audience volunteer recorded the discussion and collated a summary of responses during the meeting.

In addition to the data-driven analysis described above, the PEO model constructs of 'person', 'occupation' and 'environment' were used to categorise the interventions identified by the participants to ground the 'practice' in 'theory'. The frequency and qualitative strength of the constructs were analysed. Where the data referred to CBR interventions, the content was coded as 'person' if the intervention was targeted at the individual level (for example, strengthening or splinting); 'occupation' if the intervention was based around performing or practising tasks with a client (for example, cooking or shopping); or 'environment' if the target of interventions was factors surrounding the client (for example, family members or the use of equipment or aids).

Rigour

A number of strategies were employed to ensure rigour throughout the data collection and analysis. A single researcher undertook all interviews, using the semi-structured interview script to establish consistency with data collection. Peer checks were conducted at a number of points to verify the coding of the interview transcripts and the data analysis. An audit trail was documented throughout the data analysis, outlining the decisions that led to the final classification. Participant checks were implemented (Patton 2002), in which a summary of the analysis of interviews was emailed to each participant for verification to ensure that the themes were an accurate representation of the relevant issues. The participants were asked to comment on the statements, noting disagreement, agreement or omissions. Nine of the 11 participants gave written feedback, which was then incorporated into the analysis.

Findings

Three participants were drawn from two rehabilitation services offering multidisciplinary CBR to people with ABI in inner London. Seven participants were drawn from two rehabilitation services offering case management and vocational rehabilitation services to people with ABI in Brisbane. One additional participant had previously worked with clients with ABI in CBR settings and, at the time of the interview, was conducting research at an Australian university. In total, there were five occupational therapists, two physiotherapists, two speech and language therapists, one neuropsychologist and one social worker. The participants had been qualified in their profession for 12.1 years on average ($SD = 7.2$, range = 6-26). They had, on average, 5.2 years of experience ($SD = 3.4$, range = 1.5-9.5) of working with clients with ABI in community settings and 2.5 years of experience ($SD = 2.0$, range = 0-4.5) of working with clients with ABI in inpatient settings.

Seven key themes contributing to the achievement of optimal functional outcomes for clients with ABI in home and community settings were identified. These

factors were (a) environment focus, (b) the importance of context, (c) collaboration, (d) strategy use, (e) goals, (f) client-centred intervention, and (g) barriers to participation. These seven themes are outlined below.

Environment focus

The participants described the primary focus of CBR as the optimisation of function in the context of the *client's environment*. This included environmental compensation through the adaptation of tasks or the environment, in addition to the focus on activities and behaviours (for example, learning new skills and strategies). The participants noted that CBR is the phase when the resolution of impairment reaches a plateau, making compensation or adaptation necessary in order to achieve continued functional improvements. In particular, adaptation to the client's environment can facilitate desired performance and, provided that the target of the adaptation (that is, the physical environment, family, carers, friends or work colleagues) remains constant over time, can lead to sustainable long-term gains in performance. For example:

... whether it's teaching the family or carers or getting them plugged into local services, going to day centres, exercise groups ... we are always looking for what's going to be put in place that's going to help them continue and be able to maintain and continue with their rehab once we're not there anymore (Participant [P]8).

The content analysis comparing the frequency and strength of the constructs of 'person', 'occupation' and 'environment' in relation to interventions described by the participants indicated that the interventions that they used in the community focused primarily on the 'environment' domain. However, the concept of the interaction between the person, his or her occupations and tasks and the environment was evident in the practice examples given by the participants. For example, participant three referred to enhancing the performance of a client who had problems with initiation and motivation in saying:

It might be looking at whether medications are going to assist in that process before you can move on perhaps to the performance level if they can't initiate ... again, that's influenced by the environment because if there is no one in their environment to prompt them then they may not participate in anything.

The importance of context

The participants identified a range of benefits particularly associated with providing rehabilitation in 'a real life setting', including optimising assessment, goal setting and rehabilitation, because the therapist can observe a person's particular difficulties and strengths in his or her own environment. The challenge of assessing performance in a hospital context is exemplified in the following comments:

Walking down the paddock to feed the cows, it's very, very difficult to try and do that because you can't simulate that unless you are out there' (P6).

So when seeing them in a therapy room there is only so much you can do to help them see those changes (P9).

Furthermore, the participants identified that a therapist may be more likely to see the impact of subtle changes in the home and community environment due to its unstructured nature. This was evident when a participant was reflecting on her observations of clients in work environments and stated:

Things manifest when they get in that more complex environment and things like fatigue and subtle personality changes and behavioural changes can become bigger issues (P11).

Strategy training was reported as most likely to be effective in the real life context, which allows the therapist to assess and account for environmental factors that may impact on strategy use, thus reducing the need for the generalisation of strategies learnt in a clinical environment to home:

They may have the skills in a hospital setting but not necessarily be able to transfer them to home (P4).

The participants also identified that self-awareness may be enhanced in the real life setting since the therapist may be able to provide specific, situational feedback about tasks that were previously achievable in familiar contexts. Other themes were that it was likely that therapists would have more contact with the family in a home or community setting, and both clients and family members may be more relaxed and may talk more about or seek help for sensitive issues (for example, sexuality or emotional changes) in their own environment.

Collaboration

Collaboration 'with the community, with the voluntary sectors, ... the family, the carers' (P10) was identified as a key factor in optimising a person's participation in CBR. Collaboration was seen as more effective than working in isolation with the client and more sustainable because one service is rarely enough to support all of a person's needs. One participant stated:

If we are able to work on that level of collaboration ... we are able to then help these people not to be re-referred and continue to be dependent on our service ... if you don't collaborate and work in an interdisciplinary manner I don't think that whatever skill you have as a therapist will really make a huge difference to your client (P11).

A participant of the verification workshop further described the importance of collaborating with others to get many sources of information to enable formation of the 'whole picture' of the client.

The participants strongly emphasised that maximising and retaining the client's support network is an important

focus of CBR that contributes to optimal outcomes; in particular, the client's family, friends and carers should be involved in the processes of assessment, goal setting and rehabilitation. Including family members in assessment was described as:

Doing good assessment, doing good interviews with individuals and their families and seeking information from a wide variety of contacts is really helpful because at least you get a picture of how the person is actually functioning in their home and their community (P4).

Including family members in goal setting enables clear communication of goals and expectations as:

When we are doing the goal setting to kind of remedy that discrepancy between what we are imagining our input will look like and what the family are imagining it will look like and find some middle ground (P10).

Involvement of the family in the rehabilitation process involved 'getting them [the family] thinking about ways they can alter the environment or change the task' (P10) and 'using the person's family and considering them to be a client' (P4). The participants also reported that including family members provided opportunities to serve their educational and support needs.

The participants identified the need for education and advocacy targeted at the client and the people, services and community surrounding the client. The participants emphasised that education should be ongoing and repeated, and should be provided in written form to supplement verbal explanations. In addition to targeting the client, the participants also emphasised that education should be provided to the client's family and significant others, and to community services to improve community awareness of ABI issues and improve access to services for people with ABI. In describing the target of education in the community, one participant stated:

... liaising with support services and providing them with some education as well as employers, employees and other members of the community that are important in that person's life (P3).

The participants commonly recommended that education should include information about relevant support and community services, and information about common changes following ABI. Some sought to 'educate the family in how they can assist the client' (P3), and explained the importance of 'educating not only the client but family members about the importance of participation, occupation and encouraging independence' (P3).

Strategy use

Assessing the need for, training, testing and applying strategies in real environments was reported by participants to address a range of changes following ABI. Common strategies described by the participants to address problems with communication, memory, executive function and behaviour were external aids

such as cue cards, communication booklets, lists, diaries and whiteboards, as well as establishing daily routines, organising the physical environment and giving the client and people surrounding the client practical suggestions to manage problems (see Table 1). The importance of applying strategies in a real scenario is highlighted by the statement:

You can get someone to understand and to learn what to do but to actually apply it, it's better if it's applied in a real scenario like at home on a day to day basis or in a workplace (P7).

Strategies were identified as needing to be suited to the person's environment and the person's personality, preferences and lifestyle, and to be adjusted in accordance with changes over time (that is, developmental and environmental changes). An example given by one participant was:

It's interesting because you can get two very similar referrals on paper, social situations and you think, oh, this is going to be exactly the same thing that I'll be doing, but when you go in and you see their family situation around them you have to adapt your strategies to fit those situations and make it work better (P5).

Goals

The concept of goal setting was a strong theme that was consistently identified as an important part of rehabilitation in the community. The importance of client ownership of goals within a collaborative and supportive framework was exemplified by participant five, who stated:

Giving ownership to the client even if initially you are doing a lot of that goal setting but getting the client to agree to them is really important.

Goals were described by participants as needing to be 'very functional so we'd be more likely to set them goals that say, I'm going to be able to walk to the bus stop (rather) than I'm going to be able to walk ten metres in the gym faster than I used to' (P10) and achievable, broken down into short-term steps by 'looking at what the client's goals are and saying so you want to achieve X in the long run but that's a pretty huge playing field so how can we cut it down' (P10).

A regular review of goals to monitor progress and provide feedback to assist with client motivation was reflected in the statements: 'Reviewing the goals more regularly and checking that we are still meeting what they see as their needs has a very positive effect' (P10) and 'If you get positive outcomes they may be more willing to set another goal' (P2). Although goal setting was described as beneficial if it is a concrete process, the participants indicated that it also needed to be flexible, whereby:

You've got to be ready to respond to something happening and to provide rehab that you might not have planned to support something happening rather than have it all black and white (P7).

Also, goal setting was described as needing to be adjusted to suit changing needs and circumstances:

Table 1. Examples of practical strategy use in home and community settings after acquired brain injury

Strategy	Representative quotes
Communication	<p>'With some people we work with them having some sort of card or something that they can get used to handing over ... if it just says I've had a stroke and have a bit of difficulty talking but give me a bit of extra time' (P10).</p> <p>'With the communication book ... I might develop it with the person, liaise with the family and friends and support workers about how they think it should work and what's needed and then demonstrate to them how it's used and check in with them that it's being used' (P4).</p>
Cognitive	<p>'Some sort of card that they have or a list of what they can do ... steps' (P2).</p> <p>'We would attempt to teach people to use a diary ... or a whiteboard or some external memory aid ... but that would nearly always involve the other people in that person's life and how they're going to encourage the person to use it and prompt them' (P4).</p> <p>'Certainly diary use or weekly routines or that sort of level I would do but I do it more on showing them how to use that tool and talking to them about how they'll use it in their situation and their setting' (P5).</p>
Behaviour	<p>'It might be regular rest periods, avoiding conflict, those sorts of things' (P3).</p> <p>'Anger management strategies, strategies to avoid triggers for bad behaviours' (P4).</p> <p>'I've looked at a person's house and then worked out that there's a room that's further away from where the kids usually play and make that the quiet time for the man with the injury, where he goes and the kids know not to go near that door or open that door just for an hour in the day' (P9).</p>

... because of the nature of development as well as changes in goals and probably changes in environment and support around that person as well (P4).

Conversely, it was also reported by the participants, and emphasised by the attendees of the verification workshop, that a goal setting approach may not be appropriate for everybody as some clients are unable to participate in goal setting or relate to it. Goal setting was described as challenging where cognitive impairment substantially impairs insight and judgement:

If they've got impaired judgement and ability to sort of think through a process that makes goal setting quite difficult (P2).

Client-centred intervention

The participants emphasised that, in CBR, each client requires a unique and creative approach, with the right timing of intervention contingent upon his or her priorities, environmental considerations and constellation

of problems and strengths. For example, participant nine recalled a client who stated clearly that he did not feel as though he had any problems he needed to talk about. Seeking to 'be really creative' (P9), the therapist asked him to review a booklet that she was editing that had been written by people with brain injury about their experiences:

He came back and had written all over it, you know, there were many things that he endorsed and actually said well yeah, that's the case with me. He liked having his opinion asked rather than me sitting there and asking him questions (P9).

The importance of treating the person with respect was emphasised by all participants, achieved by valuing the client's knowledge of his or her own situation and listening to the client's perspective and needs. Of similar importance was being responsive and flexible to the client since rehabilitation needs may change over time.

The participants reported that the foundation for intervention was a trusting and supportive relationship and:

developing some sort of a positive relationship where the person's willing to give something a go (P2).

Barriers to participation

Four barriers to the achievement of positive outcomes for clients with ABI in rehabilitation programmes were identified most frequently and consistently across interviews. These were impaired self-awareness, drug and alcohol use, reduced motivation and initiation, and challenging behaviour. Strategies to overcome these barriers reported by the participants are summarised in Table 2. The provision of education and consideration of referral to appropriate specialist services was recommended to address all of these barriers. In addition, the participants identified severity of injury, time post-injury and premorbid function as factors that influence achievement of outcomes. Environmental factors identified as barriers to participation in rehabilitation and achievement of outcomes were poor access to transport, a lack of community awareness about ABI, limited access to funding for rehabilitation and support services and a lack of access to specialist ABI services, especially in rural and remote areas.

Discussion

This qualitative study sought to examine the perspectives of therapists working with people with ABI in CBR. The themes provide a summary of the rehabilitation approaches and practice principles that the participants perceived as effective in achieving positive outcomes. A key theme was the focus on 'environment' as a pivotal aspect of CBR. The findings indicate that rehabilitation efforts aimed at the 'person' and 'occupation' levels were a lesser focus in CBR for people with ABI. Even where participants referred to interventions focused at the 'person' and 'occupation' levels, their practice examples

Table 2. Recommendations for managing identified barriers to the achievement of positive outcomes

Barrier	Strategy
Self-awareness	<ul style="list-style-type: none"> – Development of a positive therapeutic relationship so the person may be more likely to trial recommendations – Give practical experiences on familiar tasks – Provide feedback about performance – Provide education about common changes following ABI – Consider timing and emotional impact of feedback and therapy – Explore the neurological and psychological bases for poor self-awareness and tailor rehabilitation accordingly
Drug and alcohol use	<ul style="list-style-type: none"> – Provide the client and family with information about risks – Provide information about referral to appropriate specialist services
Motivation and initiation	<ul style="list-style-type: none"> – Explore the bases for problems with motivation/initiation (for example, brain injury related change, amotivation due to not wishing to be involved or depression) – Set short-term achievable goals to ensure regular, rewarding progression – Meet regularly – Involve others to support the person in trying out things – Consider specialist review (for example, medication, psychological support and counselling)
Behaviour	<ul style="list-style-type: none"> – Non-confrontational education about common behavioural changes and strategies to assist – Early intervention in specialist behavioural management programmes – Education of significant others about managing behaviour – Consider specialist review

highlighted that the interventions could not be carried out without consideration of the influence of the person's environment. This emphasis on environment represents a paradigm shift away from the traditional focus of rehabilitation on the individual towards an environmental focus. This finding has implications for and poses many questions about rehabilitation for people with ABI living in the community.

If experienced clinicians working in ABI rehabilitation have indicated that access to a person's environment is a necessary ingredient in the achievement of a person's rehabilitation goals, should all rehabilitation be conducted in this context? In contrast to the United Kingdom, where in-home rehabilitation is more established, people with moderate and severe ABI in Australia typically undergo a period of inpatient hospital rehabilitation followed by a period of multidisciplinary outpatient hospital rehabilitation. Literature on the effectiveness of home-based rehabilitation, compared with hospital or centre-based rehabilitation, has focused on groups of people with stroke involved primarily in early discharge schemes (Langhorne et al 2005) or pre-post follow-up designs of home-based interventions (Boman et al 2004). Given that the qualitative findings of this study support

Table 3. Commonly identified environmental factors and interventions classified according to ICF environmental factors

ICF domain	Environmental factor	Environmental intervention
Products and technology	Assistive devices	Provision of equipment
Natural environment and human-made changes to the environment	Physical environment	Modifications (for example, rails, ramp and work set-up) Equipment and aids (for example, diaries, whiteboards, communication devices and physical aids)
Support and relationships	Family Carers and support workers Support network Work colleagues Volunteers Employers Friends	Education and liaison Provision of support Collaboration Collaborative goal setting Skills training
Attitudinal environment	Attitudes of the wider community	Education and liaison Advocacy
Services, systems and policies	Support services Community services Volunteer organisations Day centres Exercise groups Specialist support services (for example, counselling, drug and alcohol, and psychiatry)	Education Advocacy Provision of support Collaboration Sourcing funding Provision of referral

‘rehabilitation in context’ as a way of achieving optimal outcomes, further comparative studies comparing the outcomes of centre-based with home-based rehabilitation with this client group are needed.

The importance of the client’s environment was also emphasised with regard to the assessment process. Part of the role of occupational therapists working in hospital settings is to assess people’s performance and, subsequently, to make recommendations about the timing of discharge and needs on discharge. Typically, this may involve making recommendations, in conjunction with the multidisciplinary team, about equipment needs, necessary supports such as supervision or assistance from others, or referrals to meet ongoing rehabilitation needs. The findings of this study about the importance of context raise the question of how confident we can be about our recommendations when the assessment of a person’s performance takes place in isolation from the person’s familiar environment. Rogers et al (1997) commented on the advantage of observing the influence of a person’s naturalistic context in the assessment of task performance. However, Bottari and colleagues (2006) reviewed studies investigating the effect of context (familiar home settings and hospital or clinic settings) on ADL performance and concluded that there was insufficient research to make recommendations. Further studies comparing ADL performance across hospital and home settings is needed to determine the value of conducting assessments ‘in context’.

Occupational performance models acknowledge the influence of the environment on participation and the use of the environment as a treatment modality in

occupational therapy (Law et al 1996). More recently, the International Classification of Functioning, Disability and Health (ICF) (World Health Organisation 2001) has acknowledged also the role of the environment in influencing health and function. The ICF defines environment as being a facilitator or barrier to function and provides a classification framework whereby environmental factors can be organised into five domains: products and technology; natural environment and human-made changes to the environment; support and relationships; attitudinal environment; and services, systems and policies. Given the strength of the ‘environment’ theme in the present study, the ICF environmental domains present an opportunity for further interpretation of the results. Table 3 uses the ICF environmental domains to classify the environmental factors identified by the participants as being primary targets in CBR. It also summarises the corresponding interventions that they commonly described in working within the environmental domains.

The environmental factors that were most commonly reported as targets for intervention were in the ICF domains of support and relationships (such as family, friends and carers) and services and systems surrounding the client (such as community services, support services and volunteer organisations). Less emphasis was given to adapting and targeting the physical environment. This perhaps highlights the longer-term impact of psychosocial, behavioural and cognitive deficits on community functioning and rehabilitation and the relatively early improvements in physical deficits after ABI (Morton and Wehman 1995).

Several other themes emerged from the interviews that are consistent with previous research, including the opportunities for goal setting, skill generalisation and access to significant others that are provided by CBR. The participants acknowledged goal setting as an important tool for enabling individualised, client-centred practice, while recognising that it may pose challenges for some clients. Koch et al (1998) noted that goal setting and empowerment are enhanced when therapy is conducted in the client's home environment, resulting in improved motivation, initiative and involvement of the client. Further research on goal setting in ABI rehabilitation is warranted as existing research in this area is scant (for example, Fischer et al 2004, Kuipers et al 2004). Other literature has recognised the benefits of CBR, such as the reduced need for generalisation of skills from the clinical environment to home (Pace and Colbert 1996) and the increased opportunity for access to significant others for education and training (Pace and Colbert 1996, Baskett et al 1999, Pace et al 1999, Mayo et al 2000). Although previous research suggests that these factors are beneficial for the clients of CBR services, the present study suggests that they also enhance the quality of the rehabilitation experience from the perspective of rehabilitation providers.

The present study is based on a collective account of a group of therapists experienced in working with clients with ABI in home and community settings. It extends upon previous research by using an occupational therapy model as a framework to examine the focus of CBR, demonstrating an emphasis beyond intervention with the client in isolation towards adapting and targeting the environmental factors surrounding the client, using strategy training, education, support, advocacy and collaboration. Rather than focusing primarily on the person with the ABI, the emphasis on environmental factors may reflect that deficits following ABI are often pervasive and ongoing.

The generalisability of this study is somewhat limited by the relatively small sample of participants, the qualitative nature of the study and the fact that results are likely to be more representative of those working in organisations offering specialised CBR to people with ABI in the United Kingdom and Australia. It is also acknowledged that due to the personal nature of face-to-face interviewing compared with telephone interviewing, the content of the interviews may have been affected by the two different modes of data collection. Despite this limitation, the themes were generally common to participants regardless of the country of practice, with the exception of a few specific issues relevant to the geographical or political context. Examples of this were access to services by people living in rural and remote areas in Australia and access to services, equipment and programmes influenced by funding dependent upon the London borough lived in. A strength of this study was that the participants were therapists from different professional backgrounds and two separate rehabilitation systems, yet the themes were generally common to the participants regardless of background.

Further research is needed to explore the benefits and costs of CBR, since this is an expanding and developing mode of service delivery. Therapists working in CBR practice report that they are likely to be able to access the person's environment, and therefore assess and intervene at an environmental level, which may be less likely when the rehabilitation takes place away from the person's everyday environment. Studies reporting on the experiences of clients and family members experiencing rehabilitation across different environments (that is, hospital, clinic, home and community) may provide further evidence for the success of different approaches and interventions across settings.

Clinical implications and conclusions

The themes provide a summary of practical strategies relevant to occupational therapists, other health professionals and community workers and community organisations (that is, support agencies, nursing services and community groups) involved in delivering rehabilitation services to people with ABI living in the community.

The themes indicate three core practice principles for use in CBR with people with ABI, namely that therapy should be:

1. *Environment focused and contextually appropriate* – assessment and interventions (for example, therapy tasks, design of strategies and strategy training, and environmental adaptation) should be conducted in or with knowledge of the person's real life situation
2. *Collaborative* – the wider network of significant others and the community surrounding the person should be included to facilitate thorough information gathering, ongoing provision of education, maintenance of support networks and sustainable outcomes
3. *Goal directed and client centred* – individualised goals that are 'owned' by the client should be the primary outcome measure, thereby enhancing client involvement and motivation in rehabilitation, at the same time recognising the influence of cognitive changes, such as impaired self-awareness deficits during the goal setting process.

In summary, this qualitative study provides expert opinion evidence that best practice in CBR moves beyond working with the client with ABI in relative isolation towards intervening at an environmental level (that is, with family, carers, support workers, services, employers, and the community as a whole), using a collaborative approach to assist the person to achieve his or her goals. Although this conclusion may seem to be a truism for many occupational therapists working in CBR, this study has attempted to contribute to the literature on the topic for the purposes of informing the development of new CBR services that will deliver optimal outcomes for clients with ABI. These findings have contributed to the

development of an environment-focused, goal-based, client-centred occupational therapy outpatient rehabilitation programme using the PEO model as a theoretical framework. This programme is currently being clinically trialled with a sample of people with ABI living in the community.

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Appendix 1

Interview questions

1. When you are working with people with acquired brain injury (ABI) in the community, what factors do you feel help in the achievement of positive outcomes? Can you give some examples?
2. Do you do intervention at the 'person level'? For example, where your focus is to change the person, such as improve his or her strength or range of motion or concentration or mood. Can you describe the types of thing you do?
3. Do you do intervention at the 'occupation level', where your focus is the practice of tasks in order to improve the performance of a task? For example, the use of a diary to improve memory or the practice of transfers onto a toilet in order to achieve independent toileting. Can you describe the types of thing you do? How do you facilitate a person's performance of everyday activities or tasks?
4. Do you do intervention at the 'environment level'? For example, where you focus on changing things in the person's environment to improve his or her performance, such as attitudes or knowledge or skills of family/friends/employers/carers or changing the physical environment for access. Can you describe the types of thing you do? Do you change things 'surrounding' the person in order to facilitate his or her performance?
5. Do you find one level of intervention has more success? What approach do you find is most successful?
6. What are the three most important things to facilitate successful outcomes?
7. Do you feel that there are pitfalls or barriers to achieving positive outcomes that commonly recur? What things do you find often get in the way of achieving positive outcomes? How do you get around these issues? Can you give some examples?
8. What are the three most common issues that contribute to poor outcomes?

Focus on Research

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Nikki Daniels

A case study to explore whether occupational therapy students on practice placement are provided with adequate opportunities for peer interaction to support their social and learning needs. University of Derby, 2007. MA Education.

The benefits of collaborative learning in higher education are widely recognised. Based on cognitive development theories, collaborative teaching strategies can be used to enable students to develop essential skills such as critical thinking and reflection by learning with and from their peers. However, unlike the classroom setting, placement modules do not always afford opportunities for collaborative learning especially if undertaken by students in isolation. At one higher education institute (HEI) in the United Kingdom, one-third of the undergraduate occupational therapy programme is dedicated to practice placement education, requiring students potentially to spend this proportion of their studies away from peers. To establish the opportunities for collaboration amongst students during these placement modules, a case study was carried out. A semi-structured questionnaire was sent to all occupational therapy students at this HEI in the last 2 weeks of their first placement module. Through closed and open questioning, the social and learning needs and experiences of these students were explored and their behaviours and opinions in relation to peer support were evaluated. This was supported through analysis of an online discussion board, which was made available to

these students whilst on placement, by evaluating the frequency and type of contributions made.

Although a low response rate of 44% was achieved from the postal questionnaire, open responses provided a rich overview of the experiences of these students. The findings demonstrate the diversity and disparity in the opportunities available for students to interact with their peers both within placement settings and externally with their peer group. The value that first year occupational therapy students place on interacting with their peers was evident. This not only provided them with the support and reassurance required but also made a positive contribution to their learning. Although many logged on to the discussion board, the contributions made were limited. Students viewed this as a support tool to ask practical questions, with limited contribution to their learning experience.

From the findings of this study and consideration of the outcome of previous research in this field, a number of suggestions to improve future practice have been made. The support and education of placement providers by this HEI could optimise the opportunities that students have to collaborate with their peers in order for social and learning needs to be met. Continued use of an online discussion board will provide an additional opportunity for peer interaction; however, actions must be taken to ensure it provides the support required effectively and to engage students successfully in this collaborative activity. Evaluation of the experiences and opinions of placement providers could enhance practice further by establishing educators' needs in relation to facilitating collaborative opportunities and identify further actions that this HEI could take to support this process.