Workforce competencies required to provide community rehabilitation for aged clients after orthopaedic surgery - a literature review.

Prepared by

Emmah Doig
&
Delena Amsters

For the Community Rehabilitation Workforce Project

16/12/05
Executive Summary

This literature review explored the nature of rehabilitation and support needs of aged clients after orthopaedic surgery. This was undertaken in order to establish the types of workforce competencies required to meet these needs in community rehabilitation (CR) settings. For the purpose of this review CR was defined as delivery of rehabilitation in home and community settings.

Characteristics of the various client groups, as well as short and long term outcomes documented in the literature, were examined in order to inform the community rehabilitation and support needs. In turn, workforce competencies have been extrapolated from the rehabilitation and support needs.

The nature of CR will differ for joint replacements as compared with hip fracture given the unplanned nature of hip fracture. There is an opportunity for provision of pre-admission assessment and education for elective surgery participants so competencies must reflect the ability to provide consistent and meaningful informational support throughout the continuum. The review highlighted the need for high quality CR services to support early discharge programmes as these are commonly utilised in cases of elective orthopaedic surgery.

There was a strong bias in the literature towards the need for expertise in physical and functional management and environmental compensation. However, the literature clearly highlights the need for skills to assist clients to manage changing social and emotional needs and provide a focus on societal participation, both in the short and long term. Pain management skills were seen as an imperative for effective CR due to the high frequency of persistent pain amongst this client population.

Competence in assessing care support needs and carer burden, and knowledge of available community support services are a critical part of CR. Skills to assist clients and caregivers to manage cognitive deficit was emphasised for hip fracture clients. The ability to implement risk management strategies to prevent future falls and allay client fears of future falls is also an essential competency. Despite the presence of a prescriptive element to provision of CR to this client group, the need for workers to be competent at individualising assessment, planning and intervention was strongly emphasised.
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1. **Context of the Literature Review**

This review has been undertaken as part of the Community Rehabilitation Workforce (CRW) Project, funded through the Commonwealth Pathways Home Programme. The aim of the CRW Project is to optimise the capability of the current and future workforce to develop, implement and evaluate community rehabilitation (CR) programmes to meet the current and emerging health needs of the Queensland community.

This review will assist the CRW Project to determine the CR workforce competencies required to meet the health needs of aged clients after orthopaedic surgery.

The specific questions that will be addressed by this review, in relation to these aims are:

1. What are the rehabilitation and support needs of people aged 65 and over following discharge from hospital after-
   a) hip fracture
   b) total hip replacement (THR)
   c) knee joint replacement (TKR)?

2. What competencies do CR workers require in order to provide these rehabilitation and support needs to people aged 65 and over following discharge from hospital after-
   a) hip fracture
   b) hip joint replacement
   c) knee joint replacement?

The scope of the review has been limited to hip fracture, knee replacement and hip replacement as these are the major orthopaedic diagnostic groups for patients over 65 who are hospitalised in Queensland. The full literature search strategy is outlined in Appendix 1.

2. **What are the rehabilitation and support needs of people aged 65 and over following discharge from hospital after hip fracture?**

The characteristics of the hip fracture population as well as short and long term outcomes after hip fracture, indicate probable rehabilitation and support needs for this client group. A summary of these probable key needs and a description of the supporting literature have been provided in Table 1.

*Characteristics of the hip fracture population*

Arinzon (1) reports the incidence of osteoporotic fractures as increasing and refers to this as an epidemic. Consequently, there is an expected need for increased resources to treat people with fractured neck of femur due to an ageing population (2, 3) which suggests that measures to facilitate early discharge will be imperative.
comprehensive ortho-geriatric approach to rehabilitation following hip fracture, rather than an orthopaedic approach alone is advocated given the diversity and constellation of potential problems in older people due to the complications arising from age related concomitant medical conditions (4).

Increasing age has been associated with poorer functional recovery from hip fracture and older patients (85 years and over) have been found to be more functionally dependent pre-fracture, have higher co-morbidities and are likely to live alone (1, 5). Co-morbidities including osteoarthritis, pulmonary disease, diabetes, stroke, previous fracture, depression and cognitive deficit have been found to be more prevalent in old-old patients (85 years and over) compared to young elderly (65-74 years) (1). Hip fracture is more than twice as frequent in patients with dementia compared to the general population (6). Lieberman et al (7) reported the incidence of hearing or visual impairment in a large group of 896 patients hospitalised for rehabilitation with hip fracture to be approximately 25%. Visual impairment was found to have a significant and negative impact on efficacy of rehabilitation and the authors concluded that attention needs to be paid to optimising a patient’s visual acuity in rehabilitation (7).

**Functional status post hip fracture rehabilitation**

The majority of patients fail to regain their pre-fracture ambulatory and functional status (5, 8, 9) which provides the impetus for studies investigating rehabilitation programs that extend beyond the initial post operative period (ie. six and 12 months post fracture). Several factors have been associated with functional recovery following hip fracture. Older age, poorer pre-fracture physical function and cognitive deficit have been associated with poorer prognosis and functional recovery after hip fracture (1, 5, 8). Co-morbid status, gender, type of fracture and operative delay have also been associated with functional outcome (1). Increasing age and the presence of co-morbidities has been associated with increased use of home health care after rehabilitation (10).

There is a high prevalence of persistent hip pain at three months after surgical repair of a hip fracture. Those with moderate to severe hip pain report greater difficulty with activities of daily living (ADL) performance and worse self perceptions of quality of life which in turn is associated with more symptoms of depression (11). The implications of these results are that patient education about the prevalence of pain and strategies for management, as well as monitoring and treatment of depression are essential for optimising outcomes. Hip fracture is one of the most serious consequences of a fall. Mckee et al (12) found that perceived risk of further falls was associated with high functional limitations post fall and worry over further falls was associated with falling again after discharge. Further investigation was recommended into the worry over further falls in the recovery from hip fracture and the potential for intervention (12). An Australian study by Whitehead et al (13) showed that in a group of patients who had returned to live in the community post hip fracture, 20% had fallen at four months post hip fracture and this group had less confidence in their ability to carry out activities without falling (falls efficacy) than the non-fallers, and higher levels of handicap. Those assessed as having a low gait speed also demonstrated lower falls efficacy and higher levels of handicap than those with a normal gait speed. However ADL as measured by the Modified Bartel Index (MBI), which is a common rehabilitation outcome measure, was not significantly different.
between these groups. This suggests a range of outcome measures needs to be taken to ensure a comprehensive assessment.

Rehabilitation outcomes after hip fracture for patients with cognitive deficits, dementia and delirium

Patients with cognitive deficit have been shown to demonstrate similar functional gains (compared to baseline functioning) after inpatient rehabilitation post hip fracture to those without cognitive deficit (4, 14, 15) indicating that they should not be excluded as candidates for rehabilitation. Beloosesky et al (16) found pre-fracture mobility status to be predictive of mobility gains after hip fracture rehabilitation rather than cognitive status. Generally, length of stay in inpatient rehabilitation has been found to be significantly longer for those with cognitive impairment (4), with the exception of Beloosesky et al (16) who found there to be no differences in length of stay based on cognitive function.

Patients with dementia tend to have a reduced length of acute hospital stay following hip fracture compared to patients without dementia as they are often able to return to a residential care facility (2). Van Dortmont et al (17) concluded that patients with dementia who undergo hemi arthroplasty for displaced fractured neck of femur have higher mortality rates and significantly worse outcomes in terms of return to pre-fracture mobility status when compared to those without dementia. Those patients with more severe Alzheimer’s disease have been found to be more likely to remain immobile after hip fracture and this factor was found to be a major influence in precluding return to the same residential care facility (18). Post-operative delirium has been associated with the development of dementia.

One study (19) investigated patients admitted with hip fracture with no evidence of pre-fracture dementia and assessed them for postoperative disorientation and confusion with subsequent follow-up five years after discharge. The results indicated that those who experienced post-operative delirium were more likely to develop dementia and had a higher mortality rate (19). The authors indicated that those experiencing pre or post operative delirium should be assessed for aetiology and underlying organic brain disorder (19).

The particular needs of patients with dementia who experience hip fracture

The unique needs of patients with dementia who experience hip fracture are demonstrated in a study by Hedman et al (20). This study explored the perspectives of the next of kin of patients with dementia who underwent rehabilitation following a hip fracture. The study identified that relatives felt that competence is diminished in terms of hearing, vision, health, cognition, memory and communication and the person needs specific rehabilitation support. In light of this they identified the need for support in rehabilitation in terms of: strategies to attract patients into performing rehabilitation activities to prevent the person becoming bedridden; help with practising tasks; reminding the person what to do; supervision and positive encouragement. Relatives also identified the impact of the environment on the person with dementia, including the staff’s knowledge of dementia and the patient’s abilities, and emphasised the benefit of a familiar environment for the patient.
Table 1: Rehabilitation and support needs after hip fracture

<table>
<thead>
<tr>
<th>Need</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthening, Transfers training,</td>
<td>the descriptive Tinetti study suggests the main CR needs are in the areas of upper and lower extremity conditioning, transfers training,</td>
<td>(21)</td>
</tr>
<tr>
<td>ADL retraining, Environmental compensation</td>
<td>complex ADLs such as dressing and bathing and more environmental compensation for instrumental ADLs such as shopping and laundry.</td>
<td></td>
</tr>
<tr>
<td>Individualised rehabilitation plans and</td>
<td>Due to the likelihood of the presence of complicating factors such as co-morbidities and cognitive deficits, the context, content and duration of</td>
<td>(1, 5, 8, 10)</td>
</tr>
<tr>
<td>support arrangements</td>
<td>rehabilitation programs and the amount and duration of support is most appropriately assessed on a case-by-case basis.</td>
<td></td>
</tr>
<tr>
<td>Home health care</td>
<td>Patients that are clinically more complex with co-morbidities and are older are likely to require home health care after rehabilitation.</td>
<td>(10)</td>
</tr>
<tr>
<td>Involvement of patient and family in</td>
<td>Patients and their families need to be involved in communication and decision making, especially during hospital to home transition.</td>
<td>(22)</td>
</tr>
<tr>
<td>decision making</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatigue management, Pain management</td>
<td>Interventions are needed to assist in dealing with fatigue and persistent hip pain including energy conservation techniques, planning rest</td>
<td>(11, 23)</td>
</tr>
<tr>
<td></td>
<td>periods, pain management strategies which may in turn reduce depression, improve quality of life and increase independence with ADLs.</td>
<td></td>
</tr>
<tr>
<td>Falls prevention</td>
<td>Interventions such as group sessions are needed to reduce fear of falling and reduce feelings of loss of control may improve function and reduce the</td>
<td>(12, 13, 23)</td>
</tr>
<tr>
<td></td>
<td>number of subsequent falls.</td>
<td></td>
</tr>
<tr>
<td>Adaptive Equipment</td>
<td>Prescription of adaptive equipment to promote function as this has been identified as a factor in successful transition from hospital to home.</td>
<td>(23)</td>
</tr>
</tbody>
</table>
3. What are the rehabilitation and support needs of people aged 65 and over following discharge from hospital after THR?

The characteristics of the population undergoing THR as well as short and long term outcomes after THR indicate probable rehabilitation and support needs for this client group. A summary of these probable key needs and a description of the supporting literature, has been provided in Table 2.

**Characteristics of the hip replacement population**

Most people undergo hip joint replacement due to the presence of advanced primary or secondary osteoarthritis of the hip (24, 25) and do so to relieve hip pain and improve functional status (26). Therefore admission to hospital for hip joint replacement is a planned event and mostly involves a standardised protocol of preadmission assessment, pre and post surgical education and planned discharge within a predetermined timeframe. It is assumed that patients admitted to hospital to undergo elective hip joint replacement are medically fit to undergo surgery, potentially reducing the likelihood of complications due to concomitant medical problems. Consequently the timing and nature of CR for people with hip joint replacement will differ from CR for people following hip fracture, given the unplanned nature of the hospital admission and the concomitant age-related medical problems associated with hip fracture. Factors found to be associated with the likelihood of extended hospital stay following THR, however, include older age, presence of co-morbidities and lower pre-operative MBI scores (27).

**Outcomes post THR**

The appropriate timing of discharge and ability to predict discharge date from hospital to home is important in order to effectively plan post discharge support and rehabilitation services.

A Western Australian study concluded that based on a MBI score of 90/100 as an indicator of safe functional level of discharge, 58% of a sample of 65 patients were fit for discharge by day eight post THR. The group that required an extended stay of 10 days or more were older, had more co-morbidities, had pre-operative impairment in hip strength and lower pre-operative MBI scores (27). The authors concluded that some patients may be discharged earlier with lower MBI scores if they have a high level of family support on returning home (27). Predicting discharge destination is important in planning discharge and in identifying those people at risk of not returning to live at home, in order to target them for special intervention or services (28). Physical readiness and safety for discharge is the focus of planning discharge of patients after THR. Patients report prior to discharge that they are ready for discharge when they feel ‘psychologically’ safe as well as ‘physically’ safe. A perception of psychological and physical safety was found to be achieved by those who felt confident and had support at home (29). Given the reducing lengths of hospital stay, health professionals are required to address these factors within a relatively short time period. This may be achieved by giving consistent and accurate information about discharge and post-hospital period, arrangement of personal alarm systems for
patients who live alone, and discussion and arrangement of supports after discharge (29).

The Risk Assessment and Prediction Tool (RAPT), which was developed based on an Australian sample, has been shown to be a predictor of discharge destination after THR or TKR with 75.2% accuracy. It includes age, gender, preoperative walking distance and walking aid, community supports and presence of a caregiver on return home as factors relating to discharge destination (30). An American study found cognition and basic motor function associated with ADLs, length of stay and marital status were important predictors of discharge destination after hospital discharge from THR or TKR (28). A further study found that being unable to walk at discharge, older age, obesity and living alone were factors associated with likelihood to be discharged to a rehabilitation facility post THR rather than discharged directly home (31).

A study describing the outcomes post THR (265 patients) and TKR (135 patients) discharged at day 4-5 (short-stay) or day 8-10 (long-stay) concluded there were no differences in outcomes between short and long stay patients at 3 and 12 months post discharge (32). A study of outcomes for 353 patients following THR with an average LOS of 9.5 days indicated that LOS in itself is not an important determinant of outcome after THR however concluded that reduction in LOS may be accompanied by increase in demands for primary and community care services (33).

Long term outcomes following THR

Impairments in hip strength were reported in a sample of 53 participants who were at least 1.5 years post THR when compared to age-matched healthy controls (34). Impairments in postural stability of the involved hip were reported as significantly reduced in a sample of 14 participants who were 12 months post THR when compared to the uninvolved hip (35). At three years post THR 10% of a sample of 922 participants reported at least moderate difficulty with all functional activities (25). Hip strength and knee extensor strength has been shown to be a predictor of walking speed and functional performance in patients with THR (35-37). This has been the impetus for a number of studies investigating long-term and late phase rehabilitation programs focusing on weight bearing and postural stability.

The presence of preoperative impairments (33) as well as pain, poor mental health, more than one common geriatric problem such as history of a fall or decreased balance, vision or hearing problems, the presence of obesity and less than a college education (25) have been associated with poorer long-term functional recovery following THR.

Carer Burden

Carer burden is an important consideration given the potential for poorer functional status post-surgery under early discharge from hospital schemes. A survey of care services three months post THR or TKR indicated that patients who visited their GP in the early post discharge period did so primarily due to problems with pain and 97% reported no concerns with their ability to manage at home following discharge (32). However, at three months post discharge the majority relied on informal carers for
assistance with shopping and housework, less for cooking and personal hygiene with
31% of patients reporting that their carer found it difficult to cope with this in the
early post-discharge period (32). A survey of 34 informal caregivers, who were
mostly female, and care receivers prior to and 3 months following total hip
replacement indicated there was no significant reduction in carer’s stress level after
the THR and 52.2% of the carers, indicated feeling quite stressed from caring for their
relative at three months post THR (38). The feasibility of rehabilitation at home may
also be strongly influenced by the availability of support at home (30) and there is a
lack of research examining the impact of early discharge and home based
rehabilitation upon significant others.

Information needs

A study exploring patients’ perceived needs before and four months after THR across
two hospitals in the UK indicated that the standardised provision of information,
equipment and therapy post THR helped with their preparation for surgery and
recovery however this was found to be less effective for the patients who had multiple
impairments prior to surgery and who developed problems after surgery (39). The
standardised approach post hip replacement (as outlined by Harris and Candando (40)
is described as provision of information regarding precautions, activity limitations,
physical exercise, equipment and home environmental modifications and ambulation
guidelines. For patients undergoing THR with multiple pre-surgery impairments and
complications post surgery, rehabilitation and advice needs to be more individualised
(39). Patients who have undergone total hip or knee replacement and their spouses
reported the need to be prepared for potential transitional and role changes (ie.
changes in social activity, roles at home) post surgery (41), which is not typically
included in the standardised post-THR treatment regime. Patients and their spouses
also indicated that during their hospital stay, information provision and teaching of
skills occurs over a short period of time and isn’t always applicable to the home
environment (41). A survey of patients before and 2 weeks after THR indicated that
while patients learning needs were a little greater in hospital than at home, the type of
information needed remained the same across settings: information about
complications and avoidance of complications; knowledge of medication; physical
exercise and ADLs to do and avoid(42).

Table 2: Rehabilitation and support needs following THR

<table>
<thead>
<tr>
<th>Need</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term rehabilitation, Postural Stability, Lower limb strengthening, Monitoring</td>
<td>Long-term, late phase (from four months up to two years) CR in the form of a monitored home program focussing on weight bearing and postural stability for patients, appears to be warranted due to the presence of deficits in lower limb strength years post hip replacement surgery and the association this has with everyday functioning</td>
<td>(25, 35-37)</td>
</tr>
<tr>
<td>Support and assistance with ADLs</td>
<td>Potential need for support and assistance with functional activities and ADLs due to functional and mobility deficits that may be ongoing or at least a need for assistance in</td>
<td>(25, 34, 35, 43)</td>
</tr>
<tr>
<td>Support for caregivers, Skills for caregivers, Assessment for necessary aids/adaptations/services</td>
<td>For relatives who are experiencing caregiver stress, they require support and recognition, skills to assist their relative in ADLs and skills to manage stress. Patients could also benefit from assessment for necessary aids, adaptations or services required to maximise independence. (38)</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Exercise groups, Written information, Individualised protocols</td>
<td>For the majority of patients standardised regimes of therapy and advice (ie. exercise groups, standard written information RE: recovery and ADL performance) may be sufficient however for patients with multiple impairments or post-operative complications, rehabilitation and advice provided needs to be individualised. (39)</td>
<td></td>
</tr>
<tr>
<td>Provision of information</td>
<td>Provision of information regarding complications, avoidance of complications, and physical activity and ADL restrictions. (42)</td>
<td></td>
</tr>
<tr>
<td>To feel ‘psychologically’ safe for discharge</td>
<td>To feel ‘psychologically safe’ as well as ‘physically safe’ on discharge by being provided with accurate and consistent information about discharge home and having support after discharge (29). (29)</td>
<td></td>
</tr>
</tbody>
</table>

4. What are the rehabilitation and support needs of people aged 65 and over following discharge from hospital after TKR?

The characteristics of the population undergoing TKR as well as short and long term outcomes has been used to indicate probable rehabilitation and support needs for this group. A summary of these probable key needs and a description of the supporting literature, has been provided in Table 3.

**Characteristics of the TKR population**

Total knee replacement surgery is successful in the treatment of joints compromised by osteoarthritis and other disorders of the knee, and pain relief is one of the most important post operative aims (44). Therefore, like admission to hospital for THR, TKR is a planned event and mostly involves a standardised protocol of preadmission assessment, pre and post surgical education and planned discharge within a predetermined timeframe. However, one comparative study reported a 30% complication rate in a group of 37 patients allocated to early discharge and hospital at home post TKR, which prevented planned early discharge (45). A standardised protocol with pre-determined timing for hospital discharge to CR following TKR may not be possible for every patient. Older age (27, 30, 46), presence of co-morbidities and lower pre-operative MBI scores (27), female gender, absence of a carer, housebound prior to admission (30) and presence of diabetes mellitus (46) are factors that have been found to be associated with longer hospital stay and discharge to inpatient rehabilitation following TKR.
**TKR outcomes**

A particular yardstick for discharge after TKR is knee flexion range of motion. Ritter and Campbell (47) reported that the amount of post operative knee flexion had statistically significant effect on walking and stair climbing ability. Ninety degrees of knee flexion has been shown to be adequate for most ADLs (48). Studies indicate a loss of knee flexion at 12 months (49) and in patients with osteoarthritis of the knee (50). This has been found to be related to pre-operative knee contracture (51).

Oldmeadow et al (30) described outcomes of 105 patients across three Melbourne hospitals with a mean length of acute stay of 6.5 days, and reported that on discharge from acute care 56% of participants had achieved independent functional mobility adequate for discharge home. Of those participants that achieved independent functional mobility, about two thirds were discharged home and the remainder were discharged to institutional rehabilitation. The authors reported the most common reason for discharge to rehabilitation in these cases appeared to be non-clinical factors, including the availability of a rehabilitation bed and pressure to reduce length of stay. Other reasons for discharge to rehabilitation included: the need to progress from a walking frame to crutches; having a knee range of motion less than 55 degrees; and needing ongoing wound care, all of which the authors report could be managed by community services. This finding highlights the benefits of predicting timely discharge to appropriate levels of services, including the identification of ways to discharge patients directly home. Oldmeadow et al (30) suggest that identification of pre-operative factors may be useful in the early post operative period and cite their findings of association between increasing age, female gender, housebound before admission and absence of a carer with more frequent discharge to institutional rehabilitation following total knee arthroplasty (30). Forrest et al (46) identified age and the presence of diabetes mellitus to be associated with need for admission to inpatient rehabilitation after knee arthroplasty. Bindelglass et al (52) describe a rating tool based on pre-operative factors however this was found to be accurate 73% of the time in determining the need for discharge to a rehabilitation facility.

**Long term outcomes post TKR**

Fuchs et al (53) compared patients with TKR with a group of age-matched controls without TKR and found that participants with TKR (who were an average 21.5 months post TKR) had poorer functional capabilities, more pain, lower quality of life scores, poorer gait pattern and muscle activity. Brander et al (44) described a group of 116 patients following TKR and found that one in eight patients report significant pain at six and 12 months post surgery, with preoperative depression and anxiety associated with higher levels of pain and use of more postoperative health services. Identification and treatment of depression and anxiety before surgery may therefore be important for improving outcome after TKR (44). Heightened preoperative pain was also associated with heightened postoperative pain and therefore preoperative pain management, physical therapy and education may reduce poor outcomes (44). A study of quality of life (QOL) one to four months following TKR revealed that participants reported social factors such as caregiver burden, decreased social activity
and shrinking social networks to be factors that they felt prevented improvements in their QOL after TKR (54).

**Table 3: Rehabilitation and support needs following TKR**

<table>
<thead>
<tr>
<th>Need</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee ROM</td>
<td>Long term management to prevent loss of knee range of motion especially for those with osteoarthritis and pre-operative knee contracture.</td>
<td>(50, 51)</td>
</tr>
<tr>
<td>Pain management, Treatment of anxiety and depression</td>
<td>Pain management early post discharge and potentially 6-12 months post TKR and inclusion of treatment of anxiety and depression in patients where this may contribute to their experience of pain.</td>
<td>(44)</td>
</tr>
<tr>
<td>Support and assistance for ADLs</td>
<td>Potentially need for support and assistance with functional activities and ADLs due to functional deficits that may be ongoing or at least a need for assistance in the early post discharge period.</td>
<td>(53)</td>
</tr>
<tr>
<td>Resumption of social roles</td>
<td>Assistance to resume social roles despite reduced knee function in order to optimise quality of life.</td>
<td>(54)</td>
</tr>
</tbody>
</table>
5. What competencies do CR workers require in order to meet these rehabilitation and support needs?

Findings of research pertaining to outcomes early and several years post discharge from hospital after hip fracture, TKR or THR, as well as the outcomes of intervention studies, indicate the competencies required by health workers providing CR. Summaries of these suggested competencies have been provided in Tables 4 and 5.

Table 4: CR competencies for workers providing services post hip fracture

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualised assessment skills to inform an individualised intervention</td>
<td>Tinetti et al suggest an ability to implement a systematic, individualised assessment to inform an individualised intervention given the multiplicity of factors such as comorbidities, cognitive impairment, age, pre-morbid functional level on outcomes.</td>
<td>(8)</td>
</tr>
<tr>
<td>Understanding impact of cognitive deficit on rehabilitation</td>
<td>Skills in assessment of cognitive status and implementation of rehabilitation with an understanding of the impact of cognitive deficits on rehabilitation.</td>
<td>(14-16)</td>
</tr>
<tr>
<td>Care and support needs assessment skills</td>
<td>Accurate assessment of care needs and social support.</td>
<td>(55)</td>
</tr>
<tr>
<td>Understanding of unique needs of patients with dementia</td>
<td>Skills in management and understanding of needs of patients with dementia given the frequency of hip fracture in patients with dementia. This may involved upskilling rehabilitation providers in nursing homes.</td>
<td>(6)</td>
</tr>
<tr>
<td>Awareness of indicators of visual acuity problems and how to optimise</td>
<td>Awareness of the prevalence of visual acuity problems and need to optimise patient’s vision in order to optimise rehabilitation outcomes.</td>
<td>(7)</td>
</tr>
<tr>
<td>Pain Management, Fatigue Management</td>
<td>Holistic skills in the management of pain and fatigue.</td>
<td>(15, 23)</td>
</tr>
<tr>
<td>Falls Prevention</td>
<td>Skills in falls prevention and addressing worry over falls to increase confidence with participation in ADLs.</td>
<td>(12)</td>
</tr>
<tr>
<td>Exercise based conditioning, Transfers training, ADL retraining, Environmental compensation</td>
<td>Skills in exercise based conditioning, transfers training, ADL retraining and environmental compensation.</td>
<td>(21)</td>
</tr>
</tbody>
</table>
Table 5: CR competencies for workers providing services post THR and TKR

<table>
<thead>
<tr>
<th>Competency</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care and support needs assessment skills</td>
<td>Accurate assessment of care needs and social support including instrumental and social support for which there are valid and reliable orthogeriatric assessment tools including the Groningen orthopaedic social support scale.</td>
<td>(55)</td>
</tr>
<tr>
<td>Knowledge of potential range of impairments and impact on function</td>
<td>Recognition of the importance of preparing patients and their families for best case-worst case scenarios in terms of recovery and resumption of previous roles.</td>
<td>(41)</td>
</tr>
<tr>
<td>Knowledge of pre-arthroplasty protocols and information provision</td>
<td>Understanding of pre-arthroplasty protocols and information given in hospital in order to be able to repeat the information and check the skills given in hospital to ensure knowledge and skills has been transferred to the home environment.</td>
<td>(41)</td>
</tr>
<tr>
<td>Knowledge of impact impairments on QOL, Rehabilitation focus that maximises QOL by targeting activity/participation</td>
<td>Broader perspective beyond physical functioning to QOL. Attention to impact of reduced participation in social activity/roles and enabling access to/participation in social activity despite deficits in physical function (ie. community access, transport issues).</td>
<td>(54)</td>
</tr>
<tr>
<td>Rehabilitation skills: Exercise-based activity, Improving mobility, Improving physical function, ADL retraining, Environmental compensation</td>
<td>Skills in exercise based rehabilitation to maximise knee ROM, mobility and physical function, ADL retraining and environmental compensation.</td>
<td>(34, 43, 49, 51, 56)</td>
</tr>
<tr>
<td>Pain management skills</td>
<td>Expertise in pain management, education and ability to know when there is a need for specialised pain management services.</td>
<td>(44)</td>
</tr>
<tr>
<td>Skills in prevention and identification of carer burden, Knowledge of available support services, Skills in running carers’ groups.</td>
<td>Awareness of the potential for burden on informal carers and knowledge of services such as respite and paid care to ease burden on family. Skills in recognising and supporting carers who are experiencing stress associated with caring and skills in running carer’s groups.</td>
<td>(32)</td>
</tr>
</tbody>
</table>

6. Conclusion

Rehabilitation needs exist in terms of functional status, mobility, lower limb strengthening, postural stability, pain management, falls prevention and interventions to improve quality of life years post hip fracture, THR and TKR. The timing and nature of CR will differ for joint replacements as compared with hip fracture given the unplanned nature of hip fracture and the concomitant age-related medical problems associated with hip fracture. Where a prescriptive, standardised protocol of pre-admission assessment and education and early discharge to CR may be appropriate for the majority of planned elective hip and knee joint replacements, this is unlikely to be appropriate for most patients following hip fracture.
Competencies common in provision of CR for people post hip fracture, THR and TKR in the community include individualised assessment skills to guide individualised intervention programs; skills in assessing care support needs and carer burden; knowledge of available community support services; skills in pain assessment and management of pain and fatigue; skills in exercise based training to improve physical function and mobility, transfers and ADL and environmental compensation. Competencies specific for clients post hip fracture in the community include understanding of the impact of cognitive deficit on rehabilitation and skills in managing people with cognitive deficits, dementia specific skills for clients with dementia and hip fracture as well as skills in prevention of falls. Competencies specific to management post TKR and THR include knowledge of pre-arthroplasty protocols to enable carry over of education and management to the home/community environment, knowledge of the functional implications of impairments and a quality of life (QOL) and a participation focus.
7. References


Appendix 1: Search Strategy

1. Identified published literature in research journals by searching electronic databases using the following broad key search terms (number of hits):

   Hip arthroplasty rehabilitation (277)
   Knee arthroplasty rehabilitation (257)
   Hip replacement rehabilitation (290)
   Knee replacement rehabilitation (344)
   Proximal femoral fracture rehabilitation (32)
   Proximal femoral fracture (269)
   Fractured Femur (577)
   Fractured neck of femur (443)
   CR and fracture (23)

   Searches were carried out between 10/08/2005 and 18/08/2005 on the following electronic databases:
   • Silverplatter Medline
   • Rehabilitation and Physical Medicine
   • Cochrane Database register of controlled trials
   • Cochrane Database SR
   • Allied Health and Complementary Medicine
   • CINAHL and Pre CINAHL
   • Psychlit

2. Titles and abstracts of the articles retrieved were reviewed. Those not meeting the inclusion criteria were excluded. A full report was retrieved for those meeting the inclusion criteria.

3. Reference lists of included articles were reviewed. A full report was obtained for relevant articles after analysis of the title and if the article met the inclusion criteria on further review.

Inclusion/Exclusion criteria:
• All levels of evidence were reviewed
• Studies reviewed only included participants who were 65 years of age and over and have undergone orthopaedic surgery post proximal femoral fracture or have had a total knee replacement or total hip replacement.
• Studies reviewed involved post surgical/hip fracture rehabilitation interventions carried out in hospitals, day centres and the participant’s home setting, studies reporting outcomes post hospital discharge following hip fracture, THR and TKR
• English language full text published literature from 1990 to 2005.