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**A Randomised Controlled Trial  
of a  
Quick Response Team for Older People**

**A thesis presented in partial fulfillment of the requirements  
for the degree  
of Master of Arts in Nursing at  
Massey University**

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**2000**

## Abstract

### A Randomised Controlled Trial of a Quick Response Team for Older People Who Have Experienced a Health Crisis

This research investigated the impact of Quick Response Team (QRT) care on levels of independence in older people at three months, as measured by changes in living accommodation and home support packages. It was part of a large collaborative project, a randomised clinical controlled trial that tested efficacy, safety, and cost savings of a crisis intervention programme for older people in Central Auckland. The QRT, an intensive short-term multidisciplinary scheme developed in Canada, was evaluated as being very effective in preventing hospital admissions and enabling early discharges. This study explored the effectiveness of QRT care within the context of health care in New Zealand. The study population included people over 55 years of age who lived at home and, mainly due to increased social needs, would normally be cared for in hospital. QRT nurses and geriatricians at Auckland Hospital identified and screened patients, in the Emergency Department for the Admission Prevention arm of the study, and on in-patient wards for the Early Discharge arm of the study. Data on age, gender, demographics, problems, and reasons for seeking hospital care were obtained from patient records and through personal and telephone interviews with patients, family, hospital staff, GPs, and community health providers. QRT nurses completed comprehensive assessments at study entry including details about: living accommodation and the use of formal supports, such as District Nursing, rehabilitation therapy, meal services, home help, day programmes, and respite care. Consenting patients ( $N = 285$ ) were randomly assigned either to control groups receiving the usual in-patient hospital care or to experimental groups receiving QRT care. Visiting nurses, rehabilitation therapists, and social workers provided care and coordinated home supports for the QRT intervention groups, which included live-in home help if required. Medical supervision was provided by hospital geriatricians in a shared role with GPs. Interviews were completed again three months after study entry. Subjects in all groups after three months showed an

increase in dependency as evidenced by changes in living accommodation and care support packages, however there were no significant differences in the changes between the experimental and control groups ( $p < 0.05$ ). Therefore, regarding levels of independence, care at home by the QRT was judged to be as effective as hospital care for older people experiencing a health crisis. The results obtained in this study need to be considered along with the results of the larger trial.



## Preface and Acknowledgements

### Preface

In 1995, Health Services for the Elderly at Auckland Hospital entered into a contract with North Health Regional Health Authority (NRHA) to implement a QRT on a trial basis and conduct an evaluation study. I was employed as the Project Manager for the QRT and it was agreed that I could use data from the trial for the completion of a Master of Arts thesis at Massey University. The NRHA Ethics Committee granted approval in 1995 for a large-scale multi-disciplinary project, the Quick Response Team Trial at Auckland Hospital, including my use of data for this thesis. The Massey University Human Ethics Committee granted approval in 1996. The members were aware that this study was part of the QRT trial at Auckland Hospital and advised that my evaluation of the programme might be influenced by the possibility of future employment with the QRT programme, and that this was a conflict of interest. In May 1996, prior to formal collection of data for the QRT trial, my employment at Auckland Hospital ended. In November 1998, after the data were collected, it was agreed that the focus for this thesis would be on the care packages people received prior to study entry and three months later. It was anticipated that the report for the larger project would be available but this has not been the case. A person was hired to complete all statistical analyses of data presented in this thesis, which was done under my direction.

### Acknowledgements

I am most grateful for the help, support, and contributions of many people who have assisted me in this endeavour. I wish to particularly acknowledge and thank the following people.

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- All participants, their families, and support people who participated in the QRT trial.
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It has been a most interesting experience and privilege to live, work, and study in a different country. Paradoxically, we are all different from each other in different cultures, but at the same time very alike.

Linda Marianne Bapty BScN

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### Dedication

I dedicate this work to my family; to my mother who continues to demonstrate the pleasures and challenges of growing old gracefully; and to my sons, who are spreading their wings in Wellington and Hobart.



## Chapter 1

### Introduction of the Study

#### Introduction

The purpose of this research was to investigate how the Quick Response Team (QRT) concept, which was developed overseas in Canada, applied in Central Auckland, New Zealand. It was designed to identify older patients in emergency department and in-patient areas of a hospital in Auckland who could be cared for at home with short-term intensive services as an alternative to hospital care. By means of this study, a programme to provide this type of care was developed, implemented, and evaluated on a trial basis in Auckland. The aim was to compare safety, efficacy, and costs of care at home, for older people randomly assigned to the QRT scheme, with those of similar control groups offered the usual care in hospital. It was devised partly for the academic requirements of a Master of Arts degree in Nursing, but also in response to the findings of a review conducted for Health Services for the Elderly at Auckland Hospital by the researcher, an experienced Quick Response Team nurse (Bapty & Harris, 1993).

In this chapter the background leading up to the Quick Response Team (QRT) trial is presented, including an outline of what the QRT concept is; why it was developed in Victoria, Canada; and the challenges related to care of older people internationally and in New Zealand. This is followed by a description of health care services in Victoria and in Auckland, and a summary of the similarities and differences. In discussing these differences, the researcher explains why it was important to introduce the QRT programme on a trial basis and conduct a research-based evaluation.

#### Background

In 1995, North Health Regional Health Authority entered into a contract with Health Services for the Elderly (which became A+ Links - Home and Older People's Health, in 1998) to develop and conduct a research evaluation of a Quick Response Team service on a trial basis. The researcher worked as the Project Manager of this Quick Response Team Trial at Auckland Hospital in 1995/1996, prior to the formal collection of the research data, which occurred later in 1996 through 1998. The data collected and analysed for the overall QRT Trial was

detailed and complex; it was agreed that the researcher could use some of the QRT Trial data for her thesis. The methodology used to evaluate the QRT was a randomised clinical controlled trial. Information on all participants was collected prior to study entry and at three months post trial entry, with an aim to determine if the new programme would affect the outcomes of the participants. The outcomes reported on for the thesis are limited specifically to care packages over the two weeks prior to study entry and the two weeks preceding three months post study entry. A care package is the mixture of services a patient might receive such as district nursing, home carer support, or meals on wheels to assist them to be as independent as possible and at home. Other outcomes, such as care packages for the experimental groups during the Quick Response episode of care, and care packages for the experimental and control groups on immediate discharge from the acute hospital and QRT episodes of care, costings, safety, and satisfaction are not part of this study. They are reported on in the larger study and are outside of the scope of the thesis.

#### What is the QRT Concept and Why Was it Developed?

The QRT programme in Victoria, Canada provides intensive interdisciplinary care at home for older people experiencing a health crisis, as an alternative to hospital admission. The Capital Regional District (CRD) in Victoria, British Columbia, Canada, started the first QRT programme as a six-month pilot programme in 1986 (Capital Regional Health District Community Health Services, 1988; Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991; Peck, 1991). It was developed in response to a local crisis caused by a shortage of long-term institutional care beds available for older people who appeared to be unable to live independently in the community; up to 20% of acute hospital in-patients were waiting for long-term care beds (Dawson; Dawson & Critchley; LeBourdais; Robertson, 1985). Consequently the waiting lists for acute services were growing longer. Nurses involved in discharge planning thought that many older people were admitted to hospital due to a lack of social supports, rather than a need for hospital-based treatment, and that many of those admitted to the hospital environment became dependent, losing their ability to return home (Dawson; Dawson & Critchley; LeBourdais; Robertson).

The QRT in Victoria, Canada was developed to complement the existing Community Health Services in the Capital Regional District area and was administered by the Capital Regional District (CRD), a local administrative body. In 1997, the CRD Community Health Services amalgamated with a number of other health care organisations and became part of the Capital Health Region (CHR). The existing services were provincial health programmes, part of the Continuing Care Division of the British Columbia Ministry of Health, and continue to be administered in 2000 by the CHR in the Victoria area. These services include: Home Nursing Care (HNC), a visiting nursing service comparable to District Nursing in New Zealand; the Community Rehabilitation Programme (CRP), visiting physio and occupational therapists; Long-Term Care (LTC), a case management programme designed to coordinate subsidised home supports and residential care for people over 19 years of age with long-term health related disabilities; and the Nutrition Programme (Bapty & Harris, 1993; CRD Health, 1992).

The focus of the initial QRT pilot programme in Victoria in 1986 was on preventing admissions of people arriving at hospital emergency departments to in-patient areas. The original QRT consisted of six staff: a team of three on each day, including a Liaison Nurse, a Home Care Nurse, and a Social Worker (Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991). General practitioners (GPs) were responsible for medical supervision of people having QRT care at home. The programme functioned from 2 p.m. to 10 p.m., 365 days a year. It later expanded in 1988, to enable early discharge of people from hospital as well as direct admissions from the community, thereby avoiding an encounter with the hospital altogether. The staff increased to 27, adding the disciplines of physio and occupational therapists; the hours were increased and the service functioned from 8 a.m. to 11 p.m., 365 days a year (Critchley & Bingham, 1993; Dawson, 1993; Dawson & Critchley; LeBourdais) and still functions this way in 2000.

QRT nurses played a key role in identifying people suitable for QRT care at home, assessing needs and ensuring that the required care, possibly live-in home help, was safe and available (Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991). Characteristics unique to the QRT established in Victoria,

Canada included: the ability to respond quickly with one interdisciplinary service on the same day (usually within two hours of completing the referral); the ability to provide overnight home help; and the ability to closely monitor and adjust services daily as necessary (Dawson, 1988, 1993; Dawson & Critchley; LeBourdais). A comparison of the services of the Quick Response Team Programme with the services of the other community health programmes in 1988, in Victoria (Bapty & Harris, 1993), is shown in Table 1.1.

Table 1.1

Characteristics of QRT Compared to Other Community Programmes in Victoria, Canada in 1988

<b>Community Programmes</b>	<b>QRT</b>	<b>Home Nursing</b>	<b>Rehabilitation Therapy</b>	<b>LTC Home Support</b>
<b>Service</b>				
Nursing	✓	✓		
Social Work	✓			
Rehabilitation therapy	✓		✓	
Home supports	✓			✓
<b>Hours</b>				
Mon to Fri 0830-1630			✓	✓
7 days/wk 0830-2300	✓	✓		
<b>Response</b>				
Same day	✓	✓		
1 week			✓	
3 weeks				✓

Patients cared for on the QRT programme were those who otherwise would have been admitted to hospital because they required a more intensive service than was normally available in the community, but did not require invasive surgical interventions or technical treatments necessitating hospital admissions. The aim was to support elderly patients through a crisis, ideally for no longer than five days, until the other community programmes could safely assume services.

### What are the Current Challenges Related to Health Care for Older People Internationally?

When one considers health care for older people internationally several factors contribute to a growing challenge to deliver more services and higher standards of care using limited resources. Demographics are changing and more people are living longer (Jansen, Harrison, Richards, Suckling, & Nixon, 1996; Richards et al., 1998; Richmond, Baskett, Bonita, & Melding, 1995; Steel, 1987; Steel, 1991; World Health Organisation, 1997). As well, the social structure has changed, the result being that many frail older people, usually women, live alone with little support; in other cases, caregivers are often burdened, either due to their own advanced age or the level of support required, possibly in combination with work and other family responsibilities (Garber, 1988; Steel).

As people age they tend to have multiple medical problems, and their care needs are more complex; therefore they are more likely to be admitted to hospitals (Dawson, 1988). It is well documented that many older people admitted to acute hospitals become disoriented and debilitated; that the outcome is often increased dependency, resulting in a need for institutional care; and that many are admitted to hospital due to the level of home supports required rather than the need for hospital care (Clarke, 1984; Dawson; Dawson & Critchley, 1992). As it is often difficult not to admit older people who arrive at hospital emergency departments, beds allocated for other services, such as surgery, are often used for these people. In the researcher's opinion based on experience, this creates a two-fold problem: the specialty service is restricted in its ability to deliver specialised services, plus the older person admitted will not be cared for by staff who possess the knowledge and skills specific to providing care for older people. It is well documented globally that older people prefer to be cared for in their own homes (Clarke; Dawson; Dawson & Critchley; Martin, Oyewole, & Maloney, 1994; Richmond et al., 1995; Steel, 1987, 1991). Living at home becomes increasingly more difficult for people with dementia, which is increasingly more common, and for people with problems with mobility (Bapty & Harris, 1993; Garber, 1988). For the reasons documented above, those working in health care related to older people are constantly



challenged to use limited resources in ways that enable high standards of care, meet increasing consumer needs, and are cost effective.

What are the Current Challenges Related to Health Care for Older People in  
New Zealand?

A number of challenges specific to the current New Zealand situation are important to consider regarding care of older people. A greater number of people over 80 years of age in New Zealand are women living alone, (Jansen et al., 1996; National Advisory Committee on Core Health and Disability Support Services, 1994; Richmond et al., 1995; Zodegar, 1993) often with limited family support and low incomes. Population trends for New Zealand suggest that by 2031 more people will have lived to be older, that older people will be a greater proportion of the general population compared to now, and that older women will make up a greater proportion of the population (Jansen et al.; National Advisory Committee on Core Health and Disability Support Services; National Advisory Committee on Health and Disability Support Services, 1998; Richmond et al.; Zodegar).

New Zealand is bicultural, the two cultures being Pakeha and Maori. The largest portion of the population is Pakeha (European); the Maori are a minority group, as are a mixture of other ethnic groups including Pacific Islanders, Chinese, Dutch, Asian and others (National Advisory Committee on Core Health and Disability Support Services, 1994). Elderly Maori are currently under-represented in the New Zealand population; however, it is anticipated that their health status will improve over the next 20 years, resulting in more Maori who are older (National Advisory Committee on Core Health and Disability Support Services; Statistics New Zealand and Ministry of Health, 1993).

The National Advisory Committee on Core Health and Disability Support Services (1993) advised that the New Zealand public wanted more services in the community, rather than in institutions. This same theme was reflected in the New Zealand government position paper, "Your Health and the Public Health" (Upton, 1991). In response, the direction from the Ministry of Health and North Health Regional Health Authority has been toward the provision of more community-based care. Initiatives in the community for older people have been in a state of change and development, and this was still so in the late 1990s (National Advisory

Committee on Health and Disability Support Services, 1998). Highlights of a consensus conference held in Wellington, "Self Assessment: A Process for Older People" (National Advisory Committee on Core Health and Disability Support Services, 1994), were as follows:

- 1) A need was identified to provide services that enable people to remain at home longer and to prevent unnecessary hospital and institutional admissions.
- 2) Stress was placed on the need for: partnership, client-centred care, and changes in the funding and provision of services.
- 3) Key outcomes desired were quality of life for older people and for more older people to remain in their own homes, recognising Hinengaro (mental well being), Wairua (spiritual well being), Whanau (family well being), and Tinana (physical well being).

Two reports have been written about people who live in long-term institutional care in Auckland (Bonita, Broad, Thomsen, Baskett, & Richmond, 1989; Broad, Richmond, Bonita, & Baskett, 1995): the first examined the provision of care during 1988; the second examined the changes in 1988 through 1993. A summary of the findings follows:

- 1) The percentage of people over 65 years of age living in long-term institutional care in Auckland in 1988 was higher than in other parts of the country.
- 2) From 1988 to 1993 the overall population in Auckland increased by 8%, as did the number of long-term institutional beds.
- 3) From 1988 to 1993 the percentage of people over 65 years of age in care (8.3%) did not change much. It was somewhat higher than the national percentage of 6%, and much higher than the national guidelines of 3%. Note: The national document, "Planning Guidelines for Services for the Elderly" was published in 1986 by the Department of Health. It suggested staffing levels and recommended the ratio of long-term care beds per 1000 people over 65 years of age in New Zealand. The guidelines were never followed and are no longer in use since regional policy development devolved to the RHAs (Richmond et al., 1995).
- 4) A quarter of older people in Auckland rest homes in 1988 were described as independent, suggesting they had moved into care prematurely. In 1993 it was

reported that the dependency levels had risen as had the mean age of those admitted to institutions.

In regard to health care for older people in New Zealand, the literature (National Advisory Committee on Core Health and Disability Support Services; 1993; Upton, 1991) consistently emphasised a desire to increase the complement of services for older people in the community which would enable more of them to remain in their own homes, rather than going into acute hospitals or long-term residential care institutions. This was further reflected in the report *Care For Older People in New Zealand* (Richmond et al., 1995) in which several points relevant to the study of a Quick Response Team in New Zealand were made. They follow:

- 1) While older people prefer care at home, and the costs to the Regional Health Authorities are often cheaper, there may be high costs to the community, such as unpaid family support, which should be considered.
- 2) Innovative schemes to support older people in their own homes have included home help pilots, case management pilots, and a Quick Response Team in Christchurch.
- 3) The Ministry of Health introduced the Support Needs Assessment Protocol (SNAP) nationally as a pilot in 1993. The intent was that an assessment would enable older individuals and their designated support people to be involved in the process, provide a consistent and multidisciplinary needs assessment of an older person with health related disabilities, ensure the right level of support was provided, and be used for older people requiring community or residential services. The resulting assessment score was expressed as a Support Needs Level (SNL). The report by Richmond et al. refers to modification needed, mainly related to how the assessment (SNAP) and the resulting level of care (SNL) interface with residential care needs. This can be read about in more detail in the report, but in New Zealand there are five levels of care. The SNL 5 is the highest and most dependent; it reflects a need for residential Private Hospital care, while SNL 4 is for Rest Home care.
- 4) A need was identified for New Zealand research-based information. Research is available from overseas, but because New Zealand has unique demographic

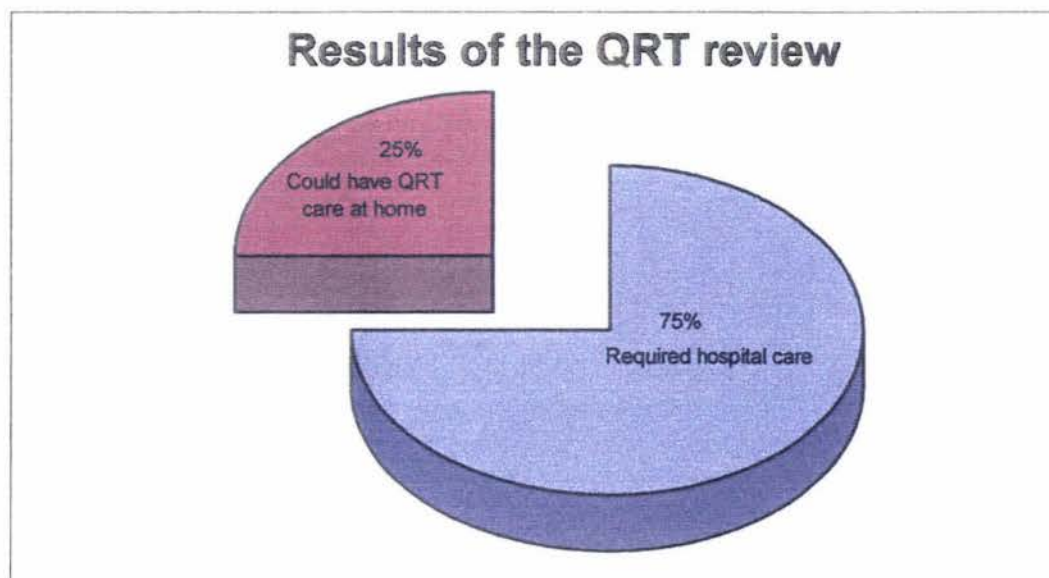


and cultural issues, it is important to evaluate how ideas developed overseas meet the needs of New Zealanders.

Exploring the development of a QRT in Auckland seemed timely, considering the aforementioned. It was clear that the ageing population preferred to remain at home and that there were questions regarding the cost effectiveness of care at home. An attempt had been made to explore the QRT concept in Christchurch, and there was a need to further research new ideas in New Zealand settings.

#### Background Related to Conducting a Trial of a Quick Response Team Programme

In 1992 Dr. R. G. Harris, the Clinical Director of Health Services for the Elderly at Auckland Hospital (personal communication, October 1992), reported that the acute hospital was full and frequently closed to new admissions. Due to an interest in the QRT concept this researcher was recruited by Health Services for the Elderly, a subspecialty of Acute General Medicine at Auckland Hospital, to assess how many older people could potentially be cared for at home as an alternative to hospital care, if the resources of the Victoria QRT were available in Central Auckland. This review was limited to patients admitted to Acute General Medical and Health Services for the Elderly areas within Auckland Hospital, which respectively had 190 and 54 beds within a 520-bed teaching hospital. Orthopaedic, surgical, and some medical subspecialty areas, such as coronary, renal, and neurology were excluded; this was in part due to the practicality of there being one reviewer but also related to the fact that the interest came from one area of the organisation, namely geriatrics, which already was involved in some community-based services. The other specialties at Auckland Hospital had had less to do with the care of patients once they had left the hospital, although this was changing. The results of the QRT review at Auckland Hospital suggested that 25% of acute admissions (Figure 1.1) potentially could be prevented, if a QRT programme was available (Bapty & Harris, 1993).



**Figure 1.1.** Results of the QRT review at Auckland Hospital, 1993.

The researcher, who had an extensive background in discharge planning including as a QRT liaison nurse in Victoria, Canada, was instructed to screen the patients as though she was in Victoria. She was to determine which patients could go home and determine the resources that would be required. One of the prime reasons noted for the success of the QRT in Victoria was the ability to identify patients suitable to be cared for safely at home, who required more intensive community services than otherwise available (LeBourdais, 1991). As LeBourdais stated about the QRT in Victoria (p. 1494), "this liaison nurse is the programme's linchpin. Without seeing the patient's living circumstances, the nurse must assess the patient's capabilities and provide the home care nurse with an estimation of what the patient is likely to need once back in the home." This decision for QRT care in Victoria was made by these nurses in cooperation with attending physicians, most often Emergency Room Physicians, who applied the Greater Victoria Hospital Society (GVHS) admission criteria known as the "Severity of Illness/Intensity of Service Criteria" (GVHS, 1991). The admission criteria were objective and specific to specialty areas and diagnostic groups; they were applied by a small group of nurses in Victoria on a regular basis (Bapty & Harris, 1993; Peck, 1991). For the QRT review at Auckland Hospital the reviewer considered medical assessments, consulted attending doctors and geriatricians, and applied the GVHS admission criteria.

What were the Differences in Health Care in Victoria, Canada Compared to Those in Central Auckland, New Zealand?

While the QRT concept was declared a success in Canada, and there appeared to be a sizeable group in Central Auckland suitable for QRT care, there were considerable differences in health care delivery between Victoria, Canada and Central Auckland, New Zealand (Bapty & Harris, 1993). Some of these differences are outlined in Table 1.2. These and other aspects of health care including community health and changes in the two cities are discussed in the following sections. These differences were regarded as likely to affect how the Victoria QRT model would apply in Central Auckland.

Table 1.2

Summary of Health Care Differences Between Victoria and Auckland in 1993

<b>Fees for doctors' services</b>	<b>Auckland</b>	<b>Victoria</b>
Hospital	Free	Free
Community visits	Charges	Free
<b>In Hospital system</b>		
General Practitioners	No	Yes
Emergency Room Physicians	Developing	Yes
Junior Medical staff	House Surgeons and Registrars	Interns
Admission criteria	No	Yes
<b>Consultants</b>		
In hospital	Yes	Yes
In community	No (except private, user pays)	Yes
<b>Problems</b>		
Wait lists for acute hospital	Yes	Yes
Wait lists for residential care	No	Yes
Wait lists for home help	Yes	No
% of population over 65 yr	13%	20%

Health Care in Victoria

Medical and hospital services.

In Victoria, virtually everyone has provincial health insurance, either self-purchased or received as an employee benefit. Doctors are paid by this universal health insurance plan on a fee-for-service basis in all settings. The majority of GPs have hospital privileges and see patients in hospitals and in their offices in the community. Patients arriving at the emergency departments are assessed for admission, most often by "Emergency Room Physicians" (a post graduate training



specialty, comparable, for example, to orthopaedics or cardiology), and in accordance with admission criteria (Bapty & Harris, 1993; Peck, 1991), the intent being that those admitted to hospital be in need of services only available in hospital. Interns (similar to house surgeons) work in Victoria hospitals but they have little involvement in the admission of patients. Consultants, like GPs, attend patients in the hospitals as well as in their offices in the community.

#### Community health services.

In Victoria visiting nursing services, community rehabilitation therapy, and nutrition counselling to house bound patients are provided at no direct cost. The Long-Term Care case managers provide assessments (equivalent to the New Zealand SNAP) and service coordination to older and disabled people who need home supports and long-term residential care. Both the budget for home supports and the residential care waiting lists are managed by Community Health Services. Charges for home help and residential care are assessed depending on a person's income. Those requiring home supports are referred to agencies, which hire and supply trained caregivers who are readily available. Quick Response Team care is free to people not already receiving home help; otherwise the long-term care home support daily rate is applied. A province-wide (British Columbia) database of past and current community health clients is accessible to community health staff. It includes details of community services received, including home support hours, charges and residential care admissions. This is invaluable for Liaison Nurses involved in discharge planning who coordinate home support for hospital patients being discharged to the community and arrange long-term residential care. For those going home, these nurses complete the assessments as well as the service coordination; this means that they set up a home support plan with the patient and the agency, specifying the tasks to be completed and the hours of service, including when the service will start, which may be on the day of discharge or the next day.

#### Problems.

In Victoria, there were waiting lists for people requiring admissions to acute hospitals in 1986, prior to the development of the QRT. Up to 20% of the beds were occupied by older people assessed for and awaiting long-term residential care (Peck, 1991; Robertson, 1985). Some people waited in hospital for over six months

because they had nowhere else to go. A fact relevant to this problem was that a large number of people retired to Victoria; the percentage of people over 65 years of age was unusually high (20%) compared to the Canadian national average of 15% (Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991; Peck; Robertson).

### Changes in Victoria Prior to Development of the QRT

A number of changes occurred in Victoria, which enabled a more coordinated approach to health care delivery, improved the use of resources, and may have contributed to the success of the QRT. Some are outlined below but can be read about in more detail in other articles (Bapty & Harris, 1993; Peck, 1991). With the introduction of Long-Term Care in 1978, home support workers were able to assist disabled older people with their personal care needs. This enabled the home visiting nurses to focus on providing more complex care at home. In 1981 a small team of Liaison Nurses was hired to better coordinate community services for hospital patients. These nurses became experts in discharge planning, completing assessments for the Long-Term Care programme (similar to the New Zealand SNAP), determining each patient's care level (similar to the New Zealand SNL), and recommending and arranging appropriate care, ideally at home or, if this was not feasible, in an Intermediate or Extended Care facility, comparable respectively to Rest Homes and Private Hospitals for older people in New Zealand.

In 1987, shortly after the QRT pilot started, the Greater Victoria Hospital Society (GVHS), an 1800-bed multi-site hospital, introduced VI-CARE (Victoria Integrated Care Alternatives Review and Evaluation), a programme aimed at ensuring that acute care beds were only used if no alternatives were available. InterQual, an American system for health resource utilisation was purchased and, as recommended, modified for the Victoria community (Linda Birdsall, Manager of Clinical Quality Improvement Programmes, Capital Health Region, personal communication, December, 1992). The result was the development of admission criteria, the "Severity of Illness/Intensity of Service Criteria" (Greater Victoria Hospital Society, 1991), which are regularly updated. These criteria reflected the ability of community health services to manage more complex health care needs in community settings with community resources.

Funding for home support caregiver training was increased with an aim to help people remain at home longer and home support carers became competent at providing over-night and live-in care. Policy regarding placement of older people in institutions became more restrictive to ensure that a broad range of community support options were considered first. Case managers, who were responsible for managing both home supports and institutional waiting lists, had to prioritise carefully when selecting which clients needed institutional care. The result was that the perceptions of health professionals changed regarding the needs of older people such that many who, in the past, would have been regarded as needing "24-hour nursing care" and admission to acute hospital or long-term institutional beds were able to be cared for at home.

### Health Care in Auckland

#### Medical and hospital services.

In Auckland, GPs are not usually present in the hospitals. Doctors at public hospitals tend to be consultants and are paid salaries funded from taxes. Patients pay a fee for out-patient doctors' appointments and visits to their GPs. On occasion they may seek reimbursement through a private health insurance, either self-purchased or received as an employment benefit. The Emergency Room Physician role is less developed and patients who arrive at hospital are assessed for admission by specialty medical team members. These doctors are often junior doctors (registrars and house surgeons) and there are no admission criteria. Publicly funded consultants are hospital-based and tend to mainly see in-patients, although it is recognised that more services on an out-patient basis need to be developed.

#### Community health services.

In the community in Central Auckland social workers are responsible only for the assessments of older people for home support services, which is different than in Victoria. They then refer those requiring services to agencies, which are responsible for providing the service coordination and for managing the budgets for home supports. The demand for caregivers is greater than the supply, thus at times there is a wait before service provision starts. Assessments for residential care for older people in Central Auckland are not completed by Community Health Services staff, but by geriatricians based at the Auckland Hospital. The supply of

residential care beds is greater than the demand, so waiting lists are not needed. A local information system recently implemented within Community Health Services includes data on all local consumers of Community Health Services but not details of home supports or residential services. Community health social workers assess the need for home supports for patients on the geriatric wards at Auckland Hospital, but not in other areas of the hospital. The service coordination is done by the agencies, sometimes with a delay from the time of discharge to the time that the service starts.

### Problems.

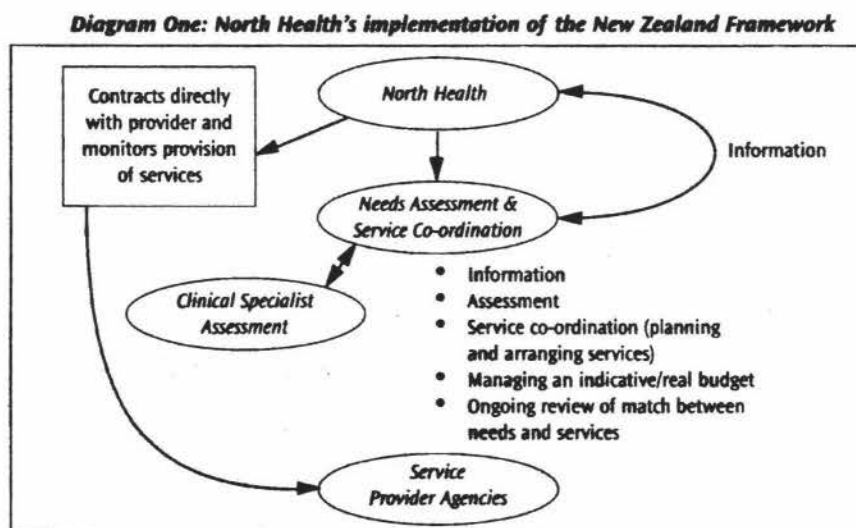
In 1995 Mike Rackley, Acting General Manager at Auckland Hospital (personal communication, August 8, 1995), reported that the hospital continued to be frequently full and closed to admissions; the shortage of beds available for acute hospital admissions was increasing each year, especially in the winter. Health Services for the Elderly and the Acute General Medicine specialty areas had less in-patient beds than in previous years, and there were often waiting lists for admissions to these services. There was no shortage of long-term institutional beds for older people in Auckland, but there was an increased demand for home services for older people. The percentage of people over 65 years of age in Central Auckland was 13%, while the national average was 12% in 1994 (Jansen et al., 1996).

### Changes in New Zealand Prior to the QRT Trial

Prior to the health reforms introduced in "Your Health and the Public Health" (Upton, 1991), the responsibilities for funding and delivery of Disability Support Services (DSS) were shared between the Department of Social Welfare (DSW) and the Department of Health (under the old area health boards - AHBs). Most community-based services were administered by the DSW, and the hospital-based and some community-based services by the AHBs. In 1988 three pilot projects, known as Sixties Plus, were established in Auckland, Whakatane, and Horowhenua to provide better coordinated home supports for older people (Richmond et al., 1995). At that time, the Sixties Plus programme, a Disability Support Service, was administered by the Department of Social Welfare (Shipley & Upton, 1992). The geographical area served by the Auckland Sixties Plus project

grew to include urban and rural areas from the Bombay Hills in the south and north to Warkworth. With the introduction of the new health structure (Upton) four Regional Health Authorities (RHAs) were established and became the “purchasers” of health services. The old area health boards became Crown Health Enterprises (CHEs), “providers” of health services. After considerable debate, it was decided that all Disability Support Services would be purchased by the RHAs (Shipley & Upton). Therefore, in 1991 the Auckland Sixties Plus project transferred from the Department of Social Welfare to the Auckland Area Health Board and then to the Waitemata Health Crown Health Enterprise (CHE) in 1993, after the development of the RHAs (Richmond et al.).

In 1994 the Ministry of Health introduced a new framework for disability and support services for all of New Zealand to provide “Needs Assessment and Service Coordination” (Ministry of Health, 1995), a model not unlike that of the Long-Term Care Programme in Victoria. The North Health implementation of the New Zealand Framework is shown in Figure 1.2 (Northern Regional Health Authority, 1997).



**Figure 1.2.** North Health's implementation of the New Zealand Framework.



The aim was for people with disabilities to be offered assessments (SNAPs - Support Needs Assessment Protocol) to identify their ongoing needs and to be offered "Service Coordination" to plan how those ongoing needs could be met. In Auckland the "North Health" RHA assumed the role of purchasing and monitoring these services. The agencies already established in the Auckland area continue, in 2000, to be the providers of home support services for older people with health related disabilities (Dr. Roger Harris, personal communication, March 7, 1999). In 1998 the Health Funding Authority, rather than the four RHAs, became the sole purchaser of publicly funded health services for all of New Zealand (National Advisory Committee on Health and Disability Support Services, 1998).

#### Initiation of the Quick Response Team Trial

The development of supports for older people in Auckland, the strong commitment by Health Services for the Elderly at Auckland Hospital to improve services to people in the community, and the evidence that there were candidates who could potentially benefit from a QRT (Bapty & Harris, 1993) made Central Auckland an ideal area to pilot a QRT scheme. However, health care is organised differently than in Victoria. Without admission criteria or Emergency Room Physicians, the medical assessment process in the Emergency Departments is quite different. One cannot receive medical monitoring at home without paying for a GP to visit, and consultant services are usually not available at home. As well the apparent shortage of trained caregivers was a concern. Because of the differences in the two cities, it was important, before establishing a QRT programme, to measure the safety, efficacy and cost effectiveness in Auckland with a pilot study. One of the best methods for evaluating efficacies of new regimes is the randomised controlled clinical trial (Dumas, 1987; McCormick, 1992), which is a scientific method based on observation.

In 1995 North Health Regional Health Authority entered into a contract with Health Services for the Elderly (HSE) at Auckland Hospital to develop and evaluate a Quick Response Team. HSE, which is now "A+ Links - Home and Older People's Health," had taken the initiative to investigate the feasibility of a QRT. They were willing to provide medical supervision of QRT patients in a

shared care role with GPs, who usually expected this type of patient to be admitted to hospital; and they had an interest in conducting a research evaluation.

The researcher, who had carried out the QRT review (Bapty & Harris, 1993) and written a proposal for a trial of a Quick Response Team as part of her academic studies at Massey University, was hired as Project Manager of the Quick Response Team Trial at Auckland Hospital. There was an agreement that some data from the QRT Trial would be used by the researcher for a Master of Arts thesis in Nursing Studies, at Massey University. The thesis, "A Randomised Controlled Trial of a Quick Response Team for Older People" is part of a larger study, which involves a number of coinvestigators. The initial plan was to pilot a QRT programme and, during that time, develop assessment tools and protocols, which would optimise the service delivery and research evaluation.

### Summary

In this first chapter the researcher introduced the intention to investigate how the QRT concept, developed in Canada for older people experiencing a health crisis, might apply in Central Auckland. The original QRT in Victoria, Canada was described, as were the circumstances that led to its development. The challenges of health care of older people were discussed in general and more specifically as they apply in New Zealand and in Auckland. Background information was provided relevant to conducting a QRT trial in Central Auckland, including some of the similarities and differences of health care in Victoria, Canada and Auckland, New Zealand. Justification was made for the need to introduce the QRT in Auckland on a trial basis first with an evaluation of the outcomes using a randomised controlled trial. A review of the relevant literature follows in chapter 2.

## Chapter 2

### Review of the Literature

#### Introduction

The aim of the literature review is to discuss the state of knowledge relevant to conducting a trial evaluation of a Quick Response Team for older people, in Central Auckland, New Zealand, modeled on the one established in Victoria, Canada. The literature included in this review is from a variety of articles, books, and government reports produced from 1968 through to 1999. The evaluation of the Victoria QRT (Dawson, 1988) served as a starting point, as the researcher considered replicating this study in New Zealand. Dawson reviewed a variety of studies, mainly from the 1970s and 1980s, in the area of geriatrics, related to illness and debility, use of institutional resources, and alternatives to institutional care. Much of this literature was reviewed as well as more recent publications. Articles were readily available about the Victoria QRT evaluation, as were publications from the New Zealand Ministry of Health, North Regional Health Authority, and from other coinvestigators of the QRT trial. Initial CINAHL and MEDLINE searches were disappointing, however, more recently, articles on other Quick Response Teams and articles on hospital resource utilisation tools were identified using the CINAHL and MEDLINE systems. The literature relevant to exploring the Quick Response Team concept is discussed in three categories: the chronic and multiple health problems of older people and their consequential need for increased supports (p. 19), their use of emergency departments and acute hospitals (p. 30), and the alternatives to institutional care available (p. 47).

#### The Health Problems of Older People

While most old people live independently, many have more multiple and chronic health problems than younger people and, therefore, have an increased need for home supports and hospital-based or long-term residential care. "Conquering Suffering, Enriching Humanity" (World Health Organisation, 1997) gives a global perspective on health and predicts that with increased life expectancy, there will be global epidemics of cancer and chronic disease, suffering and disability. The executive summary highlights follow. From 1990 to 1995 the global population over 65 years of age increased by 14% and, by 2020, will increase by 82%. With more old people prone to chronic diseases there is an

increased need for preventing and delaying diseases, reducing suffering, and providing supportive environments for the disabled. Lifestyle factors that increase risks include smoking, alcohol consumption, inadequate diet, and poor physical activity. Common diseases causing disabilities and deaths include: cancers, especially lung and breast; circulatory diseases, such as hypertension, coronary heart disease, cerebrovascular disease, cardiomyopathies, and rheumatic heart disease (particularly in developing countries); lung disease, such as chronic obstructive pulmonary disease (COPD) and asthma; diabetes mellitus; poor nutrition; musculoskeletal diseases; mental and neurological diseases including depression and dementia; violence; and occupational risks.

In summary, it is expected that there will be an increase in the number of older people in the world and that many will be prone to disabilities and premature deaths, some of which are preventable. More focus is needed on the prevention of health problems, and there will likely be an increased demand for care and support of people who are suffering, disabled, or dying. Frequently older people are identified as being at risk and needing supports but there are gaps in the provision of such supports. The mental health of older people and their need for supports are discussed in the following studies; two were conducted in Great Britain (Foster, Kay, & Bergman, 1976; Kay, Bergmann, Foster, McKechnie & Roth, 1970), and a third in the United States of America (Myers & Drayer, 1976).

#### Mental Health Perspectives on the Needs of Older People

Foster, Kay, and Bergman (1976) reanalysed results of a random sample of 477 British people over 65 years in Newcastle-upon-Tyne who were selected from electoral rolls in 1965 for a study. A social worker and a psychiatrist interviewed these people independently. The aim was to gain an understanding of the older population and their needs for supports, both formal (paid) and informal (unpaid), especially related to their mental health status.<sup>1</sup> The range of services used were: domestic help, visits from the district nurse or bathing attendant, meals, a health visitor or teacher of the blind, and other. Information was collected on people's living situations and their use of family supports. The social worker used "her

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<sup>1</sup> Formal help refers to paid help, as opposed to informal help, which is provided without charge by a carer who usually is related to the person needing assistance and lives within the same household (Richmond, Baskett, Bonita & Melding, 1995, p. 47).

previous experience of working with older people" (p. 246), rather than explicit criteria, in identifying existing services that she recommended be used and were not in place.

Twelve (12%) of the sample received formal domestic help. Within this group one quarter had symptoms of depression or anxiety; one fifth were identified as having organic brain syndrome; and 43% demonstrated short-term memory loss. Twenty percent (20%) of the sample not receiving formal help were viewed as needing it and being "at risk" (p. 249), presumably of morbidity/mortality and/or admissions to acute or long-term institutions, although this was not explicit. Psychiatric disorders were greater in this at risk group, compared to the group receiving support. The researchers cited Harris (1968) who said that the need for home help by older people was usually determined by social criteria such as: "(1) inability to cope with the requirements of everyday living, together with (2) the absence of any dependable person in or outside the household" (p. 253). When Foster et al. applied the second criterion in their study the percentage of people not receiving support of any kind was relatively small. Over a third of those identified by the social worker as having "mainly social" (p. 254) needs were diagnosed by the psychiatrist as having functional psychiatric problems such as anxiety, depression, paranoia, or personality disorders. The authors stressed that the need for psychiatric treatment not be neglected.

An attempted was made to compare services available and needed by older people in Newcastle-upon-Tyne with those in other parts of Great Britain. The services varied depending on National and Local Authority policies but the authors emphasised the need for assessments to be sensitive to dementias and short-term memory loss. In a follow-up study, Kay, Bergmann, Foster, McKechnie, and Roth (1970) considered the mortality and use of services by these same people, two-and-a-half to three years later. Those with organic brain syndrome had significantly more admissions to hospitals and nursing homes, with longer lengths of stay and higher rates of mortality. The authors predicted that those with organic brain syndrome would require increased support services and that more home-based supports would delay their need for institutional care. The use of services for those with functional psychiatric disorders was not significantly different to the rest of the population.



Myers, Sheldon, and Robinson (1963), three psychiatrists, took a different approach in their research. They conducted a retrospective review of patients admitted to a psychiatric hospital in Pennsylvania in 1962, largely in response to "hopeless" (p. 277) statistical projections that half of all older people admitted to psychiatric hospitals would die within six months. They concluded that a lot could be done to help, especially by involving families. A proposal in 1965 that funding for mental health support of older people be excluded in the Medicare Legislation in America was successfully fought with this paper. It was one of few studies addressing that issue at the time. Myers and Drayer (1979) later wrote a review article of support systems for older people with mental health problems. They said that the Pennsylvania Hospital was "a model of what not to do" and "provided the ultimate of institutionalisation" (p. 282). They criticised the inadequate treatment that older people received, particularly related to psychopharmacology and psycho-spiritual needs. Half of the patients in long-term care institutions had diagnosable mental illnesses, but while medical practitioners were becoming more aware of these diagnoses the treatment rate was low. They reported that loss of support was a key factor in depression; that few patients had to remain in hospital, if available supports were used; and that, of all the support options available, "the family and kin network" (p. 277) was the most important. They identified home help and meal services as most useful in preventing institutional care. Older people were underrepresented statistically by psychiatric services, and Myers and Drayer advocated that mental health workers support these people to maintain their autonomy and, in so doing, minimise their disability. They maintained that there was a strong inverse relationship between people's support systems and their need for institutional care. Since this 1963 review, Myers and Drayer (1979) reported that more effective services had been developed for the elderly population.

These last studies stressed that health care professionals needed to be more sensitive to diagnosing and treating mental health problems of older people. The loss of supports appears to be a big factor in depression of older people; family is an important support, as is the provision of formal supports, particularly home help and meal services; and community supports may be important in delaying and reducing the need for institutional supports, especially for those with dementia. The notion of older people being "at risk" is common in the literature; nevertheless,

different researchers have drawn different conclusions about this. Some have suggested that the provision of more supports reduces this risk. This is explored in the next studies reviewed.

### Are Older People at Risk?

In 1990, the contract for GPs in England was altered to include annual in-home assessments of everyone over 75 years of age (Iliffe et al., 1992.). Just prior to 1990, Iliffe et al. investigated whether older people living alone were at risk, as measured by higher rates of morbidity and use of health and social services in London, England. From a secondary analysis of data from a survey they reported that, of those over 75 years of age and living alone, 78% were female, and their mean age was 81 years. Of those not living alone, 53% were female and their mean age was 80 years. In comparing the groups they found little difference in cognition, mobility, morbidity, and use of general practitioner (GP) or hospital services. They concluded that older people living alone were not at risk but used more formal services, such as home help, meal services, and visiting professionals than others. Three studies explored the value of preventative home assessments of older people, one in Holland (van Rossum et al., 1993), one in America (Fabacher et al., 1994), and the third in Leicester, England (Clarke, Clarke, & Jagger, 1992). The studies were similar, but the value of in-home assessments for older people varied.

Van Rossum et al. (1993) concluded that in Weert (population 60,000), the Netherlands, preventative visits made little difference to the outcomes of older people, yet Fabacher et al. (1994), from a similar study in Los Angeles, America, concluded that they were beneficial. Both studies used a randomised controlled trial methodology. In the Netherlands potential participants were identified, and postal questionnaires were sent to those between 75 and 84 years of age who lived at home. Baseline information was gathered on self-rated health, functional abilities, informal supports, and use of services. As the intention was to assess the effect of nursing visits on health status and use of services, those receiving home nursing care were excluded. Public health nurses made four assessment visits per year, over three years, and extra visits on request, to a total of 292 people in the experimental group. No visits were made to 288 people randomly assigned to the control group, but they could access regular services. The assessments focused on social and functional abilities. General advice was given including information

about medications. The nurses provided health counselling only; no physical examinations took place, but they referred 154 subjects on 290 occasions to other services, including 111 referrals to GPs. A questionnaire was mailed to participants at 18 months and again at three years. Trained research assistants who interviewed people were unaware of group assignment.

The outcomes measured were self-rated health status, mental and functional status, social situation, loneliness, and depression. They were statistically the same for both groups. Mortality was measured, but quality of life was regarded as more important than longevity. The use of services, especially of home help and nursing, was slightly higher for those who received preventative visits, and they had slightly lower rates of institutionalisation compared to the others. One could question whether the visits were not actually diagnostic rather than simply preventative. Even though no physical examinations occurred, the nurses frequently identified problems and advised the participants to seek further advice. The costs of all services, including for institutional care, were 4% higher for the intervention group. Further analysis showed that preventative visits were most beneficial for a sub-group of people who rated their health as poor. Of this sub-group, those visited had significantly better assessments of health status, less deaths, less use of outpatient services, and fewer days spent in acute hospitals than those in the control group. The authors pointed out that by excluding those receiving home nursing the sample studied might have had better health than the overall population. A larger percentage (9.5%) of the older population lived in residential care compared to other Western countries. This may mean that the health status of older people living at home in the Netherlands was better than in other countries.

In the American study (Fabacher et al., 1994) potential participants were recruited by mail from veterans over 70 years of age. Those who had dementia, terminal illnesses, or were receiving health visits were excluded. People were interviewed by telephone and then randomly assigned to intervention and control groups. The aim was to assess whether preventative visits would improve their health status and functional abilities. Nurses and doctors' assistants visited the intervention group every four months over a year. The information collected was similar to that in the Dutch study but was more extensive. It included medical histories, physical examinations, and assessments of activities of daily living



(ADLs) and instrumental activities of daily living (IADLs).<sup>2</sup> On average each client had four problems identified. They were advised to seek attention and 76% complied with the recommendations. Those visited had higher IADL scores and used less non-prescription medication compared to the control group. The authors concluded that preventative visits helped in the maintenance of health and functional abilities in older people. As the population studied were all white male veterans, it was suggested that the results might not be generalisable to the common population. Surprisingly, there was no mention of the costs. The area around Los Angeles was probably more densely populated than the area studied in the Netherlands, and so the Americans may have had access to a greater supply and variety of services.

Clarke, Clarke, and Jagger (1992) conducted a randomised controlled trial in 1985 in Melton Mowbray (population of 32,000), England. The aim was to determine the effects of social intervention on mortality and morbidity for people over 75 years who lived alone. The groups were followed for three years. This study differed from the previous two in that the researchers only included people who lived alone, and beyond providing visits to the intervention group, provided supportive care including visitors, meals, home help, financial assistance, housing, nursing visits, and medical advice. Of 260 people visited, 130 (50%) repeatedly declined offers of help. There were no statistically significant differences in health and functional status and use of services between those visited and the others. Use of services was the same for both groups; 17% used general services, and 12% used district nursing. There was no mention of the extent that meals, home help or other services were used or of costs. One outcome measure, self-perceived health status, was significantly higher in the intervention group. The authors concluded that there was not enough evidence to support the use of preventative visits. They questioned whether the instruments were sensitive enough to detect differences and wondered if the groups should have been followed for longer, but did not suggest how long.

These studies, which attempted to assess whether older people were at risk and if preventative home visits improved their health status, used slightly different

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<sup>2</sup> ADLs are activities related to eating, bathing, dressing, toileting, and transferring. IADLs refer to tasks beyond these basic ones, such as shopping, paying bills, seeking medical and dental care, and completing housework (Ebersole & Hess, 1994, p. 83).

designs and were not very conclusive. One must remember in considering research from different countries that the organisation of health and social services is variable. Geriatric services in New Zealand and Canada are not unlike those in Britain (Clarke, 1984). Barker (1986), an American geriatrician, noted that geriatric services in Britain developed in acute hospitals and emphasised the independence of older people and reduced institutional care. He suggested that these strategies would be useful in the United States where geriatric services first developed in long-term institutions and tended to be custodial. The next discussion explores home health care in the United States where, unlike most other places, health services are usually privately owned but publicly regulated (Barker).

#### Home Health Care in America

The 1982 Long-Term Care survey (Liu, Manton, & Liu, 1985; Steel, 1991) done by the Bureau of the Census for the Department of Health and Human Services in the United States of America examined the needs of older non-institutionalised disabled people and their use of support services. A random sample of 36,000 people was selected from Medicare files (Liu et al.) and interviewed by telephone. Those with limited abilities with ADLs and IADLs due to chronic disabilities were identified. From this group representing a population of 5.1 million, 6,393 people were then interviewed. The results were that 5,582 had at least one ADL/IADL limitation. "Based on the 5,582-person-sample inflated by their sample weights" (p. 51) it was estimated that 18% (4.6 million) of the population over 65 years in the United States living at home had limited abilities in their ADLs or IADLs, and two thirds were moderately impaired (Liu, et al.). Garber (1988) concluded from the same census that family and friends provided a great deal of informal care, especially to those over 85 years of age. He estimated that, of those who required assistance with their personal care, 53.4% were over 85 years of age; and of that group, 9.6% lived alone, 18.8% with a spouse, and 25% with other people. Stone, Cafferate, and Sangl (1987; Steel, 1991) reported from the same census that caregivers were mainly women and often over 65 years of age; 80% were caregivers seven days a week, and most had been caregivers for one to four years, some for as long as 43 years. Steel concluded that there was a substantial demand for home support by older people, that alternatives were expensive, and that providing the care needed had a substantial impact on family

members. He pointed out that while the older population was growing in size and had multiple health problems, the support systems in America were quite fragmented.

Steel (1987), in discussing the development in America of home health care for older people, stated that while people preferred care at home to all institutional care, acute or chronic, "the definition of home care is extraordinarily vague" (1987, p. 264). Many varieties of home care in America have evolved, partly due to need, but mainly due to funding. There has been little financial incentive to develop home care for older people in America (1987, 1991), largely due to health care policy and legislation. In America home health care is funded differently depending on whether it is for short-term or chronic conditions. Steel argued that the place of home supports within the American health care system for a growing older population was "a question of considerable economic concern" (1987, p. 267). He maintained that researchers had been unclear as to what home care was an alternative to, and that it had been impossible to discuss the costs without knowing which agency or individual was financially at risk. Steel implied that one would be more likely to acquire funding for home care by demonstrating a cost savings, such as increased hospital discharges, rather than by ensuring that the needs of the older population were met. As Steel pointed out, in many studies (Gerson & Hughes, 1976; Kemper, 1988; Steel, 1987) home care has been perceived as an add-on cost.

Steel (1987), geriatrician at the Home Medical Service at Boston University, described it as the oldest continuously operating home care service in the United States established in 1875. Their emphasis on care in the community rather than in acute hospitals was apparently unusual in the United States. Steel stated, "The merits of seeing an individual on his or her own 'turf,' rather than in a sterile hospital environment are quickly appreciated by the sound clinician" (1987, p. 266). He later described care at home as either "substitutional" (1991, p. 439), instead of hospital or institutional care; or "partially substitutional," to enable early discharge from acute hospital and other institutional beds. A descriptive study was conducted by the Boston University Home Medical Centre (1987) in 1981. The mean age of a random sample of 150 patients was 80.6 years; they were followed for three months. Half required formal supports, such as a visiting nurse, a Home Health Aid, or homemaker services. The costs on average were \$2,022 US per

client, per annum. Over a year, one quarter were hospitalised. The best predictor of acute hospitalisation was the use of formal supports; for admission to long-term care, it was the number of medications prescribed.

The emphasis on the reduction in lengths of stay in acute hospitals has created a demand for more home care (Steel, 1987; 1991). Steel advocated the development of more short- and long-term home care to meet the needs of older people and also for physicians to take an active role in its development. He stressed the need for doctors to assess people at home, to understand services available, and to learn how to better mesh medical and social services. Steel recommended that centres involved in home care of older people have a single professional administrator, preferably a nurse, to coordinate client care. This nurse would be a client's main contact person and access all services needed, such as nursing, physical and occupational therapy, audiology, podiatry, optometry, day care, friendly visitors, medical equipment, home repairs, and prescriptions. He or she ideally would adjust services, monitor quality, and assist with reimbursement schemes. He emphasised that home care is no longer custodial. Most services can be provided at home if the right support systems are available, unless severe disability prohibits this. Steel maintained that physicians in America needed to understand and promote the development of home care options for older people.

In America there is a large population of older disabled people. Their care puts a large burden on supportive families who often have poor access to supports in a variable, fragmented health care system where funding is often complex and limited. In contrast, New Zealand, with its smaller population, has the advantage of fewer regions and a population that is more easily defined. While the number of older people in New Zealand is growing, the Ministry of Health has a good understanding of the ageing public, their health problems, and the preventative measures required; a discussion of the health status of older New Zealanders follows.

### Health Status of Older People in New Zealand

New Zealand, of all OECD member nations (Organisation for Economic Cooperation and Development), had the highest rates of cardio-vascular disease, respiratory disease, breast and bowel cancer, motor vehicle accidents, and suicide (Statistics New Zealand and Ministry of Health, 1993; cited from the 1992 World Health Organisation statistics). In 1990, the leading cause of death in New Zealand was coronary heart disease, followed by cancers (lung, bowel, prostate, then breast), and cardio vascular disease (stroke). The death rates associated with heart disease and stroke, from 1970 to 1990, have markedly decreased. Improvements are attributed to better management of hypertension and improved lifestyles; however, the death rates from cancers are unchanged. The statistics on the leading causes of death for people over 65 years of age in Auckland from 1988 to 1992 were the same (Northern Regional Health Authority publication, 1996).

The National Advisory Committee identified four priority areas for the prevention of health problems and disability for older people (National Advisory Committee on Health and Disability Support Services, 1997): osteoporosis, falls, cardio-vascular diseases (including coronary heart disease), and preventative dental care. Reviews estimated that 15% of the annual health budget was spent on these problems (National Advisory Committee on Health and Disability Support Services, 1998). Preventative measures identified included: strategies to lower blood pressure; lifestyle changes such as increased activity, cessation of smoking, improved diet; and improved social supports. The gap between Maori and non-Maori life expectancy closed between 1950 and 1990 (National Health Committee News and Issues, 1998; Pomare & de Boer, 1988; Te Puni Kokiri, 1993); however, non-Maori life expectancy has continued to rise since 1990 while Maori life expectancy has not. As discussed in chapter 1, demographic changes will probably affect the needs for support by older people in New Zealand (p. 6) and internationally (p. 5). If, as predicted, there are more old people with chronic and acute illnesses, they will require more home supports and short- and long-term institutional care. In the next section, the researcher reviews the literature on the use by older people of short-term services including emergency services and acute in-patient hospital beds.



### Use of Acute Hospital Resources by Older People

Studies on the use of hospital services during the 1970s and 1980s were mainly descriptive surveys done for planning purposes to gain a better understanding of who used both the emergency and in-patient areas of hospitals and why. More recently researchers have used hospital resource utilisation tools to successfully determine who needs to be admitted to hospitals, rather than relying solely on clinical judgment. These tools use criteria to identify when hospital based resources are needed. Descriptive studies on the use of emergency services and acute in-patient areas are discussed first followed by hospital utilisation reviews.

### Use of Emergency Services

Kleinman, Tamer, Soodalter, Cutter, and Weiss (1975) surveyed users of 11 emergency rooms in Boston, Massachusetts over nine days in 1972. The aim was to understand the use of these services for planning purposes. Problems were described as true emergencies (15%), urgent (57%), and non-urgent (28%). The highest rate of use was by children under five years of age; their rate was 27:1000. Those 65 years and older had the lowest rate of use, 6:1000, but the highest rate of true emergencies. These figures were low compared to the findings of Gerson and Skvarch (1985) discussed next. Thirty percent (30%) of all admissions to acute beds were from the emergency departments. The most frequent problem was trauma, but only one fifth of these cases was urgent. Lack of access to primary care in the community explained why a high proportion of people used the hospital emergency departments for non-urgent assessments.<sup>3</sup> The authors stressed that one agency should be responsible for organising emergency and primary health services in the Boston area. Unlike most researchers, they questioned whether emergency services should be only for true emergencies, rather than an entry point for anyone requiring medical care. The following studies on the use of emergency services by older people in America and the United Kingdom frequently reported that people used emergency departments to access primary health care.

Gerson and Skvarch (1985) studied the use of Emergency Medical Services

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<sup>3</sup> Primary care is care one receives at the first point of contact made to obtain assessment and treatment of a health problem.



in Akron, Ohio, by people older than 65 years over one year in 1978. The rates of use were much higher than Kleinman et al. (1975) found; 99.5/1000 of the population over 65 years of age, and 54.7/1000 adults under 65 years. Older users were typically male (65%) and between 75 and 84 years of age. The most common problem, cardiac, was more prevalent amongst males; trauma followed and was more common in females. Older people were 1.7 times more likely to need emergency transportation services than younger people. The authors recommended further research to explore if the high use of the Emergency Medical Services was to access primary care rather than for true emergencies.

The next two studies were conducted in Boston, USA. Bassuk, Minden, and Apsler (1983) compared the use of emergency services by patients over 65 years of age with younger patients at Beth Israel Hospital. Elderly people had an alarmingly high rate of psychiatric illnesses yet received a disproportionately low number of interventions, so they surveyed 780 older people between July 1979 and June 1980 regarding their use of the emergency department for psychiatric problems. They considered demographics, clinical factors, assessments of functional impairments, diagnoses, patterns of emergency room use, clinicians' responses, and reports from patients regarding their rapport with therapists. Six-and-a-half percent (6.5%) of the visits were for psychiatric problems including unipolar and bipolar affective disorders, organic brain syndrome, situational crises, schizophrenia, alcoholism, and borderline personality disorders. Of 46 visits made, 28 were by older people, and they tended to have minimal social support networks. Older patients were more likely to present with physical symptoms such as gas pains, nausea, or hip pain; less likely to view their problems as psychological; and more frequently used psychotropic medications. They were also more likely to be referred for medical treatment, whereas younger people were more often referred for out-patient therapy. Recidivism was common amongst older patients; 14 patients made 31 separate visits.<sup>4</sup> Poor communication between the psychiatric and medical services was a problem; once people's illnesses were identified and treated, they stopped returning. Geriatric patients' complaints of physical symptoms reflected both significant medical and psychiatric disorders, and psychiatric treatment was often

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<sup>4</sup> Recidivism refers to repeat visits.

delayed due to poor communication. They recommended better integration between psychiatric and medical services. Again, the emergency department was used to access a primary physician by many older patients in poor health.

A prospective survey was conducted by Lowenstein, Crescenzi, Kern, and Steel (1986) in a Boston teaching hospital. The aim was to gain a demographic profile of older people; to examine the reasons for and urgency of their emergency visits; to determine the costs associated with these visits; and to explore the outcomes. People over 65 years were compared with those younger over six weeks. In this community 15.3% of the population were over 65 years; their mean age was 73 years; 10.8% were over 85 years; and 33% of those over 65 years lived alone. In comparison, of the people who visited the emergency department, 19% were over 65 years of age; their mean age was 78 years; 25% were over 85 years; and 41% lived alone. There was no mention of the time of day that people attended or of their gender. A disproportionate number of older patients used the emergency department. Frequently they were low income, non-white, or non-English speaking. The most frequent problems were self-care (20%), which included falls, poor mobility, dehydration, poor food or fluid intake; followed by dyspnea or chest pain (10%). Approximately 60% of the older patients believed that the emergency department was the right place to be and that their problems were either emergencies (51%) or required admission (8.6%). In contrast physicians regarded only 8% of these cases as emergencies, 23% as urgent, and over two thirds as non-urgent and able to wait until the next day. The problems for those over 85 years were considered by physicians to be true medical urgencies or emergencies in 45% of the cases. Physicians sent in only 15% of the elderly patients. One third of the "young-old" (65-74 years) and nearly one half of the "old-old" (75 and older) were admitted. As in the previous study, recidivism was common, considerably higher (29%) for the old-old, and most frequently for treatment of the same problem. In comparison, 10% of the young-old and 15% of patients under 65 years made repeat visits within fourteen days. Older people were hospitalised more often than younger patients, had multiple and chronic illnesses, stayed in the emergency departments longer, had more admissions, and their care was more costly.

Harrop and Morgan (1985) explored the use of a short-stay ward adjacent to an Accident and Emergency Department (AED) in Wales. The purpose was to

enable older people to be quickly transferred from the emergency areas, where the staff was too busy to assist them with bed pans and administer food and drinks, to a quieter area where their needs could be met. Medical and surgical doctors were reluctant to admit older patients who had only minor problems for fear of blocking their services. These patients were admitted to the short-stay ward and assessed by geriatric specialists regarding their disabilities and needs for supportive care. They went home once they could mobilise, often with additional equipment and under the care of their GPs. Between September and November in 1983, 13,011 people attended the Accident and Emergency Department. Of 680 patients who were over 70 years of age, 580 patients were admitted to medical and surgical areas. The remaining 100 people were admitted to the short-stay ward. Over half of this "most difficult group" (p. 142) were discharged within 24-hours; 28 were eventually admitted to in-patient wards; and the remaining 72 were discharged home. Sixty-two percent (62%) of these patients attended the hospital because of a fall or collapse. The researchers suggested that all patients sent to the short-stay area be assessed and treated as needed. It was a useful service that enabled frail older people to be discharged with supports on discharge, which was not possible from the emergency department. It was recommended that patients who had fallen receive joint supervision by geriatric and orthopaedic services. Often the GPs were unavailable for consultation, and so it was unlikely that they were aware that their patients were at the hospital.

Older people in Oldham, England (population 220,000) were said to be using the emergency service inappropriately and abusing the 999 call system, therefore a prospective survey was done to explore this. Pensioners, including females over 60 years of age and males over 65 years, made up 17.1% of the total population. Gupta, Setty, & Joshi (1985) studied all pensioners who visited the Accident and Emergency Department (AED) over three months. Information was collected from patients, their relatives, and hospital records. The rate of attendance at the AED for the total population was 186.9:1000 and 12.6% were admitted. Pensioners made up 9.8% of the group attending the AED and 36.5% of them were admitted. Of the older population, 59.1% used the emergency 999 call system and, of those, 53.9% required admissions and made up 87.2% of all admissions. Thirty-eight percent (38%) of the pensioners lived alone compared to 37.8% in the

community. GPs were contacted by 25% of the patients; another 3.5% were not able to reach their doctors; and 71.5% referred themselves. Self-referral was highest amongst elderly females living alone, often encouraged to seek help by neighbours concerned about minor problems, whereas older men living with spouses did not attend unless they were more seriously ill. Admissions, in half of all cases, were due to medical emergencies; and, in one quarter of all cases, due to injuries. Collapses and falls accounted for 75% of the elderly patients' visits. Some pensioners with social problems (4.3%) were followed at home by health visitors who increased their home supports.

Many older people did not want to trouble their busy GPs. They often viewed the emergency department as offering 24-hour, seven-day access to health care and as their best option for help. The hospital admission rate was higher for older people. Their peak attendance time was between 9 a.m. and 10 p.m.; those arriving at night tended to be admitted. Most of the visits were considered to be appropriate. The authors recommended that the emergency department be used for major trauma only, and that minor trauma cases be seen at GPs offices if x-ray services were available; as they were not, most by visits by older people to the AED were justified. Only 3.5% of the visits were regarded as inappropriate. More investigations were needed related to GP/patient communication, GP follow-up of patients' calls, and the decision for patients to come to the hospital. The authors recommended that observation beds be available for older people with social problems, minor medical problems, or injuries. Patients could stay the night and often be discharged home with additional supports, possibly reducing the number of night admissions.

Studies in the 1990s continued to report that the emergency services were used frequently as primary health centers. Several studies in foreign languages were reviewed; only the abstracts were available in English and so less detail is reported. The first, a retrospective survey (Alonso, Hernandez, del Busto, & Espinar, 1993), was done over one year from June 1987 to June 1988, in Asturias, Spain. There was a growing concern regarding the high use of emergency services and the number of people using it as a primary health centre. The aim was to better understand the situation. A sample of people studied suggested that the rate of use was 116:1000 people; more of the patients were male and over 65 years of age.

More people arrived between noon and 2:00 p.m. A high number of unjustified visits occurred and, as expected, many were for primary care. Those sent in by a doctor were more likely to require admissions than others, and this was higher for patients referred by doctors based in Health Centres rather than by doctors in traditional practices.

Plasencia and Borrell (1996) studied morbidity and mortality related to injuries in people over fourteen years of age in Barcelona, Spain. Over one year, trained non-staff interviewed patients in six hospitals. Of the population over 14 years of age, 74.7:1000 presented with injuries; the incidence was higher for males and for younger people. The injuries were most often the result of falls, of being hit by something, or from traffic accidents. The leading causes of death were from traffic accidents, suicides, and poisonings. The admission rate for those with injuries was 3.34:1000 of the general population, and 45:1000 of those presenting with an injury. It was higher for females, for traffic injuries, and for older patients. The patterns of use of emergency services related to injuries were comparable to in other countries. They concluded that an injury prevention policy was needed, particularly targeted at the young and the elderly population, with a focus on traffic accidents and falls.

The third article written in Spanish was completed in Guadalajara, Mexico. Inspired by the conception that old people overloaded and misused hospital emergency room services, Gonzalez, Elosua, and Guillen (1990) presented a review of studies analysing the behaviour of older adults and their use of emergency services. The studies featured were mainly written in Spanish but included some in English and published in Canadian, American, and British journals. They found that, in comparison to younger people, older people used the services for more justifiable reasons, had more severe illnesses, more frequently required hospital admissions, and the assessment times needed were longer. They recommended that the special needs of older people be taken into account in planning emergency services.

Two studies on emergency services and alternative resources were done in Laval, a suburb of Montreal, Canada. Beland, Lemay, Philibert, Maheux, & Gravel (1991) explored the extent to which older people used hospital-based emergency services compared to the rest of the population. They suspected that the increased



use of hospital services by older people had more to do with the health care system than with their advanced age. Samples of people over 25 years of age who used emergency services at two hospitals during 1981 and 1986 were selected. Information was gathered from medical records and staff over four randomly selected one-week periods, one from each of the four seasons; it included information on age, gender, symptoms, diagnoses, lengths of stay, status and disposition on discharge, postal codes for geographic information, use of ambulance services, and alternative resource options. The doctors at walk-in clinics were GPs, rather than consultants; only minor surgery could be done there; there was little access to laboratory or x-ray services; and none had in-patient beds. Therefore it was concluded that those needing specialty medical care, laboratory, and x-ray services needed to go to the hospital. Different patterns of use did not appear to be linked to gender or to the time of the visits, but there was a link to advanced age. Older people used more hospital-based services and more ambulances than younger people; ambulance use increased at night. Those using ambulances had a mean age of 58.8 years, compared to 44.4 years for others, and tended to have chronic health problems rather than trauma or accidents. The researchers concluded that the use of the hospital-based emergency services was related to the public perception that it was the proper place to seek medical attention outside of business hours. Others had suggested that the availability of alternative services reduced the use of hospital-based emergency services, but they did not find this to be so. They concluded that the availability and use of emergency care was complex, and that different sources of care played different roles for different segments of the population. They stated that elderly patients attending the emergency rooms had specialised needs and suggested that hospital emergency services should adapt to meet the needs of those using the facilities.

Beland, Lemay, and Boucher (1998) further explored the use of the emergency departments in Laval. They conducted two surveys, the first in 1988 covering 1981 and 1986, and the second in 1991, covering 1988 and 1990. The intent was to examine the relationship between the characteristics of those using the emergency services, their environments, and the availability of other resources. The demand for emergency services increased from 1981 and 1986, and leveled off from 1986 to 1990. An extensive amount of data was collected from seven sources



including: hospital records, mail and telephone surveys, Canadian census data, the Régie de l'assurance-maladie du Québec (RAMQ) files (the RAMQ makes medical payments in the Quebec Medicare system), a hospital database known as MSSS MED-ECHO, data processing on distances and travel time between users' homes and the resources sought, and from hospital administrators. Emergency use was categorised as: urgent treatment, only available at hospital; urgent treatment available elsewhere; non-urgent treatment, only available at hospital; and non-urgent treatment available elsewhere. Slightly more men than women used emergency services, and most were younger adults, rather than children or older adults. The most frequent users in the evening and at night were young men and women not needing urgent treatment who could have used alternative resources. In contrast, those requiring hospital emergency resources for urgent and non-urgent reasons tended to be older patients with chronic illnesses. Forty percent (40%) of all cases were urgent. Of the other 60%, half needed resources only available at the hospital. Those with chronic illnesses used hospital-based resources more frequently. Younger people made greater use of the emergency services for non-urgent reasons. While older people used hospital care more frequently, they tended to require resources only available at the hospitals.

It is clear that many of the people who use emergency services are elderly, they frequently refer themselves, and often present with problems that are not true emergencies. Opinions vary as to whether these services are used appropriately; some argue that acute emergency department visits are more often justified and used more appropriately by older patients who more frequently require services only available there. Typical problems of older people attending emergency departments include falls, trauma, cardiovascular, and respiratory problems. Older people, of all those using emergency services, more frequently are admitted to in-patient hospital beds compared to people in other age groups. Literature reviewed about use of in-patient resources by older people follows.

#### Use of Acute In-patient Areas

The descriptive studies reviewed regarding the use of in-patient resources through the late 1970s, 1980s and 1990s were conducted in Israel, America, Canada, Denmark, and New Zealand. They consistently demonstrate that older people use a disproportionate amount of in-patient resources compared to other age

groups. Many studies suggest that there is a potential to develop alternative resources.

In Tel-Aviv, Israel, where medical care is pre-paid, older people were known to have high rates of chronic long-term health problems and be high users of expensive hospital resources; Polliack and Shavitt (1977) surveyed patients 65 years and older admitted to hospital with an aim to better understand and manage the situation. A previous study had identified 191 older patients with chronic illnesses within the authors' urban family practice. As a follow-up study, they did an extensive survey analysing demographic and diagnostic details of patients in the practice admitted to hospital. The admission rate was 141:1000 older people, compared to 49:1000 younger people; among younger people the admission rate was higher for women, but for older people gender differences were not significant. The number of admission days was three times greater for older patients than for younger, and twice as great for older women than men. The mean lengths of stay were similar for older and younger patients but longer for older women (15 days) compared to older men (9 days). The mean length of stay was also longer (16 days) for older patients living alone compared to those living with a spouse (9 days). The reason for admission of older people was medical in two thirds of the cases; of these, two thirds were cardiovascular disorders, and for a further one fifth the problem was cardiovascular accidents (stroke). Thirty percent (30%) of the older people were admitted to surgical areas and, in one quarter of the cases, the reasons were due to orthopaedic fractures or treatments. They explained the absence of admissions related to psychiatric diagnoses by pointing out that previously diagnosed mental disorders, which were evident in the earlier survey, were being supported and treated at home. Older people had more chronic illnesses and used more in-patient hospital resources than younger people. Married older patients tended to have shorter hospital stays. This group of older people used less hospital resources than the national average, and the authors suggested this was due to doctor-nurse cooperation and links to social and community resources. They stated that, as assessments regarding the need for hospitalisation were not usually based on objective criteria, but on a combination of "physical, emotional and social factors related to the available hospital or community services and the values of the society which they serve" (p. 366), one should use caution in interpreting the

results. In spite of this, they stated that the results were in keeping with the findings of studies in other countries, such as the UK.

Over six months in 1976 Munoz and Mesick (1979) surveyed people over 60 years of age admitted to a general hospital in Wisconsin, USA. Forty-four percent (44%) of patients admitted were men, most stayed for ten days or less, and 68% had medical problems. Their problems were mainly cardiovascular, followed by gastro-intestinal, then musculoskeletal in women, and prostatic in men. Of the 90% admitted from home, only 73% returned home, and 20% were discharged to nursing homes. It was clear that, for many people, their stays were associated with changes in their living arrangements. Those who went to nursing homes tended to be over 90 years of age. Those with spouses were more likely to return home. Those living alone or with people other than spouses were more prevalent in the group that died or went to nursing homes. The authors suggested three possible explanations regarding the low percentage (1%) of primary psychiatric diagnoses: 1) people with these problems were more likely to go to a psychiatric hospital nearby, 2) the community supports available for psychiatric patients prevented hospitalisation, or 3) people who presented with complaints of medical problems, in reality, had psychiatric problems that were not diagnosed. They suspected that the third explanation was more likely based on their knowledge and experience with the "interaction between emotional and medical problems" (p. 417) and a tendency for psychiatric problems to go undetected. They commented that this conclusion was different than that of Polliak and Shavitt (1977), reviewed in the preceding study, who thought that their patients' mental health problems were being diagnosed and treated in the community. Munoz and Mesick noticed that, on discharge, nursing and other community services could have been accessed to a greater degree.

Two studies (Robertson, 1985; van Wiltenburg & Maccagno, 1986) investigated the high number of long-term patients occupying acute hospital beds in Victoria, Canada, where this was a problem. Over the first six months of 1985, van Wiltenburg, a social worker, and Maccagno, an Emergency Room Physician, studied long-term patients occupying 32% of the acute medical/surgical beds at the Royal Jubilee site of the Greater Victoria Hospital Society (GVHS); they were interested in those who came from long-term care facilities. One third were

admitted from Personal (PC) and Intermediate Care (IC) facilities (comparable to Rest Homes in New Zealand). Of this group, one in seven had a fractured hip, the most common admitting diagnosis; this was followed by pneumonia (25%) and congestive heart failure. Contrary to what most health professionals believed, the majority of these patients (63%) returned to where they came from; 23% died; 11% stayed in hospital awaiting a higher level of care, mostly Extended Care (EC); and 3% went to a rehabilitation hospital. By definition, the EC patient is unable to mobilise and transfer without hands-on assistance. Suggestions included: emphasis on falls prevention in nursing homes, development of infirmaries to enable intravenous medication therapy for those with congestive heart failure and pneumonia, the provision of enhanced care for people needing a higher level of care, licensing for multi-levels of long-term care; education regarding minimising debility of older patients, and increased rehabilitation services. In follow-up, Robertson, a geriatrician, reviewed elderly patients within this same hospital (GVHS) who were awaiting long-term care beds over three weeks in June 1985. He suggested that the acute setting was not ideal for these people. They had a mean age of 83.5 years of age; 70% lived alone; 50% were from private homes in the community as opposed to institutional care homes; 95% were admitted from the emergency departments; half were medical patients; and one quarter had fallen. In Victoria, with a high number of retired people, the admission rate for older people was 45%, compared to 35% nationally. Robertson suggested quicker geriatric assessments for rehabilitation, education regarding discharge planning, less use of physical restraints, and more efforts to minimise incontinence.

Olesen, Knudsen, Rubak, and Kristen (1998) surveyed general medical practitioners in Denmark to determine the reasons for hospital admissions of 266 patients and to explore the alternatives. A multidisciplinary panel recommended that (15%) needed care and nursing; 37% of all admissions could have been replaced by one-day stays; and 20% of the admissions could have been postponed by a day. They concluded that if municipalities, professionals, and hospitals worked together better options, especially for fragile and ill people, could be developed.

Durham and Durham (1990) studied older patients in Wellington Hospital, New Zealand. They were aware that hospital admissions were not always the best

option for older people, that they were frequently “blocking” (p. 481) acute medical beds, and that GPs were reluctant to consider alternatives. To explore whether they would support other options GPs were surveyed. Patients over 75 years of age who were admitted to acute medical beds for longer than 72 hours were considered the most likely to require long-term hospitalisation. Their GPs were interviewed by telephone from October 1986 to May 1987. Of 276 patients, 76 were emergency admissions, and the rest were pre-arranged. In both groups the most frequent problems were cardiac, followed by respiratory, then stroke. Over one third lived alone, 42% were male, and the mean age was 82.3 years. Social problems were identified in 62.5% of the patients, mostly “living alone and not coping” (p. 482); one third were identified as needing nursing care and assistance with ADLs. Admissions to acute medical beds were the preferred option by GPs in only 48% of the cases. For nearly 17% of the cases they would have opted for admissions to GP beds, which were not available. Augmented home support was preferred in 12.5% of the cases, and considered possible in 31.5% of cases; it was anticipated that 46% would have required 24-hour home nursing care. The researchers concluded that acute medical in-patient care was frequently not the best option for people, and suggested that pilot programmes be developed that could offer augmented home care and GP beds in the acute hospital system.

The last study reviewed the use of in-patient services by older people at the Boston Home Medical Service (Barry et al., 1988). Over 18 months 35 older people who refused in-patient services were compared with 70 patients who accepted hospital care. After each refuser was identified, the following two older patients admitted were selected for a comparison group. People with deliriums were excluded. Information collected from professionals and caregivers revealed that 60% of the refusers remained at home for treatment, but over six weeks, 40% were admitted. The reasons for refusing were numerous; the most common was an acceptance of death. The next four common reasons were associated with negative hospital experiences. The refusers tended to be older, female, and had formal home supports in place at home. Their problems were cardiovascular, followed by nutritional, and then gastro-intestinal. They were less ill than the comparison in-patient group and their outcomes were better. The 60% who stayed at home were, at six weeks, all alive and living at home; at six months, 19% had died. Of those in



the in-patient group, at six weeks, 17% had died and 28% had moved into institutional care; at six-months, 29% had died. The authors concluded that most older people who arrived at hospitals were receptive to in-patient care, but that many who refused could be treated effectively at home with good outcomes. The next section is on hospital utilisation reviews, which examine the potential for care at home as an alternative to in-patient care using objective tools that specify who needs to use hospital resources and who can be cared for at home.

### Hospital Utilisation Reviews

In the past assessments of the need for in-patient admissions and in-patient care were based on unstructured arbitrary opinions given by doctors and nurses and were not reliable (Strumwasser, Paranjpe, Ronis, Share, & Sell, 1990). In the 1980s several hospital resource utilisation instruments were developed as a means of minimising unnecessary hospital admissions and unnecessary days of stay at hospitals. These tools offer standardised objective criteria to determine if patients need to be admitted to hospitals as opposed to being cared for outside of hospital settings; they also measure the appropriate lengths of hospital stay. They are based on the severity of the illness, such as uncontrolled bleeding, and the level of services required, such as intravenous therapy or neurological vital signs. The developers of these tools recommend that they be modified according to the resources available. For example, regarding the need for intravenous therapy, the tool would reflect if intravenous therapy was available outside of the hospital, and under what circumstances. The developers expected that while the criteria were objective, there would be cases when the reviewers would choose to override the decision of the tool if the circumstances warranted this.

Strumwasser, Paranjpe, Ronis, Share, and Sell (1990) investigated the reliability and validity of three such tools, the Appropriateness Evaluation Protocol (AEP), the Standardised Medreview Instrument (SMI), and the Intensity-Severity-Discharge criteria (ISD) at 21 hospitals in Michigan state in 1983. Two independent nurses reviewed records of 119 patients; then a panel of physicians reviewed the same records. The SMI scored poorly. The AEP and the ISD were judged to be about equal, moderately valid and reliable, and more reliable than the physician panels used in the evaluation. A number of studies in the literature explored the use of the AEP and ISD resource utilisation tools. The researchers in



these studies identified a potential to divert people from using hospital resources; however, that potential was dependent on what resources were available in the community.

Use of the Appropriateness Evaluation Protocol (AEP) tool is common in Spain and Italy. Its use is discussed in two review articles. Lorenzo and Sunol (1995) reviewed literature on retrospective studies done in Spain, which began in the late 1980s. The AEP criteria were modified from the AEP medical-surgical protocol to suit the setting where they were applied. The range reported for inappropriate admissions to hospitals from the studies was 2.1-44.8%; the range of inappropriate days of stay was 15-43.9%. Lorenzo and Sunol suggested that the differences reported regarding inappropriate admissions were due to a combination of different adaptations to the instrument, to the patients reviewed, and to the settings. They suggested that an inability to access alternative levels of care resulted in inappropriate admissions; as well, physicians in Spain were described as conservative, which contributed to inappropriate admissions. One could speculate on the reasons for conservative behaviour, such as physician, patient and/or family convenience; fear of litigation; or a lack of awareness of the costs involved and the alternatives available. The authors recommended that the communities in Spain develop more options for service delivery to reduce the use of hospital in-patient areas.

Fellin, et al. (1995) reported on the findings of eleven Italian studies that used the Appropriateness Evaluation Protocol (AEP). Five similar studies used the AEP to review and identify inappropriate admissions and days of stay in medical and surgical areas in large hospitals in northern Italy. Six other studies, all slightly different, targeted specialty areas for appropriateness of admissions and days of stay. Two focused on admissions in emergency departments; two on patients with AIDS and nosocomial infections; and two evaluated the lengths of hospital stay by elderly patients, one before and one after the development of a visiting nursing service. The range for inappropriateness of admissions was 25-38%; the range for days of stay was 28-49%. Frequent reasons identified for extended stays were due to delays in laboratory and operating room services and the unavailability of long-term care beds. Overall they concluded that the studies consistently demonstrated

that the AEP instrument was a standardised, diagnostic-independent tool useful in detecting potentially avoidable uses of hospital resources in Italy.

A third study using the AEP tool was conducted in a general hospital in the West Midlands region of England (Smith et al., 1997). The aims were to test for inappropriate admissions and to test the validity of the AEP tool in this setting. From 8,210 patients, 10% (821) were randomly selected from emergency admissions in 1992. A retrospective review was done from medical charts, considering the situations at admission, and on each day each patient remained in hospital. To test the validity of the tool, a panel of physicians further assessed the patient records. It was concluded that 6% of admissions reviewed were unwarranted and 45% of the days of care were inappropriate. None of the differences found were related to age or gender. Many people were appropriately admitted but stayed in hospital far longer than necessary. The main reason for inappropriate admissions was the overlooked ability to treat patients at out-patient clinics. The physician panel testing for validity of the AEP tool was in agreement at a level that was statistically significant. The hospital was able to identify areas for policy development and service delivery that would improve the use of resources in their community.

In three British articles (Coast, Inglis, & Frankel, 1996; Coast, Inglis, Morgan, et al., 1995; Coast, Peters, & Inglis, 1996) the Intensity-Severity-Discharge review system for adults (ISD-A) was discussed as it applied in two areas of south west England. The aim of the first study (Coast, Inglis, Morgan, et al.) was to explore the potential to provide care in alternative settings to the general and geriatric in-patient areas of an urban acute hospital. A sample of 700 admissions was selected over six months from November 1992 to May 1993. A trained researcher carried out a prospective review of the medical records to identify the potential to treat patients outside of the hospital. The referring GPs were interviewed by telephone to find out if they preferred admissions or alternative plans. A cost analysis was done on the alternative suggestions. Use of the ISD screening tool alone identified that 19.7% of these patients could potentially have been treated outside the hospital. A panel of GPs further assessed them and, as a result, the percentage was reduced to a range of 9.8 to 15%. The most preferred alternatives selected by physicians on the panel were urgent out-

patient assessments and access to GP in-patient beds, rather than the use of home care. Interestingly 35% of the admitting GPs surveyed by telephone preferred alternatives to hospital admission if they had been available. The investigators concluded that there clearly was a potential to divert admissions. The cost analysis of the alternatives was difficult and the authors were uncertain whether deflecting resources away from the hospital would be efficient.

A second study (Coast, Inglis, & Frankel, 1996) was done, this time at a rural hospital in south west England between August 1993 and January 1994. The aim was to explore alternatives to in-patient care, compare the decisions for alternative care by clinicians with differing backgrounds of practice, and consider which physicians were best suited to make these decisions. The methodology was similar to the previous study. The ISD tool was used. Three physician panels then reviewed the records; one included GPs without the experience of GP beds, one included GPs with the experience of GP beds, and the third one included consultants. A sample of 112 admissions was reviewed. Both GP panels recommended 8-14% for alternative care; the consultants recommended 5.5-9%. The researchers concluded that there was a potential for about 10% of admissions to be cared for outside of the hospital. The alternatives favoured were GP beds and urgent out-patient assessments. Clinicians with different backgrounds made different choices for alternative care. These choices were associated with what the physicians were familiar with. The researchers were unsure which group of doctors was better suited to decide about hospital admissions. The consultants had greater experience related to clinical specialties, while the GPs were more familiar with care alternatives and with making decisions about the need for admission. It was recommended that the effectiveness and costs of alternatives needed to be further evaluated.

The third study (Coast, Peters, & Inglis, 1996) re-examined data from the previous two studies to better understand what factors were associated with inappropriate use of in-patient admissions. The authors analysed 19 different variables to explore whether they were factors in inappropriate admissions. Some of these included gender, age, demographics, employment status, use of community services, medical specialty used, diagnoses, referral source, and time of admission. The percentage of inappropriate admissions was almost identical in both studies

(19-20%) and comparable with other studies. They found "interesting differences in the factors associated with inappropriate admission in the two locations" (p. 37). The fact that slightly different data were collected in each study explained some of the differences, but not all of them. In the urban centre, variables associated with inappropriate admission were gender, age, specialty, and use of community resources; in the rural centre the variables identified were coping failure and stroke. It was concluded that a combination of the patients, the alternative forms of care, and the acute hospital often resulted in different types of inappropriate admissions in different locations. This was in keeping with the experience in Victoria, Canada (Linda Birdsall, Manager of Clinical Quality Improvement Programmes, Capital Health Region, personal communication, March 15, 1999) where the ISD criteria were modified to reflect the resources available in that community. There were patients there who, with unmodified criteria, were inappropriate for admission, yet the circumstances in the Victoria community made an admission the best option. A discussion of the application of the ISD criteria modified for the Victoria community and applied in Auckland follows.

In January 1993, inspired by an interest in the Quick Response Team concept developed in Victoria, a utilisation review (Bapty & Harris, 1993), previously mentioned in chapter 1 (p. 9-10), was initiated over ten weeks at Auckland Hospital. The aims were: to determine what proportion of patients admitted to acute medical and geriatric areas would potentially be able to be cared for at home instead of being admitted, if they lived in Victoria with the same community resources available including a Quick Response Team; to describe this group; to determine what resources would be needed; and to specify the days of hospitalisation potentially avoided if the group was successfully cared for at home. The review was conducted by this researcher, based on her experience of identifying patients for QRT care in the emergency departments in Victoria and using the ISD-A criteria modified for the Victoria community. The review was a prospective survey. Rather than screening patients in the emergency department at arrival and possibly interfering with the decision about admission, patients were assessed at least a day after admission, and no later than two days after admission, as events after admission could have influenced the reviewer. The Severity of Illness/Intensity of Service Criteria (Greater Victoria Hospital Society, 1991) were

applied. Fifty-five percent (55%) of all patients admitted to these areas were over 65 years. Of the 455 patients over 65 years of age reviewed, 25% (112) were potential candidates for care at home if the same resources available in the Victoria community had been present in Central Auckland. Within this group, there were slightly more women than men, and the mean age was 78 years. Fifty-three percent (53%) lived with others and the rest lived alone. The most common diagnoses were falls or social problems, followed by miscellaneous medical problems, cardiac problems, and strokes or transient ischaemic attacks. Eighty-five percent (85%) were identified as needing QRT care, which meant that they required same day service, daily monitoring and adjusting of services, and possibly live-in home help. The others would have been discharged home but without QRT support. As this was a sizeable group, further development of QRT resources in Central Auckland seemed justified.

Consistently studies using the utilisation of hospital resources tools in a variety of communities including New Zealand have suggested that there are people being cared for in hospitals who could be cared for in the community. These tools have proved to be valid indicators to guide use of hospital resources and have shown that many hospitalised patients could be cared for outside of the hospital setting, reducing the use of this expensive resource. Two trends have emerged; one is the restriction of admissions, such that patients eligible must require intensive services or technical treatments only available in the hospital setting; the second is the reduction of the lengths of hospital stay (Steel, 1987). In many instances the presence of alternatives enable care required to occur outside of traditional hospital settings; they are discussed next.

#### Alternatives to Institutional Care

Literature reviewed on alternatives to institutional care includes a mixture of studies and review articles from the USA, the UK, and New Zealand. Most researchers and clinicians in the field of geriatrics would likely agree that in many cases long-term community services play a role, to some degree, in delaying or preventing acute as well as long-term institutional admissions. Therefore alternatives to long-term institutional care are of interest and are discussed first, followed by the alternatives to short-term care, that is alternatives to acute hospital care.



### Alternatives to Long-Term Institutional Care

Kane and Kane (1980) lamented that the status of research on long-term care alternatives for older people in America resembled “cacophony rather than symphony” (p. 249). They suggested that researchers examine their goals. In the 1970s, because of increased costs and demands for nursing home care, as well as reports of abuse and fraud of older people living in such institutions, the American public became concerned with alternatives to nursing home care, yet there was little agreement on what alternatives were available or desirable. Kane and Kane stated, “Alternatives are pursued in the hopes that they will be both better and cheaper, yet such an ideal synthesis may be difficult to achieve. There has been almost no public discussion of what should be done if alternatives prove to be simultaneously better and more costly” (p. 250).

They appealed for a standard process of measuring health and social status; of differentiating between short- and long-term interventions, which is important in considering preventative measures; and of measuring costs in a language that identified units of costs, inclusive of all formal and informal expenses. They questioned at what point the provision of household labour was a luxury and a poor use of taxes acknowledging that it was unclear whether an increase in services at home affected the need for nursing home care; and explained that evaluation of this was complicated as there usually were people involved who could profit from the provision of services. They emphasised that, in establishing health policies related to care of older people, the complex balance of costs and quality issues must be considered; and suggested that abuse and fraud of older people were as likely to occur in the community as in institutional care. They stated that most people moved to a nursing home in response to a crisis; tended to deteriorate once there, suggesting that institutional care was custodial rather than rehabilitative; and were unlikely to ever leave. Kane and Kane noted that, in Great Britain and Scandinavia, there was an ability to provide rehabilitation for people living in the community by admitting them to geriatric treatment units for a short period of time; and that the model used in Sweden for care of older people stipulated that providers within geographical catchment areas were responsible for delivering services needed for all older people, both in the community and in institutional settings.



Kane and Kane advocated that researchers have consensus on what the relevant issues were and use a more cohesive approach. They were critical of research, stating that issues were poorly conceptualised and efforts fragmented. They referred to a dichotomy between medical and social models and suggested that the two tools used most commonly for assessing health needs and outcomes of older people were different; the PACE instrument (Patient Appraisal, Care Planning and Evaluation), described as representing the medical model, emphasised medical and nursing needs; whereas the Duke/OARS Multidimensional Functional Assessment tool (Older American Resource and Services), described as representing the social model, included self-reported assessments of social and economic resources, mental and physical health, and activities of daily living. They were concerned about inappropriate comparisons made; for example, some studies compared the use of day centres with nursing home care, when the intent of day centres was never as a substitute for nursing home care; and if day care was appropriate for nursing home residents, these people likely should not have been living in nursing home settings. Other studies inappropriately compared day hospitals (treatment and rehabilitation) and day care centres (recreation), which had different focuses. They noted a lack of agreement about what were good outcomes and questioned the validity of self-report questionnaires, suggesting that a lot of under- and over-reporting happened, which distorted the results. While many were enthusiastic to study alternative models related to long-term care for older people, Kane and Kane stated that unless there was a "foundation of meaningful information" (p. 257) little progress would be made. They appealed to researchers to explore "where we want to go" (p. 257) before defining the goals. In conclusion their recommendations included:

- developing a common vocabulary that clearly defines the alternatives to long-term care;
- reaching consensus on measures of outcomes, target populations, and costs measured;
- analysing how to balance and weight the range of outcomes (including happiness and quality of life measures);
- examining methodological issues, such as the reliability and validity of self-report measures;

- developing common units of costs to enable comparability;
- studying the cost effectiveness of alternatives to institutional care;
- considering more sheltered housing strategies;
- exploring the abilities of families to care for their relatives;
- instigating incentives for providers by rewarding desirable outcomes; and
- providing more education about geriatrics to the various health care disciplines involved.

Hughes, Cordray and Spiker (1984) evaluated a long-term home care programme, the Five Hospital Homebound Elderly Programme (FHHEP) in Chicago using a quasi-experimental pre-post-test design. The study took place over 31 months, June 1977 through December 1979. Social services directors in five hospitals in the Chicago area were concerned with the number of older people with acute as well as chronic problems. They were difficult to discharge home because of their needs, yet were ineligible for the Medicare-reimbursed care at home, which was "severely restrained by skilled-care eligibility criterion" (p. 461). The FHHEP started in 1976 to assist these people and was linked to both the acute hospitals and community services. The programme accepted people who were: over 60 years of age; lived in the geographical area served; were homebound; needed medical and social services; and were dependent on daily assistance. Everyone without a physician offering home visits was assigned one who would; the visits were offered as needed, generally every 3-6 months, and these physicians followed those admitted to hospital. Other services provided included home health aides, homemakers, chore services, telephone reassurance, volunteer visitors, physical therapy, podiatry, and laboratory tests. While the programme had a fixed budget, it had less restrictions than Medicare, which was only available to patients who had been hospitalised and limited the number of service visits allowed. The aims were to determine if the FHHEP services would reduce deterioration in the functional status, mortality, hospitalisation rates, and the number of admissions to long-term care institutions of chronically ill/impaired older people. The evaluation of cost effectiveness was not an outcome measure because billing information was not accessible.

A desire to accept and support everyone eligible for the FHHEP at home prevented randomisation. A control group was selected from a group of similar

people receiving a home delivered meal service; they were over 60 years of age; lived in a geographical area including the area served by the FHHEP, as well as nearby areas; were homebound; and had some impairment in their ADL scores. The experimental group included 122 out of 162 clients who had been consecutively accepted to the programme; the control group included 123 out of 167 clients who had been consecutively accepted to the meal delivery programme over a similar time period. All participants were assessed at entry and nine months later using the Duke/OARS Multidimensional Assessment Questionnaire (OMFAQ). This assessment includes information on demographics, social and economic resources, mental and physical health, illnesses, sensory deficits, use of aids, and abilities related to ADLs/IADLs. Data was collected on hospital and long-term care institutional admissions over the nine-month time frame using the OMFAQ and this was verified by telephone with hospital and nursing home staff.

Assessments at entry showed that the two groups were similar regarding the demographic and health data. The experimental group had a mean age of 80.4 years; 57% were widowed; and 76% lived in unsubsidised private housing. The control group had a mean age of 77.6 years; 52% were widowed; and 74% lived in unsubsidised private housing. Both groups were predominantly white. Their main problems were arthritis, circulatory problems, and heart disease. The experimental group had reduced abilities with their ADLs and physical health. There were unexpected differences between the two groups, likely linked to the geographical area differences; the meal delivery catchment area included areas with a high density of impoverished people. This difference may have accounted for the people in the experimental group having slightly higher education and incomes, and therefore less anxiety about money.

At the end of nine months the mortality rates for both groups were very similar. The experimental group increased their use of services, was less able to perform ADL functions, but had an increase in self-perception of their health status. The researchers described this as "paradoxical" (p. 466). They proposed that either: 1) ageist well-intentioned providers, rather than promoting client self-care, offered too much help; or 2) that clients, fearful of losing home assistance, exaggerated their disabilities. The authors wondered if reduced abilities to perform ADLs, usually considered a negative outcome, would be viewed this way by the

clients who also reported an improved social, mental and physical health. They suggested and favoured the second explanation and suggested that if people were assisted regularly with ADLs that were difficult and/or painful, they would be less likely to view their health as poor. Hospitalisation rates were the same for both groups. The rates for institutional long-term care for the control group were double the rate of the experimental group. They concluded that the FHHEP was effective and recommended that studies be done that followed the people for longer.

Szekais (1985) described the development of adult day centres in the America in the 1970s and early 1980s, which were one type of community based service that provide multiple services for multiple needs. Five models were:

- 1) Day hospital, which is in a hospital setting and offers rehabilitation;
- 2) Restorative health care model, which is similar, short-term, but not hospital-based;
- 3) Maintenance health care model, which is recreational and long-term;
- 4) Psychosocial care model, which is recreational and long-term with a focus on mental health;
- 5) Respite care, which is long-term and offers respite for family.

These could easily be grouped as adult day hospital (1 & 2 - treatment and rehabilitation) and adult day centres (3, 4, & 5 - recreational) as Kane and Kane (1980) described. Szekais stated that these options have expanded offering a broader range of options to support older people that are both assessment and treatment oriented as well as recreational.

In "The Evaluation of the National Long-Term Care Demonstration" (1988) Kemper presented an overview, summarisation of the findings, and generalisability of a rigorous randomised evaluation of this comprehensive American study. Eighteen technical reports collectively formed the evaluation. What were referred to as "chanelling demonstrations" were established in five American communities between 1982 and 1984. The aim of these chanelling demonstrations was to provide comprehensive case management and expanded community services as a substitute for nursing home care. Two different models of case management were used in each location. Within the basic case management model the case managers acted as brokers between clients and service providers. Within the financial control model services could purchase from anywhere, however this resulted in greater

payments per client. The cap on expenses was 60% of the costs of nursing home care and the actual amounts spent ranged from 30-47%. Due to low incomes, only 5% of the clients paid part of their expenses, and the case managers reported that, in these instances, the clients and families took a greater interest in the quality of the services. Comprehensive needs assessments were done, and detailed care plans were completed documenting informal and formal services. Case management was done by telephone as well as by home visits, at least at six-month intervals and included regular monitoring and adjusting of care plans. The design was replicated in five sites to reduce the likelihood of the results being due to a unique community, and the samples were large. Those on the channelling programme were frail and had considerable disabilities related to their ADLs/IADLs. Over half had problems with incontinence; 81% had mobility difficulties; and they tended to have cognitive problems. The population served was frail, and contrary to expectations, did not appear to be at high risk of nursing home admissions.

About 10-20% of the control group, who all had access to some form of case management in their communities, used that service, and 60-69% had home visits within 6 months of entering the study. Therefore, the research was not on the effects of community care, but on the effects of an expanded comprehensive case management and community services system. The control group did use more nursing home time, but the difference was not statistically significant. The channelling group used more services than the others; this increased the costs and was not compensated for by fewer costs associated with nursing home care. There were no differences in longevity, or in the use of hospital and medical services. The channelling group reported a reduction in unmet needs, were more confident that they had the care they needed, and reported an increased satisfaction with life. The author was cautious about the generalisability of the result as the interventions, populations, and environments were complex. He suggested that researchers might make their own judgments of this study's applicability to different situations. In conclusion, Kemper suggested that in introducing an expanded model of case management and community services, the justification needed to be based on the benefits to older people and their families, rather than on the cost savings.

Weissert and Hedrick (1994) reviewed the research done to date related to community-based long-term care (CBLTC), which included a wide variety of



services available for older people in the community. They described the review as rigorous, but stated that of 32 well designed studies, only three were published in clinical journals, meaning that this information was not readily available to people working with older people. The authors stated that people commonly assumed that CBLTC programmes provided cost-savings when studies have consistently not demonstrated this. They cited Weissert (1990), "It may be time to lay aside studies showing that home care is not cost effective and get started on ways to make it become so."

Studies reviewed included schemes on in-home nursing, interdisciplinary team care, homemakers or home aide care, adult day health care, hospice, respite care, and programmes that provide packages of care. They were critical of studies that claimed cost effectiveness when there was no appropriate control group. They said that randomised controlled studies and quasi-experimental studies were stronger as they control for the fact that some patients improve and others do not regardless of the treatment. A common weakness found in studies is subtracting the cost of CBLTC from the costs of nursing home care and then claiming the difference as a cost savings. The use of control groups in clinical trial studies has generally demonstrated that patients who do not receive CBLTC do not tend to live in nursing homes. Twenty-two studies reviewed were clinical trials with randomly selected control groups; the other ten were quasi-experimental using control groups matched to experimental groups. Few studies were available evaluating post-acute care at home.

Weissert and Hedrick (1994) commented on the Adult Day Health Care study, which was conducted in eight sites, included large numbers of people, and was therefore generalisable. The admission criteria included traits typical of the appropriate target group. The design was important because the review of similar studies showed that the associated effects of the intervention were weaker in the controlled studies. The outcomes reported on in the clinical trials were appropriately broad including a full range of items such as mental and physical health assessments, social functioning, survival, use of services, costs, satisfaction, quality of life, and burden, among others.

Weissert and Hedrick found the results of the studies they reviewed to be "robust and consistent" (1994, p. 349). In general CBLTC had not improved the

survival rates of older people or reduced the deterioration of their physical abilities. Of 35 studies reporting on unmet needs, 21 showed a significant increase; 5 of 24 studies showed a significant increase in life satisfaction for clients; 4 of 18 studies showed significant positive changes in caregiver satisfaction, stress, and illness. A table (p. 349) of these outcomes shows how many studies were found, how many results were positive and negative, and whether the results were statistically significant. All studies are listed in their references. The cost of CBLTC had not reduced the need for nursing home care enough to justify the increased expenditure of CBLTC. Hedrick, Koepsell and Inui (1989), in an earlier meta-analysis of literature, found that studies showing significant increased survival effects associated with CBLTC proved to all be from non-randomised studies. Results on survival were looked at more closely by Weissert and Hedrick; compared to controls and regardless of statistical significance, 16 treatment groups showed better survival rates; 18 showed worse survival rates. The identification of sub-groups helped to determine target groups that might benefit more from interventions, however, sub-groups analysed were often too small, or were poorly defined. The results showed that younger less disabled people might benefit more from CBLTC and that older more disabled people were likely to become more dependent. High risk experimental group patients had better survival rates than high risk control group patients. Higher functioning older people in Adult Day Health Care studies had worse physical and emotional outcomes than those in control groups. Some studies reported cost savings and reduced use of nursing homes, but when one considered all studies reviewed, the findings were contradictory. Reduced hospital stays were associated with people who were living alone, over 75 years, less disabled, had moderate unmet needs, had good prognoses, and were considered to be high risk for nursing home care. In some studies, people who met the criteria that supposedly predicted high risk for needing nursing home care were found to have lower nursing home use. Weissert and Hedrick suggested that the results of a subgroup of veterans identified in the Adult Day Health Care study conducted in eight sites might be "instructive" (p. 350). Veterans with a 50% or greater service-connected disability who were referred to the day centre had significantly lower costs for other services such as laboratory, pharmacy, home help, clinics, and nursing home use.

In discussion, Weissert and Hedrick stated that if cost effectiveness could be achieved with CBLTC, it would demand tight controls and reasonable expectations by policy makers. They noted that it was unclear what outcomes one should hope to achieve with CBLTC, what combinations of services were ideal, and what negative outcomes might be associated with it. Many people had services provided to prevent risks that likely were not there. Also the amounts of care provided may have been beyond what was required to maximise the benefits. Better risk prediction was needed as well as improved identification of target groups. Regarding the use of tools giving quantitative scores to predict the risk of nursing home admissions, they cautioned clinicians to consider these as an important factor in clinical decision making, rather than using the tools alone.

A series of studies (Challis, Chessum, Chesterman, Luckett, & Woods, 1987; Challis, Darton, Johnson, Stone, & Traske, 1991a; Challis, Darton, Johnson, Stone, & Traske, K., 1991b; Challis & Davies, 1988) led by Challis, a social worker and the primary author, explored case management schemes targeted at the most frail elderly population in Britain. The authors were critical of the services offered because they were fragmented. No one person was responsible for coordinating the broad range of services available, and the assessments and care plans had been "service-oriented rather than client-centred" (p. 192). The first trial of the Community Care Approach (CCA) was at Kent, south east England; it was replicated later at Gateshead in north east England. The focus was on people who were "on the margin of entry to institutional care" (p. 192).

Within the CCA projects social workers acted as case managers, used a problem oriented approach in assessing needs, and then organised appropriate care packages, which catered to each individual's needs. Case managers were allocated small case loads of 15 to 20 people. A decentralised budget enabled purchasing on discretion from a variety of sources. This included: existing services within social services, such as home health, and meals-on-wheels; aids, materials, and services not normally available, for example, electric shut-off kettles, or alarm services; and a third and common option, the hiring of local workers who were able to offer a variety of innovative services, for example, taking a phobic person on gradually longer walks, or providing small day care groups within their own homes for people unable to attend the usual type of day care services. Care packages included

respite services for caregivers. Clients' needs were reviewed regularly and there was an aim for stronger links with health care services, such as community nursing and geriatric services.

The methodology used in both studies was quasi-experimental, rather than randomised. Control groups were matched by gender, age, accommodation, and mental and physical abilities. They had to be receptive to help and were supported at home with the services normally available. The Kent study included 74 matched pairs. The study at Gateshead included 90 matched pairs, and the results confirmed the findings of the Kent study. All participants had independent and comprehensive assessments done, which occurred at study entry and one year later. Participants' problems in both studies included poor mobility, being at risk of falls, incontinence, and cognitive deficits. Some had been residents of long-stay residential care institutions and were discharged home, which is uncommon; many were from acute geriatric wards.

The CCA groups, in comparison to the control groups, had lower mortality rates; lower long-term care admission rates; and less depression, loneliness, and dissatisfaction with care. While they had a higher use of community services, they reported improved social and emotional states, and an improvement in the quality of the care received. The worst outcome for those receiving the usual services was social isolation. The costs for both groups tracked for one year were not statistically different. Costs included those of the Social Services Department, the National Health Service, and of "society as a whole" (p. 198). Later, increased longevity tended to increase the costs for the CCA groups. It was concluded that staying at home with standard services was less effective; the Community Care Approach model, which offered lower rates of institutionalisation and improved welfare at no greater costs, was superior. Two sub-groups identified as particularly likely to benefit regarding cost efficiencies were dependent frail people receiving a lot of informal help and less dependent people socially isolated and at risk of depression.

A third study at Darlington (1991a, 1991b) was designed to provide more intensive services to vulnerable older clients who would otherwise have required institutional care. While randomisation was ideal, it was impossible because funding was allocated for one hospital only, with an aim to close wards. Therefore

a quasi-experimental method was used. The intent was to improve the services available by expanding on the CCA model developed at Kent and replicated at Gateshead. A joint health and social services model based within the geriatric department and known as the Darlington Project was developed.

Under a project manager, three social workers, employed by the Social Services Department as case managers, became members of the geriatric multidisciplinary team. The development of the "home care assistant" role was unique and helped to reduce the number of people going into patients' homes. They were employed by the Social Services Department and given formal training two weeks prior to their assignments. Under supervision, they performed a broad range of skills including: supervision of medication; assisting with personal care, such as washing and dressing; assisting with walking, transferring, toileting and incontinence; hair and nail care; helping with exercises; simple dressings and pressure skin care; catheter care; speech therapy; personal care for caregivers; and stoma care.

Twenty-six out of 101 people enrolled in the Darlington programme were discharged from long-stay wards and were described as severely disabled related to their mobility; many were patients on acute geriatric wards. There was a preference to accept people for care at home if they had accommodation to go to. Those accepted were matched with others receiving long-stay hospital care. Individual assessments and care plans were completed for those looked after at home. Each case manager had between 15-18 clients but a case load of 20 was considered reasonable. They also supervised about 18 home care assistants who they met with individually for problem solving. Carers were compared with two other groups of carers, those of older people attending the day hospital and living at home with the usual community supports, and carers of older people in the control group who stayed in hospital. All participants were interviewed, in hospital at study entry, and six months later. The Behaviour Rating Scale from the Clifton Assessment Procedures for the Elderly (CAPE BRS) was used; the overall score is the total of four individual scores related to physical disabilities, apathy, communication difficulties, and social disturbance.

The initial CAPE BRS scores of all participants were similar, 14.1 for the experimental group, and 14.2 for the control group. However, the control group



had a greater degree of impairment related to social disturbance; the authors explained that the Darlington Project focused on the alert but physically frail. Most participants had been in hospital two years or less. The main problems were stroke; self-care problems; incontinence, in two thirds; anxiety; depression, in most; and, for one third, confusion. The mean age of the experimental group was 80 years; and for the control group, 81 years. More of the experimental group had died after six months, but an unusually high number were terminally ill (14), compared to only one in the control group. By 12 months the death rates had evened out.

Those who went home improved and needed less care. Participants' locations were tracked at six months and one year. The use of acute hospital and long-stay care was low in the experimental group. Interviews at entry and at six months, excluding the terminally ill people, indicated that those in the Darlington project experienced less depression, an improvement in morale, and an increase in life satisfaction compared to the control group. The CAPE BRS scores showed less apathy in the project clients and an increase in their social activity. The carers of the experimental group were interviewed within two weeks of entry and again at six months to determine the change in scores. The other two carer groups were only interviewed once. Information was recorded related to tasks, behaviour, burden, and stress. There were no significant differences with the exception of stress, which was low for the Darlington project group and surprisingly high for the group in long-stay care. The authors explained that this was likely due to guilt and loneliness experienced when relatives moved into care. The evaluation of the study (1990b) concluded that care in the community gave the recipients a better quality of life, the costs were no more expensive than hospital care, and it linked well with existing geriatric multidisciplinary teams. The Darlington Project appeared to be a more efficient way of caring for older people. This model was similar to that used for the Northern Case Management Study in Auckland, which is described next.

In the late 1990s the Northern Case Management Study (Richmond, Northey, Moor, Kerr, & Kelsall, 1997) was implemented in Auckland, New Zealand. It was an attempt to develop research-based information on the advantages and disadvantages of institutional care in comparison to enhanced care at home for frail older people who would normally be cared for in rest homes. It was a non-randomised trial. The control group included 95 people admitted to rest

homes. The experimental group included 91 people who were offered case management at home. The case managers used a budget holding model, similar to that used in Darlington, and the case loads were 30 or less patients. Assessments were completed at entry and at six months. The outcomes assessed included: place of residence; the New Zealand Support Needs Levels (SNL); assessments of functional, cognitive, and ADL abilities; quality of life; satisfaction of the subjects; carer morale, stress, and satisfaction; and use of health care resources and costs. At entry the two groups were similar with the exception that more in the home care group were married or had a carer.

The results showed no difference in the two groups related to death rates; the Support Needs Levels (SNLs); assessments of functional, cognitive, and ADL abilities; and quality of life. The home care group were satisfied with their choice of living at home. While they used more acute hospital care resources the overall cost of their care was less, approximately 70% that of the rest home care group. The data on the carers were less positive; they had higher levels of stress, lower morale, and reported often thinking that it would be better if their relatives were living in institutional care. The researchers concluded that while the model was cost effective, it was important that the service have strong links between community health and geriatric services and provide respite to reduce carer stress.

A complimentary study to the Northern Case Management Study (Belgrave & Brown, 1997) investigated the costs of informal care provided for these same older people by interviewing relatives and unpaid carers who were mainly women. While the real cost differences of informal care in rest homes compared to in homes were surprisingly small, the non-financial costs were judged to be very high, particularly related to increased stress and social isolation for the carers. The day-to-day care was described as a situation of drudgery, but the fact that the demands were all-day every-day care was the real burden for these people. The recommendations were that: more timely and effective formal care be available; respite care be more adequate and flexible; prospective carers have better information about being carers, about the formal services available, and about the consequences of being a carer; other family be encouraged to be more involved; and there be training for people acting as carers. Case management models for care of older people at home are often assumed to be alternatives or substitutes for

institutional care (Kane & Kane, 1980). Some have suggested that programmes offering long-term care at home are cost effective while others have suggested that they are additional care with added costs (Gerson & Hughes, 1976; Kemper, 1988; Steel, 1987); the same has been said of early discharge programmes, which are discussed next.

#### Alternatives to Short-Term Care

The literature on alternatives to short-term care for older people varied in focus. Some were alternatives to admissions to geriatric areas of acute hospitals providing assessment and rehabilitation at home, or provided enhanced care post hospital discharge to prevent readmissions to hospital or institutional care. Many focused on early discharge, some in particular for people post orthopaedic surgery. Some were intensive Quick Response Team models of care focusing on early discharge and admission prevention. They are discussed in this order. In light of the criticisms and critiques of Kane and Kane (1980) and Weissert and Hedrick (1994), one can see that the more recent studies have improved in design and conduct. The authors of five articles discussed programmes that reduced the use of acute geriatric hospital stays. The first was an older descriptive study set in America; two other descriptive studies were conducted in Israel. Two more recently conducted studies were randomised controlled trials set in Sweden and the UK.

#### Alternatives to geriatric admissions.

Tolkoff-Rubin, Fisher, O'Brien, and Rubins (1978) described a pilot study, the Massachusetts General Hospital Coordinated Home Care programme, conducted in the mid 1970s. The aim was to better coordinate the existing community resources with diagnostic, educational, and therapeutic facilities at the hospital in a way that would enable better post hospital discharge care in the community, shorten lengths of acute hospital stays without compromising quality, and enable more people to remain at home instead of moving to institutional care. The service provided nursing care; social services and counselling; occupational, physical, and speech therapy; and nutritional, homemaker, and home health aide services. Those accepted lived in the geographical catchment area, were receptive to being at home, had significant health related disabilities requiring support, and had family physicians agreeable to involvement in the pilot programme. The target

group was patients assessed as not needing acute hospital care and awaiting admission to long-term residential care.

The Home Care Coordinator, a visiting nurse, was described as "pivotal" and the "key link" (p. 456) between the patient, their family, and the health care team. This nurse assessed the patients' needs; organised equipment, supplies, appointments for therapies, and follow-up conferences; taught family members as appropriate; and coordinated communication between health care team members. Descriptive data on the patients serviced was presented, as well as three case studies, examples of situations for which the programme was considered the most useful. The case studies included: an older person with chronic multiple illnesses, an older person with a terminal illness, and a young man with a catastrophic neurological disability. It was assumed that these people would all have required institutional care without the programme, and on that basis, it was considered cost effective. The authors emphasised the need for education and respite for family members and the ability for services to be flexible when circumstances changed. They agreed with Stone, Patterson, and Felson (1968) who are reviewed later in this section; patients did as well cared for at home, and health care staff, patients, and their families preferred home care when possible.

Two articles described programmes in Israel. The first, by Galinsky, Schneiderman, and Lowenthal (1983), was a hospital-based home care programme and part of a geriatric unit in Beer Shiva. Patients were referred from in-patient wards and clinics in the community. The scheme was similar to the one previously described; patients had a high level of disability and were regarded as likely to have required institutional care if that level of support had not been available at home. The authors reported that home care as an alternative to hospital worked well and stressed the importance of involving the family physician. They stated that involving the hospital-based multidisciplinary team members increased the quality of services and the knowledge and motivation of the team. Similarly, Michaeli, Ficu, Mor, and Har Paz (1984) evaluated a day programme and a multidisciplinary home care scheme, which were developed to provide an alternative to hospitalisation in a Jewish community in Tel-Aviv where there was a high ratio of older people. They too reported that more people were able to remain at home and had an increased quality of life that was cost effective. They had trouble with their

cost analysis as the actual hospital costs were unclear. They estimated that the cost of home care was 38-69% less than hospital care, 31 beds were vacated, and 100 people were able to be at home rather than in institutions. Neither of these studies used a control group to compare the outcomes.

A Swedish randomised clinical controlled trial by Melin, Håkansson, and Bygren (1993) explored the outcomes resulting from the provision of an enhanced home rehabilitation programme for a group of older people with chronic illnesses and disability post hospitalisation. The aim was to decrease costs. Between May 1988 and April 1990, 249 eligible and consenting patients were recruited. When clinically ready for discharge, they were randomly assigned either to the control group and received the usual treatment, or to the experimental group and received care at home by the new intervention programme. Usual care included short- and long-term hospital care, home help, and home care, without access to the new intervention team, which was multidisciplinary and consisted of physicians, district nurses, physio and occupational therapists, assistant nurses, and a secretary. The study was well designed. A broad range of data was collected blindly at baseline and at six months. It included: demographic information, mental and ADL/IADL assessments, social activities, medical diagnoses, complications, use of health services, and medications. At six months, the experimental group had fewer medical diagnoses, less prescription medications, increased ADL/IADL scores, less problems, less time spent in hospitals, and their care costs were 20.2% less than the control group care costs. The experimental group also reported higher levels of satisfaction. The authors recommended this care especially for those at risk of long-term hospitalisation, excluding the very demented, the healthiest, and the sickest of the general older population.

In the UK, Martin, Oyewole, and Maloney (1994) investigated an enhanced home support programme post hospital discharge for people thought to be at risk of readmissions to hospital or of needing long-term institutional care. Those meeting the selection criteria were randomly assigned either to the Home Treatment Team (HTT) ( $n = 29$ ) or to the control group ( $n = 25$ ). Typically participants were low income older women living alone. Both groups were statistically similar. The control group went home with the usual community services. A nurse manager for the HTT group instructed and supervised ten home care assistants in home



rehabilitation. They assisted patients with personal care and domestic duties up to three times a day between 8:00 a.m. and 9:00 p.m. for up to six weeks. The participants were followed for 12 months. After six weeks the HTT group were twice as likely to be living at home. Over one year the experimental group had fewer hospital admissions, spent many more days at home than the control group, and used less hospital and long-term care resources. The benefits were regarded as long-term and patients preferred the HTT. A detailed cost analysis was not done but the researchers were certain it was cost effective considering the reduced use of hospital and long-term institutional care beds.

#### Early discharge models.

Nine early hospital discharge programmes were reviewed. They all used similar multidisciplinary teams, some hospital-based, others community-based and this seemed to make little difference. Four studies were mainly orthopaedic focused and set in Australia and the UK. Three descriptive studies are discussed first; one had a general focus and no comparison group was used to assess the impact; and it is followed by two orthopaedic focused studies that both used prospective groups to draw comparisons.

Apart from articles about the Victoria QRT (Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991; Peck, 1991), one of the best examples of early hospital discharge was the Peterborough Hospital at Home (HAH) (Mowet & Morgan, 1982) in Cambridge, England. The social worker, Clarke, visited the Sante' Service Bayonne in France, which inspired the development of the HAH. The other staff consisted of three nurses and eight aides who had a wide responsibility for personal care and domestic duties similar to the aides in the Darlington Project (Challis, Darton, Johnson, Stone, & Traske, 1991a; Challis, Darton, Johnson, Stone, & Traske, K, 1991b). The patients had a wide variety of diagnoses. Part-time physio and occupational therapy was available, and GPs provided the clinical supervision. Initially separate nurses were hired for the HAH, but they had little to do and it was difficult for the GPs to liaise with them. The authors warned others that neglecting to use already developed services made for duplication and confusion, and was a mistake. The scheme changed in 1980 to incorporate the GP attached district nurses and this worked well. An evaluation of 53 patients cared for by the HAH scheme was done by chart audits and

interviewing the staff, patients, and their relatives. The mean age of the patients was 71 years, with a range from 34 to 95 years; 73% were over 60 years of age. Two thirds were women, one third lived alone, and many were low income. The main care needs involved nursing tasks and supervision of the aides who carried out mainly bathing and domestic assistance. Staff, patients, and relatives indicated that HAH was acceptable, the satisfaction was high, and there were few problems with this care as an alternative to hospital. The estimated daily costs at home were less than hospital care, but the patients tended to be on the programme for longer. They speculated that the initial start up costs were high and likely could be reduced. The researchers were cautious regarding the cost analysis, as the design was not a controlled comparison. A quasi-experimental study of this same programme (Pryor, Myles, Williams & Anand, 1988) is reviewed later in this section.

Sikorski and Senior (1993) investigated a Domiciliary and Rehabilitation and Support Programme in Western Australia. It was aimed at enabling early surgery, rapid mobilisation, minimal sedation, and early discharge home with physiotherapy and nursing services for older patients recuperating from surgical repair of fractured hips. They treated 615 people over 60 years of age during 1982; their mean age was 82.6 years. A prospective design was used to compare costs. The length of hospital stay was 18.9 days in comparison with 28 days for a comparable group of patients cared for in hospital the previous year. The morbidity and mortality rates were better than in other schemes and the cost savings were 15%. They regarded the service as a safe way of enabling earlier mobilisation and improved results.

Hensher, Fulop, Hood and Ujah (1996) were less positive about their review in 1993 to 1994 of three early discharge multidisciplinary hospital at home services in west London. They were all community based and focused on the early discharge of orthopaedic patients. The Peterborough at Home programme was referred to as the best known, most established scheme in the country and it had been assumed that care at home, in comparison to the usual hospital care, was preferable and cheaper. The researchers wanted to further examine the costs as the information to date had been vague. The researchers ran into difficulty at Site # 2 and so prospective comparison groups at only two of the three sites were identified

over six weeks through July and August of 1985. The comparison patients lived outside of the programme catchment areas; and the review examined lengths of stay and detailed costings to the National Health Service.

The home care schemes were less active than the hospital programmes and not working to full capacity and efficiency. The costs per day of care at home were lower than in-patient care in two of the schemes. Scheme # 1, due to the level of inactivity, cost more per day than in-patient care. A home care day in Scheme # 2 was always cheaper than in-patient care. The cost comparison in Scheme # 3 was unclear; the hospital overhead costs were later reduced by 5% resulting in home care becoming more expensive than the hospital. Variability in each programme regarding the lengths of stay for hospital care and the home care affected the overall costs per patient. Where in-patient time was reduced, the home care time was longer. There was a potential for reduced costs per day with hospital at home care, but it could not be assumed to be cheaper per episode of patient care. They described the costings of in-patient care as "lumpy" (p. 551) as some costs were fixed and others were not. They suggested that unless wards were closed cost savings were unlikely. The authors advised caution in interpreting the results as, without randomly allocated comparison groups, bias in the selection of the comparison groups was likely. Six controlled studies on early discharge are now discussed.

The earliest trial reviewed was in the late 1960s. Stone, Patterson, and Felton (1968) investigated home care as an alternative to hospital care at Mount Sinai Hospital in Milwaukee, Wisconsin, USA. Their intentions were to determine whether care at home was useful, and to explore the quality, the outcomes, and the costs compared to hospital care. The design was described as a randomised controlled trial, although they used interval rather than random sampling (Wilson, 1989); they selected two patients for the experimental group and every third patient was allocated to the control group. They had problems with the design and later decided to match control patients to experimental patients by age and gender. The programme was only for people who would normally require in-patient care, which was the treatment for the control group. The experimental group was discharged home to the care of a hospital-based multidisciplinary team. Everyone assigned to care at home went home; however, twelve patients allocated to the hospital care

group also elected to go home and so were excluded from the study. The groups were not statistically different. Physicians and patients completed questionnaires regarding acceptability and satisfaction. The questions were about recovery, progress, rehospitalisation, progress, and costs. In spite of the length of stay of home care being triple that of hospital, because home care was much cheaper per day, home care was still under half the cost of hospital care. The authors concluded that the service was acceptable, of high quality, and cost effective. All involved had a strong preference for care at home.

A second study was done at Peterborough District Hospital to investigate the effects of early discharge of older patients with hip fractures. Pryor, Myles, Williams, and Anand (1988) conducted a quasi-experimental study over a ten-month period starting in October of 1986. One consistent team managed the care of 200 patients admitted with fractured hips. They were screened on admission; 102 (51%) were suitable for this study on early discharge as they were independently mobile prior to their injury and without medical conditions that would delay mobility post operatively. Fifty-six patients of 102 eligible (55%) were selected for early discharge because they lived in the Hospital at Home (HAH) catchment area. The other forty-six (45%) formed the control group and were cared for in hospital in the usual manner. The aim was to facilitate discharges within five days of hip surgery. The mean age was 78.4 years. The control group had a mean hospital length of stay of 22 days compared to 14.6 days for the experimental group, which was a combination of days in hospital and days with the HAH scheme. Within three months two (3.6%) in the group discharged early had complications and required readmission compared to nine (19.5%) in the control group. The cost savings for the early discharge group were greater than anticipated. The need for nursing staff for the HAH scheme was variable; therefore the authors recommended using part-time staff who would be available as needed. They reported that patients could be safely discharged early to a Hospital at Home scheme in a cost effective manner.

Farnworth, Kenny and Shiell (1994) investigated the costs of a Fractured Hip Management Programme (FHMP) for patients at Westmead Hospital in New South Wales, Australia. The investigators were declined ethical approval for a randomised controlled study and so used a 'before and after' study design. The

aims of the programme were to minimise delays with surgical repair of fractured hips, to involve geriatric medical supervision of patients, to facilitate early mobility post operatively, and to enable early discharge with home rehabilitation by a small multidisciplinary team. Suitable patients were selected during the first six months of 1990; 67 out of a total of 87 patients were included in the experimental group. A control group was selected from patients in hospital for hip surgery during the first six months of 1989; 71 patients out of a total of 102 were suitable for early discharge and formed the control group. The groups were not significantly different. The costs for care of hospital patients was \$11,060 Australian compared to \$9,280 for patients discharged early with the FHMP, and the other outcomes were as good.

In 1976, Gerson and Hughes investigated the economics of home care versus hospital care in Saint John's, Newfoundland, Canada. The study included 583 patients from three hospitals (population 140,000) who were randomly allocated to experimental and control groups. No formal home care existed prior to this, and the focus was patients who would need a short hospital stay. The home programme included nursing, therapy, home support, transportation, medications, equipment, and supplies at no cost to the patients. Typically patients' problems were categorised as varicose vein surgery, hernia repairs, cholecystectomies, anal and rectal surgery, abdominal hysterectomies, and diabetes; some were outside of these but too small to categorise. The researchers argued that only the costs directly related to direct patient care should be considered in a cost analysis and stressed that equivalents must be compared. Beyond lengths of stay, they considered the level of care required and the direct services for each patient (for example, the actual nursing time), as well as the fixed costs. Over 13 months, 399 patients were allocated to the experimental group but were not all referred to home care. Two groups received only hospital care and so three groups were analysed; the two hospital groups were lumped together for economic comparisons; 184 were in the control group. The costs for patients who received hospital care only was not much different than the total costs of those discharged early with home care. In some instances, the patients who received home care were in hospital longer than the hospital care only patients and the researchers suggest that in these cases home care was an add-on cost.



Shepperd, Harwood, Jenkinson, et al. (1998) conducted a randomised controlled trial of a hospital at home scheme at Kettering General Hospital, in Northampton, England in 1996. The outcomes reported on were related to health status, functional abilities, diagnoses, readmission and mortality rates, caregiver strain, and satisfaction. The costs of care at home compared to normal care in hospital were investigated by Shepperd, Harwood, Gray, Vessey and Morgan (1998). The patients were recovering from hip surgery, knee surgery, or hysterectomy surgery; were older medical patients; or had chronic obstructive airways disease (COAD). The service offered nursing; occupational, physio and speech language therapies; 24-hour care if needed; and observation, administration of medications including intravenously, and rehabilitation of patients who could not manage with the usual community health services. Consent and baseline data were collected prior to computerised randomisation between October 1994 and November 1996. Follow-up information was collected three months after study entry.

With the exception of the women who had hysterectomies and were 20 to 70 years of age, all patients were over 60 years. No major differences were reported in the outcome measures of those cared for at home compared to those cared for in hospital. The recruitment rate for patients with COAD was small and those who had knee surgery had frequent complications, and so the researchers concluded that these patients were not suitable for early discharge. While most preferred care at home, the outcomes were no different than for those cared for in hospital. The costs of hospital care, GP costs, and carer costs were evaluated. Home care for post hysterectomy patients was more expensive than in hospital, but for the other categories, it was about the same. The GP costs were higher for older medical patients and COAD patients. The difference in costs to patients and carers was not significant.

Coast, Richards, et al. (1998) conducted a randomised controlled trial of an early discharge programme north of Bristol, England (population 224,000) in 1995. The aims were to examine the effectiveness and acceptability of hospital at home care and Richards, et al. (1998) reported on the cost effectiveness. Patients were screened on acute medical, geriatric, orthopaedic, and surgical wards for study suitability and stratified by admission type (elective or emergency). After informed

consent, 241 eligible people were randomly allocated, on a 2:1 ratio, to rehabilitative care at home (n=160) or stayed in hospital (n=81). If patients were incapable, responsible relatives provided consent. Baseline data was collected prior randomisation in all cases except for the elective surgical patients. They were identified and randomised at admission, but their baseline data was collected about five days post operatively, at a time thought to be similar to the other participants. Demographic and health information, mental and functional assessments, and quality of life data were collected at entry, at four weeks, and at three months.

The patients' problems were fractured hips (31%), other fractures (21%), elective hip replacements (11%), strokes (10%), and miscellaneous (10%) including respiratory infections or falls without injury. Most were older women and half lived alone. The groups were similar except that more of the at home group (58%) lived with carers than in the hospital group (49%). The mortality rates for the groups were the same. The lengths of stay were longer for the care at home group. Functional abilities, quality of life, and most satisfaction measures over time were the same for both groups; the exception was that the staff favoured hospital at home. The conclusion was that the outcomes of both care options were equal. All costs were tracked for three months, and the analysis showed that three patients cared for in hospital used the same resources as four patients looked after by the hospital at home. The hospital at home scheme did not operate to full capacity, partly due to the difficulty of recruiting patients and also because one third of all suitable patients were allocated to control group. The GP costs were slightly higher for hospital at home patients and the conclusion was that care at home was cheaper. It was acknowledged that one researcher, M.A. Darlow who was a hospital at home team coordinator and researcher, had a conflict of interest in the evaluation process.

#### Quick Response Teams.

Several Canadian studies explored a Quick Response Team model of care; that is one that focuses on admission prevention of older people and provides, on short notice, intensive multidisciplinary care at home for a short period of time, similar to the Victoria QRT. Three were developed in the late 1980s and early 1990s in Calgary, Niagara, and Windsor; as well, a fourth QRT was developed in Christchurch, New Zealand, but to the researchers knowledge has not been

published. With the exception of the evaluation of the QRT in Victoria, Canada (Dawson, 1988), which used a controlled trial methodology but was not randomised, the studies were all descriptive.

Boyack and Bucknum (1991), two social workers, wrote about a QRT pilot project developed jointly by the Foothills Hospital Social Work Department, the Emergency Department, and Calgary Community Health Services partly in response to a nursing strike. Between July and December of 1988 a social worker was available for the Emergency Department between 3:00 p.m. and 11:00 p.m., Wednesday to Sunday, to identify patients suitable for care at home as an alternative to hospitalisation; as well this person provided social work within the rest of the hospital. A high risk screening tool developed the previous year was used to identify patients for the QRT. If the Emergency physician indicated that the patient was medically stable and able to go home with QRT care, the social worker assessed the needs and set services up. Over six months 24 patients were cared for by the QRT rather than in hospital. The first option for help was the patient's family and then agency services. Agencies already involved were used first. Some already offered 24 hour services such as nursing, homemakers, oxygen, and alcohol treatment. The social worker assumed responsibility for making arrangements, most often for nursing and home maker help, especially for personal care. The nurses and doctors in the Emergency Department were kept informed to ensure a feasible plan was coordinated. Only 14 of the 24 patients required additional home support. It would appear that the Social Worker was the only extra staff, and the usual agencies were accessed for extra services but there was no mention of a budget. The patients were interviewed by telephone one month later. The authors reported that the scheme was effective and that the patients and staff were satisfied. Patients had managed well one month later without a lot of increased services. They claimed to have saved costs by freeing acute care beds for other patients. While it freed resources for other acute patients, unless beds were closed it is unlikely that costs were saved.

Darby (1992) described a QRT in Niagara, Ontario, Canada explicitly modeled on the Victoria, Canada QRT. Starting in December 1990, over 12 months, 206 frail older and disabled adults were cared for in the community by a QRT thereby preventing hospital admissions. As in Victoria, the aim was to enable

a quick discharge home, with nursing, rehabilitation, home support, and equipment. The patients who would normally have been admitted to hospital were often surprised to be going home, however, the quick availability of intensive QRT services dispelled their apprehension. People went home within one to three hours of being seen by a QRT nurse case manager in the hospital. They were more often female and between 75 to 85 years of age. Most patients were referred between 9:00 a.m. and 2:00 p.m. rather than later in the day, which was more common in Victoria. The referral rate was consistent each day. Unlike Victoria where the problems were approximately one third medical, one third social, and one third falls, in Niagara half had medical problems, a quarter had fallen, and a fifth had social problems. Nurses were hired as QRT case managers because of their clinical assessment skills; the author commented that this was the right decision especially in view of the high number of medical problems. Niagara Regional Home Care provided nursing, physiotherapy, occupational therapy, and home supports. Twenty-five of 237 patients had problems that necessitated return visits to the hospital. The service cost approximately \$80,000 Canadian for one year. The programme was regarded as successful, cost effective, and satisfaction was reported to be high.

The Windsor, Ontario, Canada Quick Response Programme (QRP) (Freeman, 1994) was developed from the Hotel Dieu of Saint Joseph's Hospital. It was a joint project between five hospitals in the region, the Windsor-Essex County Home Care Programme, and community services. The focus was crisis intervention at home for people over 60 years arriving at the hospital emergency departments as an alternative to hospital admission. It operated similarly to the Victoria QRT, providing intensive multidisciplinary services over a short period of time, including live-in home support if needed. One third of the patients had had falls. Patients returning to hospital within two weeks were considered failures; this occurred for 7.6% of the patients, although the Victoria QRT Manager advised that this should be expected. The daily cost was \$157/day versus \$400/day for hospital care and the QRP was considered to be cost effective. Physicians and patients were satisfied with the service. Rajacich and Cameron (1995), faculty members of the University of Windsor School of Nursing further described and evaluated the Windsor QRP over its first year of operation. QRP liaison nurses completed comprehensive

assessments of all patients prior to discharge as part of their usual care. The service was offered for up to five days and then patients were discharged to usual community supports. The providers were contacted for follow-up information after five days; patients and their families were interviewed by telephone after 30 days.

Of 716 patients screened, 573 were admitted to the QRP. The mean age was 79 years; 70% were women and they frequently lived alone. The problems people presented with were medical (65%), falls (29%), and coping (6%). After five days of QRP care, 19% were independent, 8% returned to hospital, and 73% received community supports. Thirty-six percent (36%) reported that they were better, 37% were managing, and 27% were still having problems. The questions regarding satisfaction were answered with very positive comments and 92% reported being pleased with the QRP. The authors recommended that further data on those continuing with home supports be collected over time to determine their outcomes. They noted that in Victoria some people had remained on QRT up to 14 days in spite of a goal of five days of QRT. They described the QRP model as nurse driven and client-centred. The QRP nurses were considered to be clinical experts at identifying when patients were able to be supported at home or needed hospital care and advocates for a frail older population often institutionalised too soon.

Dr. Richard Sainsbury, at Christchurch School of Medicine, University of Otago investigated a QRT in Christchurch, New Zealand in the early 1990s (personal communication, August 4<sup>th</sup>, 1995). A pilot study without a controlled comparison group was done and it operated over six months. Some difficulties were experienced in obtaining live-in home support on short notice for QRT patients; also the QRT staff was uncertain initially about how to identify patients suitable for QRT care at home. Assessments done at entry included the MSQ, which is a mental questionnaire out of a score of 10; self-rated Rosser disability and distress scales; and the Barthel, an ADL assessment tool. Disciplines on the QRT included nurses, registrars, occupational and physiotherapists, and social workers.

From unpublished data (Sainsbury, 1995), of 54 patients accepted, 29 (54%) lived alone, 32 (59%) were female, and the mean age was 79 years. Their problems (more than one selection for some patients) in order were CVAs (46%), back pain (31%), dementias (17%), fractures (13%), urinary problems (9%), and



cancers (4%). At discharge from QRT, 2 had died, 2 were in institutional care, 3 had missing data, 4 were in hospital, 11 were at home with no increase in services, and 32 were at home with an addition of district nursing, gardening assistance, respite/day care, meal service, and/or home assistance. Three month follow-up information was collected, but only on 23 participants; 2 had died, 3 were in institutional care (2 had cancer), 8 were at home with increased services such as district nursing, meal service, family assistance, and/or home assistance, and 10 were at home with no change in their services. Over three months two patients had returned to hospital once. From available but incomplete data the results for the Rosser disability and distress scales and the Barthel indicated that most patients were the same or better at three months. The length of QRT intervention was from 1 to 98 days, and the mean and medians were 41 days; that was substantially longer than the Victoria QRT goal of 5 days maximum, which in practice stretched to 14 days. The programme apparently did not continued, but the reasons were unclear.

The University of Victoria School of Nursing was involved in the planning and evaluation of the original QRT pilot study, which took place in Victoria, Canada (population 260,000) between October 1, 1986 and March 31, 1987 (Dawson, 1988, 1993; Dawson & Critchley, 1992). The focus was admission prevention of people over 60 years of age. Those eligible were: people who normally would be admitted to hospital and be unable to manage with the normal community supports available; and were not requiring technical treatments or invasive surgery only available in hospital. It was anticipated that intensive services needed by the participants would be available for five days or less, and they then would be referred to the usual community services. The evaluation was formative (process); that means an evaluation done to guide the design of the study (Rossi & Freeman, 1993; Wilson, 1989). It was followed by a summative evaluation, which looked at the outcomes six months after the pilot study. A quasi-experimental design was used; assignment to the QRT experimental and control groups was done on the basis of the participants' addresses. The area served by the QRT was an urban part of the city and 150 subjects were in the QRT group. Those living in more rural areas around the city were assigned to the control group, which had 56 subjects.

The QRT in Victoria had two teams of part-time staff; each team consisted of a QRT liaison nurse (.6 FTE [full time equivalent]), who went between two acute hospital emergency departments; and a home care nurse (.5 FTE) and social worker (.6 FTE) who visited patients at home, often together. The programme operated between 2:00 p.m. and 10:00 p.m. The usual community health forms for Home Nursing Care and the Long-term Care assessments (similar to the New Zealand SNAPs) were used for so that on completion of the trial the programme could continue operating in the same way. These forms documented demographics; a health history; medications; ADL/IADL information; and supports and equipment available, in use, or needed. The evaluation monitored: safety, as indicated by accidents and problems for the QRT group at home; effectiveness, as indicated by the ability of patients to cope in the community; the number of admissions prevented; and the cost savings. Information was gathered by chart audit. Those in the QRT groups were interviewed by telephone; part of this interview focused on whether the use of a medical alert or safety alarms would have prevented a trip to the emergency department. Dibner (1984) studied the "Lifeline" system in Boston; she reported that its use demonstrated a significant decrease in the number of visits by older people to the emergency departments. If older people wear these devices, fall and are able to alert assistance, this prevents them from lying on the floor, sometimes for days, before someone finds them.

The groups were virtually the same with respect to mean ages, which were 79.3 years for the QRT group and 79.5 years for the control group. There were gender and living situation differences; in the QRT group 68% were female and 65% lived alone whereas, in the control group, 78% were female and 46% lived alone. Patients' problems were grouped into four categories (more than one selected for some) and included: falls (38%), coping (37.8%), medical (40%), and psychiatric (6%); these were only presented for the QRT group. The mean length of stay for the QRT group was 3.6 days, compared to 10.7 days for the control group cared for in hospital, suggesting that those cared for by the QRT regained their independence more quickly. The QRT group received home supports that included live-in help for 70%, night sitters for 12.5%, and hourly help only for the other 17.5%. Eight patients returned to hospital due to problems.

At six months, outcomes of the QRT group of 150 included: 4 referrals for in-patient rehabilitation beds, 5 repeat QRT admissions, 6 deaths (2 were hospice patients), 31 on waiting lists for permanent Long-term Care beds, and 150 Long-term Care assessments completed (there was more than one selection for some clients). The percentage of visits by both groups to the emergency department was greater six months prior to the pilot than six months after the pilot, and the change was similar; 89% of the QRT group and 95% of the control group before, compared to 53% and 56%, respectively, after. The death rates at six months were also similar, 10.6% for the QRT group and 12.6% for the control group. The need for supports and changes in living arrangements were not reported separately for the QRT and control groups at six months so these comparative outcomes are not known. Those who had QRT said that in 30 instances the use of a home alarm would have prevented a trip to the hospital, and 18 said that it might have.

More of the control group lived with others and, as was suggested in a CRD Report on the Quick Response Team (1988), this could have led to earlier discharges. One could also suppose that they chose not to live closer to health care services and were probably healthier than those in the city. On the other hand, their discharges could have been impeded with access to fewer services in rural areas. They may also have been slower to seek medical attention, as the services were less accessible, and therefore have been sicker once at hospital. These are problems of comparing dissimilar groups.

QRT costs varied from \$80/day Canadian, for fairly light care, to \$260/day Canadian, for live-in homemaker service and care from all QRT disciplines. It was estimated that the acute beds used by the control group cost \$550/day Canadian. Questionnaires to staff and patients indicated that the QRT was well received; 122 (91%) staff reported that QRT was helpful, 2 said it was not, and 10 did not respond. Of the physicians responding, 79 said QRT was helpful and 5 said it created problems. In 1988 the Victoria QRT expanded from a staff of 6 to 27, the hours were extended to 8:00 a.m. to 11:00 p.m., and occupational and physiotherapists joined the team. In addition to referrals of patients assessed in the emergency departments, the QRT in Victoria accepted referrals of in-patients for early discharge, as well as direct admissions of patients assessed by physicians in

the community, thereby avoiding contact with the hospital altogether. This is still so in 2000.

### Summary

With more people living longer, there is an increase in the incidences of disability and chronic illness and an increased demand by older people for health care services. As people advance in age, they are more susceptible to complex health problems that threaten their ability to live independently. When an older person's ability to cope at home is in question, he or she is often prematurely or unnecessarily admitted to hospital or moved to institutional care, sometimes because home supports are unavailable or unknown (Dawson, 1988, 1993; Dawson & Critchley, 1992; Steel, 1987, 1991; Szekais, 1985). Hospital emergency departments frequently seem like the best option for older people to access help, especially outside of business hours (Gupta, Setty, & Joshi, 1985). The literature reviewed on the use of hospital emergency and in-patient services by older people suggested that many who arrived at hospitals had problems that were not true emergencies and that many people admitted potentially could have been looked after elsewhere. The most frequent problems tended to be related to injuries, especially from falls (Gerson & Skvarch, 1985), or were cardiac in nature (Barry, Crescenzi, Radovsky, Kern, & Steel, 1988; Gerson & Skvarch). The majority of patients were older and female (Barry et al.; Munoz & Mesick, 1979). In general, older people had more illnesses and more hospital admissions than younger people (Gerson & Skvarch; Kane & Kane, 1980) and their needs were specialised (Beland, Lemay, Philibert, Maheux, & Gravel, 1991). Hospitalised older people generally have more complex rehabilitation and discharge planning needs, necessitating longer lengths of stay. A hospital stay for an older person can result in a dependent role, which can be a factor in increasing debility. For these reasons, it is important that those involved in the care of older people attempt to address their needs in the community with initiatives such as the Quick Response Team concept. The methodology for this randomised controlled trial of a QRT in Auckland is described in chapter 3.

## CHAPTER 3

### Methodology

#### Introduction

It is clear that people and societies are similar the world over yet are distinctive. Different countries, regions, and agencies have differing policies, which guide how people work. The value of the Victoria, Canada QRT intervention in New Zealand, where health care is organised differently, was unclear. The intent was to evaluate its application in Auckland using the best methodology possible, which is a randomised controlled experiment (Rossi & Freeman, 1993; Weissert & Hedrick, 1994). Most admission prevention studies have been descriptive, case controlled, or quasi-experimental designs as was the evaluation of the original Quick Response Team in Victoria, Canada (Dawson, 1988); therefore this proposal to study the Quick Response Team was unique.

In this chapter the methodology of this thesis, a Randomised Controlled Trial of a Quick Response Team for Older People, is explained. A brief description of the larger study, the QRT Trial at Auckland Hospital, is given. The remainder of the chapter indicates only the aspects of the trial relevant to this thesis. A description of the pilot study and resulting changes is followed by information on the assumptions, theoretical basis, hypothesis, and operational definitions. The research design is explained including the setting, study population, data forms and collection, ethical considerations, and data analysis.

This research investigated the impact of Quick Response Team (QRT) care on levels of independence/wellness in older people, as measured by changes in living accommodation and home support packages; it was part of a large collaborative project, a randomised clinical controlled trial that tested efficacy, safety, and cost savings of a crisis intervention programme in Central Auckland. The researcher worked as the QRT project manager at Auckland Hospital during the pilot phase prior to formal data collection and was involved in the development of the research design, hypotheses, operational definitions, data collection tools and protocols, information sheets, and consent forms. What evolved was the result of collaborative work. The data released to the researcher for this thesis were restricted specifically to living arrangements and care packages for the outcome



measurement of independence/wellness at study entry and at three months and so these are the limitations of this study. Data on the resources used for QRT care, and the care packages patients were discharged with from QRT and the hospital were not provided. These and other aspects of the evaluation, such as safety, functional assessments, satisfaction, and costs are described separately in the larger QRT Trial report and are outside of the scope of this thesis.

The process of writing a proposal for a randomised controlled trial of a Quick Response Team for care requirements at Massey University in 1993, to having funding in place within Auckland Hospital Crown Health Enterprise, establishing the QRT, receiving ethical approval from two committees, and collaborating with other investigators to enable formal data collection in 1996, was complex and lengthy. It demanded flexibility, a commitment to work issues through with various staff members within the hospital, and consultation with a variety of external purchasers and providers.

It was the researcher's experience that people were initially reluctant to use the new QRT programme in Victoria, Canada. Therefore the researcher's original proposal was for a simpler, smaller trial over six months with a budget of approximately \$150,000. Part-time community-based nurses and social workers would have worked in the afternoons and evenings, from 2:00 p.m. to 10:00 p.m., seven days a week. The focus would have been on admission prevention of people 65 years and older. The intention was to approach the agencies already providing home help to increase supports as needed for QRT, including overnight and live-in help. Data would have been collected on: demographics, admission dates, health problems, resources used, lengths of stay for the experimental group cared for by QRT and for the usual hospital care group, the complement of services people were discharged with, satisfaction with the care received; and follow-up data related to problems, use of supports, living accommodation, illnesses, and hospital admissions over a six-month period after study entry.

A comparison of the structure of health care services in Auckland with those in Victoria, Canada, where the QRT model developed, raised several questions regarding applicability of the Victoria, Canada QRT model in Auckland that were difficult to answer. One difference was the lack of Emergency Room

Physicians and GPs in hospitals in Auckland, as well as the lack of publicly funded consultants practicing in the community, much like in the UK. Clarke (1984) reported that during World Wars II and I the practice of medicine evolved in Great Britain in a way that divided medical doctors, resulting in GPs working exclusively in the community, and public consultants generally being attached to public hospitals, which is similar in Auckland, and contributed to problems in establishing "Hospital at Home" schemes. In this instance, what were the incentives for hospital doctors to organise QRT care, and which doctors should have been responsible for medical care of QRT patients? It was decided that the geriatricians, who already worked in the community, would share responsibility with GPs, who said that they often referred patients to hospital to access diagnostic tests, the services of consultants, or for increased supports rather than because admissions were needed.

How should QRT care have been funded, considering that hospital care was free, that the QRT was new with unclear outcomes, and there was a desire to recruit participants? It is clear from the literature that questions about who should bear financial responsibility for health care are ongoing (Malcolm, 1983). It was decided that the QRT Trial would bear the costs of most items associated with an early discharge. The out-patient fees normally charged for patients going home were waived, but the GP charges were not covered. The design and conduct initially proposed by the researcher had to be modified to fit in with those of the QRT Trial at Auckland Hospital. During the pilot phase a number of issues became apparent that influenced the research design and the scope of the thesis. A discussion of these changes follows.

#### Pilot Study and Changes

In Central Auckland, as in Victoria, it was initially difficult to recruit many patients for the QRT. Patients at the Auckland Hospital Emergency Department were screened for admission by various medical specialty teams. Junior doctors on these teams were responsible for care of patients in the Emergency Department as well as those admitted to in-patient areas. Their priority was the sickest people, so it was, at times, difficult for them to complete medical assessments within a time frame that prevented admissions. This was different from Victoria where Emergency Room Physicians evaluated the majority of Emergency Room patients,

referred those requiring specialty services to specialists, and were not responsible for in-patients. Another delaying factor was that laboratory results, upon which assessments were based, were not always readily available. It was important, for safety reasons, that adequate screening was done before people were sent home with QRT care. For these reasons, early discharge was often more appropriate in Central Auckland, therefore the focus changed to include early discharge as well as admission prevention. The study included an Admission Prevention arm and an Early Discharge arm, each with an experimental and control group. To enable larger sample sizes for the research, the age for QRT eligibility was lowered to include patients over 55 years of age. The Health Services for the Elderly geriatricians found it difficult to be available on short notice for the QRT, so a registrar was hired especially for the QRT.

The researcher initially assumed that the QRT staff would complete the Special Needs Assessment Protocols (SNAPs) to ensure services needed were in place immediately following a QRT episode of care (similar to the practice of QRT nurses in Victoria). This would have assisted with the completion of paper work normally required within the health care service, might have ensured that care continued following the need for QRT care, and would have given Support Needs Levels (SNLs) that could have been used as levels of independence/wellness for this research. Changes were evolving; it was determined that the SNAPs would instead be done later in the usual way by staff in the community. A comprehensive series of functional tests, the Functional Independence Measure (FIM), the Multidimensional Functional Assessment Questionnaire, and the Mini Mental State Exam (MMSE) were selected for the QRT Trial. These tools used for assessing older people are regarded as valid and reliable instruments for research purposes (Folstein, Folstein, & McHugh, 1975; Gallo, Reichal, & Andersen, 1995; Wade, 1992). While the results of these assessments are not part of this research, their use by the QRT nurses ensured that each patient was thoroughly assessed prior to leaving the hospital.

### Assumptions

The researcher made the following assumptions in conducting this evaluation study:

- 1) Observation using an empirical-analytical, or scientific method of enquiry enables one to measure changes; and empirical evidence explains causal relationships.
- 2) Older people prefer to be independent and living in their own homes, rather than dependent and living in institutional care settings; and they associate independence with wellness.
- 3) There is a relationship between an older person's place of residence and his/her level of independence/wellness. For example, someone living in their own home is likely to be more independent than someone living in a private geriatric residential care home.
- 4) There is a relationship between the amount of formal services used by an older person, such as visiting nurses, rehabilitation therapy, home help, and meal services, and his/her level of independence/wellness. For example, someone living in their own home with no formal support is likely to be more independent than someone receiving regular daily nursing visits, home help, and meal services.

### Theoretical Basis

A question raised as to whether a clinical trial of a QRT is nursing research rather than a study about administration lead this practising nurse researcher to explore literature about theoretical concepts, nursing research, and hypotheses. Wilson explains that theory, derived from the Greek word "theora," means vision (1989, p. 277); she states "Theories are conceptual inventions of reality that are used to describe, explain, predict or understand phenomena of concern." Earlier discussions have been concerned with whether research was basic or applied. Diers (1979) described all nursing research as applied. She suggested that nursing research problems:

- 1) Involve making a difference that matters related to improving patient care,

- 2) Are related to conceptual issues that potentially could lead to theory development and new knowledge, and
- 3) Are such that nurses have access to and control over the phenomena being studied.

Wilson suggested that in view of this, all nursing research is clinical, a blend of basic and applied research; but most importantly it must be clinically relevant for nursing practice and knowledge about practice. In summary, nursing research is done to improve the services given to consumers of nursing services.

It is clear that this research is relevant to nursing practice and to the care of older people. This randomised controlled trial tested a hypothesis deduced from theory (Diers, 1979; Wilson, 1989). The theory was that older people could manage well and safely at home, as an alternative to hospital care with the intensive multidisciplinary support of a QRT. It had already been tested in Victoria (Dawson, 1988). The aim of this study was to explore whether providing a QRT service would make a difference to the care of older people in Auckland, New Zealand. Nurses actively identified patients, made nursing assessments, and decided, in consultation with a geriatrician, whether patients were suitable for QRT care at home. All older people receiving QRT care were followed by QRT nurses who ensured that appropriate care and supports were in place. The theory being tested was relevant to all disciplines involved in the care of older people. Applying a nurse's perspective makes this research relevant to nurses and to nursing practice.

### Hypothesis

For the purposes of this thesis, it was hypothesised that:

Older people experiencing a health crisis and randomly assigned to care at home with the intensive multidisciplinary support of a Quick Response Team would, at three months time, be as independent as, or more independent than people randomly assigned to control groups cared for in the usual manner in hospital.

The dependent variable was independence; the independent variable was the care provided, either care by the QRT at home, or the usual care in hospital. It was predicted, in this experiment, that by changing the type of care people normally received (independent variable) from hospital care to QRT care at home, that the level of independence (dependent variable) would either be the same or



improved in comparison to people cared for in hospital. It was designed to test a predicted relationship between observable and measurable variables (Wilson, 1989, p. 245).

Typically, when using inferential statistics, one tests the null hypothesis, and makes an inferential decision to accept or reject it, specifying the level of significance (Kviz & Knafl, 1980). The null hypothesis is a statement that is in opposition to what one is predicting. Therefore the researcher planned to reject, at the .05 level of significance, the null hypothesis, which follows:

Older people experiencing a health crisis cared for at home with the intensive home and multidisciplinary support of a Quick Response Team would, in three months time, be more dependent than those in control groups cared for in the usual manner in hospital.

#### Operational Definitions

For the purposes of this study, the following operational definitions were used.

1. Older people: people 55 years of age and older.
2. Admission prevention: applied to patients who had been in the Emergency Department or Acute Assessment Ward (adjacent to the Emergency where patients were assessed prior to either being discharged or admitted to in-patient areas of the hospital) and for less than 36 hours.
3. Early discharge: applied to patients who were on in-patient wards or had been in the Emergency Department or Acute Assessment Ward for 36 hours or longer.
4. Quick Response Team (QRT) groups: Groups of subjects who met the selection criteria for the QRT trial and were randomly assigned to QRT care at home. They may also be referred to as the experimental, intervention, or new treatment groups.
5. Control groups: Groups of subjects who met the selection criteria for the QRT trial and were randomly assigned to the usual hospital in-patient care groups. They may also be referred to as the in-patient groups, or usual treatment groups.
6. Quick Response Team: A multidisciplinary team consisting of nurses, a social worker, physio and occupational therapists, and geriatricians, available from 8:00 a.m. to 9:00 p.m., 7 days a week that provided intensive short-term care, including live-in help if needed, for patients selected for QRT.

7. Independence/wellness: Level of independence/wellness as measured by address type, care package required, and mortality. The more independent, the better the outcome; the best outcome would be independence and an absence of problems requiring further assessment.

8. Address type: where a person lives, which was used as a measure of independence/wellness, for example, a rest home was considered to be indicative of a higher level of dependency than living at one's home in the community.

9. Care package: the variety and amount of formal home supports required, which served as a measure of independence/wellness, for example, daily home help was considered indicative of a higher level of dependency than no home services.

#### Design and Conduct of the Study

The design of this study, a randomised controlled trial, is useful for testing hypotheses, measuring outcomes, and testing cost effectiveness. It is the ideal method for evaluating a QRT programme and is invaluable for guiding nursing practice and making decisions related to health care policies and funding (Dumas, 1987; McCormick, 1992). Most studies on home care alternatives to hospital care have been case controlled and quasi-experimental designs, as was the evaluation of the original Quick Response Team in Victoria, (Dawson, 1988). This study was similar to the Victoria QRT trial (Dawson, 1988), however by randomly assigning the participants to the experimental and control groups this research design is stronger. Randomisation improves the likelihood of internal and external validity and offers good control for variance and reliability (Wilson, 1989; Scheetz, 1987); this is discussed further below.

#### Validity and Reliability

Use of a control group allows one to determine if a manipulated variable has caused change, however, it is crucial that the groups are similar. The randomised controlled trial offers a high degree of internal and external validity. Internal validity means that the experimental and control groups are alike, and that it is reasonable to conclude that the manipulated variable caused the changed response in the experimental group. External validity means that the study group and the target population are alike and that one can generalise from the study about the target population.

The use of randomisation improves external validity by reducing bias. Three strengths of the randomised trial follow (Scheetz, 1987):

- 1) The likelihood of bias is reduced if the researcher has no control over the assignment of the subjects to control or experimental groups.
- 2) If the subjects are assigned to the groups randomly, provided that the study population is large enough, the groups should be comparable. This is a way of controlling for external variables and any error should be randomly distributed.
- 3) If the trial has been well designed, one can assume statistical validity. However, this is dependent on the adequacy of the operational definitions of the variables, and on the precision of their measurement.

Another strength of the controlled trial is the ability to control for variance. Wilson (1989) identifies three types of variance that are desirable:

- 1) Minimal experimental variance: means that there is a definite difference in the conditions for the experimental and control groups regarding the manipulated variable.
- 2) Controlling extraneous variables: means preventing outside factors from influencing the dependent variable. The use of blinding minimises this; in this study, group assignment was obvious to the subjects and the researchers, and so blindness was not possible.
- 3) Minimising error variance: or having reliability, means that the measures are correct, that the collection tools actually measure what the researcher claims to be measuring, and that the values given are accurate.

#### Setting

The setting for this trial was within the Auckland Hospital, a 520-bed teaching hospital, and within the geographical catchments served by the QRT. The areas included were: Hobson/Eastern Bays, Eden/Roskill, Tamaki/Maungakiekie and Waterview/Te Kuraenga and are shown in the map in Figure 3.1.

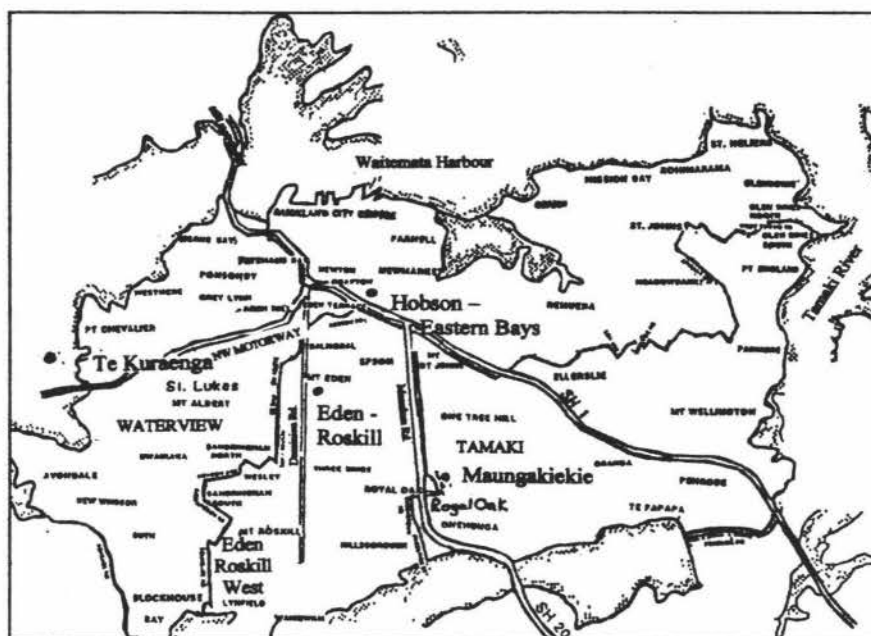


Figure 3.1. Map of the geographical area served by the QRT in Central Auckland.

#### Study Population Sample

If the study sample and the target population are alike, the findings are more likely to be generalisable. This is best achieved by randomly selecting participants. As the budget and time frame were limited for the QRT trial, a convenience sample was selected from patients at the hospital who were identified as suitable for the QRT trial according to the study inclusion/exclusion criteria. It was important that the sample was large enough to enable a strong power analysis. The size of the study affects the quality of the findings (Scheetz, 1987), as does the power analysis. The larger the number studied and the greater the values of the power analysis, the stronger are the study results and conclusions. Power analysis is a value of statistical significance used in accepting or rejecting a hypothesis; as stated earlier, the plan was to accept the hypothesis at the .05 level. The Clinical Trials Research Unit, Department of Medicine, Auckland University initially suggested that 300 patients in each study group would enable detection of statistically significant differences, but this was based on using the MMSE and Barthel ADL assessment scores, and the Barthel was not being used. The change in focus to include early discharge as well as admission prevention meant that there were four study groups rather than two. Therefore the aim was to recruit as many patients as possible to maximise external validity and the power analysis, and to re-

evaluate the number of participants required after an interim analysis was completed part-way through the study.

The study sample was selected from patients in the Auckland Hospital Emergency Department and in-patient areas. The QRT nurses and doctors continually assessed whether people were suitable, and other health care professionals made referrals to the QRT. Staff in the Emergency Department and the Acute Assessment areas routinely recorded the arrival details of all new patients. The QRT nurses frequently checked this information to see if any new patients were in the correct age group, lived in the right geographical area, and had problems that made them suitable for the QRT trial. Every week day morning all of the medical teams met together to discuss new in-patients; a QRT nurse attended these meetings to remind the medical staff about the study and to identify possible QRT candidates. Patients suitable for QRT usually required increased social supports, rather than treatments only available in the hospital. Some might have had an exacerbation of a medical problem that could be monitored at home after initial treatment either in the Emergency Department or on a medical ward. At times potential candidates who were in the Emergency Department were transferred to the adjacent Acute Assessment Ward (AAW) where a QRT nurse could assess them for the QRT trial later in the day.

It was important that the QRT nurses introduced the QRT concept early to potential QRT participants. They had to apply the study selection criteria carefully, and fully explain the consent process and what randomisation meant. Flow Charts for the Admission Prevention and Early Discharge arms of the QRT Trial illustrate the recruitment process (Appendixes A and B). A list of the QRT inclusion/exclusion criteria follows; as well, informed consent and randomisation are explained.

#### Inclusion Criteria

1. Subjects have either been:
  - a) Referred to Auckland Hospital by their General Practitioners or presented themselves in the Emergency Department for evaluation, or
  - b) Have been identified by hospital staff for early discharge.
2. a) There are doubts about whether they require hospital inpatient care or not.



b) The ongoing medical treatments required are not intensive and could be easily and safely carried out in home situations.

c) Supervision by a doctor is not each patient's main care requirement.

d) The patient is very likely to be able to manage with usual community health services programmes or other alternatives such as hospice or institutional care in about five to seven days.

3. Patients are over 55 years of age.

4. Patients live within the geographical boundaries served by the QRT: Hobson/Eastern Bays, Eden/Roskill, Tamaki/Maungakiekie and Waterview/Te Kuraenga.

5. Home Support Services are initially required at a frequency or intensity beyond the capabilities of regular Community Health Services programmes.

6. Patients are willing to give informed written consent to be in the QRT trial prior to random assignment to either a control or experimental group.

#### Exclusion Criteria

1. Patients who are currently being followed in any of the QRT Trial groups.

2. Patients whose living situation is not suitable for the care required.

3. Patients who are residents in Rest Homes or Private Hospitals.

4. Patients who can manage at home on the usual home support programmes including those funded by the Accident compensation Corporation.

#### Obtaining Informed Consent

The Northern Regional Health Authority guidelines for obtaining informed consent were adhered to. The QRT nurses introduced the QRT concept to potential participants and explained their role as soon as possible during their assessment. They explained the QRT trial, provided the Information Sheet (Appendix C), and discussed the Consent Form (Appendix D) and the randomisation process. Only after patients were identified as eligible for the QRT trial were they actually invited to participate in the QRT trial. This took place only after a QRT nurse and a QRT geriatrician were satisfied that the patient met the study criteria and could be safely cared for at home with the resources available. The Information Sheet and the QRT project were fully discussed with them and with anyone they wanted included. They were made aware of their right to withdraw from the study at any time

without explanation. Anyone unable to decide whether to participate in the trial was not pressured to do so and received the usual in-patient treatment. It was recognised that some patients might elect go home against advice, however, the QRT was intended to extend the level of care and support available in the community as an alternative to hospital care. It was expected that those who could manage at home alone or with existing community supports would do so, the QRT trial was a new option for those who otherwise would require in-patient care. Those who agreed were asked to provide written informed consent before randomisation occurred.

It was anticipated that some subjects would be incapable of giving informed written consent due to mental confusion. The QRT geriatrician assessing patient suitability for the trial decided, based on clinical judgment, whether the patient was mentally incapable of giving informed written consent. In these cases, if the patient agreed to a care at home option with the QRT, a responsible relative or "close other" was invited to consent in writing on the patient's behalf. This person was given the same information as the participant and had to be responsible for the patient. If the study team was unable to locate a relative or "close others" to provide consent the person was excluded. The option of care at home with the QRT instead of hospitalisation was thought to be of particular benefit for older people with dementia, for whom a change in environment is distressing and disruptive.

### Random Sampling

As described earlier, the advantage of a randomised controlled trial is that the likelihood of having similar groups for comparison is much better than in non-randomised controlled studies. Random assignment means that each person has an equal chance of being assigned to an experimental or a control group. The Clinical Trials Unit, Department of Medicine, University of Auckland was contracted to provide a computerised randomisation service for the trial that was accessed by telephone.

It was anticipated that some patients, due to the nature of their health problems, might have been substantially more dependent, and/or have required a lot more resources after the QRT or hospital episode of care. Examples were: a trial discharge home where the patient might not manage and would then need long-

term institutional care, a patient waiting for a hospice bed or for chemo or radiotherapy, or a patient waiting for a planned admission to acute care. If more of these participants had been distributed to the experimental or control group this might have affected the study outcomes and skewed the results. To prevent this, the Clinical Trials Unit recommended stratified random sampling. That meant dividing the study population into strata, two or more homogenous sub-populations (Wilson, 1989, p. 259), prior to randomisation. Those who might have been more dependent formed "Stratification Group 1" and the others were "Stratification Group 2". Separate randomisation systems were used for the two groups, the aim being even distribution of these potentially more dependent people to the experimental and control groups.

### Data Forms and Collection

QRT nurses at study entry recorded data on the Interview and Contact Sheets. These forms documented the assessment process of all patients being considered for the QRT trial. The researcher only considered information of patients who actually became participants; a portion of the Interview and Contact Sheet data was used for this thesis. Interview Sheet data included details about: living arrangements, the use of formal and informal supports, and the scores of a comprehensive series of health assessments. The Contact Sheet was used to guide the QRT nurses through the process of registering a participant in the QRT trial, and to document details about demographics, eligibility of patients for the trial, informed consent, and randomisation. Trained research assistants visited all participants three months after study entry and again documented details about living arrangements and supports on the Interview Sheets.

The data was collected from the clinical notes, and by personal and telephone interviews with patients and their families, health professionals involved in their care, Auckland Health Care Limited Community Health Services, GPs, and support providers. The University of Auckland Geriatric Unit at North Shore Hospital was contracted to carry out the statistical analysis. The Contact Sheet data was entered onto the QRT data base and electronically sent to the Geriatric Unit weekly for analysis. Other data for each patient were entered by study number, rather than by name, onto a computerised database at the Geriatric Unit.

### Interview Sheet

Early in the screening process as QRT nurses identified potential QRT study participants they began to complete the Interview Sheets (Appendix E) according to the Interview Sheet Protocol (Appendix F). The data used for this thesis included: the study number, the date, and questions 1, 2, 14, and 16. These questions included information about the patient's place of residence, the number and relationship of the people that the person lived with, details about all formal supports used over the two period prior to hospitalisation, and whether he or she helped other people in the same household. The services listed in question #14 included district nursing, therapies, home help, meal services, day care, carer support, respite care, and use of alarms. Community Health Services and the Home Care agencies verified that these services were in use on QRT Tracking Forms. The Interview Sheet was used to guide and document a comprehensive nursing assessment using the Functional Independence Measure (FIM), the Multidimensional Functional Assessment Questionnaire, and the Mini Mental State Exam (MMSE). While these assessment scores were not part of the thesis measurements, the information was important for planning safe QRT care at home.

### Contact Sheet

The Contact Sheet (Appendix G) documented demographic information and served as a guide for the QRT nurses for the selection, consent, stratification, randomisation, and QRT trial registration. The sheet was filled out according to the Contact Sheet Protocol (Appendix H) for all potential participants. The data used for this thesis included: from the patient label, the dates of birth, and gender; items A 1, 2, 4, 6, and 7, which included the arrival to hospital details, the source of the referral, the responsible medical team, the nature of the problem that brought the patient to hospital, and whether the patient had and used an alarm; and items B 15, 16, 17, 19, and 20, which included "Stratification Group", the "Trial Type" (admission prevention or early discharge), the randomisation details, ethnicity, and language. The nurses used this form to indicate whether each patient met the admission criteria; this was a joint decision made by a QRT nurse and a Health Services for the Elderly geriatrician who determined if the patient was medically safe for the trial. If eligible, the nurse then indicated the consent and care decision

details. For patients identified as unsuitable or not receptive to being in the trial this assessment process stopped. The procedures for obtaining informed consent and dealing with subjects who are mentally incapable of consenting follows.

It was anticipated that on occasion, the QRT service might not be able to accept new referrals for QRT care at home, either due to a lack of nursing time or care givers. If this was the case, the patient had to stay in hospital until QRT care was available, and if still agreeable, could continue as a QRT Trial participant. However, randomisation was applied only after the QRT option was available. Once a patient had met all the criteria for entry into the trial, the QRT nurse determined the stratification group; and the trial type, either Admission Prevention or Early Discharge depending on their location and how long they had been at the hospital. The nurse then phoned the randomisation service, and provided the hospital number, the date of birth, the "Stratification Group" and the "Trial Type" to the operator. The computer for the QRT trial was programmed to automatically exclude a patient already being followed in one of the QRT trial study arms. The operator advised if this was the case and if not provided a study number.

#### QRT Trial Treatment Groups

Up until this point all participants had had the very same treatment. A QRT nurse and a Health Services for the Elderly geriatrician had assessed them all. The baseline data for the Interview Sheets had been collected during the screening process and informed written consent had been provided prior to randomisation. All participants had been registered in the QRT Trial, assigned to care in the hospital (control group) or to QRT care at home (experimental group), and the Contact Sheet data had been completed.

#### Control Groups – Usual Hospital Care

All participants in the control groups were admitted to hospital if they were in the Emergency Department or the Acute Assessment Area. In-patients continued to be cared for in the hospital in the usual manner. Patients in in-patient areas were cared for by the medical specialty team assigned related to the nature of their health problems. The multidisciplinary teams located on the corresponding specialty wards looked them after. Their GPs did not routinely attend them in hospital. They were all given a copy of the "Quick Response Team Trial Information for



Participants in the Hospital" (Appendix I), which explained that follow-up interviews would be done and provided contact details if they had questions related to the QRT Trial. On discharge, these patients were referred to the usual variety of community services, such as District Nursing, therapy services, meal services and home help, as was the normal practice.

#### Experimental Groups - Quick Response Team Care at Home

All participants in the QRT groups were prepared for a discharge home from the hospital with QRT care. They were all given a copy of the "Quick Response Team Trial Information for Participants at Home" (Appendix J), which explained that follow-up interviews would be done and provided contact details if they had questions related to the QRT Trial.

The Quick Response Team staff consisted of four registered Nurses, a registrar, an administrator, a manager, and three research assistants. There were approximately 15 home carers who were trained in home care rehabilitation under the supervision of the QRT nurses. The manager provided part-time social work consultation. Two occupational therapists were available from Auckland Healthcare Community Health Services and physiotherapy services were contracted in from the private sector.

The medical staff of Health Services for the Elderly assumed responsibility for the medical care and monitoring of QRT patients. A geriatrician contacted each patient's GP to discuss and negotiate a shared care role while the patient was on QRT (on the weekends and evenings the GP was not always available). A list of medical problems was completed for the clinical notes and faxed to the GP.

Prior to leaving the hospital, a QRT nurse assessed each patient's needs. Equipment was provided for immediate use from the QRT loan cupboard. When necessary, patients were transported home by ambulance and were often met on arrival at their homes by QRT nurses and caregivers. The need for home supports was evaluated with the patient and their family to ensure that the patient would be safe and supported at home for the immediate twenty-four hours. This included 24-hour live-in support by trained caregivers as needed. Carers were matched culturally where possible and appropriate in keeping with Auckland Health Care

Services bicultural policy, which encouraged greater participation of Maori in planning services.

The QRT nurses visited at least daily, made individual care plans and instructed families and caregivers, as needed. These nurses offered professional nursing care and counselling, and authorised changes in the amount of home help required. A social worker, physiotherapist, and occupational therapist were available as needed.

The skills required of the QRT nurses were much the same as those of District Nurses. The difference with the QRT model was that the nurses were able to respond immediately, could access other disciplines the same day, and provided and supported live-in home help by trained caregivers at no cost to the patient. The service was short-term and intensive; it was aimed at minimising dependency and maximising independence. The main difference in the care needed was the amount of supervision of and assistance with activities of daily living related to meal preparation, personal hygiene, mobility, and toileting. This care was provided by trained caregivers under the supervision of the QRT nurses who were available from 8:00 a.m. to 9:00 p.m., 365 days of the year.

The goal was for those receiving QRT care to reduce services, usually in five to seven days. Patients were discharged from the QRT as soon as District Nursing, long-term home help, and other community services could assume care. If this was not feasible, alternate plans were made. A person requiring more intensive physiotherapy or longer to rehabilitate might be referred to the Health Services for the Elderly Day Ward, or be admitted, either to an in-patient bed or a short-term bed in a Rest Home. If after ten days, the patient required care that was only available in hospital or with the Quick Response Team, they were readmitted to hospital.

#### Follow-Up Information Collected at Three Months

Trained research assistants visited all participants between 85 and 100 days after study entry. The same Interview Sheet (Appendix E) was completed as per the Interview Sheet Protocol (Appendix F). The main outcomes measured were the levels of independence/wellness as indicated by address type, and the amount of supports required including services over the previous two weeks.

### Ethical Concerns

Ethical review and approval was obtained from the North Regional Health Authority Ethics Committee. In addition, the study was subject to the ethical review according to the guidelines of the Massey University Human Ethics Committee. It was important that all participants' rights were protected and that they were ensured safety, confidentiality, and privacy, as much as was possible.

It was thought that the risk of potential harm to participants would be small. Those assigned to the control groups received the same treatment that was normally provided to patients in hospital. Those sent home with the new QRT treatment were thoroughly evaluated prior to their discharges and were closely supervised and monitored by the QRT at home. The older people identified as suitable for this study were frail and had multiple health problems, including confusion. There was a potential that some would be vulnerable and could have been taken advantage of. For these reasons it was important that adequate care and attention were given to the need for fully informed consent. Anyone who was mentally unstable and at risk of harming himself or herself, or a caregiver, was not accepted for the trial. However, if this developed later and the patient was receiving QRT care at home he or she would have been readmitted to the hospital. An interim data analysis was done ("The Quick Response Team Trial: An Alternative to Hospital Care, 1997"); if any detrimental outcomes had occurred, the trial would have been stopped immediately.

Participation was by invitation. Everyone had the right to withdraw at any time without reason. If people had withdrawn while receiving the QRT care at home, they would have either been readmitted to hospital or have had the option of support in the community, depending on their needs and wishes; if they had been in hospital, their care would have continued in the usual manner. Any reports generated from this study will include only aggregated data and no individual patients are identifiable.

This study involved doctors, nurses, social workers, physiotherapists and occupational therapists, all who were employed by Auckland Healthcare Services Limited. Each profession was accountable to their appropriate professional body. All participants were patients at Auckland Health Care Limited, so clinical records

and computerised data bases generated are being stored within the organisation in the usual manner. As required by the North Health Ethics Committee, a confidential register of all participants is being retained for ten years; as well confidential computer files are being stored for ten years.

The Privacy Act, the Health and Safety in Employment Act 1992, and the Accident Rehabilitation Compensation Insurance Act 1992 were adhered to. The ACC Booklet, "Clinical Trials - Your Guide to ACC Cover" was available for all participants. In the case of any accidents or mishaps, all participants were entitled to ACC cover.

#### Data Analysis

The University of Auckland Geriatric Unit at North Shore Hospital was contracted to carry out the statistical analysis for the QRT Trial; data files specific to the thesis were electronically transferred from there to the researcher. Excel files were sent in Excel and ASCII formats; Statistical Analysis System (SAS) files were sent in SAS XPORT and ASCII formats. The researcher contracted with a separate individual to conduct the data analysis. The Statistical Package for the Social Sciences (SPSS) was used to correlate and analyse the strength of the relationships between where the care was offered and the different outcome variables measured. The statistical procedures used were chi-square, t-tests, ANOVAs, and MANOVAs.

#### Summary

In summary an experimental methodology was used to investigate the impact of a Quick Response Team on levels of independence/wellness in older people in Auckland. This research was part of a large collaborative project with broad outcome measurements. The researcher's original proposal was modified to fit in with the wishes of the other investigators. A pilot study demonstrated that the focus needed to expand from admission prevention to also include early discharge. The age group was reduced to include patients 55 years and older to increase the number of participants. The theory that older people can be cared for at home by a QRT as an alternative to hospital admission had been proved in Canada. This study investigated how this QRT concept applied in a New Zealand community. In this chapter the design and conduct were described including the assumptions,

hypothesis, and operational definitions. The screening process the QRT nurses used to identify and select older patients in the Emergency Department and in-patient areas in Auckland Hospital was described including the inclusion and exclusion criteria, informed consent, dealing with those incapable of consenting, and randomisation. The ethical considerations and rights of participants were outlined, as was the handling and analysis of data. The results are presented in the following chapter.



## CHAPTER 4

### Analysis and Results

#### Introduction

The results for this thesis, a randomised controlled clinical trial of a QRT at Auckland Hospital, were that, while all participants were more dependant three months after the QRT trial study entry, the increase in dependency was no different for those who received QRT care at home than for those who were cared for in hospital in the usual manner. The findings are presented in three sections on the study population characteristics, the baseline data collected at study entry, and the changes that occurred between study entry and three months later. The results of the two experiments, one on admission prevention and the other on early discharge, are presented together. An alpha level of .05 was used for all statistical tests. The intention was to recruit 100 subjects in each group, however the study stopped long before there were 100 participants in the admission prevention study groups because the recruitment of these patients was more difficult than for early discharge and there were financial limits to the duration of the study. While it is important to consider the total numbers of patients screened for QRT and why people were not suitable, this information was not available to the researcher; only information about the participants is reported on in this research. The data received, which was in electronic format, had some discrepancies that the researcher was unable to clarify, as the raw data was not available. These discrepancies appear to be minimal and are identified in each section.

#### The Characteristics of the Study Population

Between November 3, 1996 and June 16, 1998, 285 patients were identified as suitable, consented, and were recruited for the QRT trial. Those in the study ranged in age from 57 to 95 years, with a mean age of 80.5 years; 72% were female, and 64% lived alone. A bar graph, figure 4.1, shows all QRT participants by age bands and gender and illustrates that the biggest group were women between 75–84 years of age.

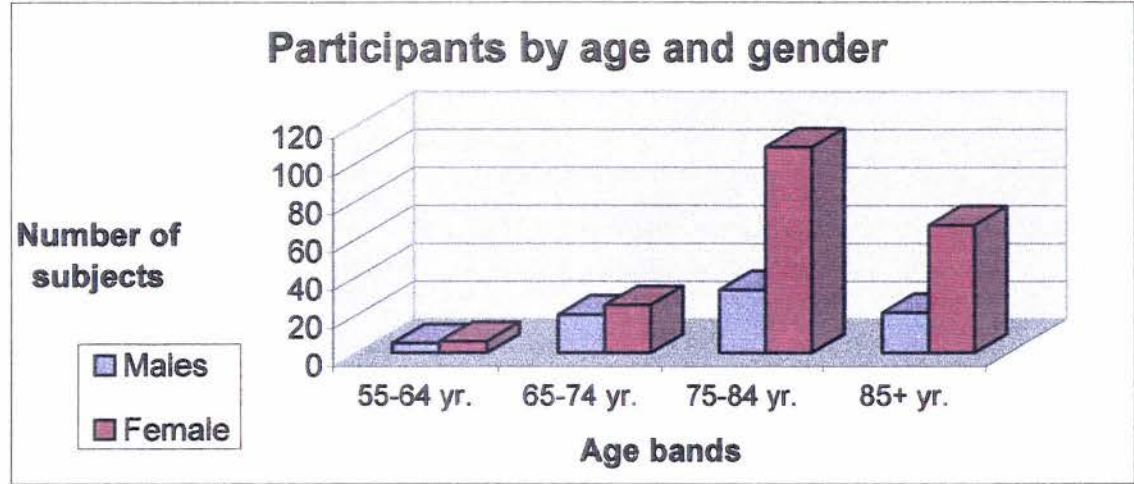


Figure 4.1. Gender of QRT trial participants by age bands.

Slightly more than half of the subjects, 159 (55.8%), used the emergency department as a primary health centre going there directly, while General Practitioners (GPs) referred the other 126 (44.2%) to the hospital. The nature of the patients' problems, in over half of all cases, was medical; this was followed by fractures and falls as shown in figure 4.2. The majority of the participants were European (276); there were 2 Maori, 4 Pacific Islanders, 1 Asian, and 2 from "other" ethnic groups. Most spoke English (279); the other languages spoken were Maori (2), Samoan (1), Tongan (1), Chinese (1), and "other" (1).

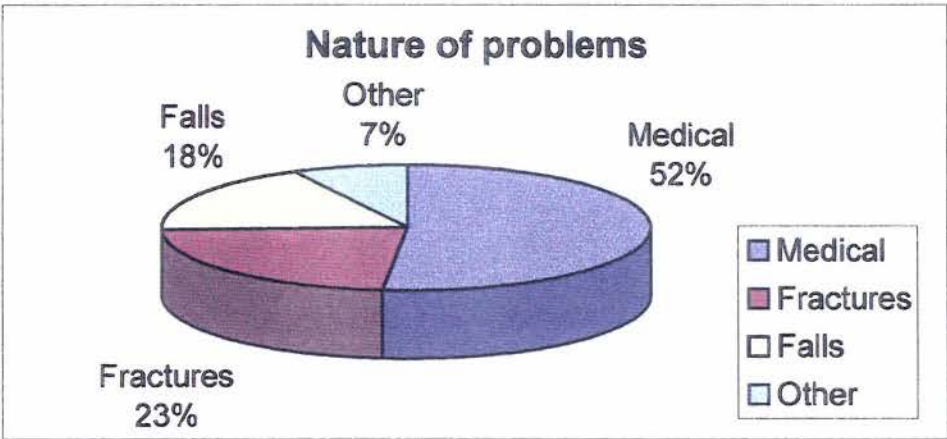


Figure 4.2. Problems of the QRT trial participants.

Of the total study population, 35 subjects (12.3%) were identified as likely to have increased morbidity and mortality, or require more costly resources, such



as acute or long-term institutional care, dialysis, chemotherapy, radiotherapy, or hospice care after their initial QRT or hospital care, compared to the others. They were allocated to Stratification Group 1; the rest were allocated to Stratification Group 2. There were significant differences between the stratification groups with respect to age, gender, and responsible teams ( $p$ s < .05). A two-tailed pooled variance t test determined that Stratification Group 1 was older; the mean age was 84.3 years compared to 80.0 years for Stratification Group 2. Chi-square ( $\chi^2$ ) revealed that there was a significantly higher proportion of men (45.7%) in Stratification Group 1 compared to 25.2% in Group 2, and that the distribution of responsible medical teams was significantly different between the two groups, particularly within the Health Services for the Elderly (HSE) team. Regarding the chi-square calculation for gender, the degrees of freedom ( $df$ ) were one, and, as is standard procedure under these circumstances, a Yates correction was applied. Table 4.1 shows the characteristics of the stratification groups that were significantly different.

Table 4.1  
Significantly Different Characteristics of the QRT Trial Stratification Groups

Strat Group	I		II		Total		t-Value	df
Mean age	84.30 yr		79.98 yr		80.51 yr		3.23	283**
SD	± 6.60 yr		± 7.50 yr		± 7.53 yr			
SE	1.115		.475					
Gender	No	%	No	%	No	%	$\chi^2$	
Males	16	45.7%	63	25.2%	79	27.7%	5.46544	1*
Females	19	54.3%	187	74.8%	206	72.3%		
Total	35	12.3%	250	87.7%	285	100.0%		
Resp Team							14.98073	5*
Emerg	4	11.4%	50	20.0%	54	18.9%		
HSE	20	57.1%	75	30.0%	95	33.3%		
Med	9	25.7%	93	37.2%	102	35.8%		
Ortho	0	0.0%	23	9.2%	23	8.1%		
Surg	1	2.9%	8	3.2%	9	3.2%		
Other	1	2.9%	1	0.4%	2	0.7%		

\* $p$  < .05. \*\* $p$  = .001.

Baseline Data

The baseline data were recorded on the Contact and Day 1 Interview Sheets at study entry. It was important that the experimental and control groups were

similar at study entry in order to attribute any differences detected in outcomes as likely to be due to manipulation of the dependent variable. Chi-square ( $\chi^2$ ) was used to compare the category data including gender, nature of people's problems, address type, who people lived with, ethnicity, language, and formal home support services of the experimental and control groups; t tests, and multivariate analyses of variance (MANOVAs) were used to compare the changes from Day 1 to Day 90 of the ordinal data. The experimental and control groups were not significantly different ( $p < .05$ ).

#### Contact Sheet Data

As stated in chapter 3 (p. 93) the Contact data (Appendix G) reported on in this thesis were: age and gender; items A 1, 2, 4, 6, and 7, including the date and time of arrival to hospital, the source of the referral, the responsible medical team, the nature of the problem that brought the patient to hospital, and whether the patient had and used an alarm; and items B 15, 16, 17, 19, and 20, including the "Stratification Group", the "Trial Type" (admission prevention or early discharge), the time and date of randomisation, ethnicity, and language.

The characteristics of the QRT intervention and the control groups for admission prevention and early discharge are shown in Table 4.2. While there was a greater difference in the mean age of the admission prevention experimental and control groups, it was not statistically significant. As expected, there were more women than men in each group; while the ratio varied between the experimental and control groups in both studies, these differences were not significant. Those in the admission prevention groups tended to arrive at hospital either between 8:00 a.m. and 3:00 p.m., or between 8:00 p.m. and 11:00 p.m., in which case they stayed overnight in the Acute Assessment Ward and went home the next day; in the early discharge groups, the majority arrived between 9:00 a.m. and 9:00 p.m.

Table 4.2

Characteristics, at Study Entry, of the QRT Trial Experimental and Control Groups

Admission Prevention (n=76)					Early Discharge (n=209)					
Characteristics	QRT (n = 39)		Control (n = 37)		QRT (n = 104)		Control (n = 105)		Total (N = 285)	
<b>Age</b>										
Mean	78.87 yr.		83.14 yr.		79.94 yr.		80.75 yr.		80.51 yr.	
Standard deviation	± 8.44 yr.		± 6.16 yr.		± 7.86 yr.		± 7.11 yr.		± 7.53 yr.	
Range									57.71 to 95.47 yr.	
<b>Gender</b>	No.	%	No.	%	No.	%	No.	%	No.	%
Male	8	20.5%	5	13.5%	30	28.8%	36	34.3%	79	27.8%
Female	31	79.5%	32	86.5%	74	71.2%	69	65.7%	206	72.2%
<b>Problem</b>										
Fractures	10	25.6%	8	21.6%	23	22.1%	24	22.9%	65	22.8%
Falls	11	28.2%	13	35.1%	16	15.4%	12	11.4%	52	18.3%
Other accident	0	0.0%	3	8.1%	1	1.1%	0	0.0%	4	1.4%
<b>Medical:</b>										
acute	13	33.3%	9	24.3%	52	50.0%	51	48.6%	125	43.9%
chronic	3	7.7%	1	2.7%	8	7.7%	10	9.5%	22	7.7%
Psychiatric	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Frailty	0	0.0%	1	2.7%	0	0.0%	2	1.9%	3	1.0%
Other	2	5.1%	2	5.4%	4	3.8%	6	5.7%	14	4.9%
<b>Stratification</b>										
Group 1	4	10.3%	4	10.8%	13	12.5%	14	13.3%	35	12.3%
Group 2	35	89.7%	33	89.2%	91	87.5%	91	86.7%	250	87.7%
<b>Ethnicity</b>										
European	36	92.3%	37	100.0%	101	97.1%	102	97.1%	276	96.8%
Maori	0	0.0%	0	0.0%	0	0.0%	2	1.9%	2	0.7%
Pacific Is	1	2.6%	0	0.0%	2	1.9%	1	1.0%	4	1.4%
Asian	0	0.0%	0	0.0%	1	1.0%	0	0.0%	1	0.4%
Other	2	5.1%	0	0.0%	0	0.0%	0	0.0%	2	0.7%
<b>Language</b>										
English	37	94.9%	36	97.3%	102	98.1%	104	99.0%	279	97.8%
Maori	1	2.6%	1	2.7%	0	0.0%	0	0.0%	2	0.6%
Samoan	1	2.6%	0	0.0%	0	0.0%	0	0.0%	1	0.4%
Tongan	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.4%
Chinese	0	0.0%	0	0.0%	1	1.0%	0	0.0%	1	0.4%
Other	0	0.0%	0	0.0%	1	1.0%	0	0.0%	1	0.4%

More of the early discharge participants were referred to hospital by their GPs (48%) than in the admission prevention groups (34%). The medical teams responsible for admission prevention patients were emergency (71%), geriatric (17%), medical (9%), and orthopaedic (3%); for early discharge they were medical (46%), geriatric (39%), orthopaedic (10%), surgical (4%), and other (1%). For



admission prevention patients, falls, fractures, and accidents accounted for 59% of the main problems, followed by medical (34%), and other (7%); in the early discharge groups, 58% had medical problems, followed by 36% with problems related to fractures, falls, or other accidents, and 6% had other problems. Approximately one quarter (24.2%) in both studies had home alarms; 15% in the admission prevention group used their alarms to summons help in coming to hospital, compared to 10% in the early discharge group.

While those identified as more likely to use expensive resources, Stratification Group 1, were significantly different than Group 2, use of a separate randomisation system succeeded in an even distribution of them amongst all four groups as shown in table 4.2 (p. 103). Those identified for early discharge (73.3%) far out numbered those identified for admission prevention. The first participant was randomised and registered into the study for early discharge and this occurred on November 21, 1996. People were recruited for early discharge up until December 13, 1997, when there were 209 participants, 104 in the QRT experimental group and 105 in the hospital control group. The first participant was registered for admission prevention on November 22, 1996. June 15, 1998 was the last date that a participant was accepted for the study but there were still only 76 admission prevention participants, 39 in the QRT experimental group and 37 in the hospital control group. The majority of early discharge participants were randomised between 8:00 a.m. and noon. The admission prevention participants tended to be randomised into the trial between 10:00 a.m. and 2:00 p.m. Regarding ethnicity and language, as shown in table 4.2, the numbers of participants who were not of European ethnic background and English speaking were very small. It is possible that some of the data were recorded incorrectly as it is unlikely that two people in the admission prevention study would speak Maori but not identify themselves as Maori.

#### Day 1 Interview Sheet Data

The Interview data (Appendix E) collected at Day 1 and used for this thesis, as stated in chapter 3 (p. 92), were from questions 1, 2, 14, and 16 and included information about the patient's place of residence, the people with whom each participant lived, details about all formal supports used over the two week period prior to hospitalisation, and whether or not he or she helped other people in

the same household. The Day 1 Interview Sheet for one early discharge participant in the hospital control group was missing. Data from questions 1 and 2, about people's living situation, are shown in table 4.3; the experimental and control groups were statistically similar. In all four groups the majority lived in houses or flats/units; for the admission prevention groups,  $\chi^2(3, n = 76) = 1.08626, p = .7804$ , where 3 is the degrees of freedom; for the early discharge groups ( $n = 209$  minus 1 missing = 208),  $\chi^2(3, n = 208) = 5.16838, p = .1599$ . In the admission prevention groups, 75% lived alone; and  $\chi^2(4, n = 76) = 1.29915, p = .8615$ . In the early discharge groups 59.6% lived alone; and  $\chi^2(4, n = 208) = 5.31761, p = .2562$ . Seven percent (7%) of all participants were caregivers of people that they lived with, and this was not significantly different amongst all four groups.

Table 4.3

Living Situations of the QRT Trial Participants at Study Entry

	Admission Prevention (n=76)				Early Discharge (n=209)					
Characteristics	QRT (n = 39)		Control (n = 37)		QRT (n = 104)		Control (n = 105)		Total (N = 285)	
Address type										
House	18	46.2%	19	51.4%	60	57.7%	48	46.2%	145	50.9%
Flat/unit	19	48.7%	17	45.9%	44	42.3%	53	51.0%	133	46.7%
Granny flat	1	2.6%	1	2.7%	0	0.0%	2	1.9%	4	1.4%
ILU/residential	1	2.6%	0	0.0%	0	0.0%	1	1.0%	2	0.7%
Missing data	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.3%
Lives (with)										
Alone	29	74.4%	28	75.7%	55	52.9%	69	66.3%	181	63.5%
Spouse/partner	7	17.9%	5	13.5%	31	29.8%	26	25.0%	69	24.2%
Partner + others	2	5.1%	2	5.4%	8	7.7%	3	2.9%	15	5.3%
Relatives	1	2.6%	1	2.7%	8	7.7%	5	4.8%	15	5.3%
Non-relatives	0	0.0%	1	2.7%	2	1.9%	1	1.0%	4	1.4%
Missing data	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.4%

Question 14 listed 16 formal supports that made up the care packages people received over two weeks, in this case, prior to their visits to the hospital; it also identified the providers from a potential of five different ones. It was designed for the larger study to be used at Days 1, 10, 30 and 90 to track all resources used over three months. This information was collected from participants during interviews and was much more detailed than the researcher had anticipated collecting for this thesis. Each item, of 77 items listed including the provider

entries, was analysed in SPSS using chi-square; the degrees of freedom (*df*) were consistently one, and so a Yates correction was used. The experimental and control groups were not significantly different ( $p < .05$ ).

In order to quantify the many variables in the care packages in a way that would be meaningful, the services were divided into six categories. District nursing was the first. The second category, therapies, included occupational, physio, and speech language therapy. As there were no entries for Maori Community Health Worker at Day 1 and Day 90, it was not included. Home help formed the third. The fourth included Meals On Wheels and other meals. The fifth, support/care, included day care, carer support, and respite care. The sixth category, medical, included out-patient and day ward services, specialist services, and GP and Emergency and Medical Centres. Fifty-six participants had entries under "other" but as no details were given on what "other" included, it was not considered further. The alarm data was consistent with that recorded on the Contact Sheets; approximately one quarter (69) had alarms and, with the exception of one purchased by ACC, they were all paid for privately.

The services used by all participants over the two weeks immediately prior to hospitalisation are shown in Table 4.4. A lot of participants (39.3%) used no services, however, many used more than one. The services most frequently used were home help, followed by meals, nursing, and therapies. Category 5 was used infrequently, while there were no entries for category 6. The A+ Community Health Services (CHS) Crown Health Enterprise (CHE) purchased all of the nursing services. Within therapies, some used more than one type of therapy; the main use was occupational therapy (21) and physiotherapy (19), while four participants used speech/language therapy. The provider again was mainly A+ CHS, with the exception of four early discharge patients receiving physiotherapy. The physiotherapy was purchased privately for two, and by the Accident Rehabilitation and Compensation Insurance Corporation (ACC) for the other two.

Table 4.4

Services in Use Prior to Hospitalisation by the Experimental and Control Groups of the QRT Trial

	Admission Prevention				Early discharge					
Service	QRT		Hospital		QRT		Hospital		Total	
		( <u>n</u> = 39)		( <u>n</u> = 37)		( <u>n</u> = 104)		( <u>n</u> = 105)		( <u>N</u> = 285)
1. Nursing	6	15.4%	4	10.8%	12	11.5%	19	18.3%	41	14.4%
2. Therapies	3	7.7%	4	10.8%	11	10.6%	11	10.5%	29	10.2%
3. Home help	23	59.0%	15	40.5%	51	49.0%	59	56.7%	148	52.1%
4. Meals	8	20.5%	6	16.2%	22	22.1%	25	23.8%	61	21.4%
5. Supp/care	2	5.1%	2	5.4%	2	1.9%	2	1.9%	8	2.8%
6. Medical	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Missing	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.4%

Over half of all participants (52.1%) received home help and some participants had more than one provider. Most were either paid for privately (65), or by CHS (51), which would have been a short-term service. Only 26 received Regional Health Authority (RHA) funded long-term home help, while 8 received ACC funded home help, which would have been short-term, related to recovery from accidental injuries. Of the 21.4% receiving meals, 37 were Meals on Wheels, mostly provided by CHS (24); 13 were purchased privately, and one by ACC. The other 26 were other meal services all purchased privately. Within the fifth category, three participants received day care (two purchased by the RHA and one privately), three received carer support (one by the RHA, one by ACC, and one privately), and six received respite care (two by the RHA and four by the CHE). No services within the sixth category were used at all.

The services were grouped together to determine, within each of the four study groups, the number of categories of services that people used. The majority (90%) either used no services or services from only one or two categories. Nearly 40% were living completely independent of formal services; approximately 30% received the services from one category only and 20% used services from two categories. The remainder, less than 10%, used services from three or four categories, and no one used more than this. Of those receiving one service only, home help was by far the most frequently used service (71), followed by therapy



(10), and nursing (4). The numbers of categories of services that were in use are shown in table 4.5.

Table 4.5

Number of Services in Use Prior to Hospitalisation by the Experimental and Control Groups of the QRT Trial

Service	Admission Prevention				Early discharge				Total	
	QRT		Hospital		QRT		Hospital			
	(n = 39)		(n = 37)		(n = 104)		(n = 105)			
None	15	38.5%	17	46.0%	46	44.2%	34	32.3%	112	39.3%
1 only	13	33.3%	11	29.7%	30	28.9%	36	34.3%	90	31.6%
2 only	6	15.4%	7	18.9%	18	17.3%	24	22.9%	55	19.3%
3 only	3	7.7%	2	5.4%	8	7.7%	8	7.6%	21	7.3%
4 only	2	5.1%	0	0.0%	2	1.9%	2	1.9%	6	2.1%
Missing	0	0.0%	0	0.0%	0	0.0%	1	1.0%	1	0.4%
Total	39	100.0%	37	100.0%	104	100.0%	105	100.0%	285	100.0%

All of the combinations of services that made up participants' care packages were identified. There were 20 different combinations ranging from no services to services from four categories, however, the six most frequently used combinations accounted for 88% of all participants. The combinations are illustrated in figure 4.3. The most frequent situation was no services, which was the case for 112 participants (39.3%). As illustrated in the bar graph, home help featured heavily in most of the combinations. The second most frequent care package included home help only and was received by 71 people (24.9%). This was followed by the combination of home help and meals, for 33 people (11.6%); and then by home help and nursing, for 14 (4.9%). Two combinations tied for fifth place and were each received by 10 people (3.5%); they were home help, meals, and nursing; and therapy only. The remaining 14 combinations included 34 participants (12%), and eight of the combinations had home help as part of the care package. Data for one participant (0.4%) was missing.



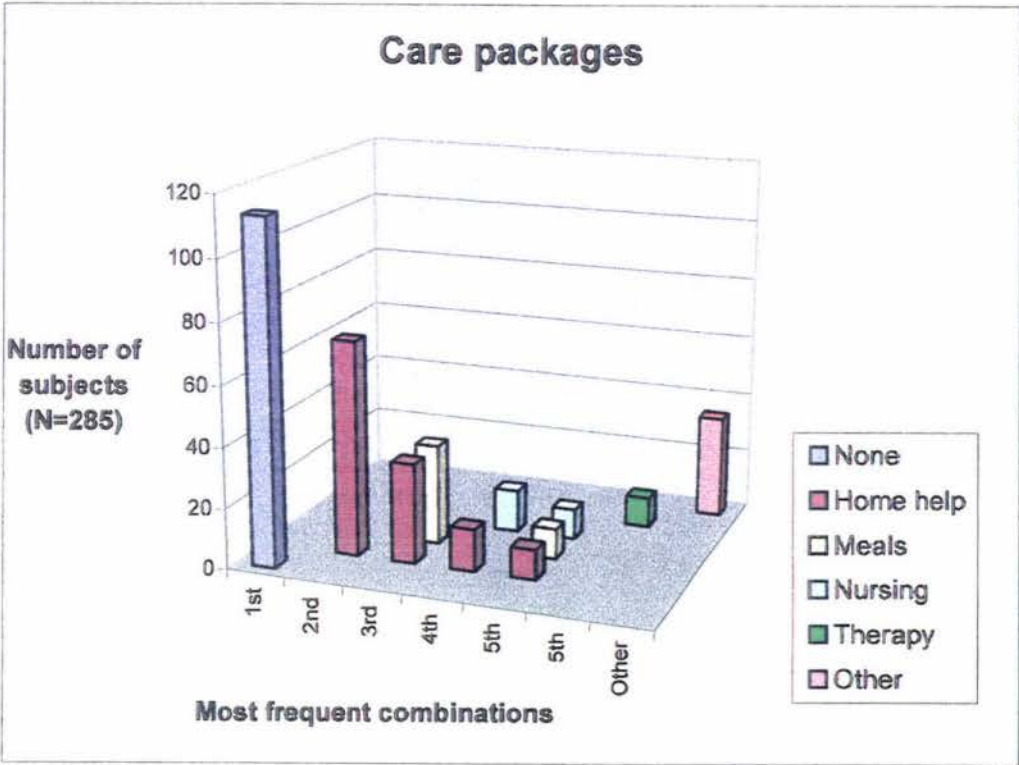


Figure 4.3. Most frequent combinations of services within the care packages received by all participants at study entry.

The Changes Between Study Entry and Three Months Later

Participants were interviewed approximately 90 days after study entry, and the data was recorded on the Day 90 Interview Sheets. Of the 285 participants in the study, the reasons for 40 (14%) participants not having exit data were death, illness, moved, refusal, or missing. The experimental and control groups were not significantly different regarding the number of participants without Day 90 data. For the admission prevention groups,  $\chi^2(1, n = 76) = .08713, p = .7679$ ; and for the early discharge groups,  $\chi^2(1, n = 209) = .0000, p = 1.0000$ . Table 4.7 shows the reasons for no follow-up data within each of the four groups at Day 90. There was some inconsistency regarding those without exit data. Some of the calculations have only 37 without exit data, while others are based on 40; the difference being three early discharge participants with Day 1 data missing, as shown in table 4.6; therefore some calculations are based on 177 early discharge participants, and others on 180.

Table 4.6

Reasons for QRT Trial Participants Having No Follow-Up Data

	Admission Prevention		Early Discharge		Total	
	QRT	Control	QRT	Control	No	%
Died	2	0	8	8	18	6.3%
Too sick	1	1	0	2	4	1.4%
Moved	0	0	1	0	1	0.4%
Refused	0	2	3	5	10	3.5%
Missing (Day 1)	0	0	2	1	3	1.1%
Missing (Day 90)	2	0	2	0	4	1.4%
No Day 90 data	5	3	16	16	40	14.1%
With Day 90 data	34	34	88	89	245	85.9%
Total	39	37	104	105	285	100%

Twelve participants out of 35 (34.3%) in Stratification Group 1, those expected to be less well and/or have a high need for resources, did not have exit data compared to 28 participants out of 250 (11.2%) in Group 2, but the difference was not statistically significant. Within the early discharge groups, related to the number of participants without Day 90 data in each of the stratification groups: for the QRT group,  $\chi^2 (3, n = 16) = 1.73333$ ,  $p = .6295$ ; and for the control group,  $\chi^2 (4, n = 16) = 2.48889$ ,  $p = .6466$ . For the admission prevention groups, the chi-square calculation was not possible for the QRT group as there were no participants in Stratification Group 1 without Day 90 data; for the control group an alternative statistic, the Fisher's exact test ( $F$ ), was done because the contingency table was two (rows) by two (columns), and had frequencies under 5 ( $F = .3333$ , one-tailed and two-tailed). The reasons for no Day 90 data for Stratification Groups 1 and 2 within the four study groups are identified in table 4.7. One fifth (20%) of Stratification Group 1 had died compared to only 4.4% of Group 2.

Table 4.7

Stratification Groups of QRT Trial Participants Without Follow-Up Data

Stratification	Admission Prevention				Early Discharge					
	QRT ( <u>n</u> = 39)		Control ( <u>n</u> = 37)		QRT ( <u>n</u> = 104)		Control ( <u>n</u> = 105)		Total ( <u>N</u> = 285)	
	I	II	I	II	I	II	I	II	I	II
Died	0	2	0	0	4	4	3	5	7	11
Too sick	0	1	0	1	0	0	0	2	0	4
Moved	0	0	0	0	0	1	0	0	0	1
Refused	0	0	2	0	1	2	1	4	4	6
Missing Day 1	0	0	0	0	0	2	0	1	0	3
Missing Day 90	0	2	0	0	1	1	0	0	1	3
No follow-up data	0	5	2	1	6	10	4	12	12	28
Follow-up data	4	30	2	32	7	81	10	79	23	222
Total	4	35	4	33	13	91	14	91	35	250

Day 90 Interview Sheet Data

The protocol was for all participants to be interviewed at Day 90 and the range allowed was from 85 to 100 days from study entry. The Day 90 interviews occurred between February 23, 1997 and August 23, 1998, and the data collected was the same as for Day 1 interviews. Information regarding the living situations, where participants lived and with whom, for all four groups are shown in table 4.8.

Table 4.8

Living Situations, at Study Exit, of the QRT Trial Groups

Characteristics	Admission Prevention (n=76)				Early Discharge (n=209)				Total (N = 285)	
	QRT		Control		QRT		Control			
	(n = 39)		(n = 37)		(n = 104)		(n = 105)			
Address type										
House	14	35.9%	14	37.9%	47	45.2%	36	34.3%	111	38.8%
Flat/unit	14	35.9%	12	32.4%	28	26.9%	39	37.1%	93	32.6%
Granny flat	0	0.0%	1	2.7%	2	1.9%	0	0.0%	3	1.1%
ILU/residential	2	5.1%	3	8.1%	7	6.7%	5	4.8%	17	6.0%
Rest home	3	7.7%	3	8.1%	3	2.9%	6	5.7%	15	5.3%
Geriatric hospital	0	0.0%	0	0.0%	1	1.0%	0	0.0%	1	0.4%
Public hospital	1	2.6%	1	2.7%	2	1.9%	4	3.8%	8	2.8%
No Day 90 data	5	12.8%	3	8.1%	14	13.5%	15	14.3%	37	13.0%
Total	39	100%	37	100%	104	100%	105	100%	285	100%
Lives (with)										
Alone	23	59.0%	22	59.5%	47	45.2%	60	57.1%	152	53.3%
Spouse/partner	5	12.8%	5	13.5%	27	26.0%	14	13.3%	51	17.9%
Partner + others	0	0.0%	0	0.0%	4	3.8%	2	1.9%	6	2.1%
Relatives	3	7.7%	2	5.4%	8	7.7%	6	5.7%	19	6.7%
Non-relatives	1	2.6%	3	8.1%	0	0.0%	3	2.9%	7	2.4%
Long-term care	2	5.1%	2	5.4%	4	3.8%	5	4.8%	13	4.6%
No Day 90 data	5	12.8%	3	8.1%	14	13.5%	15	14.3%	37	13.0%
Total	39	100%	37	100%	104	100%	105	100%	285	100%

The majority (71.4%) lived in houses or flats/units, however this was less than at study entry (97.6%), and the experimental and control groups were not significantly different. For admission prevention,  $\chi^2 (5, n = 68) = 1.35385, p = .9293$ . For early discharge,  $\chi^2 (6, n = 180) = 8.26380, p = .2194$ . In this case these calculations were based on 180, rather than 177, participants having Day 90 data as explained earlier (p. 111); this difference in the number without Day 90 data is highlighted in table 4.9. Of all participants, 71.3 % lived alone or with spouses/partners compared to 87.7% at study entry. The experimental and control groups were also statistically similar regarding who they lived with at Day 90; for admission prevention,  $\chi^2 (4, n = 68) = 1.22222, p = .8744$ ; and for early discharge,  $\chi^2 (5, n = 180) = 9.76488, p = .0822$ .

Multivariate analyses of variance, MANOVAs, used to compare the changes in where people lived and with whom they lived from study entry to exit indicated a significant increase in dependency within all four groups ( $p < .05$  and  $p$

< .01), but the increases were not significantly different between the experimental and control arms of the admission prevention or early discharge trials. These calculations included 247 subjects with Day 1 and Day 90 data; the MANOVA statistics are shown in table 4.9.

Table 4.9

Multivariate Analysis of Variance of Changes in Living Situations

Source	df	SS	MS	F
<b>Where people lived</b>				
Between subjects				
Within cells	243	475.84	1.96	
Constant	1	1368.24	1368.24	698.73**
Arm	1	1.09	1.09	.56*
Trial	1	1.59	1.59	.81*
Arm by trial	1	1.09	1.09	.56*
<b>Where people lived</b>				
Within subjects				
Within cells	243	324.44	1.34	
Where	1	43.71	43.71	32.74**
Arm by where	1	.54	.54	.40*
Trial by where	1	.16	.16	.12*
Arm by trial by where	1	.02	.02	.02*
<b>With whom people lived</b>				
Between subjects				
Within cells	243	562.19	2.32	
Constant	1	1165.80	1165.80	503.91**
Arm	1	.21	.21	.09*
Trial	1	.32	.32	.14*
Arm by trial	1	1.79	1.79	.78*
<b>With whom people lived</b>				
Within subjects				
Within cells	243	253.56	1.04	
Who	1	17.05	17.05	16.34**
Arm by who	1	.93	.93	.89*
Trial by who	1	1.27	1.27	1.22*
Arm by trial by who	1	.15	.15	.14*

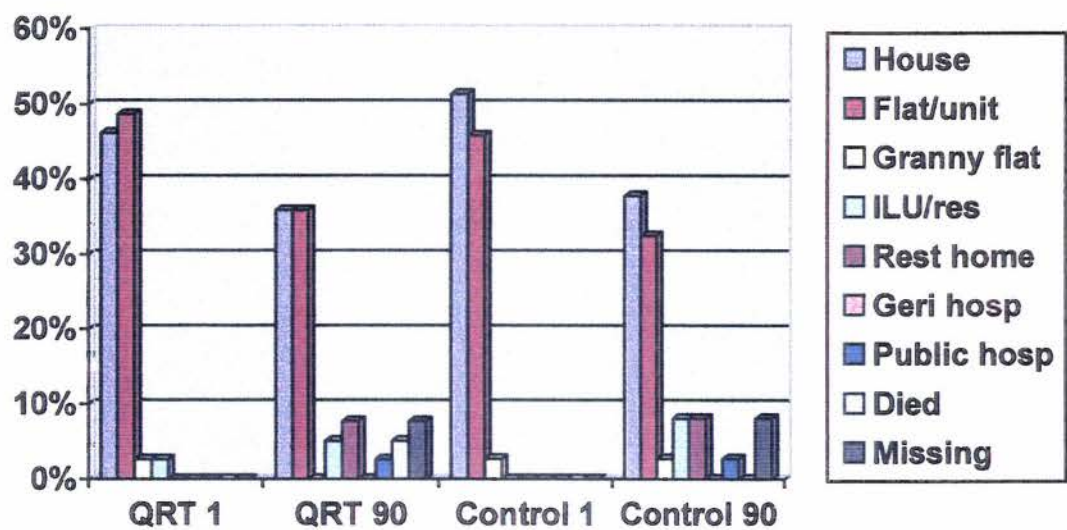
\* $p > .05$ . \*\* $p = .000$ .

The percentage of those living in houses and in flats/units were each 10 to 15% less than at study entry; the percentage of those living in independent living units, rest homes, and geriatric hospital had increased by 3 to 8% each. Overall 5.7% (16) by study exit had moved into long-term residential care including rest homes and geriatric hospitals; 6.3% (18) had died. Less lived alone, with spouses/partners, and with spouses/partners and others; and more lived with relatives, with non-relatives, and in institutional care. Of all participants in the



study, 13% were caregivers of other people with whom they lived, which was an increase from 7% at study entry. The number of participants with home alarms increased slightly from 24.2% at Day 1 to 29.0% at Day 90. While 13 were identified as living in long-term care, there were at Day 90, 15 living in rest homes and one in a geriatric hospital. Therefore it was assumed that three were in institutional care for short-term needs, such as convalescence or respite. The changes in place of residence from study entry to study exit three months later for all four groups are illustrated in the bar graphs; figure 4.4 shows the changes for admission prevention and 4.5 for early discharge.

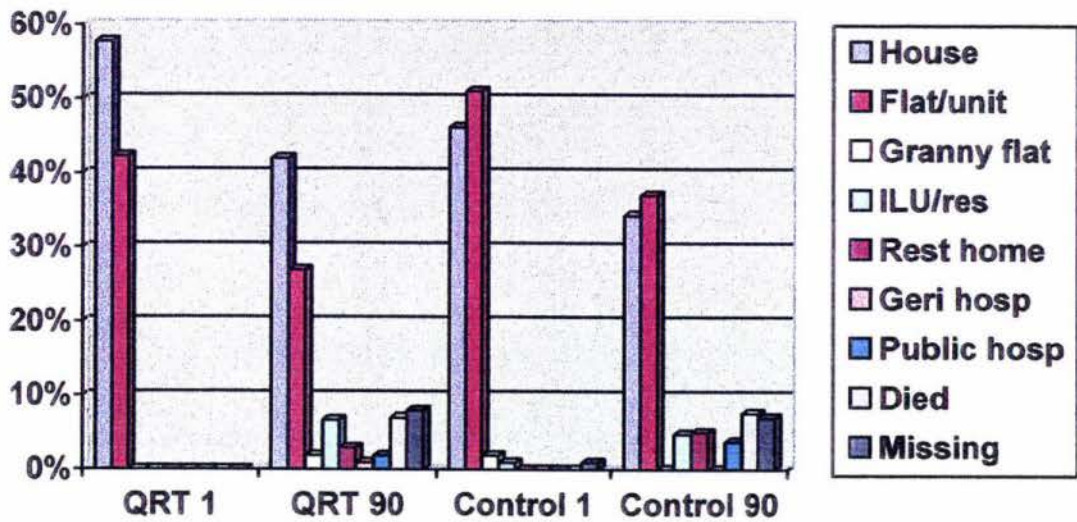
Changes in Accommodation from Day 1 to Day 90



Admission Prevention (n = 76)

Figure 4.4. Changes in accommodation from QRT trial entry to study exit for the admission prevention QRT and control groups.

### Changes in Accommodation from Day 1 to Day 90



#### Early Discharge (n = 209)

**Figure 4.5.** Changes in accommodation from QRT trial entry to study exit for the early discharge QRT and control groups.

Question 14 listed 16 formal supports that made up the care packages people received over two weeks, in this case, prior to the Day 90 interviews. Again, as happened with Day 1 Interview data, each of the 77 items was analysed in SPSS using chi-square; and the experimental and control groups were not significantly different ( $p < .05$ ). The service categories that people used over the two weeks immediately prior to Day 90 Interviews are shown in Table 4.10. The most notable changes were that fewer people (4.9%) used no services at Day 90 compared to 39.3% at Day 1; and the medical category, which was not used at Day 1, became the category used the most (89.1%). All service categories were used more at Day 90 than at Day 1. After the medical category, the service categories most frequently used, in order, were home help, meals, therapies, nursing, and support care.

Table 4.10  
Services in Use Prior to Study Exit by the Experimental and Control Groups of the QRT Trial

Service	Admission Prevention		Early discharge		Total	
	QRT (n = 39)	Hospital (n = 37)	QRT (n = 104)	Hospital (n = 105)	(N = 285)	
1. Nursing	3	7.7%	5	13.5%	20	19.2%
2. Therapies	6	15.4%	5	13.5%	28	26.9%
3. Home help	17	43.6%	22	59.5%	65	62.5%
4. Meals	7	17.9%	4	10.8%	30	28.8%
5. Supp/care	2	5.1%	2	5.4%	7	6.7%
6. Medical	32	82.1%	31	83.8%	95	91.4%
Missing	5	12.8%	3	8.1%	14	13.5%
					15	14.3%
					37	13.0%

Within the admission prevention groups, the QRT group, at Day 90, used less nursing, home help, and meals than at Day 1, while all three other groups increased in all categories of services from study entry to exit, although statistically the groups were not significantly different. As at Day 1, all of the nursing services were purchased by the A+ Community Health Services (CHS) Crown Health Enterprise (CHE). Of the 22.5% receiving therapies, 46 had physiotherapy (PT), 13 had occupational therapy (OT), and only five had speech/language therapy (SLT). PT was purchased by ACC, the CHE, and privately; two purchased by QRT likely were an error as the policy was that QRT would be used on a short-term basis of up to 14 days. The provider was mainly A+ CHS for OT and SLT. Some of the services appear to have had more than one provider. For example, four participants in the QRT admission prevention group had PT at Day 90; the providers were ACC for three and private for three making six entries, and this occurred often.

The amount using home help increased from 148 (52.1%) to 174 (61.1%), most being paid for privately (81 out of 183 entries), the remainder in order, by the CHE (39), RHA (34), and ACC (29). Again QRT was recorded as the purchaser in one instance. At Day 90, 27.0% received meals compared to 21.4% at Day 1. Slightly more had Meals on Wheels than other meals; 7 were purchased by the CHE while the remaining 71 were purchased privately. The fifth category, which included day care, carer support, and respite care, was the least used service of those in use, both at Day 1 and Day 90, but increased from 2.8% to 7.4% at exit. Fifteen attended day care, mostly purchased privately and the rest by ACC and the



RHA. Nine received carer support; five were purchased privately, three by the RHA, and one by ACC. Only one participant received respite care, purchased by the CHE. Within the sixth category, medical, approximately two thirds were for GP and Emergency and Medical services, purchased privately by 154 and by ACC for four. This was followed by day care paid for mainly by the CHE, and then specialist services paid for by the CHE or privately.

Table 4.11 shows the number of categories of services that people received within each of the four study groups; the calculations were done with data missing for 40 participants. An additional 19 participants, included in “other” in table 4.12, were without services, likely related to short- and long-term care admissions. At Day 90, 24 were residing in care, 15 in rest homes, one in a geriatric hospital; and eight in public hospitals. Presumably 13 of the rest home/geriatric hospital residents were there for long-term care and three for respite or convalescent (short-term) care. Whether these participants received any of these services in the last two weeks prior to Day 90 interviews would have depended on when they were admitted to care and whether the care was part of category five, respite care or carer support; this was unclear from the analysis done.

Table 4.11

Number of Services in Use at Study Exit by the QRT Trial Participants

Service	Admission Prevention				Early discharge				Total	
	QRT ( <u>n</u> = 39)		Hospital ( <u>n</u> = 37)		QRT ( <u>n</u> = 104)		Hospital ( <u>n</u> = 105)		(N = 285)	
None	4	10.3%	4	10.8%	4	3.8%	2	1.9%	14	4.9%
1 only	9	23.1%	7	18.9%	8	7.7%	11	10.5%	35	12.3%
2 only	7	17.9%	10	37.0%	27	26.0%	24	22.9%	68	23.9%
3 only	6	15.4%	8	21.7%	27	26.0%	30	28.5%	71	25.0%
4 only	3	7.7%	2	5.4%	11	10.5%	16	15.2%	32	11.2%
5 only	0	0.0%	0	0.0%	3	2.9%	3	2.9%	6	2.1%
Missing	5	12.8%	3	8.1%	16	15.4%	16	15.2%	40	14.0%
Other	5	12.8%	3	8.1%	8	7.7%	3	2.9%	19	6.6%
Total	39	100.0%	37	100.0%	104	100.0%	105	100.0%	285	100.0%

At study exit there were 40 different combinations of the six categories of services ranging from no services to services from five categories, in addition to those living in institutional care. The seven most frequently used care packages

accounted for nearly half (49.5%) of all participants and two combinations tied for sixth place. The bar graph in figure 4.6 illustrates the seven most frequent combinations of services. These, along with the 20.6% missing or in the “other” category, included over 70% of all participants. Home help and the medical services featured heavily in the care packages. The third most common care package featured home help only. The fifth most common situation was no services, which applied to less than 5%, compared to 39.3% at study entry. The following seven most common care packages used by 13.3% included one to four services, most frequently nursing (4), followed by home help (3), medical (3), and meals (3).

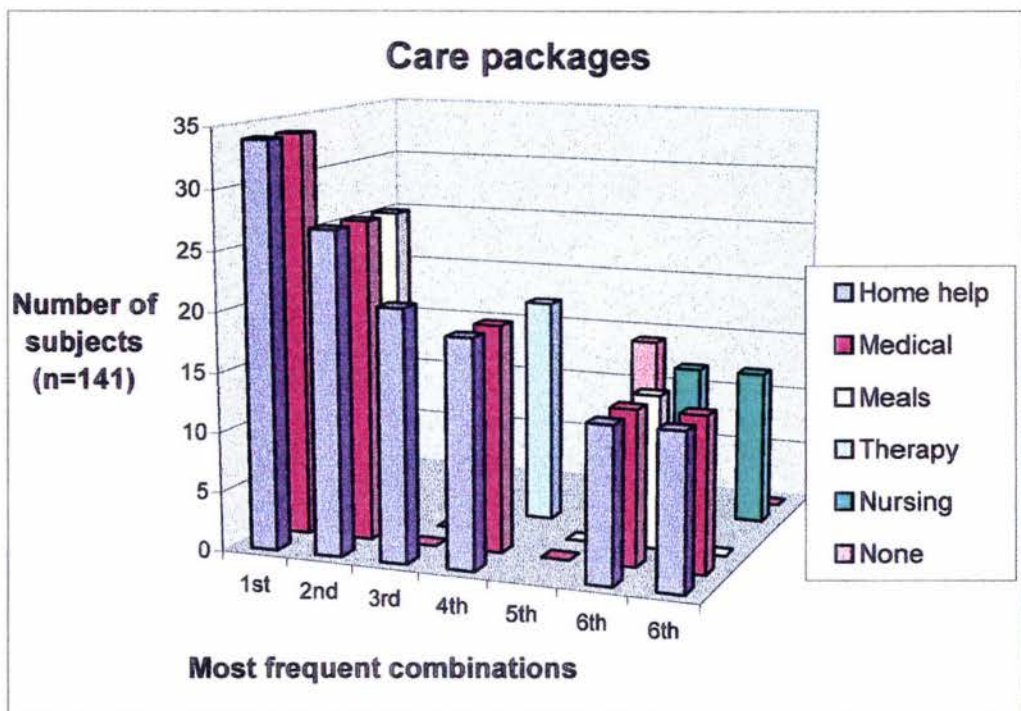


Figure 4.6. The six most frequent care packages at QRT trial study exit.

Unfortunately there was a discrepancy in the home help data. The numbers of participants receiving home help as part of the care packages from the Day 1 and Day 90 Interview Sheets were different, in all four groups, than the numbers receiving hours of home help from the Excel data. Therefore, as this research was mainly based on the Interview data, the tables on the number of home support hours and the ANOVAs comparing the mean hours in the experimental and control groups at Days 1 and 90 generated from the Excel data, were not included,



although the analyses done also showed an increase in dependency from Day 1 to Day 90 in all groups and no significant differences between the experimental and control groups.

### Conclusion

The conclusion of this research was that, of the older people selected for the Quick Response Team Trial, those cared for at home by the QRT were, in three months time, as independent as those cared for in hospital; and the confidence level was 95%. Therefore, from the perspective of independence as an outcome, as evidenced by living situations and care packages, the development of a Quick Response Team in Auckland is justifiable, however the results of this research must be considered along with the outcomes of the larger QRT trial, such as satisfaction, problems, and costs. It was also apparent from the pilot phase and bore true at the end of the study, that the potential to use QRT for admission prevention, under the current circumstances at Auckland Hospital (p. 79-81), was not as great as for early discharge.

As was predicted, by changing the type of care people normally received (independent variable) from hospital care to QRT care at home, the level of independence (dependent variable) was at least as good as for those cared for in hospital. While both the experimental and control groups had increased dependence, these increases were not significantly different. As is typically done when using inferential statistics, the null hypothesis, a statement opposed to what the researcher predicted, was tested using a scientific method of enquiry. The plan was to accept or reject it, at a .05 level of significance. The null hypothesis, that older people experiencing a health crisis cared for at home with the intensive home and multidisciplinary support of a Quick Response Team would, in three months time, be more dependent than those in control groups cared for in the usual manner in hospital, was rejected.

The data analysed, upon which the conclusions of this study are based, included the living situations, and the care packages. For the living situations, which were interval data on where people lived and with whom, the statistical calculations used were MANOVAs, or multivariate analyses of variance to compare the changes from Day 1 to Day 90 between the experimental and control groups in both the admission prevention and the early discharge QRT trials. For

the care packages, which were nominal data, chi-square was used. The hours of home help, ratio data, were analysed using ANOVAs, analyses of variance, and also supported the conclusions. However, due to discrepancies in the Interview data and the Excel data, the hours of home help and the ANOVAs from the Excel data were not included.

### Summary

The results of this research, a randomised controlled clinical trial of a QRT, supported the hypothesis that the patients selected for the QRT trial who were cared for at home by the QRT were as independent, three months later, as those cared for in hospital. The results were presented in three sections on the characteristics of the overall QRT study population, the baseline data collected at Day 1 on all four study groups, and the changes from Day 1 to Day 90. Each section included a series of tables and figures showing the data analysed; and the statistical calculations were described and the values given. This was followed by the conclusion, which was that the experimental and control groups in each trial were comparable at study entry, and that while all groups were more independent after three months, they were not significantly different. Therefore the outcome of independence was just as good for the experimental groups that were cared for by the QRT as it was for the control groups cared for in the hospital. From that perspective, the development of a QRT in Auckland is warranted, but, in making that decision, one needs to consider the limitations of this study as well as other aspects of the QRT evaluation, which are discussed in chapter 5.

## CHAPTER 5

### Discussion and Conclusions

#### Introduction

This last chapter completes this thesis on the Quick Response Team trial at Auckland Hospital. The results are summarised as they relate to the hypothesis and the variables studied. This is followed by a discussion of what the results mean. The findings are then discussed in relation to those of other studies reviewed. The implications of the findings are considered from the perspective of a nurse with a special interest in geriatrics and community health as they relate to nursing theory, nursing research, and nursing practice. The limitations are discussed, including internal and external validity issues, and measurement and statistical problems. In conclusion, some suggestions are made for future nursing research related to care of older people, particularly with an aim of promoting independence.

#### Summary and Integration of Results

The findings of this study were that patients at Auckland Hospital selected for the Quick Response Team trial and cared for at home by the QRT were just as independent three months later as those cared for in hospital in the usual manner, as evidenced by living situations and care packages used. On this basis, the development of a QRT in Auckland is justified. The original QRT, which was developed in Victoria, Canada, focused on admission prevention. It was found to be cost effective, and to enable older people to be cared for safely at home rather than in hospitals that were full and with waiting lists. Unexpectedly, the patients appeared to recuperate more quickly and remain in the community for longer than those admitted to hospital. The Victoria QRT later expanded to include early discharges and direct community admissions for people who otherwise would have required hospital care, often related to the level of social supports required, due to a health crisis. A randomised controlled clinical trial was designed to evaluate the application of such a programme in Auckland, New Zealand.

This research, which was part of a larger study, examined the outcome of independence. All other outcomes, such as functional assessments, problems, satisfaction, lengths of stay, and costs were evaluated in the larger QRT trial. During the pilot phase of the study, it became apparent that recruitment of admission prevention patients was difficult partly related to the organisation of

health care in Auckland, New Zealand, which is quite different than in Victoria, Canada. In contrast, recruitment of early discharge patients was more easily achieved. The hypothesis for this research was: Older people experiencing a health crisis and randomly assigned to care at home with the intensive multidisciplinary support of a Quick Response Team would, at three months time, be as independent as or more independent than people randomly assigned to control groups cared for in the usual manner in hospital. Independence (dependent variable) was measured by where a person lived, and with whom; and by the care packages received, which were made up of a variety of formal community supports. It was predicted that, by changing the care (the independent variable) from the usual hospital care to care at home by the QRT, the patients, at three months, would be as independent as or more independent than similar patients cared for in hospital.

Those identified as suitable for QRT, which comprised patients over 55 years of age, were mainly European and spoke English. Over 50% had medical problems, and another 40% had falls or fractures. At study entry, most lived in houses or flats/units, and lived alone or with a spouse/partner; seven percent were caregivers. The formal supports that participants received were divided into six categories as described in chapter 4 (p. 106). Over the two weeks prior to hospitalisation at study entry, 39.3% had used no services, while 50.9% had received services from one or two categories only. The most frequently used service was home help (52.1%), followed by meals (21.4%), nursing (14.4%), therapies (10.2%), and support/care (2.8%). No one had used the medical category of services.

The study sample was stratified; 12.3% who were more likely to have increased morbidity and mortality, and therefore increased use of resources, formed Group 1; the other participants formed Group 2. While Stratification Group 1 was significantly different than Group 2 with respect to gender, age, and responsible medical team, Group 1 participants were evenly distributed between the experimental and control groups in both the admission prevention and the early discharge trials. Of 285 participants, 209 were recruited over 13 months for the early discharge trial, 104 in the QRT group and 105 in the control group. Only 76 people were recruited for the admission prevention trial despite registering patients for an extra six months; 39 were in the QRT group and 37 in the control group.

At study entry, the characteristics of the participants in each trial were compared with respect to age, gender, problem, responsible medical teams, use of alarms, ethnicity, language, living situations, use of formal supports, and caregiving. The experimental and control groups in each trial were similar and therefore comparable. While the mean age of the admission prevention QRT group was only 78.9 years, and the admission prevention control group mean age was 83.1 years, this difference was not statistically significant.

At three months, data on living situations, care giving, use of alarms, and formal supports were again compared and the experimental and control groups in each trial were similar. The number of participants providing care to other people increased from 7% at study entry to 13%, and this was similar in all four groups. The number of participants with alarms increased from 24.2% at entry to 29.0%. As was expected, in Stratification Group 1, there were more deaths (20%) and more participants without exit data (34.3%) compared to 4.4% and 11.2% respectively in Group 2. At study exit, 13 participants (4.6%) had moved into long-term care, and 18 (6.3%) had died; this was evenly distributed between all four groups. The data on where people lived, and with whom people lived, were ordered numerically from the most independent to the most dependent. Multivariate analyses of variance, MANOVAs, were used to compare the changes in the means at Day 1 and Day 90 between the experimental and control groups. While this reflected an increase in dependency in all four groups, the changes between the experimental and control groups were not significantly different.

Because the care packages consisted of so many different services that did not lend themselves to being ranked in order, they were difficult to quantify. All of the combinations of service categories used were identified; then the numbers of participants within each of the four study groups who received each combination were listed. From this it was determined how many people in each group received anywhere from no services to up to combinations of five categories of services. In comparing the admission prevention data regarding services at entry and exit, it appeared that the QRT group used less services at Day 90 and that the control group used more, suggesting that the effect of QRT care within the admission prevention groups was greater independence. The QRT admission prevention group used less nursing, home help, and meals at Day 90 than at Day 1; in



comparison the control group only used less meals. Both groups used more therapy and medical services. In comparing the number of categories of services used at entry with the number used at exit, the increase in those using one or more categories was also greater in the admission prevention control group than in the admission prevention QRT group. However, these differences were not statistically significant at entry or exit.

Overall, there was an increase in the number of participants who received home supports from study entry to study exit. Based on the data provided for the thesis, and the analysis done, the experimental groups that received QRT care were as independent as the control groups that received the usual care in hospital, three months following study entry. Therefore it was concluded that the hypothesis was true at a 95% level of confidence. A discussion follows exploring the meanings of the findings.

#### Explanations for Findings

It appeared from the data analysed that the older people who participated in this research, having had a health crisis that lead them to seek attention, either at their GPs offices or at the hospital, tended to use more support services at study exit than at study entry. This increase in dependency appeared to have little to do with being cared for by the QRT as opposed to being cared for in hospital. Either, the health crises were the beginning of declining abilities of these people to care for themselves independently, or coming to the hospital provided opportunities for them to access services that they needed. The decline in their abilities may have been temporary. While 6.3% of the participants died, this was to be expected in an older population experiencing health problems. The fact that a higher proportion of Stratification Group 1 died and were without exit data compared to Group 2 showed that it was useful to have stratified the sample.

The changes from Day 1 to Day 90 in living situations, as indicators of independence, were no different between the experimental and control groups. The decision to move into long-term residential care is difficult for an older person; this type of move occurred for 4.6% of the participants and was evenly distributed within all four groups. Participants and/or family may have resisted this, but an increased need for assistance could have influenced participants, carers,

physicians, and support staff to accept or support participants' decisions to move into long-term care.

More support services were used at Day 90 compared to at Day 1. It is possible that some people, prior to the trial, were either unaware that services were available or of how to obtain them. Their GPs or families may also have influenced them to keep the services that were in place after their initial QRT or hospital discharges. As well, it is possible that some who had previously resisted formal support services found that they liked them. Regardless, there appeared to be a need for increased use of support services by these older people, especially for home help and meal services. Long-term home help funded by the RHA was used by 18% of those using help both at Day 1 and Day 90. This was 9% of all of the participants at Day 1 and, 12% at Day 90. All others using home help either paid for it privately, or it had it paid for by the CHE, or by ACC, and it was likely short-term in many cases. The large increase in the use of medical services may have been temporary and related to recovery. It is not clear whether these were short- or long-term services, and a longer study would be needed to determine this.

The use of QRT care as a substitute for hospital care appeared to have little affect on the outcome of independence for older patients. If a QRT was established in New Zealand, more people would be suitable for early discharge than for admission prevention, under the current circumstances that prevail in Auckland. Establishing a QRT programme in Auckland may be worth considering, but first the outcomes of this research would need to be considered with those of the larger evaluation. While the researcher has not received the report from the larger study Dr. R. G. Harris, the Clinical Director of Health Services for the Elderly at Auckland Hospital (personal communication, December 1998), indicated that the QRT was discontinued because of the costs. It was estimated that the programme would require 450 patients a year to be cost effective. A discussion follows of how the findings of this research fit in with those found in the literature.

#### Integration of Findings With Literature

A QRT serves as a means of preventing residents of a community who need increased supports due to a health crisis from having to stay in hospitals, rather than in their own homes. In developing and evaluating a Quick Response Team, it is important to consider the continuum of services for older people in the

community and the hospital, and how they interface with geriatric services. In exploring whether a new intervention has made an impact or not, a randomised controlled study is ideal (Weissert & Hedrick, 1994). Most studies reviewed were descriptive. Few used a control group, and most that did were not randomised. Of many studies considered in a broad review of literature on older people, the QRT population studied in Auckland was similar in characteristics to those of other Quick Response Team studies. Many researchers collected data on living situations and use of supports, which, in this study, were used as measures of independence. Because this research was part of a large collaborative project and the data provided was limited, the researcher focused on the support services that made up the care packages in much more detail than was found in other studies. A discussion follows of how the findings of this study compare with those of other studies about supportive services and programmes related to promoting independence of older people.

The populations of all of the QRT programmes found in the literature were fairly similar in characteristics. In Auckland most often they were women (72%) who lived alone; they were between the ages of 75 and 84 years and the mean age was 80.5 years. In comparison the participants in the Niagara study (Darby, 1992) were also mostly females between 75 and 84 years of age, and the percentages of females in the Victoria (Dawson, 1988) and Windsor QRT studies (Freeman, 1994; Rajacich & Cameron, 1995) were virtually the same as in Auckland. However, the percentage of females identified as suitable for QRT care during the review at Auckland Hospital (Bapty & Harris, 1993) was only 54%, and in the Christchurch QRT study (Sainsbury, 1995) it was 59%. In the Auckland trial 64% lived alone compared to 60% in Victoria and 54% in Christchurch. In Windsor, the women were described as most frequently living alone. The mean ages were 79 years in Victoria, and Windsor, in Canada, as well as in Christchurch, New Zealand.

The problems of the Auckland QRT trial participants were mainly medical (52%), fractures (23%), and falls (18%), and were similar to those of other QRT projects. However, frailty (social/coping - 1%) and psychiatric problems (0%) were not as prevalent in Auckland; the other 6% consisted of other accidents (1%) and unspecified "other" (5%). In Victoria, the problems were medical (40%), falls (38%), coping (37.8%), and psychiatric (6%), but more than one category could be

selected. In Niagara, the problems were medical (48%), falls (24%), coping (19%), and psychiatric (9%). In Windsor, there were more medical problems (65%); falls (29%) were slightly higher than in Niagara, and coping was only 6%. In the Auckland study, participants' problems, when applicable, were recorded as fractures first and as falls only if there were no fractures. In Victoria, falls were selected when applicable, and a second problem could be indicated, but, as in the other studies, there was no category for fractures. Therefore it was difficult to compare the incidence of falls for participants in the Auckland QRT with those of other QRT studies.

There have been various ideas in the literature regarding the absence of psychiatric problems in older people. Polliack and Shavitt (1977) suggested that the lack of older people admitted to hospital in their research was because those people were being treated elsewhere, whereas Munoz and Mesick (1979) theorised that psychiatric problems were present but not being diagnosed in older people admitted to hospital. Bassuk, Minden, and Apsler (1983) were concerned about the high rate of psychiatric problems in older people and the low treatment rate. They found that older people were more likely to present with physical complaints than younger people, and because of this, treatment was sometimes delayed. In the Auckland QRT trial participants may have been diagnosed and treated for psychiatric problems, such as depression or delirium, but unless these were primary diagnoses, they would not have been documented for the study.

The emergency department was frequently used for primary care by patients in the Auckland QRT trial (55%), as was the case in many other studies (Alonso, Hernandez, del Busto, & Cueto, 1993; Bassuk, Mindler, & Aspler, 1983; Harrop & Morgan, 1985; Gupta Setty, & Joshi, 1985). Unlike most authors who implied that this was wrong, Kleinman, Tamer, Soodalter, Cutter, and Weiss (1975) questioned why emergency departments were not set up as primary entry points for patients. Beland, Lemay, Philibert, Maheux, and Gravel (1991) suggested that hospital emergency services should cater to the specialised needs of older people. In a further study Beland, Lemay, and Boucher (1998) found that older people tended to require resources only available at the hospitals and suggested that their use of hospital services was justified. As all of the participants in the QRT trial were identified as those who would normally be admitted to

hospital, it would seem that their decisions to attend the hospital were appropriate. The Acute Assessment Ward (AAW) adjacent to the Emergency Department at Auckland Hospital enabled older people to stay overnight and be assessed the following morning regarding the need for admission to in-patient care, or for discharge home, possibly with the QRT or with other community supports. The AAW worked well for older patients and was similar to the short-stay ward described by Harrop and Morgan (1985) in Wales, and to the observation beds recommended by Gupta, Setty, and Joshi (1985) in England.

Stratification of the QRT population regarding the potential need for increased resources proved useful. Stratification Group 1 had significantly more deaths and more participants without exit data than Group 2. The only other study reviewed that used stratified randomisation was by Coast, Richards, et al., (1998), done to ensure that elective and emergency admissions were evenly distributed between their experimental and control groups in a randomised trial of early discharge in the UK. The Darlington study (Challis, Darton, Johnson, Stone, & Traske, 1991a; Challis, Darton, Johnson, Stone, & Traske, K, 1991b) was not a randomised study so that stratification was not possible, but the researchers noted that, due to an unusually high number of terminally ill patients in the experimental group, there were far more deaths in that group. By stratified randomisation of the QRT trial in Auckland, the potential for this type of skewing of results was prevented.

Of well over 50 studies in the literature reviewed for this research, only nine were randomised controlled trials, two of which were studies on alternatives to acute hospitalisation. The evidence from studies on admission prevention and early discharge was limited. The admission prevention studies reviewed were all explicitly modeled on the Victoria Quick Response Team, with the exception of the QRT in Calgary, Canada (Boyack & Bucknum, 1991). The authors claimed that the QRTs were successful and cost effective. The only evaluation that used a control group was the Victoria QRT (Dawson, 1988), and it was not randomised.

Three of nine early discharge studies reviewed were randomised controlled trials, but the first (Gerson & Hughes, 1976) had methodological problems. The other two well conducted studies were done to investigate hospital at home schemes in the UK, at the same time as the Auckland QRT trial was in process.



The researchers had different conclusions regarding the economics of hospital at home. Shepperd, Harwood, Jenkinson, et al., (1998) found that most preferred hospital at home care, with the exception of patients with chronic obstructive airways disease (COAD). Shepperd, Harwood, Gray, Vessey, and Morgan (1998) investigated the costs and found that this care at home scheme studied was not cheaper than hospital for most, and was more expensive for patients recovering from hysterectomies and those with COAD. Coast, Richards, et al. (1998) in the second study found no differences in mortality, quality of life, and physical function. Satisfaction was higher amongst the care at home group. Although the hospital patients were discharged sooner than the hospital at home patients, the costs (Richards, et al., 1998) for hospital care were greater. In summary, there have been few randomised controlled trials done to investigate admission prevention and early discharge schemes like the QRT. The results have not been consistent and none have measured living situations and care packages as measures of independence. The problems in Auckland were different than in Victoria where the QRT originated, and the health care system was different. This and the limited evidence from previous studies, made it important to explore the QRT in Auckland on a trial basis and a randomised controlled trial was a stronger methodology than most of the previous studies on early discharge and QRTs.

The literature regarding the use of hospital resource tools, such as the ISD and AEP tools consistently indicated that in a number of different places, including England, Spain, Italy, and Canada, there were patients being admitted and staying in hospital who could have been cared for at home (Coast, Inglis, & Frankel, 1996; Coast, Inglis, Morgan, et al., 1995; Coast, Peters, & Inglis, 1996; Fellin, et al., 1995; Lorenzo & Sunol, 1995; Smith et al., 1997). The use of the ISD criteria modified for the Victoria, Canada community at Auckland Hospital in 1993 (Bapty & Harris, 1993), showed that a lot of people admitted to Auckland Hospital would probably have been cared for at home, if they had been at the Greater Victoria Hospital Society at that time, where there was a QRT service. However, the decisions were based on information that was available 24 to 48 hours after arrival time at the Emergency department. The researcher noticed that during this review, completed in 1993, there was often a delay from the time that diagnostic tests were ordered until the results were available. In order to prevent admissions,

doctors need to have test results quickly, to ensure that those being sent home are stable and that a discharge home is a safe plan. When the QRT was implemented at Auckland Hospital in 1995, there appeared to be a more developed team of Emergency physicians than in 1993, and admission criteria were not in use. The researcher was not aware of whether test results were available more quickly than in 1993, or not, but was aware that in-patients received higher priority for diagnostic tests. This could influence doctors to opt for hospital admissions to access diagnostic services more quickly when patients do not need in-patient care.

The aim of this research was to measure how QRT care (independent variable) affected independence (dependent variable) as measured by where and with whom people lived, and care packages. Of the other studies on admission prevention, only the Victoria (Dawson, 1988) and Christchurch (Sainsbury, 1995) Quick Response Team evaluations included data on people who had moved from home into long-term residential care, deaths, and the use of supports, but the information was incomplete. At three months, 4.6% of all participants in the Auckland QRT trial had moved from home to long-term care institutions and 6.3% had died. In comparison, 5.4% of the QRT trial participants in Christchurch moved to long-term care and 3.6% had died. In Victoria, 2.7% of the control group, at hospital discharge, had moved into long-term care. At six months, 4% of the QRT group had died, and 20% were on waiting lists for long-term residential care. No data was given for the control group at six months. Long waiting lists for long-term residential homes in Victoria were shorter after the introduction of the QRT (LeBourdais, 1991). However the QRT still operates in Victoria in 2000, and from experience the researcher is aware that those waiting lists are again quite long.

In Auckland three months after study entry the percentage of QRT trial participants receiving support services had increased from 60.4% at entry to 74.4%. In comparison, in the Christchurch study (Sainsbury, 1995), 80% continued to live at home at discharge, 20% had no increase in supports, and 57% had more formal supports. Data, at three months, were presented on only 43% of the original 56; 15% had increases in supports and 19% did not. In Victoria (Dawson, 1988), 150 (100% possibly) had been assessed by the Long-Term Care Programme, which may have resulted in the provision of home support, institutional care, both, or

neither. Assessments could have been done more than once for some participants, and no information on the amount of supports used was given.

Of the early discharge studies, most outcomes were about lengths of stay, costs, and services during the initial phase of care. Few researchers considered combinations of living situations and support services at three months time. The results of the Swedish randomised controlled trial on post hospitalisation home rehabilitation as an alternative to geriatric admission (Melin, A., Håkansson, S., & Bygren, L. O. 1993) showed, at six months time, that the experimental group, which received a multidisciplinary service post hospitalisation, were functionally more independent, used less support services, and spent less time in hospital than the control group. They did not report on deaths or the need for long-term institutional care. Martin, Oyewole, and Maloney (1994) conducted a similar randomised controlled study. Those studied were mainly older women living alone. The results were that the experimental group, after six weeks, was twice as likely to be living at home, and at twelve months, the participants spent more days at home and used fewer resources than those in the control group. These two studies were not unlike the Auckland QRT early discharge trial; although the Auckland QRT programme was not targeted specifically at geriatric rehabilitation patients, they were all older patients and 40% had had falls or fractures.

The researchers of a number of controlled studies on alternatives to long-term care found that increased supports were associated with less need for institutional care, but the populations studied were frail and at risk of not managing at home. These include non randomised studies led by Challis on enhanced case management (Challis, D., Chessum, R., Chesterman, J., Lockett, R., & Woods, B. (1987; Challis, D., Darton, R., Johnson, L., Stone, M., & Traske, K. 1991a; Challis, D., Darton, R., Johnson, L., Stone, M., & Traske, K. 1991b; Challis, D., & Davies, B. 1988), and by Hughes, Cordray, and Spiker (1984), as well as a randomised evaluation by Kemper (1988). The care packages described in these studies contained an extensive array of support services, but they were not quantified. Other researchers (Clarke, Clarke, & Jagger, 1992; Fabacher, et al., 1994; van Rossum, et al., 1993) explored whether older people were at risk in the community and also outlined extensive care packages, but they were not

conclusive regarding the value of home supports. Illiffe et al. (1992) found that older people living alone used more formal supports.

Little consistent evidence was available about the value of alternatives to hospital care for older people and the effects they might have on the independence of older people. In conducting this research, it showed that older people in Auckland cared for at home by a QRT similar to the Victoria, Canada, QRT, were just as independent as those cared for in hospital. It was demonstrated that QRT in New Zealand is more often an option for early discharge patients, rather than for admission prevention. The population that the QRT served tended to be older women living alone presenting with medical problems, fractures, or falls. As well, the QRT trial presented an opportunity to explore the development and use of live-in home support, which was easily developed. This study has documented information regarding care packages that is more detailed than found in other studies and is specific to the New Zealand community.

#### Implications of Findings

The implications of this research are that it is possible to do more at home for older people as an alternative to hospital care, both to prevent hospital admissions and to enable early hospital discharges, in ways that are not detrimental to the outcome of independence for older people. In this section the nursing implications of the findings are discussed. In doing this, one must consider how the findings have changed what is known, and consequently how this alters what is thought about nursing and care of older people. The implications are discussed as they apply to nursing theory, research, and practice, however they are interrelated and difficult to separate. This is done from the perspective of a nurse with a special interest in promoting independence of older people and enabling them to remain in their own homes. There were limitations regarding the outcomes measured in this research, which was part of a larger evaluation of a QRT in Auckland. These are elaborated on in the following section on the limitations.

In this research a randomised controlled trial methodology was used to test a hypothesis that was deduced from theory (Diers, 1979; Wilson, 1989). The theory was that older people could manage at home, as an alternative to hospital care, with the intensive multidisciplinary support of a QRT, and in doing so, would be as independent as those admitted to and cared for in hospital. It had already

been tested in Victoria (Dawson, 1988). The idea originated with nurses working in discharge planning in a hospital where many older patients were occupying acute beds and awaiting long-term institutional care (Dawson, 1988, 1993; Dawson & Critchley, 1992; LeBourdais, 1991; Robertson, 1985). These nurses wondered if increased supports might prevent these patients from being admitted to hospital, where they were at risk of further debility (Dawson & Critchley, 1992). The overall aim of the Auckland QRT trial was to explore whether providing a QRT service would make a difference to the care of older people in Auckland, New Zealand. In conducting this study, the researcher stated the assumptions that were made, and they are found in chapter 3 (p. 82). It was hoped that the participants would regard the experience of being cared for at home by the Quick Response Team as a positive one in comparison to being cared for in hospital. This impression probably would have been based on a variety of aspects including, as well as independence judged by living situations and need for supports, satisfaction, problems, health status, functional assessments, lengths of stays, and use of resources. Because only the concept of independence was being evaluated in this thesis, the intent regarding independence was to demonstrate that QRT care was at least as good as hospital care, and definitely not worse.

In terms of independence, it was demonstrated that the QRT concept was successful in Auckland, New Zealand. It supported the theory that older people can do as well at home as in hospital when the support services that they require are available. The theory being tested was relevant to all disciplines involved in the care of older people. Applying a nursing perspective makes this research relevant to nurses and to nursing theory. One of the major premises or goals of nursing in the field of geriatrics is that older patients with health problems that lead them to seek interventions receive nursing assessments and care plans, which maximise independence, minimise debility, and optimise their health (Ebersole & Hess, 1994).

In this research, nurses actively explored whether the development of a QRT would make a positive difference related to care of older people. It showed that the QRT nurses, who had a key role in assessing and planning care for older people as an alternative to hospital, could facilitate discharges in a clinical setting and coordinate the services at home for patients with complex care needs, in a way



that was not detrimental to the outcome of independence. With the knowledge that more complex problems can be managed within patients' home settings, that nurses can competently identify patients suitable for this type of care and facilitate complex discharges, and that patients cared for by QRT are just as independent as those cared for in hospital, the implications are that nurses must continue to explore ways that enable older people to be cared for in the community.

Collaborative research projects involving multidisciplinary teams are especially important in exploring care of older people. Nurses need to be involved in these studies, and, as well as using a collaborative interdisciplinary perspective, they must use a nursing perspective. In this way the research is relevant to nursing practice, benefits older patients who receive their care, and ensures that the voices of nurses are heard. Nurses rely on theoretical and empirical knowledge to explain situations and to guide their practice. As well, much of what nurses know is learned through experiences in practice. Most nurses can think of conversations and procedures with patients that did not go well, and as a result, they learned that there were better ways to approach the subject, the patient, or the task at hand, better ways to nurse. Typically, nurses share and discuss these experiences with their colleagues. As pointed out by Weissert and Hedrick (1994), much of the formal health research that is done is never published, meaning that others do not have the opportunity to gain from the experiences of others. The more information that nurses have about the areas that they work in, the better they will be able to develop nursing knowledge, skills, and practice that will optimise the care that they provide. Therefore it is important that nurses be involved in extending nursing knowledge by being involved in nursing research and disseminating it, both as members of multidisciplinary teams, but also as nurses who can apply a nursing perspective to the area of study.

In this project, nurses were actively involved in this research, and the nursing that they were engaged in demanded advanced nursing assessment and counselling skills. The QRT nurses identified patients, made nursing assessments, and decided, in consultation with geriatricians, whether patients were suitable for QRT care at home. They ensured that all older people who received QRT care at home were monitored and that appropriate care and supports were offered and available. These nurses were involved in exploring activities that affected the

delivery of nursing care and the responses of their patients. The implications of this study are that nurses need to continue to explore the ability to provide more care in the community for older people and to better understand how this affects the care and health of older people. Suggestions for future nursing research are made both in the limitations and the future directions, which follow, after a brief discussion of the implications of this research for nursing practice.

Nursing involves a synthesis of knowledge, gained in various ways, that is applied by nurses in their practice. The implications of this research for nursing practice are limited because the findings of the larger QRT evaluation are not known, however, the QRT at Auckland Hospital is not currently operating as it did. The roles of nurses are changing in New Zealand, as in other places, with regard to the care of older people and community health. The restructuring of health care and the devolvement of community supports from social to health programmes have created opportunities for nurses to be more involved in the care of older people in ways that are different than in the past. An example of this is in the area of case management, that is the assessment and service coordination for older and disabled people. These changes have also affected the need for planned discharges in hospitals and for care in the community. A QRT is a link between acute hospital services and community services, and as Steel (1987, 1991) suggested, most supports can be delivered at home if the right systems are in place. If one considers the studies related to criteria for resource utilisation of hospital services and the corresponding development of resources in the community, there are many possibilities for new and rewarding areas of nursing research and practice that could contribute to the provision of nursing care and improve the service delivery and the outcomes for older patients. In summary, Wilson (1989) cited Dickoff (1968) as follows "Theory is born in practice, is refined in research, and must and can return to practice if research is to be other than a draining-off of energy from the main business of nursing and theory more than idle speculation" (p. 415).

#### Limitations

While there are many strengths of the randomised clinical controlled trial methodology, one must be aware of and acknowledge the weaknesses, or limitations, of the method and how the limitations may affect the findings. The strengths and weaknesses of this research are discussed as they relate to the larger

QRT project, as well as to the research design, the internal and external validity, the analysis and statistical power, and the measurements used. This work was part of a large collaborative project that involved three other investigators, as well as North Health, Massey University, the two corresponding ethical committees, Auckland Health Services Limited, and contracted services from Auckland University. It was not until after the data had been collected, that it was suggested that the information released to the researcher be limited to ensure that this report, which was to be written up separately for academic purposes, would be different in focus than the larger report. Ideally this should have been planned in advance. Much of what was developed was done so collaboratively, and because of this, and the fact that the overall evaluation was so comprehensive, the knowledge and the experience that this novice researcher gained was immensely greater than it would have been, had this not been the case. In spite of the fact that there were restrictions on the data released, the amount of data that the researcher received was overwhelming. The analyses reported in this research were done independently of the other investigators, so they are the work of the researcher, but do need to be considered with the other findings, which the researcher had not seen, when this report was written. One aspect of the formal data collection for the QRT evaluation that was overlooked was the localities that participants resided in, which would be important to know in planning community health services. The patient labels on the Contact Sheets have this information, so it could easily be generated if desired.

An experimental design was used for this scientific inquiry of a QRT in Auckland, which was a randomised controlled trial (RCT) done in a clinical setting. Apart from laboratory experiments, this is the most precise of all methods (Dumas, 1987; McCormick, 1992; Rossi & Freeman, 1993; Scheetz, 1987; Weissert & Hedrick, 1994). It is useful for evaluating new interventions, and enables the best quality of data for explaining causal relationships, provided that the groups are similar to start with. Oakley (1990), who describes herself as a feminist sociologist, presents a thorough review of the RCT and a convincing argument in favor of the methodology. In summary, she pointed out that:

- Evaluating of the effectiveness of a new treatment tested with a RCT is based upon two issues, the significance and judgments about causation.
- Uncertainty regarding the value of the treatment being explored is essential; otherwise, a trial is pointless and subjects the participants to what is known to be less effective, which is unethical.
- Randomisation increases the likelihood of the groups being comparable by ensuring an equal chance of assignment of a participant to the experimental or control group, by eliminating the opportunity for bias, and by controlling for extraneous variables, which should be randomly distributed.
- Fully informed written consent must be obtained from all participants, ideally after eligibility has been determined and prior to random allocation. It must include the option to withdraw, with data only being collected on those who have consented to be in the study. Oakley advised clinicians troubled about what information to provide participants that researchers should only be conducting trials if there are questions of uncertainty regarding the benefits of treatments being tested.

The RCT offers a high degree of validity, and enables good control for variance and reliability. In order to obtain results of high quality, as was the intent of the investigators of the QRT in Auckland, the design and conduct must be well defined and everyone involved in the research process must be scientifically rigorous. A clinical trial has the advantage of being set in the normal environment, but because, in this case, the QRT intervention was not easily disguised, double blinding was not possible. Generally, problems related to controlling for extraneous variables are minimised with randomisation and also with stratification. There are also ethical constraints with the RCT. In response to criticisms of the method and frequent disapproval regarding the ethics of experimental research and human health, Oakley stated (p. 192), "Much of it misses the absolutely critical point that the condemnation of experimentation under the heading of research allows a great deal of experimentation to pass unnoticed under the heading of standard practice." Oakley questioned the ethics of not researching new practices. She advocated that

it is important that research is done and that it be done well. Typically problems with research are either related to the decisions made regarding how to conduct a study, or they develop during the study. The use of a pilot study can reduce these problems.

During the pilot phase of the study in Auckland, the QRT programme was established, and the Clinical Trials and the Geriatric Units at Auckland University were consulted. The Clinical Trials Unit recommended having 100 participants in each group for the power analysis and suggested stratification because some patients, such as those who were terminally ill, could have affected the outcomes and skewed the results. During the pilot phase there were difficulties with the recruitment of admission prevention patients, which is described in more detail in chapter 3 (p. 80) and had not been anticipated. To increase the rate of recruitment, the focus was changed to include early discharge patients as well as admission prevention patients, the inclusion criterion for age was lowered to 55 years, and the QRT nurses liaised with the specialty teams to increase their ability to identify potential participants for the study. While a geriatrician was required to complete the assessment and recruitment of QRT trial participants, one was not always available on short notice. Therefore, a registrar was hired as a member of the team and was available to screen QRT participants, discuss patients being cared for at home by the QRT, and attend daily QRT patient conferences. The pilot phase enabled time to determine the need for social work and occupational and physiotherapy services, which were in short supply, and to hire staff and contract out some services as appropriate. The Auckland University Geriatric Unit, which analysed the data, was involved in the planning. With their assistance and guidance, the research forms, protocols, and procedures related to the selection and assessment of participants, and obtaining informed consent, were developed and tested. This made the collection, handling, and analysis of the data easier. Ethical approval was obtained, and the computerised randomisation service was established. The pilot study prior to the QRT trial at Auckland Hospital enabled modifications to the study as necessary and prevented many potential design and conduct problems.

The use of a randomised controlled trial that was carefully designed allowed for both internal and external validity, common strengths of a controlled



trial. The use of randomisation increased the chances that the QRT trial experimental and control groups were alike, that it was reasonable to conclude that the manipulated variable caused any changed responses, and that the study therefore had internal validity. The use of stratification controlled for conditions that were more likely to result in greater dependence, increased use of resources, or death. This stratification also improved the chance of the groups being similar. By manipulating the care that participants received from the usual care in the hospital to QRT care at home, which was clearly different, it was determined that all participants were less independent at study exit than over the two weeks prior to hospitalisation at entry, but that the changes were similar in the experimental and control groups. The expectation was that independence of the experimental groups would be the same or better, and if so, that QRT care in Auckland would be worth considering provided that the other outcomes of the larger evaluation were positive.

External validity means that the study sample and the target population are alike and that one can generalise, by applying the results of the study to other subjects, populations, or treatments. It was hoped that the study sample selected for the QRT trial would be similar to the target population of older people in Auckland who might be suitable for QRT care in the future. Random selection of a study sample reduces the likelihood of bias and increases the likelihood of the sample being like the target population. In this instance, because it was hoped to identify and recruit as many of the patients who were suitable for the QRT trial as possible within a limited time, a convenience sample was selected. If the selection criteria are formulated carefully with regard to identifying appropriate people, the likelihood of the study population being similar to the target population is good (Scheetz, 1987). The greater the number of participants in the study sample, the more they are likely to be similar to the target population, as well. The use of random allocation to the experimental or control groups reduced the likelihood of bias, and ensured that each participant had an equal chance of being in either group. The findings in this study showed that the differences in health care in New Zealand made admission prevention by a QRT in a New Zealand setting more difficult than in Canada. The concept of early discharge could be applied to other populations, for example low-birth weight neonates (Brooten, et al., 1986; Brooten,

et al., 1988), children, and specific diagnostic related groups, such as post operative hip surgery, mental health problems, respiratory problems, and younger people with acute medical back pain. In comparing the different conditions in Victoria, where the QRT was first initiated, and in Auckland, the interventions and the environments were different. For example, in Auckland care by the QRT included geriatric consultations, which was not the case in Canada. As well, at Auckland Hospital, there are no admission criteria, GPs do not work in hospitals, and public consultants are hospital-based. Because of these differences, it would seem that others should use caution regarding the generalisability of the QRT concept, as it operated in Auckland and in Canada, to other places. However, this research on the use of a QRT in Auckland would probably be more applicable in a New Zealand setting, where the circumstances are more likely to be similar to in Auckland.

Another strength of the RCT is the ability to control for variance. There are three types of maximal experimental variance. One is where there is a definite difference in the conditions for the experimental and control groups. In the case of the QRT trial in Auckland, QRT care at home was clearly different than care in the hospital. The chief difference was the setting. The intent was to assess what services patients required and assure that they received them, but the services that the QRT group received were coordinated by QRT staff and delivered to the patients in their own homes rather than in hospital. The second type of variance is controlling for extraneous variables; that is preventing outside factors from influencing the dependent variable. The use of random allocation made it likely that any extraneous variables that might affect or interfere with causation would be randomly distributed between the experimental and control groups. The use of stratification, as well as randomisation, made the likelihood of this very good. It is possible that seasonal variations in health problems could have affected the results. As the participants were randomly allocated to experimental and control groups, and the study lasted approximately one year for the early discharge arm, and over approximately 17 months for the admission prevention arm, which had fewer participants, this is not likely to have affected the results. The third variance is error variance, or reliability, which is minimised when the measured effects are correct. A discussion of the issues related to measurement follows.

While a limitation of the RCT is its concern with quantity rather than quality, this is not a weakness of the design, but of its application (Oakley, 1990); the real concern is whether the instruments measure what they are claimed to measure (validity) and whether the values are accurate, or reliable. The validity and reliability are dependent on the adequacy of the assumptions, the operational definitions, the definitions of the variables, and how precisely one is able to measure them. The assumptions were that older people prefer to be independent, and that those living at home are likely to be more independent than those living in care. Increased use of formal support services by older people was assumed to be indicative of less independence. Independence, in this study, was measured by living situations and care packages. The first issue is whether these variables measure independence. The second issue is whether the measurements were accurate.

As previously mentioned, it was not until after the data had been collected that the researcher became aware that this study was to be based on the care packages, and only as recorded at Days 1 and 90. Therefore the hypothesis was changed in focus from broad outcomes to the outcome of independence, based on living situations and care packages at study entry and at exit. However, there were several other measures of independence that were collected for the larger evaluation, but were not part of this research. They were: the three functional assessments completed at Days 1 and 90; the care packages used during the QRT episode of care for the QRT groups; and the care packages used at discharge from QRT care for the experimental groups, and from hospital care for the control groups. Care packages are usually in place as a result of increased need, related either to a reduction in independence, or to a reduction in the availability of informal support (Harris, A., 1968). Informal support was not included in this research either, but it was part of the larger evaluation. Most support services, such as meal services or home help, are directly related to the completion of the activities of daily living, while others, such as day care or short-term admissions, relieve the burden to caregivers. Other services, such as therapy or nursing supervision of medications, are related to maintaining health or improving function. In contrast, medical services are more often related to diagnosing and treating problems, and less directly to supporting the daily activities of living.

Bearing this in mind, it would be useful to consider what services should be included in the care package data when making comparisons about independence.

Assessments regarding the need for supports can vary considerably between organisations, as well as between the staff that work for them unless the policies are clear and carefully monitored. In Auckland, the purchasers and providers involved included the QRT, the CHE, the RHA, ACC, private agencies, and private individuals. Organisations have differing objectives, policies, and amounts of available funding, and due to changes in the structure of health care and support services, their policies were likely in varied states of development. This meant that there likely was variability in the decisions made regarding the use of supports and the amount of services provided at study entry and after hospital and QRT care. Given that the participants were randomly assigned to the experimental and control groups, this variability at Day 1 should have been randomly allocated and not have affected the outcomes at Day 90. Without the Days 10 and 30 Interview Sheet data, which were not part of this research, little was known about what services were set up immediately following discharge from hospital or QRT care, or how long it took for the services to start. If the process was different for one group than another, this could have affected the outcomes at Day 90. A long delay for home help after QRT care could defeat the purpose of having a QRT. In Victoria, the agencies provided QRT and long-term home help, such that long-term patients requiring QRT were already known to the agencies and often the home support workers already knew the patients. When discharging patients from the Victoria QRT, the home help, if required, continued until long-term case managers could visit to assess the patients' needs. In this way, the service was not interrupted. The patients had to agree in advance that they would pay their share of the costs, which depended on their eligibility for subsidised help, and financial assessments. In Auckland, all of the QRT patients received geriatric consultation as part of the QRT care. This may have increased the likelihood of their use of supports on discharge. In turn, this may have resulted in quicker improvements and earlier reductions of extra services, but it would have depended on the responsiveness of the systems in place that provided for the monitoring of patient needs and adjusting of services.

As the care packages used during QRT, the functional assessment scores and the use of informal supports, are all related to independence but were not part of this research, the evaluation of independence for those cared for at home by the QRT, in comparison with those cared for in hospital, was limited. These other variables need to be considered with the findings of this research in evaluating independence. The data on the care packages at Day 1 pertained to the two weeks prior to the crises that caused the participants to visit the hospital, whereas the functional assessments were complete during the recruitment of QRT participants, either at arrival in the emergency department, or later in hospital, after these health crises had occurred. Therefore the functional assessments should have reflected greater dependence at Day 1 than the care packages. With the limitations as stated above, it would seem that the living situations and care packages were valid measurements of independence.

With regard to the accuracy of the measurements, the data from the Interview Sheets were used to record where people lived, and with whom, and the care package details. The information was obtained by interviews, which, for this research, occurred only at Days 1 and 90. The use of the services recorded from the interviews was compared with information given by the organisations that provided the services. While the Interview Sheet data appeared comprehensive, the Excel home help data showed substantially less participants receiving home help than recorded on the Interview Sheets, both at Day 1 and Day 90. This raised some questions regarding the accuracy of the Interview data, which was dependent on the accuracy of those providing and recording the data. It is possible that the Interview data was fairly accurate and that there were agencies missing in the collection of the Excel data, but without access to the raw data, this was difficult to know. Self-reported data can be less reliable. The research assistants who obtained the interview data from the participants and their relatives were trained, and it was hoped that this would have minimised any errors. In spite of this, there were some questions regarding the reliability of the data for the amounts of home help that people received. The next area of discussion concerns the power and statistical analyses.

Power analysis is a value of statistical significance used to accept or reject a hypothesis. The greater the group size, the greater is the power analysis, and the



stronger are the results and the conclusions. It had been recommended that there be 100 in each QRT trial group for statistical purposes. The sizes of the early discharge groups, which had 104 participants in the experimental group and 105 in the control group after 13 months, were precisely as recommended. Despite continuing to recruit patients for admission prevention for an extra six months there were still only 39 experimental and 37 control participants, which limited the power of the statistical calculations done to compare these two groups. While the statistical calculations were completed separately on the early discharge and admission prevention trial groups as presented in chapter 4, they were also all calculated on the combined experimental and control groups. There were 143 participants in the QRT groups in total, and 142 in the combined control groups, and this gave a stronger power analysis. While there were lower numbers in the admission prevention groups, which meant that these comparisons were weaker and limited the ability to test the effects within the admission prevention groups, it was useful to be able to consider the two applications of QRT, admission prevention and early discharge, separately.

The statistical problems in this study were relatively few. In comparing the admission prevention trial groups separately, the QRT group appeared to use less services at three months than at study entry, while the control group used more. These observed differences were not statistically significant using chi-square separately at Days 1 and 90, but the low number of participants may have limited the power to detect any differences. The fact that Day 90 data for over 25% of the QRT group and 16.2% of the control group were missing reduced the power analysis even more.

The home help service, which was quantifiable, was used frequently, but unfortunately there were problems with the analysis of this data. The Excel sheets contained the hours of home help that participants received. From these, ANOVAs were calculated on the changes in the hours received in each group over the two weeks preceding Day 1 to the two weeks preceding Day 90. For reasons unknown to the researcher, there were less people with home help hours in all four groups, both at Day 1 and at Day 90 in the Excel data, compared to the Interview Sheet data. Therefore, the Excel data and the ANOVAs, which would have given a stronger analysis of the changes over three months, were not used. It was hoped

that this discrepancy would be clarified in the larger evaluation. It would have been better to have had follow-up data on the participants for as long as six or twelve months, but would have added to the cost of a study that was already expensive. The use of analyses of variance (ANOVAs) or multiple analyses of variance (MANOVAs) to compare the changes in the care packages from Day 1 to Day 90 would have been superior. This was not possible as the care packages were difficult to quantify. In hindsight, perhaps the number of categories of services in use could have been used to rank the care packages enabling the use of ordinal data, from which to calculate ANOVAs.

In summary, this nursing study on the application of a Quick Response Team for older people in Auckland, New Zealand, demonstrated that, in terms of independence, those cared for by a QRT were just as independent as those cared for in hospital. From this evaluation limited to independence, it appeared that a QRT similar to the Victoria QRT was applicable in Auckland, but was more useful, under the circumstances at the time, for early discharge rather than admission prevention. Having little information about the larger QRT evaluation kept the focus of this report on the independence as evidenced by changes in living situations and care packages, but there were variables in the larger study that were also measures of independence. The findings of this study must be integrated with the findings of the larger QRT evaluation done at Auckland Hospital. Despite these limitations, the study was well conducted, and the methodology was superior to other studies on QRTs found in the literature. Research related to the care of older people is difficult as there are so many variables to consider. As well, there is little consistent data from other studies available. Patients suitable for QRT care in Auckland were typically older women living alone, with either medical problems or trauma related to falls or fractures; they frequently used the emergency department as a primary health center. Generally those studied over a three month period required increased supportive services compared to before they came to hospital, but the increases were similar for the experimental and control groups. This research considered the use of formal care packages in more detail than was found in most other studies, and the care packages documented were specific to New Zealand. As well, it explored the development of a live-in home help service, which worked well. As there were few participants from minority groups, the

ability to distinguish any information specific to their needs was limited. The findings of studies typically raise many questions that warrant further research, as was the case with this study. This leads to the final area of discussion, the recommendations for future nursing research related to care of older people.

### Future Directions

The questions raised by the findings of researching a Quick Response Team alternative to hospital care for older people inspired many ideas for future nursing research. Some of these ideas were related specifically to the focus of this research, that is the relationship between QRT care and independence as measured by living situations and care packages, which are determined by assessment and service coordination services, and these are discussed first. This is followed by ideas that are broader and are related to alternatives to hospital care, and the use and development of hospital and community services.

In this research the focus was on the relationship between QRT care and independence as measured by living situations and care packages. Most health care professionals working in the area of care of older people would agree that there is a relationship between the supportive care available at home and the need to move into institutional care, and that both are related to independence. As mentioned before, most support can be provided at home, but it is dependent on a system being in place that allows this (Steel, 1991). In cases of severe disability, there would be a demand for ample formal and informal support, which means the availability of generous financial and family resources. In the instance of QRT care, the service involved the provision of an intensive care package of supportive services, including home help related to completion of ADL/IADLs, but also professional care by nurses, doctors, rehabilitation therapists, and social workers. At that point, the QRT was an alternative to acute hospital care. However, the research in this study was to explore how people, who all had been living at home in the community prior to a health crisis, fared three months after QRT care, in comparison to similar people cared for in hospital. This raised two issues that could be explored with further research. The first was related to developing better ways to quantify care packages and services, in order to make comparisons that are statistically stronger than was possible in this study. In doing this, one needs to consider what services, formal and informal, should be included in care packages.

The second issue was related to whether care packages for older people in New Zealand reflected levels of independence, and if so, how the types and amounts of services were determined. A care package is usually the result of an assessment of needs, and consists of a mixture of short- or long-term services that are coordinated based on the identified needs. This is often referred to as case management in the literature, but in New Zealand the terminology used varies between programmes. In this study the services were either private, or were provided by ACC, the CHE, or the RHA; at times they were a mixture.

Case management services have developed, changed, and expanded in New Zealand through the 1990s, partly due to the shift of services from the Department of Social Welfare to the Ministry of Health, as well as to the changes within ACC. Some examples include the "Sixties Plus" programmes, the introduction nationally of the SNAPs, the corresponding health contracts for the long-term service coordination for older people, and the development of case management by ACC. While a variety of health care professionals are involved in short- and long-term case management services in New Zealand, the number of nurses practicing in this area has grown considerably through the 1990s to the present.

With pressure to provide services that are of a high quality to many older people, when resources are limited, it is important that the services be allocated to those who need them the most. But, in assessing older people, how does one determine whether home supports are needed or not? As Kane and Kane (1980) questioned, at what point is the provision of household labour a luxury and a poor use of taxes, particularly when it is unclear whether increased services delay or prevent the need for nursing home admissions. Under what circumstances should supports be provided, and how does one determine the quantity needed? Ideally policies should stipulate what subsidised services are approved and under what circumstances, and allow the staff to be responsive to the need for changes, in a timely manner.

Regarding long-term services for older people in New Zealand, it would be useful to examine the interface between the SNAPs and care packages. If the SNAPs reflect need, then the service coordination should match this need. At the same time, it would be worth exploring the value of the assessment and service coordination being separate services, as they are at present. Surely those

determining dependency would be able at the same time to recommend the appropriate supports. This present situation may be an expensive duplication of services that interferes with the continuity of care for older people.

It is not realistic to expect that the assessments (of dependence) and service provision (in the way of care packages) of the various programmes in New Zealand be the same, nor may it even be desirable. However, it would be useful to have consistency within each programme. In studying older people in New Zealand, where ACC exists and is unique to New Zealand, it likely would be wise to use standard functional assessments that are more likely to be valid and reliable, for measuring independence, unless one is studying people who are all receiving the services of one programme. Nurses working in the areas of short- and long-term assessment and service coordination need to be involved in research to extend knowledge about how to deliver better care and services to meet the needs of older people and promote their independence. More research needs to be done to determine if the assessments of older people done by the staff of the short- and long-term programmes measure independence, and whether the allocation of types and amounts of services are consistent and based on assessments of need.

With regard to alternatives to hospital for older people in New Zealand, the QRT concept has obviously been of interest to providers and consumers of services for older people. While the outcomes of the larger evaluation of this application of a QRT at Auckland Hospital were not clear to the researcher at this time, it was known that the expenses were too high to justify continuing the programme as developed. As with any service, it is important and challenging to balance the benefits of services with the costs. In response to a shift in policy in New Zealand from institutional to community care Malcolm (1983) discussed the debate of the economic outcomes and argued that effectiveness and acceptability to the providers of care and the recipients are equally important outcomes. However, Weissert and Hedrick (1994) cited Weissert (1990) who said, "It may be time to lay aside studies showing that home care is not cost effective and get started on ways to make it become so." If the other benefits of a QRT in Auckland warrant this, there are ways of delivering a similar QRT programme on a smaller scale that may be more cost effective and could be explored. Some ideas would be to operate the programme every day but over shorter hours, to involve the GPs more, and to



possibly integrate the QRT with existing community services. It might also be useful to develop a tool that predicts when hospital in-patient geriatric rehabilitation is better, as opposed to a short-term admission, or the use of enhanced care like the QRT provided at patients' homes.

With increased demands for in-patient hospital beds, health care professionals must look for ways to deliver better services that provide the best outcomes, and are cost effective. It is no longer acceptable for people to be in hospital, in many places, unless they have criterion based needs either related to specialised treatments, tests, and procedures, or to the monitoring of unstable conditions that necessitate hospital care. If one considers the studies related to criteria for resource utilisation of hospital services and the corresponding development of resources in the community, there are many possibilities for new and rewarding areas of nursing research that could contribute to better care and improve the service delivery and outcomes for older patients. In planning for a Quick Response Team service, staff in the emergency department and other specialty services may want to consider the use of such criteria. There may be other solutions that would effect admission prevention or earlier discharges, such as quicker laboratory results, planned discharges with better access to out-patient and community services, as well as measures to reduce the incidences of falls and trauma, and the exacerbation of chronic medical conditions of older people. These are all areas that nurses could be involved in, both in practice, and also in researching whether these are useful options.

A QRT is a link between acute hospital services and community services. The potential is there to do more in the community, but there needs to be consensus in determining if a QRT is a useful alternative to hospital care for older people, and if so, consensus on how it would fit into the continuum of existing services. In planning and developing a QRT that maximises the benefits to older people, ideally all of the stakeholders should be consulted. There needs to be agreement about the goals, and support of its development. In Canada, most often GPs manage the medical supervision of QRT patients. The researcher recommends that GPs be involved in QRT care, but access to all of the medical specialty services, if feasible, would enable care at home of more patients with more complex needs. It is also important that patients be adequately screened medically

prior to acceptance for QRT care at home to ensure their safety, and there would need to be agreement about which physicians would make these assessments. Nurses are essential QRT members as they play key roles in the identification, assessment, screening, and case management of QRT patients. Depending on the circumstances and the funding available, one or more of social work, physio and occupational therapy services could be added. Daily service and the ability to provide live-in home help are essential in delivering a Quick Response Team service.

In considering ways to improve the outcomes for older people, nurses need to collaborate with the other disciplines in using an interdisciplinary perspective, but also need to use a nursing perspective. As they become more involved in the care of older people in ways that are different than in the past, nurses need to be involved in research in order to extend nursing knowledge that enhances their practice in clinical areas. Ideally this should involve both nurses from academic settings with expertise in research, as well as nurses involved in practice (Wilson, 1989) with clinical expertise and a desire to improve nursing practice. As more nurses in New Zealand advance their education, there will be more research conducted in clinical settings. The aims of ethical committees in educational settings and health regions should be similar, and it would be useful if these committees worked together in order to facilitate this type of collaborative research. Research is complex, and it is most likely that the nurses who become involved in these activities are truly interested in the areas of study and have strong feelings about their nursing practice. In essence, it is unlikely that they will be without biases. While the Quick Response Team concept had worked well in Canada, this QRT nurse was concerned regarding its application in New Zealand because of the differences in the health care environments. Therefore it was important to exercise caution in its introduction, and conducting a randomised controlled clinical trial was the ideal way to evaluate this new programme in New Zealand. As well as using a trial and quantitative analysis to explore the QRT, this study would have been enriched with the documentation of broader interviews and dialogue with QRT nurses about their practice, and last but not least, with the patients and their families, to explore what worked for them and what did not.

In conclusion it is important that nurses interested in the care of older people, both in acute and long-term institutions, and in the community, have a full understanding of the services available to older people related to early hospital discharge and admission prevention schemes, as well as an awareness of the complex balance between hospital and community services, and that they keep questioning those options. Nurses, of all of the disciplines within the multidisciplinary team, are the largest profession in number and the one most often involved in direct patient care. With a greater awareness of the health care needs of older people, nurses will be in a better position to influence the development of nursing theory, research, and practice in ways that will improve the care and the options for older people.

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## APPENDIX A

### FLOW CHART FOR QUICK RESPONSE TEAM TRIAL ADMISSION PREVENTION ARMS

See the attached flow chart.

Entry into the study is by the following phases as detailed in the attached flow chart.

**1. General Practitioner/Home**

Patients will either present themselves to the Emergency Department or see their General Practitioners who will refer them to Auckland Hospital.

**2. Auckland Hospital Department Evaluations**

Patients will be assessed in the Emergency Department by staff from various hospital departments such as General Medicine, Surgery, or Health Services for the Elderly. The decision-making process will include:

- a) Whether the person can definitely manage at home using currently available home support services, and if not;
- b) Whether the patient's condition definitely requires hospital care.

**3. Assessment for Quick Response Team**

Any patient who is not obviously a candidate either for care at home with current support or for hospital admission will be referred to the Quick Response Team. An assessment will be carried out by a Quick Response Team nurse and the assessment will also be reviewed by a Geriatrician.

Patients who do not meet the criteria for the Quick Response Team will be cared for in hospital.

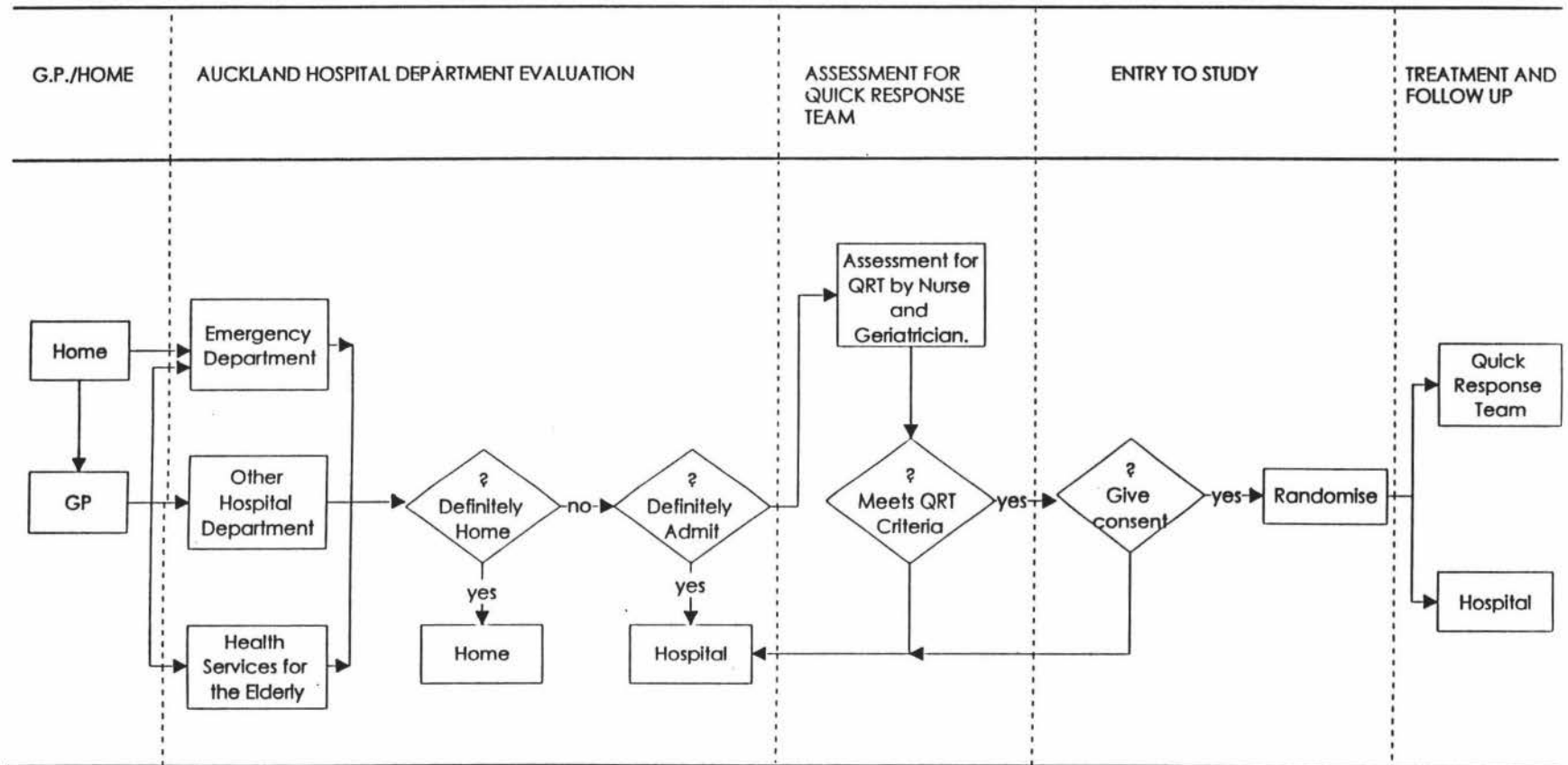
**4. Entry to Study**

Patients who meet the criteria for Quick Response Team care will be invited to participate in the study. If they decline this invitation they will be admitted to hospital. If they agree to participate they will then be randomized to either the Quick Response Team (intervention) group or to the hospital (control) group.

**5. Treatment and Follow-Up**

Patients will then receive treatment either by the Quick Response Team or by hospital admission and will be followed up by research workers who will gather information about their progress.

## QRT TRIAL - ADMISSION PREVENTION





## APPENDIX B

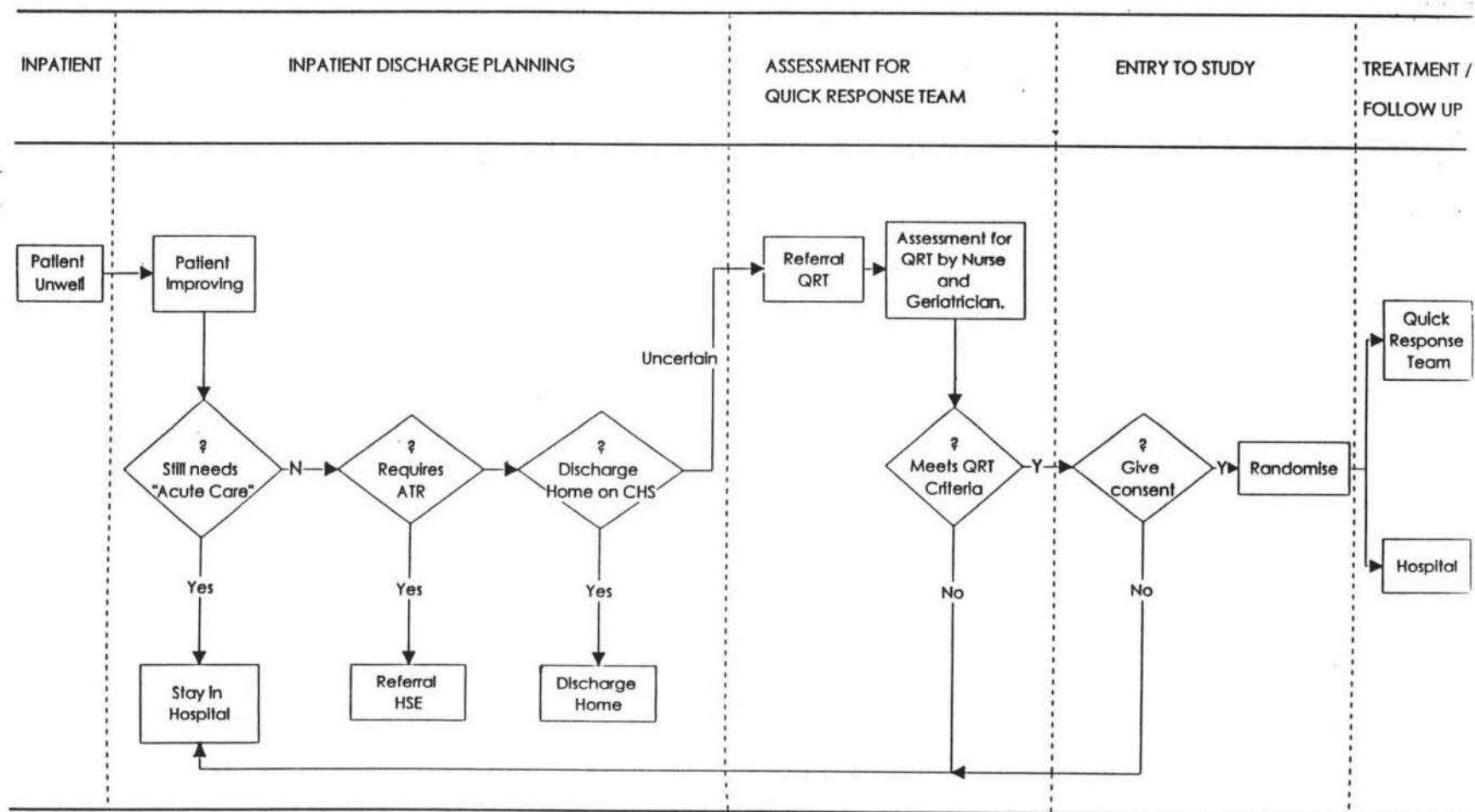
### FLOW CHART FOR QUICK RESPONSE TEAM TRIAL EARLY DISCHARGE ARMS

See the attached flow chart.

Entry into the study is by the following phases as detailed in the attached flow chart.

1. **Inpatient**  
Patients are unwell and have been admitted to inpatient areas of Auckland Hospital.
2. **Inpatient discharge planning**  
Patients will be assessed by staff from various hospital departments such as General Medicine, Surgery, or Health Services for the Elderly, related to ongoing planning. The decision-making process will include:
  - a) Whether the patient's condition definitely requires continued acute hospital care,
  - b) Whether the patient requires AT&R,
  - c) Whether the patient can definitely manage at home using currently available home support services.
3. **Assessment for Quick Response Team**  
Any patient who is not obviously a candidate either for a continued hospitalisation or care at home with current support will be referred to the Quick Response Team. An assessment will be carried out by a Quick Response Team nurse and the assessment will also be reviewed by a Geriatrician.  
  
Patients who do not meet the criteria for the Quick Response Team will be cared for in hospital.
4. **Entry to Study**  
Patients who meet the criteria for Quick Response Team care will be invited to participate in the study. If they decline this invitation they will continue to be cared for in hospital. If they agree to participate they will then be randomized to either the Quick Response Team (intervention) group or to the hospital (control) group.
5. **Treatment and Follow-Up**  
Patients will then receive treatment either by the Quick Response Team or by continued hospital care and will be followed up by research workers who will gather information about their progress.

## QRT TRIAL - EARLY DISCHARGE



## **APPENDIX C**

### **QUICK RESPONSE TEAM TRIAL AUCKLAND HOSPITAL**

#### **INFORMATION SHEET FOR PARTICIPANTS**

You are invited to participate in this study, which is designed to investigate a new form of treatment and support at home by the Quick Response Team. This is being studied as an alternative to the usual inpatient care at Auckland Hospital.

#### **Description of the Study**

The Quick Response Team is organised to provide intensive support services at home. The team is multidisciplinary. People cared for on the scheme receive daily nursing visits. In addition the following services are available if needed:

- \* home support (which may include live-in or overnight care)
- \* assessments by rehabilitation staff
- \* help from social workers\physiotherapists\occupational therapists

Medical supervision is provided by specialists from Health Services for the Elderly at Auckland Hospital in a shared care role with GP's.

Those who agree to participate in the study will be randomly allocated (this means that there is a 50:50 chance of receiving either treatment) to management by the Quick Response Team or to hospital care. The study will compare the outcomes of the two groups. Participants in the study will be visited by a research worker and interviewed. Information will be collected about how those in both groups have managed and how they feel about the service they have received. General practitioners and other healthcare and support providers (including ACC) may be contacted for information about peoples' health conditions and their use of health and support services.

Although there is a small risk of things not going well, for example, falls at home, the supervision provided by the Quick Response Team will reduce these risks considerably. The results of this study will help to guide future practice and to determine whether there are strong benefits of management at home by a Quick Response Team. The data will also be used for the completion of a thesis in Nursing by Linda Bapty, a Masters student of Massey University.

#### **Your Involvement**

You have been selected for this study on the basis that the nature of your medical condition allows safe management in the home and that you are likely to be better in two to three weeks time.

We would like you to decide during the next hour, whether you wish to participate in this study. The reason for this is that should you be allocated to the Quick Response Team group it will help us to get you home more quickly. The only way you will be able to obtain treatment via the Quick Response Team is by agreeing to participate in the study and then being randomly allocated to the Quick Response Team Group.

Should you choose not to participate in this study this will not affect your future management in any way and you will be cared for in hospital. You may withdraw from the study at any time and, if so, your medical care will not be affected in any way. While the Quick Response Team is free of charge, you will be expected to cover the cost of items you would normally be charged for, such as General Practitioner visits.

### **Consent Where Subject is Incapable of Giving Consent**

In cases where people are incapable of giving consent a responsible relative or "close other" will need to give consent and accept responsibility on the participant's behalf. In this event, the person giving consent on behalf of the subject will be given all the information which the subject would have been given in order to provide informed consent.

### **Compensation**

Everything we can think of has been done, and will continue to be done, to prevent problems occurring during this research. However, should you suffer personal injury resulting from medical error or mishap in the trial you are entitled to ACC cover (Accident Rehabilitation and Compensation Insurance), and may be entitled to compensation. ACC has the final decision on the level of compensation which may be provided.

The ACC booklet 'Clinical trials - Your Guide to ACC Cover' is available on request.

### **Further information**

If you have any questions please contact:

Dr Roger Harris - Geriatrician

Phone 379 7440 Extension 6553

If you have any queries or concerns regarding your rights as a participant in this research project, you may telephone the Health Advocates Trust at 638-9638.

APPENDIX D

Attach Patient Label

Study number

CONSENT FORM

Title of Project: QUICK RESPONSE TEAM TRIAL

Principal Investigator: DR R G HARRIS

Name of Patient or Subject: \_\_\_\_\_

English	I wish to have an interpreter	Yes	No
Maori	E hiahia ana ahau ki tetahi tangata hei korero Maori ki ahau	Ae	Kao
Samoan	Oute mana'o e iai se fa'amatala upu	Ioe	Leai
Tongan	'Oku fiema'u ha fakatonulea	Io	Ikai
Cook Island	Ka inangaro i tetai tangata uri reo	Ae	Kare
Niuean	Fia manako au ke fakaaoga e tagata fakahokohoko	E	Nakai

I have heard and understood an explanation of the research project I have been invited to take part in. I have been given, and I have read, a written explanation of what is asked of me, and I have had an opportunity to ask questions and to have them answered. I understand that I may withdraw from the project at any time and that, if I do, my medical care will not be affected in any way. I understand that my consent to take part does not alter my legal rights. I also give permission for the data to be used by Linda Bapty, a Masters student at Massey University, for a thesis in Nursing.

I consent to take part as a subject in this research project.

Signature of Subject: \_\_\_\_\_ DATE \_\_\_\_\_

OR (subject is unable to give consent)

I agree to accept responsibility for \_\_\_\_\_ taking part in this research project. (subject's name)

Signature \_\_\_\_\_ Relationship \_\_\_\_\_ (relative/guardian/other)

In my opinion consent was given freely and with understanding.

Name of Witness (Please Print) \_\_\_\_\_

Signature of Witness \_\_\_\_\_

CONSENT OBTAINED BY:

Name \_\_\_\_\_

Signature: \_\_\_\_\_ DATE \_\_\_\_\_



APPENDIX E

QUICK RESPONSE TEAM TRIAL  
INTERVIEW SHEET

Study No.   
Interviewed At Day   
Date (ddmmyy)

Days appropriate: 1, 10, 30, and 90

1. What type of building do you normally live or reside in?   
0. Unable to decide                      5. Boarding house  
1. House                                      6. Rest home  
2. Flat \ Unit                              7. Geriatric hospital  
3. Granny flat                              8. Public Hospital  
4. ILU \ Residential village              9. Other

2. Who lives with you? (social or care network while living at home)   
0. Unable to decide                      5. Non relative\s (no spouse\partner)  
1. Alone                                      6. Paid live in help  
2. Spouse\partner only                  7. Institutional long term care  
3. Spouse\partner and relatives\others  
4. Relative\s (no spouse\partner)

3. Administer the FIM

Score

1. Eating	<input type="text"/>
2. Grooming	<input type="text"/>
3. Bathing	<input type="text"/>
4. Dressing upper body	<input type="text"/>
5. Dressing lower body	<input type="text"/>
6. Toileting	<input type="text"/>
7. Bladder management	<input type="text"/>
8. Bowel management	<input type="text"/>
9. Transfer bed/chair/wheelchair	<input type="text"/>
10. Transfer toilet	<input type="text"/>
11. Transfer tub/shower	<input type="text"/>
12. Walk/wheelchair	<input type="text"/>
13. Stairs	<input type="text"/>
14. Comprehension	<input type="text"/>
15. Expression	<input type="text"/>
16. Social interaction	<input type="text"/>
17. Problem solving	<input type="text"/>
18. Memory	<input type="text"/>

## 4. Telephone

☐

2: able to look up numbers, dial, receive and make calls without help

1: able to answer phone or dial operator in an emergency but needs special phone or help in getting number or dialling

0: unable to use the telephone

9: unable to answer

## 5. Travelling:

☐

2: able to drive own car or travel alone on bus

1: able to travel but not alone

0: unable to travel

9: unable to answer

## 6. Shopping:

☐

2: able to take care of all shopping with transportation provided

1: able to shop but not alone

0: unable to shop

9: unable to answer

## 7. Preparing meals:

☐

2: able to plan and cook meals

1: able to prepare light foods but unable to cook full meals alone

0: unable to prepare any meals

9: unable to answer

## 8. Housework:

☐

2: able to do heavy housework (like scrub floors)

1: able to do light housework, but needs help with heavy tasks

0: unable to do any housework

9: unable to answer

## 9. Medication:

☐

2: able to take medications in the right dose at the right time

1: able to take medications but needs reminding or someone to prepare it

0: unable to take medications

9: unable to answer

## 10. Money:

☐

2: able to manage buying needs, write cheques, pay bills

1: able to manage daily buying needs but needs help managing cheque book, paying bills

0: unable to manage money

9: unable to answer

## 11. Have you made a complete recovery from the problem that caused you to come into hospital?

☐

1. Yes

2. No

3. Day 1 N/A

4. Unable to decide

## 12. Do you have a Community Services or High User Health card?

☐

1. Yes

2. No

3. Don't know

13. MMSE

points scored



total possible



14. What services do you have in place now, or have you used (paid/formal)?

*Please tick appropriate columns*

SERVICES			Who pays / provides?				QRT	Comments
	No	Yes	CHS/ CHE	RHA/ Agency	ACC/ Agency	Private/ Agency		
<i>For Day 1 &amp; 90, for previous two weeks; for days 10 &amp; 30, since last interview</i>								
District Nurse								
OT								
PT								
SLT								
Maori CHW								
Home Help								
MOWs								
Other Meals								
Day Care								
Carer Support								
Respite Care								
Alarm								
<i>For Day 10, 30 only, since last interview; for day 90 last two weeks:</i>								
OP /Day Ward								
Specialist								
GP /E & M centre								
Other								

15. Does anyone help you with any tasks related to your daily activities (unpaid/informal)?

- |                   |                          |
|-------------------|--------------------------|
| 1. Spouse         | 4. Neighbour /friend     |
| 2. Son/daughter   | 5. Other, please specify |
| 3. Other relative |                          |

HELP	No	Yes	Who?(use codes above)
Personal care			
Medications			
Meal preparation			
Housekeeping			
Laundry			
Transportation /social activity			
Finances			
Shopping			

16. Are you helping others, with whom you live, with their daily activities?

1. Yes

2. No

3. N/A

17. As a result of your recent health crisis, is there a change to the costs relating to these daily activities for you or your family/carer - as listed? (Day 10, 30, 90 Assessment only)

ACTIVITIES	No	Yes	If Yes: More?	If Yes: Less?
Personal care				
Medications				
Meal preparation				
Housekeeping				
Laundry				
Transportation /social activity				
Finances				
Shopping				
Home heating				
GP fees				
Cost of carer's time (e.g. loss of earnings/lost holiday/sick leave)				

18. ADVERSE EVENTS (Day 10, 30, 90 Assessment only)

Ask subjects and significant others:

“Since we last saw you, has anything gone wrong, or have you had problems with your health, safety or medical care?

1. Yes

2. No

☐

ADVERSE EVENT	QRT/HOSP	NOTES
Problems with medication		
Unplanned (re)admission to hospital		
Unplanned (re)admission to the QRT		
Fall, no injury		
Fall, with injury		
Other accident causing injury		
New medical problem discussed with Dr		
Dissatisfaction with care - documented		
Other (please specify)		

.....  
Who completed the questionnaire? ☐

1. Patient only

3. Carer or proxy only

2. Patient and carer/proxy

Duration of assessment (min.) ☐☐

Completed by..... ☐☐

Checked by.....

## PROTOCOL FOR INTERVIEW SHEET

### 1. ASSESSMENT DATE

Circle applicable Day - 1, 10, 30, or 90.

**Note:** Day 1 is always done on Day 1 within 24 hours of assessment.

Assessment Date	Allowable Range
10	9-14
30	28-36
90	85-100

### 2. PLACE OF LIVING - DOMICILE

Refers to the type of structure, i.e., "bricks and mortar" that a person usually lives in.

Day 1 assessment - this is to be recorded as at the time of the interview. If the current situation is a temporary arrangement then enter what is usual. For example, on day 1 the person will be in hospital, but enter where the person normally resides.

Day 10, 30, and 90 assessments - enter the person's usual living situation. If however, the current situation is different because of a medical reason, then enter where they are living temporarily, e.g., a relative's home or a rest home while they may be recovering. Prompt with "Could you have managed at home?" If the answer is no, then enter what the temporary situation is. If the usual living arrangement has been altered due to a social reason, e. g., staying at a relatives because of a birthday party then in this instance enter where a person normally lives.

### 3. LIVING ARRANGEMENTS

This question refers to the patient's basic social or care network within their usual place of residence. Enter what is a permanent arrangement with regard to who lives with them. If there is a change to the status quo because of a medical reason then enter that reason. If it because of a social need then enter the usual permanent arrangements, e.g., may also care but not necessarily with the patient.

### 4. FIM

After administering the FIM, write the score for each section in the boxes provided. The accompanying training manual used for the FIM should be used for the wording of questions.



### 5. QUESTIONS 4-10 - Multidimensional Functional Assessment Questionnaire

These questions are a record of what a patient does, not what they could do. i.e. **“at the moment are you .....?”**

For the day 1 assessment this applies to the last few hours (less than 24 hours), now that a patient is suffering the effects of a health crisis, it is not a measure of what they could do before the health crisis occurred.

The person may however be unable to physically demonstrate how they are able to perform a certain activity because of their current situation. Ask the person, for example that if they had access to a phone or kitchen would they be able to perform the certain activities listed (unlike the FIM where if a person is not performing a certain activity they are scored down).

If however a person has had another health crisis at the time of an interview then it is again what they are able to do as a result of this health crisis not what they may have been able to do a day or few hours ago.

### 6. COMPLETE RECOVERY

This question seeks a Yes/No answer. The interviewer may probe in more depth if the patient is not certain and try to ascertain a more definite answer. The same question can be asked of a relative with similar probing. (Reminder: Please complete the answer to Question 12 - that the patient has completed the questionnaire only, both the patient and Proxy/carer have answered all the questions together, or Proxy/Carer only). If the patient is definitely unable to decide then number 4 is placed in the box.

Usually if the questions are being answered both by the patient and a proxy, negotiation will find the most appropriate answer. If, however, there is a conflict of opinion between the patient and carer, and the patient appears to demonstrate signs of dementia, or has an MMSE score of less than 22, or other signs of anxiety/depression, the answer of the carer should be considered as the most appropriate.

### 7. MMSE

After administering the MMSE, write the score in the box provided. If the patient is unwilling/unable to do or finish the questionnaire, the score can be left out. However, this should apply in only a very small proportion of the Admission Prevention candidates in ED. If too few MMSE scores are obtained, too much data will be missing in this arm of the study. In some cases a patient may not have been able to complete all the questions because of physical disability. If this is the case and a reason for this has been noted then score the patient out of the total questions answered, for example 25/27.

If a subject is deaf, then try administering the test with headphones, or alternatively try writing the questions down. Check whether the person is able to follow this procedure and note what has been done in order to administer the test on the front of the form. If a subject is suffering from a neurological condition such as dysphasia and you are unable to administer the test successfully write “unable to answer” on the front of the form.

## 8. SERVICES USED/ FUNDING

The left hand column lists all possible services that are available and the row across the top lists the agencies. This is formal paid help that a patient may have used or be using. The table indicates which parts are to be completed for each day of the assessment. Put a tick in the **yes** or **no** column.

Indicate who provides or pays for the service in the next column. Shaded boxes indicate that this particular organisation would be neither providing nor paying for the service. At Day 1, this is recorded for the two week period prior to the person coming into hospital, for example they may have been in hospital for a month, it is what they were receiving before they came into hospital.

At day 10 and 30 record usage from the date of the last assessment, e. g., for day 10 from 1-10; and for 30, day 10-30. At day 90 record this information as for the last two weeks. If a person is in hospital or institutional care at the day 10, 30, and/or 90 assessment, then what they received at home, or at the institution must be listed. There may be a combination of resources used in this situation.

## 9. INFORMAL/ UNPAID HELP

Enter a tick in the Help column on the left side of the box. Enter the code of who is helping in the right hand column. This is unpaid informal help that a patient is regularly receiving. For day 1 assessments this applies to the previous two weeks prior to the person coming into hospital. For day 10 and 30 assessments it applies to the days from the last interview. For day 90 this refers to the previous two weeks.

## 10. HELPER OR CARER

If the participant cares for or helps another person on a regular basis then the answer is yes. Regular means that another person is unable to live independently without the help of the patient.

## 11. CHANGE IN COSTS TO PATIENT/FAMILY

This question helps identify whether there has been any change in costs to the patient or their family/carer as a result of their recent health crisis. Only identify whether there has been a change, and if yes, write M for paying more now or L for paying less now in the appropriate columns.

## 12. ADVERSE EVENTS

Use the grid as prompt for adverse events. This is a record of the patient's perception of medical and health service problems or adverse events.

**Dissatisfaction with Care** refers to: any dissatisfaction with care in Hospital or at Home provided by formal services, e.g.: services not received or inadequate, unexpected charges, lack of liaison between agencies/GP, etcetera. A detailed description should be documented with each patient's research file.

**Other** refers to: any other events which cause distress to a patient or their carers, which is not directly related to the level of formal care they are receiving, e. g.,: emotional stress with family members, researcher's concern for patient safety, etcetera. A detailed description should be documented with each patient's research file.

### 13. WHO COMPLETED THE QUESTIONNAIRE

Carer refers to a person who regularly helps the patient and without whom they would be unable to be independent. A spouse who does not care for their partner would be a proxy (designated person to answer).

### 14. COMPLETION DETAILS

Complete the date of this assessment, who the assessment was completed by, and who checked the assessment by using your own initials and code number e.g., 01, 31.

Enter the duration of assessment, that is the time that it took to complete the interview sheet including the MMSE. This does not include other activities e.g., following up on a medical problem or travelling to the patient.

## APPENDIX G

## QUICK RESPONSE TEAM

Referral date (ddmmyy) 

## CONTACT SHEET/ASSESSMENTS

Referral time A1 Arrival to hospital detailsDate of arrival (ddmmyy) Time of arrival (24 hr) 

Attach patient label

A2 Referred to hospital by GP1. Yes 2. No ☐A3 Patient's current locationA4 Responsible Team

1. Emergency Dept 2. HSE  
3. Medical 4. Orthopaedic  
5. Surgical  
6. Other (specify) .....

☐A5 Potential trial type

1. Admission prevention (ED/AAW & < 36 hrs)  
2. Early discharge (ward or >36 hrs)

☐A6 Nature of problem (Select first that applies) ☐

1. Fracture 2. Falls  
3. Other accident 4. Medical: acute  
5. Medical: chronic 6. Psych  
7. Frailty  
8. Other (specify) .....

A7 Patient has alarm

1. No 2. Yes, not used  
3. Yes, used

☐A8 Identified for QRT by

1. QRT staff 2. Other hospital staff  
3. Combination  
4. Other (specify) .....

☐A9 INCLUSION CRITERIA

1. YES 2. NO 3. NOT KNOWN

- Over 55 years of age. ☐

- Living within the QRT catchment area. ☐

- There are doubts about whether they require hospital inpatient care or not. ☐

- Medical treatments required could easily and safely be carried out at home. ☐

- Supervision by a doctor is not the main care requirement. ☐

- Likely to manage with usual community health services  
programmes or hospice/institutional care in 2-3 weeks. ☐

- Support is required beyond the capabilities of available home supports. ☐

A10 EXCLUSION CRITERIA

- Resident in a rest home or private hospital. ☐

- Living situation is not suitable for care required. ☐

- Currently being followed in a QRT trial group. ☐

- Booked for major surgery within 36 days. ☐

- Other (specify) ..... ☐

A11 Prerandomisation actions

1. Yes 2. No

1. CT Scan ☐  
2. MRI ☐  
3. Overnight in ED/AAW ☐  
Other (specify) ..... ☐

☐A13 Care decision

1. Non QRT, admitted to/or continue in hospital  
2. Non QRT, discharged with additional community health services/ACC  
3. Non QRT, discharged without community health services  
4. Continue to randomisation for QRT

☐A12 Consent

1. Verbal refusal  
2. Verbal agreement, but not written  
3. Written and verbal consent  
4. Not applicable (otherwise ineligible)

A14 Exclusion date (ddmmyy)

Exclusion time (hours)

If not eligible or consent not given,  
DO NOT CONTINUE, go to bottom of next page

**B15 Stratification group**

- A) Trial discharge: to determine whether the patient can continue at home, likely to fail and long term rest home/private hospital care will be needed.
- B) Brief period of care at home pending, dialysis, hospice admission, acute hospital admission, chemotherapy or radiotherapy
- C) Neither of the above.

Group 1      Group 2

☐☐☐**B16 Trial type**

- 1) Admission prevention (in ED/AAW & less than 36 hr.)
- 2) Early discharge (on ward or in 36 hr. or longer)

Type 1

Type 2

☐☐**B17 Randomisation**

Phone 366-4053

Identify yourself and ask to randomise a patient

Give the participant's hospital number and date of birth

Date (ddmmyy)

Time

Study number

Assigned to:

☐

Randomisation completed

☐

1. Home care

1. Yes

2. Hospital care

2. No (specify reason) .....

**B18 Relevant ACC claim**

1. Yes

2. No

If yes, M46 # is

☐**B20 Language spoken**

1. English

2. Maori

3. Samoan

4. Tongan

5. Chinese

6. Other (specify) .....

**B19 Ethnicity (patient identified)**

1. European

2. Maori

3. Pacific Is (specify)

4. Asian (specify)

5. Other (specify) .....

**B21 Casemix type**

1. Palliative care

2. Rehabilitation

3. Psychogeriatric

4. GEM

5. Maintenance care

6. Acute

**B22 Patients chosen support person**

Name

Address

Relationship

Phone -

home

work

**B23 Casemix Impairment code** *If GEM or Rehabilitation Casemix type***B24 Duration of assessment:** ..... + ..... + ..... =

(mins)

Completed by.....

Checked by.....



## APPENDIX H

# PROTOCOL FOR COMPLETION OF QUICK RESPONSE TEAM CONTACT SHEET/ASSESSMENTS

## PAGE 1

**Contact Sheet/Assessments:** are to be filled out for all patients seen for longer than 15 minutes, as a way of documenting eligibility and giving some perspective to the numbers and types of patients considered for the QRT trial. If seen by several QRT team members, information from each should all be placed on the same contact sheet. The sheet will need to be retained on the patient's chart until completion.

**Enter referral date and time:** in boxes at top of page; date in dd/mm/yy format; time, for example, 0930. See note 11 for the rationale for collecting this information. If the time to be recorded is late at night, and no work can be done with the patient, enter time for the next day.

**Attach patient label,** which will need to provide legible evidence of:

Name  
Date of birth  
Gender  
Hospital number

**A1. Arrival to hospital details**

For all patients, including those in a ward enter the **time of arrival** using a 24-hour clock and their **date of arrival** using ddmmyy format. This time should correspond with the time of arrival on the initial ED stickers; otherwise make your best approximation from the ambulance and initial clinical records, rather than the time entered in the ED/AAW books.

**A2.** Regardless of their location, show whether patients have been **referred to hospital by their GPs**. This indicates whether consideration for care at home is seemingly at variance to the GP's original recommendations.

**A3.** Indicate the **patient's current location** in the boxes, using 2 or 3 digits or letters:

e. g., patient's current location ED, AAW, 4B, or 7B.

**A4. Responsible team:** Select the appropriate sub specialty responsible for the patient's care at the time of the referral. If the responsible team has referred the patient to another team, select the team currently responsible (this may mean that

there is a discrepancy between the team on the patient's hospital label, and your selection).

**A5. Potential trial type:** indicate the potential trial type at the time this section is filled out, even though it may change by the time randomisation occurs, if the patient becomes a QRT trial participant.

i) **Admission Prevention:** applies to people who are in the Emergency Department or Acute Assessment Ward and have been there less than 36 hours.

ii) **Early Discharge:** applies to people who have been admitted to an in-patient ward within the hospital or have been within the hospital confines for 36 hours or longer.

#### **A6. Nature of problem**

From the list select the number of the first problem that applies. The definitions are constructed in a way that makes each one mutually exclusive.

##### Definitions:

Fracture:	Any fracture
Fall:	Any fall where no fracture has resulted
Other accident:	An accident that does not involve either a fall or a fracture
Medical acute:	A new medical problem emerging, for which there is no previous history, e.g., a new stroke, new pneumonia or CORD
Medical chronic:	Usually an exacerbation of an existing problem or recurrence of one for which there is a history
Psych:	Psychiatric including acute confusion, dementia and anxiety.
Frailty:	The person is generally frail and is having difficulty at home, but is not acutely ill
managing	
Other:	If none of the above problems apply, tick other and specify the nature of the problem.

**A7. Alarm:** Indicate whether the patient has an alarm system that activates a phone call from a neighbour, relative, ambulance, or another healthcare agency (not a burglar alarm). If the patient has no such alarm system, select "no". If the patient has this type of an alarm, indicate whether it was used or not in this instance to come to hospital.

**A8.** Indicate whether the patient was **identified for QRT** by QRT staff, other hospital staff, a combination, or by someone else, in which case specify who (show role or position, not name).

#### **A9, A10. Inclusion Criteria and Exclusion Criteria**

**Purpose:** to ensure those identified as suitable for the QRT trial meet all of the criteria and to identify why patients are excluded. Enter a 1 ("yes"), a 2 ("no"), or a 3 ("not known") for each item in the appropriate boxes. Suitability for the QRT trial is a joint decision between QRT nurses and doctors. In the first instance, QRT nurses will likely consult the medical team responsible for the patient's care. The

QRT doctor must be involved in determining eligibility for the trial. If any criterion is undetermined and a decision is made to hold the patient overnight, then stop form completion until it is determined.

Exclusion criteria No.3: Those already in the QRT trial, and still being followed (i.e. within 100 days) are ineligible. If this is not apparent, the randomisation service will identify these people, later.

Exclusion criteria No. 4: for patients booked for major surgery, which will entail several days in hospital directly resulting in high resource utilisation altered functional outcomes. "Major surgery" involves a joint or is an abdominal or chest/cardiac procedure (if unsure, discuss with QRT medical staff).

- a) **Include** - those on a waiting list, but who have no specific dates
- b) **Exclude** - those who have a date for surgery, which is prior to 36 days after randomisation.

Exclusion criteria No. 5: should be used for any reason other than one already selected. Briefly state the reason. If the patient appears suitable, but is not receptive to a care at home option, this is to be indicated later as "not giving consent" (see Consent), rather than here.

If a patient being assessed is terminally ill or not expected to last the full term of the trial (to 90 days) because of a medical condition then they are not eligible to be in the Quick Response Team Trial.

**A11. Prerandomisation actions:** Indicate if any of the following actions will have been done before randomisation: CT scan, MRI, Overnight in ED/AAW. The rationale for collecting this information is to determine if any significant costs had been incurred in the time after the patient had been referred to QRT (referral date and time at top of sheet) and before randomisation. (This is mainly applicable to patients in the Admission Prevention arm of the study.)

#### **A12. Obtaining Written Informed Consent (pink form)**

Northern Regional Health Authority: guidelines for informed consent must be adhered to. The guidelines (Section 4) stress the need for:

- *competence* to give consent
- quality and extent of *information* given
- *voluntary* nature of consent without duress.

#### Important Elements

- a) Early introduction of the QRT concept to *potential* participants
  - explain your role as soon as possible, during the assessment
  - explain the trial, provide the Information Sheet, and discuss the Consent and randomisation processes early.
- b) Invitation to patients *eligible* for the QRT Trial

- is to take place only after the QRT nurse and QRT geriatrician are satisfied that the patient: i) meets the study criteria, and  
ii) can be safely cared for at home with the resources available
- A full explanation of the project and an Information Sheet must be given to the patient and to anyone else they want included
- They must be aware of their right to withdraw from the study at any time without prejudice.

c) The Consent form (original is pink)

- must be signed by the participant (or a responsible relative if unable to consent)
- the consent must be witnessed
- the original must go into the patient's clinical record (kept on the ward); the participant must have access to either a copy or the original in the clinical record. A copy of the original should be kept with the research data.

d) Subjects incapable of giving consent

- The QRT geriatrician must decide based on clinical judgment if a patient is mentally incapable of giving consent
- If such a patient agrees to a care at home option with the QRT, a responsible relative or "close other" is to be invited to consent in writing on the patient's behalf. This person must be given the same information as the participant, and is agreeing to be responsible for the patient
- If the study team is unable to locate relatives or "close others" to provide consent these people will be excluded
- If there is any reasonable doubt about the person's ability to comprehend the situation and give informed consent then a relative must be involved. This is essentially a matter of clinical judgement. A person scoring 30 on the MMSE may still lack the insight to give informed consent. Anyone scoring 6 or more wrong on an MMSE must have relatives involved.

Anyone unable to decide to participate in the QRT trial will receive the usual in-patient treatment, and is not to be pressured to take part in the trial. **NOTE:** If QRT care is not available for potential trial participants due to a lack of resources, randomisation will not occur until the care is available.

**A13. Care outcome:** Select one box only within this section to record if patients are suitable for the trial. In cases where patients are identified as ineligible, select 1, 2, or 3 to indicate what will happen to the patients; then proceed to A14. For those consenting and entering the QRT randomisation, select 4 and proceed to B15.

**A14. Date and time of exclusion:** If the patient is excluded enter date and time that the decision was made to exclude the patient. Proceed to B26; enter the

duration of the assessment, initial the form and enter your ID #. Then have a colleague check the form.

## PAGE 2

### **B15, 16. Information required prior to randomisation**

a) Stratification Group - Select which situation (A, B or C) applies.

**Group 1** - Patients with a good chance of requiring an expensive treatment after the QRT or hospital episode (A or B)

**Group 2** - Patients for whom this does not apply (C).

b) Trial type

The trial type will be either Type 1 (Admission Prevention), or Type 2 (Early Discharge).

### **B17. Randomisation**

In order for the study comparisons to be valid, it is important that the groups are as similar as possible. The best way of ensuring this is to let "chance" be the deciding factor (rather than personal preference) in allocating people to either the experimental or control groups. In this context, it is important that there is a 50:50 chance of being assigned to either group. This is much like using the toss of a coin to make this decision. In this instance, the selection will be done using a computer program that will be accessed by a commercial phone service.

Phone the randomisation service. Tell them your name and say that you want to randomise a patient. Provide the hospital number, the date of birth, the "Stratification Group", and the "Trial Type". The person answering the phone will access the computer screen for the QRT trial. The programme will be set up to automatically check whether the patient is already being followed in one of the QRT trial study arms, in which case you will be told the client is not eligible. For all patients who are eligible, a study number will be assigned, and you will be advised whether the client is assigned to home care (QRT) or hospital care (control group). Record the date and time that randomisation is carried out. If there are any problems and the randomisation cannot be completed, state why.

**NOTE:** Write the study number on the original pink consent.

### **B18. ACC Claim Number**

Indicate here if this episode has an ACC claim. If it has, enter the claim number from their M46 form. If the M46 number is not available, the office will establish this.

### **B19. Ethnicity**

Ask the patient what ethnic group he/she identifies with most. Do not rely on hospital records.

### **B20. Language Spoken**

Indicate the language spoken, from the list.



**B21. Casemix type**

Indicate the casemix type, from the list.

**B22. Patient's chosen support person**

Indicate name, address, relationship to patient, and phone numbers.

**B23. Casemix Impairment code**

Indicate code. This is not applicable if a patient is excluded from the trial.

**B24. Duration of assessment:** Include time spent in phone calls and conversations with the patient, family, other hospital staff, community health services, etc.

It begins with the first contact related to the patient. It includes time spent seeing the patient, reading their notes, and discussing needs with hospital staff or relatives. It ends when the care decision is made. Exclude time spent obtaining consent or consulting the randomisation service. Do not include time spent explaining the QRT concept to staff members or time spent at meetings trying to recruit potential candidates. If several QRT team members put in time, the sum for all should be shown.

Fill out one Contact sheet for each patient assessment to cover the time from the start to the care decision, even if it covers more than one day. If a patient has already been assessed as not suitable, and a new assessment is initiated later, a new Contact Assessment should be initiated.

**Completed by:** Check the form to ensure all entries have been made. Initial that you have checked the form and it is complete and correct. Enter your two-digit identity number in the boxes.

**Checked by:** A colleague is to check that the form is complete and accurate, and initial that this has been done. On completion, the contact assessment form and the copy of the consent form are to be clipped together and placed on the contact assessment clipboard, for data entry and filing with the research forms.

## APPENDIX I

### QUICK RESPONSE TEAM TRIAL

#### INFORMATION SHEET FOR PARTICIPANTS IN HOSPITAL

You have agreed to be a participant in the QUICK RESPONSE TEAM TRIAL study in which participants are allocated by 50:50 chance to either CARE AT HOME (by the QUICK RESPONSE TEAM) or to HOSPITAL CARE. The aim of the study is to compare the outcomes of the two groups. This will be done by following up on you for 3 months after your entry into the study.

You have been randomly allocated to HOSPITAL CARE, by a computer programme. This result had nothing to do with the answers that you may have given to the questions in your interview.

This means that

- You will be cared for in hospital in the usual manner.
- You will be visited by a research worker who will interview you to get some information about how you've managed and how you feel about the service you have received. These interviews will take place at **10 days, 1 month and 3 months** after your entry into the study, whether you are in hospital or at home.

Your contribution is an important part of our study, and we value your continued involvement.

Thank you for being a participant in the study. If you have any further questions please contact Jo Hodge (manager)

Phone: 307-4949 extension 5567.

**APPENDIX J****QUICK RESPONSE TEAM TRIAL****INFORMATION SHEET FOR PARTICIPANTS AT HOME**

You have agreed to be a participant in the QUICK RESPONSE TEAM TRIAL study in which participants are allocated by 50:50 chance to either **CARE AT HOME** (by the **QUICK RESPONSE TEAM**) or to **HOSPITAL CARE**. The aim of the study is to compare the outcomes of the two groups. This will be done by following you for 3 months after your entry into the study.

You have been randomly allocated to **HOME CARE**, by a computer programme. This result had nothing to do with the answers that you may have given to the questions in your interview.

This means that

- You will be cared for at home by the Quick Response Team.
- You will be visited by a research worker who will interview you to get some information about how you've managed and how you feel about the service you have received. These interviews will take place at **10 days, 1 month and 3 months** after your entry into the study, whether you are in hospital or at home.

Your contribution is an important part of our study, and we value your continued involvement.

Thank you for being a participant in the study. If you have any further questions please contact Jo Hodge (manager)

Phone: 307-4949 extension 5567.