RGPs OF ONTARIO

ORGANIZATION DESIGN FOR GERIATRICS:
AN EVIDENCE BASED APPROACH

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Chapter 1

About This Handbook

David Lewis

Executive Summary
- This handbook is aimed at providing an evidence-based approach to service delivery for the elderly patient in core specialized geriatric services.
- Core inpatient services include geriatric rehabilitation, assessment and consultation services. Core outpatient programs include geriatric outreach, outpatient clinics and geriatric day hospitals. In addition, there are a number of condition-specific units, focused or innovative areas of care.

Each chapter follows the same broad layout:
- an executive summary
- a definition and description of the service
- a description of the information sources used
- the recommendations from the literature, along with the evidence level for each.

Some chapters also contain tools for clinical assessment.

Introduction
- A hospital director, mandated to design a new geriatric assessment unit on a limited budget, wonders what staffing mix is required. Does the unit need a psychiatrist? Social worker? Recreation therapist? If there is only the minimum number of staff, will patients be at risk?
- The medical director of an outreach service for the elderly needs to know whether the service could be redesigned to increase the number of patients who are seen. If that is done, will the quality of care be affected?
- Decision Support Service personnel at a general internal medicine care unit have found that elderly patients have twice the usual length of stay, and it is increasing. They are arguing for an acute care for the elderly unit to reduce elderly patients' lengths of stay. But the hospital's CEO notes that every effort to reduce elders' length of stay has merely resulted in increased readmissions. Can lengths of stay be reduced be reduced without increasing admissions.

Background

The number of older adults is increasing around the world. The costs of providing health care to this portion of the population continues to increase. Older adults require a variety of different services depending on their needs, resources and location. Some of these are specialized geriatric services (SGS) that include both direct services provided by geriatricians and/or geriatric psychiatrists and services provided in affiliation with one of these medical specialists. Core clinical areas include inpatient programs like geriatric rehabilitation, assessment units and consultation services. Outpatient programs include geriatric outreach, outpatient clinics and geriatric day hospitals. Eligibility criteria vary and these services are provided in a wide variety of settings such as acute care, community, clinics and long term care. Assessment processes and the provision of care typically are not standardized.

There are forces at work in Ontario and elsewhere that militate in favour of more systematic provision of SGS. For example, a key challenge to any health service planning concerned with the elderly is the ongoing difficulty in recruitment and retention of geriatricians, geriatric psychiatrists and allied health specialists (Hogan, 2001). Shortages in all these areas, along with historic imbalances – in Ontario, at least – in where SGS can locate, lead to difficulties in ensuring equitable access by those in need.

Planned and existing SGS must also pay close attention to growing demands for accountability or transparency. The Romanow Commission Report entitled *Building on Values: The Future of Health Care in Canada* contained no fewer than 33 references to this theme (Commission on the Future of Canada, 2002). The Commission noted:

> *Canadians are the shareholders of the public health care system. They own it and are the sole reason the health care system exists. Yet despite this, Canadians are often left out in the cold, expected to blindly accept assertion as fact and told to simply trust governments and providers to do the job. They deserve access to the facts. Canadians no longer accept being told things are or will get better; they want to see the proof. They have a right to know what is happening with wait lists; what is happening with health care budgets, hospital beds, doctors, and nurses, and whether the gaps in home and community care services are being closed; whether the number of diagnostic machines and tests is adequate; and whether treatment outcomes are improving* (p. 20).

This handbook is aimed at collating some of that evidence. In an era of constrained resources, we can no longer afford to engage in activities which are ineffective or inefficient. And in an age of accountability, we cannot ask our stakeholders to fund services whose efficacy and return-on-investment are not clear.

A generation ago, the province of Ontario developed a plan for a comprehensive system of health services for the elderly (A New AGEnda; Ontario Ministry of Health and Long-Term Care, 1986). Part of the plan was to use the expertise developed by the academic health sciences centres to help improve the quality of geriatric services provided by Ontario's acute and chronic hospitals. Thus, the Ministry of Health established regional geriatric programs in the province's five academic health sciences centres. These were defined as: A

comprehensive, coordinated system of health services for the elderly within a region [with the objective of] assisting the elderly to live independently in their own communities, thereby preventing unnecessary and inappropriate institutionalization. To further that objective, Dr D.W. Molloy, a geriatrician and chair of the Regional Geriatrics Program central (RGPc, located in Hamilton) suggested a guide to best practices in the delivery of services to the elderly. The RGPc Steering Committee endorsed the idea, and so the RGPs of Ontario determined to develop a practice manual on the organization of all SGS. This is to be a handbook for administrators, managers and planners of SGS programs on how to organize core services, including staffing requirements, assessment tools, evaluation strategies, and so on. It is to build on the combined research and evaluation expertise of the five RGPs, and is intended to identify areas where research supports a given strategy, along with gaps in the evidence.

This handbook is the result of that plan. It is intended to:

- Produce guidelines on how effective core SGS could be constituted. That is, to gather together the evidence-supported elements of each geriatric service.
- Build local capacity. Using this handbook, planners and providers can increase their knowledge of what has been demonstrated to be effective in other settings.
- Introduce a set of standards to SGS service delivery. This does not mean that all SGS services must conform to a one-size-fits-all model, for that would eliminate all innovation. Rather, it means that services will be able to make a conscious decision about whether to depart from the beaten path.
- Identify areas where research is needed. There are substantial gaps.
- Provide an expert resource for health services managers and administrators.
- Reduce redundant or ineffective effort. Ultimately, such improvements should have the effect of reducing costs per patient.

In health services research, there have been systematic reviews of comprehensive geriatric assessment, geriatric day hospitals, inpatient geriatric consultation services, of inpatient geriatric rehabilitation and outpatient care. Thus, it is often possible to adduce the screening, assessment, staffing, treatment and/or follow up processes that maximize outcomes, effectiveness and efficiency in these settings.

The objective of this exercise is to identify and describe components of SGS that have been demonstrated to be effective. Based on this information, we provide administrators and clinicians with evidence-based recommendations regarding protocols, screening criteria, assessment, treatment, follow-up strategies, and team make-up. Isolating those activities that have been demonstrated to enhance the quality of geriatric outpatient care will have particular value for those who need to choose and operationalize models of service.

Our intended audience includes students, administrators or managers – including medical directors, – along with planners, clinicians responsible for program design, and the like. We hope the handbook will be useful to decision makers who are involved in the planning and execution of new geriatrics services, along with those who may wish to reconfigure an existing SGS.

The handbook is aimed at the program or service level; it does not include information on "structural" factors such as hospital governance or how to organize community care. We offer no advice on needs assessment, because we presume that the need for the service has already been established. Nor is this a replacement for clinical manuals or skills: there is no information on medications, for example.

Design of the Work

Each chapter is organized according to a "flow" of patients from eligibility/targeting, through screening, assessment, treatment, discharge and/or follow-up, along with staffing. In each instance, our concern is with those processes that demonstrably maximize the desired outcomes, effectiveness and efficiency in the setting under discussion. Moreover, each chapter follows the same broad layout:

- An executive summary section which produces a digest of the chapter information for use as a "quick and dirty" manual.
- A definition and description of the service, program or specialty to be addressed in the chapter. This includes both what the service is and what it is not. As already noted, "real world" services vary enormously, and may not use the same names employed herein.
- A description of the information sources which were accessed and of the search strategies used. Where possible, we use Cochrane data, meta-analyses, and structured reviews (Oxman, 1994; Sachs, Berrier, Reitman, Ancona-Berk, & Chalmers, 1987). Otherwise, we use randomized trials or other high quality research comparing specialized geriatric outpatient services with alternative forms of care (Moher et al., 1995). In addition, we consider the weight of the evidence, that is, the number of research articles which consistently support a given approach. Gaps in the available information are also described. Where there is no evidence, or where the evidence that exists is of lesser quality, we sometimes make suggestions based on local experience.
- Information, in text and tabular form, on the recommendations from the literature, along with the evidence level (see Table 1.1) which supports each recommendation.
- Where possible, a set of recommended, or at least acceptable, tools for clinical assessment and patient evaluation are presented. Our minimum criteria for each of these is that they be validated, available free or at fairly low cost, and involve little burden to patients or clinicians. In addition, we recommend that, insofar as it is possible, these tools should be useable in a variety of clinical settings in order to smooth patient transitions across the continuum of care.

Levels of Evidence in this Work

Bandolier, the journal on using evidence-based medicine techniques, describes evidence-based medicine as:

The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means

integrating individual clinical expertise with the best available external clinical evidence from systematic research. Evidence-based medicine does not mean "cook-book" medicine, or the unthinking use of guidelines. It does imply that evidence should be reasonably readily available in an easily understood and useable form to provide advice about particular treatments or diseases for healthcare professionals and consumers.[1]

Evidence-based health care extends the application of the principles of evidence-based medicine to all professions associated with health care, including purchasing and management. Usually, the evidence being used is categorized by "quality." There is a variety of such classifications, and they have grown increasingly elaborate over time. One of these is presented in Table 1.1; a simpler version from Patterson and colleagues (1999) is presented in Chapter 4 (Table 4.1). One notable difference is that Patterson and colleagues grade evidence from "at least one" randomized controlled trial" at Level I. We might note that if evidence is presented from only one trial, of any quality, then there is no way to detect whether that evidence was in error. In jurisprudence, it is common to seek corroboration.

Table 1.1: Recommendation Grades and Evidence Levels

Grade of recommendation	Level of Evidence	Methodology
A	1a	Systematic review (with homogeneity) of randomized controlled trials
	1b	Individual randomized controlled trials (with narrow Confidence Interval)
	1c	All or none studies
B	2a	Systematic review (with homogeneity) of cohort studies
	2b	Individual cohort study (including low quality randomized controlled trials; e.g., <80% follow-up)
	2c	"Outcomes" Research; Ecological studies
C	3a	Systematic review (with homogeneity) of case-control studies
	3b	Individual case-control study
D	4	Case-series (and poor quality cohort and case-control studies)
E	5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"

Adapted from: http://www.eboncall.org/content/levels.html

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[1] Bandolier e-journal. Retrieved from: http://www.jr2.ox.ac.uk/bandolier/booth/glossary/EBM.html.

If It Ain't Broke, Don't Fix It

While there are many advantages to an evidence-based approach to service design, there are a few disadvantages as well. Normally, "evidence" refers to research studies. Health research is often designed to investigate the merits of procedures, interventions, or drugs, rather than the organization of health service. It follows that there is a paucity of high quality evidence, whether for or against particular mechanisms for the provision of health care to the elderly.

For this Handbook, the absence of such research carries several consequences:

- In some cases, it is difficult to distinguish what is (and is not) encompassed by a particular label. For example, is the Geriatric Rehabilitation Unit at Hospital X different from the Geriatric Assessment Unit at Hospital Y? How?
- In many chapters, there are large gaps in forms of organization which have been the subject of any published research at all. Some authors bridge these gaps with reliance on grey literature or anecdote.
- As a result, individual forms of SGS service may not be described in this Handbook. This is also true of units – like Acute Care for the Elderly (ACE) units which have been the subject of some study, but are not "core" SGS.

Ironically, we are aware of no research evidence supporting the use of schemes (like that in Table 1.1) for organizing evidence. The stature of the persons who produced them is very high, and their expertise is undeniable. In other words, recommendations for use of Table 1.1 are, at best, Level D (expert opinion). There is another school of thought that stresses multimethod or triangulated approaches as superior to any one (Brewer and Hunter, 2005).

With some exceptions, the literature on evidence-based geriatrics organization is simply not very well developed. Hence, we can distinguish between only 3 levels of evidence:

- High quality systematic literature reviews, meta-analyses, randomized controlled trials, or other high quality trials (such as quasi-experimental designs)
- Lower quality research trials
- All other evidence

This Handbook is intended as a guide to best practice in organization. However, there could be forms of organization which work quite well but are not described herein. If they work, and there is evidence that they do, then please contact any of the authors c/o info@rgpc.ca

References

Commission on the Future of Health Care in Canada. (2002) *Building on Values: The Future of Health Care in Canada – Final Report.* Ottawa: Commission on the Future of Health Care in Canada.

Hogan, B. (2001). Human Resources Training and Geriatrics. *Geriatrics Today: Journal of the Canadian Geriatric Society, 4, 7-10.*

Moher, D., Jadad, A. R., Nichol, G., Penman, M., Tugwell, P., & Walsh S. (1995). Assessing the quality of randomized controlled trials: an annotated bibliography of scales and checklists. *Controlled Clinical Trials, 16(1),* 62-73.

Ontario Ministry of Health. *(1986). A New AGEnda, Health and Social Service Strategies for Ontario's Seniors. Toronto, ON: Queen's Printer.*

Oxman, A. D. (1994). *Section VI: Preparing and maintaining systematic reviews.* Cochrane Collaboration Handbook. Oxford: Cochrane Collaboration.

Patterson, C. J., Gauthier, S., Bergman, H., Cohen, C. A., Feighther, J. W., Feldman, H., et al. *(1999).* The recognition, assessment and management of dementing disorders: Conclusions for the Canadian Consensus Conference on Dementia. *Canadian Medical Association Journal, 160(12), 1-15.*

Sacks, H. S., Berrier, J., Reitman, D., Ancona-Berk, V.A., & Chalmers, T. C. (1987). Meta-analysis of randomized controlled trials. *New England Journal of Medicine, 316(8),* 450-5.

Chapter 2

History of Geriatrics

Rory Fisher and Barry Goldlist

The French physician Charcot (1881) was the first to advocate for a specialty of geriatric medicine in his lecture series on medicine of old age, which were translated and published in English in 1881 (Charcot, Hunt, & Loomis, 1881). These aroused scientific interest in the field. The term "geriatrics" comes from two Greek words; "iatros" a healer and "geros" an old man, and was coined by Ignatz L. Nascher (1909), a Viennese born immigrant to the United States. In the next five years Nascher published 30 articles in the field, along with a textbook called "Geriatrics: The Diseases of Old Age and their Treatment" in 1914 (Clarfield, 2001). This textbook was well received, with a review in the Canadian Medical Association Journal stating that, "Dr. Nascher has made the subject his own and has now written a most interesting and valuable book besides". He also considered the need for a separate specialty, used the analogy of paediatrics, and suggested that geriatrics should be considered in a similar fashion (Barton, & Mulley, 2003). Though Nascher's work provided a stimulus for development of research on aging and the care of the elderly, the development of the clinical specialty occurred in the United Kingdom, much influenced by the introduction of the National Health System (NHS) after the end of the Second World War.

If Nascher was the father of geriatrics, the British physician Marjory Warren was its mother (Grimley, 1997). She took an interest in the care of the elderly, unusual for the time, and was a major force in pioneering care of the elderly. She worked at the West Middlesex Hospital, which in 1935 took over a nearby workhouse with 714 beds. She assessed every patient from the old workhouse, made appropriate diagnoses, and instituted treatment and rehabilitation where appropriate. In a major change in approach, discharges were planned when feasible. Environmental changes were instituted, and patients were encouraged to be mobile. As a result of her work, she was able to reduce the number of chronic beds to 240 and gave the unwanted beds to chest physicians for the treatment of tuberculosis (Barton, 2003). She was an advocate for a specialty of geriatric medicine, for geriatric units in acute hospitals, and for the education of medical students about care of the elderly (Warren, 1943; Warren, 1946). As a result of her work and that of other pioneers, the first geriatric consultants were appointed in the UK with the introduction of the NHS in 1948.

Geriatricians initially took over responsibility for patients in the workhouses and municipal hospitals, which had become the responsibility of the NHS. Here they concentrated on improving both the care and the environment for patients and they introduced the comprehensive assessment and the multidisciplinary approach to care that are the hallmarks of the specialty. A very valuable link to the community was developed through the establishment of geriatric day hospitals, first introduced by Lionel Cosin (1954)

in Oxford in the 1950's. As the value of geriatric services became established, geriatricians became more involved in the acute care of patients in general hospitals. Later, the concept of a close clinical relationship between geriatrics and orthopaedics was instituted in Hastings (Devas, 1974; Irvine, 1983). The first chair of geriatric medicine was established in Glasgow in 1965 (Wykes, 2001). Geriatric services gradually evolved into three models. The first model was traditional, or needs based, where geriatricians took selected referrals from other consultants for rehabilitation, or, if appropriate, placement in long term care. The second model was age defined care, based on an arbitrary age cut off, usually 75 years and over, and the third was of geriatric services fully integrated with general medicine (Barton, 2003). The specialty has grown substantially over the years and, by 2003, there were 894 consultant geriatricians in the United Kingdom (House of Commons Hansard, 2004).The care of the elderly has also been aided by the introduction of a National Service Framework for Older People (Department of Health, 2001). This framework sets out evidence based standards, which address such issues as age discrimination, patient centred care, stroke, falls, mental health in older people, and promotion of health and active life in older age.

In Canada, the development of geriatrics found a fertile ground in hospitals run by Veterans Affairs Canada, since this Department had a responsibility for the comprehensive care of entitled veterans before the introduction of a nationwide health care system. In the 1960's, there was a need to focus on care of the elderly, since the veteran population from the First World War was aging. This trend was helped by the expertise in rehabilitation developed from the care of Second World War veterans. Deer Lodge in Winnipeg was a leader in implementing specialized geriatric services for veterans, followed by Sunnybrook in Toronto in the 1970's. There were also innovations made during the following years, from Camp Hill in Halifax in the east, through St. Anne de Bellevue in Montreal, Parkwood in London, to Shaughnessy in British Columbia. These hospitals had the advantage of a combined responsibility for both acute and chronic care, bringing geriatrics into the acute field from the start. The handover of the Veterans hospitals to the various provinces allowed these geriatric services to be made available to the public at large. Also, since the transfers usually involved teaching hospitals and University connections, it allowed geriatrics to have a foot in the academic door. The introduction of universal health and hospital insurance removed financial barriers to the provision of geriatric care to the general public.

Innovations also took place in long term care homes which had religious affiliations such as Baycrest in Toronto, and Maimonides in Montreal, representing the Jewish community. St. Mary's on the Lake in Kingston, and Providence Centre in Toronto, are examples of sites supported by the Catholic community in Ontario, while St. Peter's Hospital in Hamilton was founded by the Anglican Church.

The Homes for the Aged program in Ontario appointed a consultant in geriatrics in 1953, and a decade later an acute care ward was opened at the Toronto Western Hospital for patients from the Homes for the Aged.

Geriatric services were very influenced by British models, introduced by Canadian physicians, who had visited and trained in the United Kingdom, and by geriatricians from the British Isles who immigrated to Canada. In Saskatoon and Ottawa, geriatric services were developed by prominent British geriatricians, John Brocklehurst and John Dall, who then returned to the UK.

The number of geriatricians in Canada has been increasing over the years. There were 107 in 1995, and this had risen to 204 in 2006 (Canadian Medical Association, 2006). In spite of this increase, the numbers fall short of the benchmark of one geriatrician for every 4000 people 75 years and over endorsed by the British Geriatric Society (British Geriatric Society, 1998). The Canadian "Hogan standard" (2001) is 1.25 geriatricians per 10,000 population aged 65 or older, and actual numbers are far short of that standard as well. Recruitment of new geriatricians also remains an ongoing issue.

In Ontario, A New AGEnda, Health and Social Service Strategies for Ontario's Seniors was introduced by the government in 1986 (Ontario Ministry of Health, 1986). In this document, the government announced its intention of introducing specialized geriatric services on a regional basis throughout the Province. In the following year, the Ministry of Health in Ontario issued its Guidelines for the Establishment of Regional Geriatric Programs in Teaching Hospitals, which led to the current five Regional Geriatric Programs (RGPs) in Hamilton, Kingston, London, Ottawa, and Toronto. In 1995, the RGPs published a document entitled, "Understanding the Five Regional Geriatric Programs in Ontario," which described the role, functions and benefits of the programs, and outlined the service components of geriatric assessment units, geriatric rehabilitation units, consultation teams, outreach teams, day hospitals, and geriatric clinics. Since that time, the RGPs of Ontario have continued to develop services, reaching out to communities outside the usual limits of their teaching hospital base. They have also actively advocated for improvements in care of the frail elderly. Through the Academic Divisions of Geriatrics at their Universities, they have played an important role in undergraduate and postgraduate education, and have developed an ever increasing role in research related to care of the elderly. In spite of the success of the RGPs, there remains a need to expand specialized geriatric services so that all aging Canadians have suitable access to appropriate geriatric care.

References

Barton, A., & Mulley G. (2003). History of the development of geriatric medicine in the UK. *Postgraduate Medical Journal, 79,* 229-234.

British Geriatric Society Newsletter. (1998, November). p. 21. Archived: http://www.bgsnet.org.uk

Canadian Medical Association. (n.d.). Statistical Information on Canadian Physicians. Retrieved May 5, 2006, from http://www.cma.ca

Charcot, J. M. (1881). *Clinical lectures on senile and chronic diseases.* London: New Sydenham Society.

Charcot, J. M., Hunt, L. H., & Loomis, A. L. (1881). *Clinical lectures on the diseases of old age.* New York: William Wood.

Clarfield, A. M. (2001, July). History of Geriatrics. *Annals of Long Term Care, 9, (7).* Retrieved May 1, 2008, from http://www.annalsoflongtermcare.com/article/838.

Cosin, L. (1954). The place of the day hospital in the geriatric unit. *The Practitioner, 172,* 552-559.

Department of Health (2001). *National Service Framework for Older People.* London, UK: Stationery Office.

Devas, M. B. (1974). Geriatric orthopaedics. *British Medical Journal, 1(5900),* 190-192.

Grimley Evans, J. (1997). Geriatric medicine: A brief history. *British Medical Journal, 315,* 1075-1077.

House of Commons Hansard. (2004, January 5). House of Commons Debates Session 2003-2004 Written Answers. Retrieved May 13, 2008, from http://www.publications.parliament.uk/pa/cm/cmvol416.htm

Hogan, B. (2001). Human Resources Training and Geriatrics. *Geriatrics Today: Journal of the Canadian Geriatric Society, 4,* 7-10.

Irvine, R. E. (1983). Geriatric orthopaedics in Hastings: The collaborative management of elderly women with fractured neck of the femur. *Advanced Geriatric Medicine,* 130-6.

Nascher, I. L. (1909). Geriatrics. *New York Journal of Medicine, 90,* 358-359.

Ontario Ministry of Health. (1986). *A New AGEnda, Health and Social Service Strategies for Ontario's Seniors.* Toronto, ON: Queen's Printer.

Warren, M. W. (1943). Care of the chronic sick. A case for treating chronic sick in blocks in a general hospital. *British Medical Journal, 2,* 822-823.

Warren, M. W. (1946). Care of the chronic sick. *Lancet, 1,* 841-843.

Wykes, L. (2001). Sir William Ferguson Anderson. *British Geriatrics Society.* September, 1-3. Retrieved May 13, 2008 from http://www.bgsnet.org.uk/pdf/Sept2001.pdf.

Part A: Inpatient Services

In this section, we review inpatient specialized geriatric services (SGS), largely in acute care. These include consultation services in Chapter 3, along with geriatric assessment units (GAU's), geriatric rehabilitation units (GRU's) and the combinations of the two (GARU's) in Chapter 4. In addition, we review some more specialized services surrounding common conditions of the elderly in Chapter 5. Jennie Wells, Michael Borrie and Paul Stolee review a wide-ranging literature in Chapters 4 and 5. In brief, they support careful screening and targeting so that patients are neither "too well" (so that they could receive outpatient care) nor "too sick" (so that they are unable to benefit from SGS interventions). This combined with a comprehensive geriatric assessment (CGA) and treatment using standardized tools and techniques has been shown to be effective.

Inpatient units are amenable to study by randomized controlled trial in that they operate as self-contained "total institutions"; in these institutions, it is possible to manipulate and control variables in ways that are less available in other settings. They are perhaps the best-researched elements of SGS, by the nature and traditions of healthcare; the authors note several areas that could benefit from further research.

Geriatrics consultations are an important element of SGS in terms of the numbers of patients seen. They are often the prelude admission to a geriatrics unit, in the same institution or another. In other cases, they are intended to assess patient's readiness for discharge, and if ready, to what living arrangements.

This can have an impact on patient length of stay, which has been the subject of considerable attention. In Ontario, there are extensive programs and incentives to shorten average lengths of stay – and there are anecdotal reports that some staff are hesitant to request an SGS consult because it will generate orders for more tests and therefore an increased length of stay.

It is difficult to detect the impact of SGS consults on patients, but the literature that does exist suggests, again, that careful targeting along with formal SGS follow-up is effective.

Chapter 3

Inpatient Consults

David Lewis

Clinician's Perspective: Anne Crowe, MD

The ideal geriatric consultation is a collaborative effort between the attending physician, the patient, their family caregivers, and the geriatric consultation team. The outcome should be a defined diagnosis and/or problem list and an achievable treatment plan. Consultations are also an educational opportunity for requesting physicians, who may have varying degrees of skill in geriatric assessment. While routine geriatric consultations have not been proven to improve outcomes, there is no doubt that, in selected patients, properly requested and conducted consultations are beneficial. In any case, given the current shortage of geriatricians in Canada, routine consultations are hardly feasible.

To ensure that a consultation is worthwhile, the requesting physician should clearly communicate his or her expectations to the consultant, whether it is to develop a list of differential diagnoses or problems; to recommend a course of investigations; to identify the correct diagnosis(es); or to develop a treatment or care plan. In some cases, the expectation may be that the consultant provide a second opinion to confirm the diagnosis and verify that the plan is appropriate, especially when a diagnosis is devastating or the treatment is risky, or when the patient or family are particularly anxious. The requesting physician should also ensure that all relevant information is made available to the consultant. In addition, the consultants should make him/herself aware of the wider context within which the patient exists, so that recommendations are achievable within the patient's circumstances. The better that these requirements are met, the likelier it is that the consultant's recommendations will be implemented.

This sounds simple, but geriatric care is rarely simple. Geriatrics in acute care must be viewed in the context of the broader community. Twenty-five years ago, virtually all patients had a family physician. In most community hospitals, the primary care physician was the attending physician for all but surgical cases, even in the intensive care unit. The family physician usually assisted at surgery and followed the patient daily until discharge, interacting with the consultants on a regular basis and coordinating multiple consultants in complex cases. Follow-up after discharge was seamless as the primary care practitioner had been involved at every step of the process. Today however, in all but the most rural hospitals, patients are attended by hospitalists who are unlikely to have met them previously, and who may never have practiced in the community. In addition, increasing numbers of elderly patients have no primary care physician, as family physicians retire without being able to find a replacement and aging patients move to distant communities to be closer to family. Acute care hospitalization is generally very short and there is little time

to evaluate implementation of the care plan. There may be no family members close by to ensure that follow-up appointments are kept. Outpatient services may be lacking. Home care is limited and varies greatly from one community to another. For younger patients with single system episodic illnesses, the increased skill level of the hospitalist may outweigh any loss of continuity of care. However, for the frail elderly or chronically ill patient, the lack of a bridge between inpatient care and the community may negate the benefits of hospitalization.

As the population ages and more people develop chronic illnesses and become frail, the health care system will need to address the divide between acute care and the community. There is a severe shortage of primary care practitioners in Canada. Within a publicly funded system limited resources should be directed towards those in greatest need. Clearly chronically ill patients and the frail elderly are most in need of continuity of care. Because community physicians are unable to accommodate newly discharged patients, at Grand River Hospital we have developed a nurse practitioner-run primary care clinic for chronically ill and elderly patients whose inpatient or outpatient encounter requires follow-up. New models of primary care for vulnerable patients need to be developed everywhere in Canada. For instance, primary care reform initiatives should give incentives to community primary care clinics to accept the most needy of our population on discharge from acute care.

Computerization of health records also has great potential to improve continuity of care, which to date has not been realized. Due to rationalization of hospitals, patients are forced to seek care at multiple institutions, which do not have direct access to the records of other hospitals. Most family physician's records are still using paper charts. Home care agencies have little access to any information. If a patient has no family physician, there is no one outside the hospital that has any record of previous encounters. Patients often cannot recall details of past medical care. Theoretical concerns about breaches of privacy have trumped the reality that lack of information and poor communication cause medical errors that may result in severe harm or death. Patients who are discharged may stop taking the medications they were prescribed in hospital, or add the new medications to the prescriptions they were taking prior to hospitalization. Often the family physician does not receive a timely discharge summary or medication list. For instance, I recently saw a frail, elderly diabetic patient in my office whose Glyburide had been stopped in hospital. He left his discharge medication list at home. Had I not called his pharmacy about an unrelated issue, I would not have learned this information, and would have written him a prescription renewal for Glyburide. The discharge summary arrived days after his visit. It is essential that within each health care region properly accredited professionals practicing in hospitals and in the community be given access to complete health care records, with patient consent. This would save money by preventing duplicate consultations and investigations; reduce hospital stay by giving hospitalists and consultants a head start in patient care; improve patient outcomes; and reduce the risk of medical errors.

We must strive to develop a collaborative model of geriatric care that spans the continuum of care. A consultation is supposed to be a brief encounter with the patient. For many subspecialties this is a realistic expectation. However, geriatricians deal with complex poorly defined problems and multiple chronic diagnoses. Medications may need to be

titrated over weeks or months. Drug-drug interactions may surface. Side effects may be intolerable. New problems emerge continually.   New models of collaborative care are being developed for patients with a variety of with chronic medical and psychiatric conditions to improve access to scarce specialist resources. These involve long term relationships between a consultation team and community caregivers. Because the consultant is more readily available, it is hoped that primary care practitioners will be better able to manage complex patients and that quality of patient care will be enhanced. By increasing the likelihood that consultant recommendations will be implemented and modified appropriately over time, hospitalization and permanent institutionalization may be prevented. Existing collaborative models should be adapted to geriatric care and researched to ensure that the use of geriatrician resources is efficient and effective, both within the acute care setting and in the community.

Executive Summary

Functional decline occurs in 25% to 60% of older persons after entering acute care. Evidence has shown that comprehensive geriatric assessments are effective in improving survival rates and reducing annual medical costs in acute care settings and nursing homes.

Geriatric consults involve a geriatrician and nurse and often other allied health professionals to assess the physical, emotional and cognitive function of an older patient. The types and comprehensiveness of assessments are variable.

As with any consultants, the recommendations specialized geriatric services consultants make may or may not be followed. This consultation can take place in a variety of inpatient or outpatient settings; this chapter is focused on acute-care inpatients. Geriatric consults can be used to provide recommendations for care, manage current care problems, assess a patients readiness for transfer (to a specialized geriatric service, or to rehabilitation), or plan for post-discharge care. Geriatric consults often reveal cognitive impairment in patients that were previously undiagnosed.

The most effective comprehensive geriatric assessments are those that target patients more likely to benefit from geriatric intervention such as those with remediable disabilities, older patients (age 75 and over) and those facing a transition. Follow-up services are also an integral component to successful geriatric assessment. There is conflicting evidence as to whether geriatric consults improve function or mortality, but the evidence seems to suggest that comprehensive geriatric assessments which target frailty and involve follow-up and/or outpatient care are more likely to produce favourable clinical effects. Consultation services should be directed at patients with the highest risk, while ensuring that recommendations are implemented.

Implementing a consult service involves determining the need among elderly patients and assessing the human resources available. The potential demand for geriatric consults and the benefit of such a service should be considered along with the characteristics of the institution. Criteria to consider are: patient population; patient

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functional decline; and average length of stay. A pilot program should be utilized for evaluation and recommendations. The outcomes can assess the merit or worth of the program for that specific setting.

Effective consultations require: a targeting or screening system; quick response to referrals; identifying goals and recommendations immediately; planning for follow-up consults; and tracking the outcomes. Standardized assessments which include a structured history, functional assessment, and measured cognition are recommended. Continuous evaluation of the program will assist in determining areas requiring change, services needing expansion or alteration, and to ensure the effectiveness of the geriatric assessment program.

Although evidence proving the effectiveness of geriatric consults is sparse, there are clear goals and recommendations outlined in the literature for best-practices. Geriatric consults should target patients that are more likely to benefit from assessment. A structured assessment should be implemented with a fast response to referral, recommendations for treatment, and a follow-up plan. The consultation program should be continually evaluated and adjusted to provide efficient and beneficial service.

Definition

Geriatric consults involve assessment of physical, emotional, cognitive, and functional status in older persons. A "consult" can refer to inpatient or resident care at facilities, ranging from acute-care hospitals to long-term care homes, as well as to outpatient or outreach services. The review in this Chapter will be confined to geriatric consultations in the acute-care inpatient setting.

Consults can have several purposes. They can be used to:

- assess a patient's readiness for an internal transfer from a medical or surgical unit such as cardiology or orthopaedics to a specialized geriatric service
- provide recommendations to the care teams regarding the primary or secondary prevention of common geriatric syndromes or functional decline
- manage problems that have already emerged
- evaluate a patient's readiness for transfer to rehabilitation, discharge home, or discharge to long term care and in these cases can often provide important input in the development of the plan for care post-discharge.
- assist in the formulation of a plan for care post-discharge.

A geriatric consultation often deals with issues beyond the reason for admission to hospital; for example, a patient may be admitted for hip fracture following a fall, and a consult requested to investigate the reason for the fall.

Consultants are never the most responsible physician (MRP) for the patient's care at that time and as a result the recommendations they make may or may not be followed. In part because adherence to recommendations is an ongoing issue (Allen, 1998; Cefalu, 1996; Fallon et al., 2006; Marcantonio, Flacker, Wright, & Resnick, 2001; Fa), recommendations are charted and may be communicated to the MRP more directly; there may also be follow-up until the patient is discharged and sometimes post-discharge.

Literature Search for this Chapter

A MEDLINE search was conducted, using the MeSH terms "Consultants" or "Referral and Consultation" and "Geriatrics." In addition, searches were conducted of British, American, and Canadian guidelines clearinghouses, and of the internet. This yielded 60 sources, of which 33 were focused on referrals rather than consultations, or on outpatient rather than inpatient settings. Of the remaining 27 sources 16 were empirical studies, i.e., evaluation studies, clinical trials, reviews, etc.

Table 3.1: MEDLINE Search Strategy

Step	Term	Yield
1	Consultants/ or "Referral and Consultation"/	36730
2	Geriatrics/ (6505)	6505
3	1 + 2	154
4	Limit to (humans and English language and abstracts)	60
5	Exclude outpatient and referral	27
6	Limit to research (hand search)	16

The results of this search are shown in Table 3.2

The literature shows that a variety of strategies share the rubric "consult." At a minimum, however, geriatric consults involve a geriatrician and a nurse (usually a clinical practice nurse, nurse practitioner or other advanced-degree nurse), and often other allied health professionals as well. The types and comprehensiveness of consultants' assessments may vary by purpose, by institution and even by team. Depending on the purpose of the consult, assessments may include measures of mobility, function, cognition, and screening for "geriatric giants" such as malnutrition, incontinence, polypharmacy, and/or safety. Most often a consult involves an in-depth comprehensive geriatric assessment that examines the interplay of all of these aspects in the older patient.

Rationale for Geriatric Consultations

Older adults aged 65 and over make up 13% of the Canadian population and they account for one-third of all hospital admissions and more than half of all hospital days (CIHI, 1997, as cited in Loeb, 2005) Elderly inpatients are often frail and require more recovery time than their younger counterparts. The literature shows that functional decline occurs in 25% to 60% of older persons after entering acute care (Agostini, et al. 2001 a).

Regardless of age, an in-hospital stay increases the risk of infections and adverse events such as falls, but the impact of such events is far more severe among older patients (Darchy et al., 1999; Hoffman et al., 1995; Lautenbach, Bilker, & Brennan 1999; Plouffe, et al., 1996; Simor et al., 2005). In 2002, more than 20% of elders admitted to 16 hospitals for hip fracture, pneumonia, delirium and dementia, heart failure, psychiatric disorder or stroke died in-hospital or experienced an unplanned readmission within 28 days. Another 10%, who had been admitted from home, were discharged to long-term care (Lewis et al., in-press).

Table 3.2. Studies of Multidisciplinary Geriatric Consultation Services

Study	N	Level of Evidence	Results
Allen, 1998 Becker, McVey, Saltz, Feussner, & Cohen, 1987 Saltz, McVey, & Becker, 1988 McVey, Becker, Saltz, Feussner, & Cohen, 1989	185	1	No significant differences in hospital-acquired complications (overall 38% for both groups) No statistically significant improvement in functional status (activities of daily living) No statistically significant differences in readmission or placement Compliance with recommendations: 71.7% overall (from 47-95% for selected interventions)
Fretwell, Raymond, & McGarvey, et al. 1990[1]	436	1	No significant difference in mortality at discharge No significant differences in length of stay, physical or cognitive function, or hospital charges
Gayton, 1982	222	2	No significant mortality difference up to 6 months follow-up, but trend favoring intervention group No significant differences in functional status, length of stay, or mental status between study groups
Hogan, Fox, Badley, & Mann, 1987[1]	113	1	Mortality at 4 months lower in the intervention group (p<0.05), but not at 12 months Fewer medications on discharge (p<0.05) and improved mental status (p<0.01) in the intervention group
Hogan, & Fox, 1990	132	1	Decreased 6-month mortality in the intervention group (p<0.01) No significant difference in outcomes at discharge Improved functional ability at one year but not at 3 or 6 months in the intervention group
Kennie, Reid, Richardson, Kiamari, & Kelt, 1988[17]	144	1	Intervention patients more functionally independent (p=0.005) at discharge and were discharged to home at higher rates (p=0.03)
Marcantonio, Flacker, Wright, & Resnick, 2001	126	1	Occurrence of delirium: 32% vs. 50% in control group (p=0.04) Adherence to recommendations: 77%

Ray, Taylor, Meador, Thapa, Brown, Kajihara, et al. 1997	82	1	Lower rate of recurrent falls: 19% vs. 54% in control group (p=0.03) Trend toward lower mean rate of injurious falls
Reuben, Borok, Wolde-Tsadik, et al. 1995	2353	1	No statistically significant differences in mortality at up to one-year follow-up No significant change in functional status at 3 or 12 months
Thomas, Brahan, & Haywood, 1993	120	1	Reduced 6-month mortality: 6% vs. 21% controls (p=0.01) Trend toward improved functional status in the intervention group Hospital readmission in 6-months significantly lower in the intervention group
Winograd, Gerety, & Lai, 1993	197	1	No significant mortality differences between groups No significant change in physical function, length of stay, or placement between groups Compliance with all recommendations: 67%
Trentini et al., 1995a, 1995b	4510	1	Standardized selection program improves outcomes at little cost Inpatient assessment gains are minor and transient

There is substantial evidence that comprehensive geriatric assessments (CGAs) are an effective mechanism to prevent such adverse events. They have been shown to improve survival and to reduce annual medical costs, acute care utilization, and nursing home use. The 1987 NIH Consensus Statement noted that CGAs improve diagnostic accuracy, guide care plans, direct placements in "an optimal environment for care" (e.g., placement in long-term care), predict outcomes, and monitor clinical changes. The Statement concluded that "comprehensive geriatric assessment is effective when coupled with ongoing implementation of the resulting care plan." (NIH Consensus Statement, 1987). A meta-analytic review by Stuck, Siu, Wieland and colleagues (1993) confirmed these results (see Agostini et al., 2003 b).

Usage

Inpatient geriatric consultation is an important device for delivering CGAs to hospitalized elders. Consults far outweigh most other services in terms of the numbers of patients seen. In regions covered by the five Regional Geriatric Programs of Ontario for instance, there were 5786 geriatric consults in 2003-4, compared to 3089 admissions to specialized inpatient geriatric units, 1864 to day hospital, and 4910 outreach visits. Only outpatient clinics enroll more patients (Table 3.3).

Table 3.3: Geriatric Service Volumes in Ontario, 2003-4

	Sites	Admissions/Visits
Assessment Units	10	1591
Rehabilitation Units	7	1498
Consultations	19	5786
Day Hospitals	12	1864
Outreach Services	11	4910
Outpatient Clinics	20	11891

Note: Does not include all specialized geriatric services

Agostini and colleagues (2001a) estimate that only about half of American hospitals have any SGS consult services. Local information suggests that the proportion in south-central Ontario[2] is about the same. In January 2002, for instance, geriatricians reported providing consults at 11 of 20 hospitals in the region. They served all 4 local academic health

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[2] The district covered by RGP South-central includes Brant, Haldimand and Norfolk, Halton, Hamilton, Niagara, Waterloo and Wellington - Dufferin

sciences centres, 5 of 8 large community hospitals, but only 2 of 8 small community hospitals.

Dementia and related disorders makes up the leading diagnosis for almost half of the consults in South-central Ontario (not just those in academic health centres) as shown in Table 3.4.

Table 3.4: Leading Diagnostic Categories Reported by Consultants,
South Central Ontario, 2003-4

Diagnosis	N	%
1. Senile dementia, presenile dementia	1353	44.4
2. Convulsions, ataxia, vertigo, headache, except tension headache?	216	7.1
3. Anxiety neurosis, hysteria, neurasthenia, obsessive	132	4.3
4. Osteoporosis, spontaneous fracture, other disorders of bone	116	3.8
5. Chest pain, tachycardia, syncope, shock, edema, masses	97	3.2
6. Epistaxis, hemoptysis, cough, dyspnea, masses, etc.	92	3.0
7. Psychosis, alcoholic, delirium tremens, Korsakoff's psychosis	93	3.0
8. Other cerebral degenerations	71	2.3
9. Diabetes mellitus, including complications	55	1.8
10. Pneumonia - all types	56	1.8
11. Cerebrovascular accident, acute, CVA, stroke	51	1.7
12. Congestive heart failure	48	1.6
13. Chronic obstructive pulmonary disease	47	1.5
14. Fracture- other fractures	42	1.4
15. Parkinson's disease	43	1.4
16. Hypertension, benign	39	1.3
17. Anorexia, nausea & vomiting, etc.	24	0.8
18. Asthma, allergic bronchitis	21	0.7
19. Leg cramps, leg pain, muscle pain, etc.	22	0.7
20. Metabolic disorders, other	20	0.7
21. Other diseases of central nervous system, e.g. Brain abscess	21	0.7
22. Tachycardia (also shows up in #5, paroxysmal, atrial or ventricular flutter etc.	20	0.7
23. Coronary insufficiency, acute, angina pectoris, acute	18	0.6
24. Psychoses	18	0.6
25. Other ill-defined conditions	15	0.5
26. Arteries, other disorders	12	0.4
27. Lumbar strain, lumbago, coccydynia, sciatica	11	0.4
28. All others	297	9.7
Total	3050	100

Inpatient Consultation and Comprehensive Geriatric Assessments

While some targeted geriatric consults may not require a CGA, most do. Not all CGAs are equal: the NIH Statement (1993) notes that good evidence supports only combined assessment and rehabilitation units or inpatient geriatric assessment units. Results for other settings - including inpatient consultation services -- were mixed; that is, some showed positive effects and others did not. This is because there are two major prerequisites to an effective CGA:

1. Targeting the assessment to persons most likely to benefit. These are:
   a. The oldest old (generally over age 75)
   b. Those with conditions amenable to a geriatric intervention, such as
      i. Falls, gait and balance problems
      ii. Functional limitations
      iii. Confusion
      iv. Depression
      v. Incontinence
   c. Those with potentially reversible or remediable disabilities
   d. Those at points of transition or instability (Trentini et al., 1995a; Winograd, 1991).
2. Linking assessment and follow-up services. Indeed, in some studies it is unclear whether the consult or the follow-up was the source of change.

The impact of geriatric assessment on mortality rates is not yet clear. Among the largest and most detailed evaluations of inpatient geriatric assessment was Reuben and colleagues' (1995) multisite study involving over 2300 patients. They found no significant differences in mortality or functional status at up to one-year. Although, two other studies also found no difference in mortality associated with geriatric assessment (i.e., Fretwell, et al., 1990; Winograd, et al., 1993), other studies have found that geriatric assessment is associated with improved survival. Hogan and colleagues (1987), found a significant difference in mortality rates at four month follow-up, favoring those who received geriatric assessment. Similarly, other studies, Hogan and Fox (1990) and Thomas and colleagues (1993) found that geriatric assessment was associated with lower mortality rates at six month follow-up. Gayton and colleagues (1982) also found a trend towards lower mortality rates for those who received geriatric assessment.

Similarly, the impact of geriatric assessment on readmission rates and hospital length of stay is not clear. While Campion and colleagues (1983) found no improvement in readmission rates with consults, Thomas and colleagues (1993) found those who received geriatric assessment had significantly fewer readmissions (.3 per patient) than control patients (.6 per patient). Consults had no detectable impact on hospital length of stay in three studies (i.e., Fretwell, et al., 1990; Gayton, et al., 1982; Winograd, et al., 1993). In contrast, Germain and colleagues (1995) found that the consultative services of a geriatric assessment and intervention team (GAIT), when administered to inpatients waiting for admission to a Geriatric Assessment Unit (GAU) can significantly decrease hospital length of stay and GAU burden and increase the likelihood of a home rather than institutional placement. Elliot and colleagues (1996) also found that regular input by a consulting

geriatrician reduced length of stay by seven days compared to usual care, and reduced costs. Similarly, Barker and colleagues (1985) found that a geriatric consultation team could reduce backlogs of patients awaiting discharge to long term care. Geriatric consultations for patients at risk for prolonged hospital stays, reduced the mean monthly census of elderly patients backed up in hospital by 21%.

Studies examining the impact of inpatient consultation and geriatric assessment on functional studies have found contradictory results. While some of the reviewed studies (Allen, 1998; Fretwell, et al., 1990; Gayton, 1982; Rueben et al., 1995; Winograd, et al., 1993) found no improvement in functional status as result of geriatric consultation and assessment, others have identified functional improvements Hogan and colleagues (1987), in a randomized controlled trial, found improved mental status in the intervention group and improved functional ability at one year, but not at three or six months (Hogan et al. ,1990 Post-discharge follow-up by a geriatric team may have accounted for this difference, rather than in-hospital consults (Agostini, et al., 2001a). Kennie and colleagues (1988) and Thomas and colleagues (1993) found consult patients were more functionally independent at discharge.

Inpatient consultation and geriatric assessment have the potential to reduce complications. Although, one randomized controlled trial (RCT) found no difference in hospital-acquired complications (i.e., Allen, 1998) others have found that geriatric consultation and assessment can reduce the incidence of delirium and falls. Marcantonio and colleagues (2001) found that hip fracture patients randomized to geriatric consultation were less likely to develop delirium than those who received usual care; delirium was reduced by over-third, and severe delirium reduced by over one-half. In a randomized control trial conducted in nursing homes, Ray and colleagues (1997) found that the incidence of falls in recurrent fallers was significantly lower (19%) for those who received geriatric assessment than those in the control group (54%). This may suggest that CGA, rather than inpatient consults as such, are the locus of effectiveness.

In general, there is still some ambiguity regarding the value of geriatric consultation and assessment in acute care, in terms of patient outcomes. Although, as reviewed above, there is some evidence of improvements in functional and mental status and survival associated with inpatient geriatric consultation and association it has been suggested that the benefits of inpatient CGA are minor and transient; they can be better achieved with outpatient assessment (Karpi, 1997). Highlighting the important role of community-based screening, Hébert (1997) has indicated that early detection of older adults at risk for functional impairment, via screening in Emergency Departments, at home by home services, and by family physicians, and initiation of geriatric assessment and intervention can prevent or delay functional decline. This screening will target CGA to those who will benefit most from assessment, rehabilitation, and intervention programs.

More recent interventions – including "elder-friendly" environment changes, activation or "prehabilitation" programs, and intensified efforts at infection control – show promise of reduced emphasis on some specialized geriatric services (SGS) consults by reducing the incidence of in-hospital events like delirium, falls, deconditioning, and nosocomial infection (Palmer, 1995).

Starting a Consult Service

Consult services are a familiar element of many hospitals. Compared to a specialized unit or program, consults are easier to implement and are rarely disruptive to the hospital's routine. Human resource issues are the chief difficulty facing any institution contemplating the addition or expansion of an SGS consult service, because geriatricians, geriatric psychiatrists, and allied health professionals with a gerontological focus are in short supply. For these reasons, it is especially important to ensure that the consult service is directed to where it can do most good. That can be done by targeting consults at those at highest risk, and ensuring that recommendations are implemented. To start a consult service:

1. Determine the need for an SGS consult service by the level of iatrogenic and nosocomial illness among elderly inpatients.
2. Determine the availability of human resources. The team should be small (e.g. a geriatrician and nurse practitioner, with allied health professionals available), with little rotation among members in order to enhance team cohesion and collaboration with hospital staff.
3. To maximize coverage, use geriatric nurse specialists (or a similar level of skill) in consultation with geriatric medicine.

For a consult service to be effective:

1. Use an online system to flag at-risk patients. Use a trained staff member to further screen. This may mean that some requests for consults are refused
2. Ensure capacity to respond to a request for consult within 24 hours of receipt.
3. Identify the goals of the consult immediately. As already noted, these may be evaluation of readiness for transfer or discharge, post-discharge care planning, or control or prevention of geriatric syndromes and functional decline. All consults require a structured assessment, but the nature of that assessment should be targeted to the consult's purpose: if the goal is transfer to an SGS unit, the need for a CGA is lessened (since it will take place in the unit).
4. Provide written recommendations at the time of the consult,
5. Plan for follow-up consultations to take place biweekly at a minimum, until the patient is discharged or transferred to an SGS service.
6. Track outcomes among the patients seen by the team.

Given that the impact of SGS consults remains questionable, a pilot program may be useful.

Targeting

Studies by Ray and colleagues (1997) and Marcantonio and colleagues (2001) are two among many which emphasize that SGS consults must be directed at "high-risk" elders or they will be ineffective (Winograd, 1993; Stuck, et al., 1993). Many consult services are directed at those over 75 years of age, but there may be other, more effective targeting strategies.

An Irish study (Todd, Crawford, & Stout, 1993) found systematic differences between "geriatric" and "medical" inpatients over the age of 75: the former were more often female, admitted during business hours, seen by their family physician, and had more chronic and

multiple illness with non-specific presentations, and stayed longer in hospital. Trentini et al., (1995a) showed that a standardized selection plan will help to identify the older inpatients in need of CGA. The cost of identifying appropriate candidates has been reported by Winograd, Gerety, Brown, & Kolodny, (1988) as involving a .25 FTE trained employee per year.

Rapid Response

Although Katz, Dube and Calkins (1985) found uptake of consultants' recommendations averaged 33%; more recent studies note better adherence. Winograd (1996) found 67% adherence, Cefalu (1996) 55%, Allen et al. (1998) 72%, and Marcantonio and colleagues (2001) 71%. In Cefalu's chart review, speed of team response to the request for a consult proved to be the most important predictor of implementation (see also Germain et al. 1995; Elliott, et al., 1996)

Standardized Assessment and Care

Standardized assessments are recommended throughout geriatric care (Challiner, et al., 2003). Katz and colleagues (1985), noted that a team using a structured assessment format was an efficient case finding and patient management tool. The assessment will include a structured history and functional assessment tools such as the Katz or Lawton index of activities of daily living, the Barthel Index, or the Functional Independence Measure. Cognitive function is usually measured using the Mini-Mental Status Exam, but there are many such instruments available and widely accepted.

Other elements of the assessment, while still structured, can be contingent on the reason for referral to the consult team. For example, delirium can be measured using the Confusion Assessment Method or the Delirium Rating Scale. Various versions of the InterRAI Corporation's MDS instrument includes subscales for pressure ulcers, functional performance, continence, falls, and mood.

The structured assessment aids in determining the patient care plan, but it requires a balance between thoroughness and brevity. A very thorough assessment will fatigue the patient, which in turn may produce to unreliable responses to questions. It may also limit the consult team's capacity to respond to requests for consults, effectively reducing hospital coverage. Conversely, a very brief consult may fail to detect remediable issues or may result in recommendations that are not adequately understood and therefore poorly implemented.

Focused Interventions and Follow-up

Lichtenstein and Winograd (1984) found that with a focus on "reversible conditions that affect patients' functional levels," SGS consults can improve care and prevent unnecessary long-term placement". Similarly, Dellasega and colleagues (2001) found that a geriatric assessment team was most effective among "high-risk" elders if there are focused interventions (see also MacNeil and Lichtenberg, 1997). By contrast, Kennie (1988) found no differences in discharge status between patients who received a geriatric consult and those who had standard care only.

The NIH consensus statement (1993), Stuck and colleagues' (1993) meta-analysis, and all of the studies that showed some impact following consult included frequent follow-up. The study by Marcantonio and colleagues (2001) included daily follow-up to reduce incidence of delirium after hip fracture. Gayton, Wood-Dauphinee, de Lorimer, Tousignant, and Hanley (1987) examined a consult service which included biweekly follow-up and found no significant effects. Follow-ups taking place twice a week did show some effects. In addition, some authors have described adherence to consultants' recommendations as an issue (Allen, 1998; Cefalu, 1996; Marcantonio et al. 2001).

Evaluating Consults

Needs assessment

Before implementing an inpatient SGS consult service a needs assessment should be undertaken to determine the potential demand for and benefit of such as service within the hospital. This should include considerations of the characteristics of the hospital's patient population, length of stay, adverse events, readmissions and repeat ED visits, in-hospital functional decline, and numbers of discharges to long term care. Discussions with services most likely to request a SGS consults will likely also yield valuable information.

Few inpatient units, other than rehabilitation units, routinely collect data on patient function, but the other information should be available from hospital administrative databases. Mortality rates may also be affected by SGS consults. There is considerable variation in patient demographics and diagnoses over time and between facilities, so these should be included as controls.

Pilot Program

A pilot program should be instituted in order to conduct both formative and summative evaluations. A formative evaluation aims at identifying process issues that can be improved, and would focus on volumes and lengths of stay, continuity of care, timeliness of response, and provider and patient (or proxy) satisfaction. Summative evaluation assesses the merit or worth of the program. In it, the outcomes and costs of care for patients seen by the consult team would be compared to a control. Ideally, patients will be randomly assigned to intervention and control group, but that may not be practical or ethical. A frequency-matched intact group (for instance, patients at another hospital) can be used instead.

A continuous evaluation, gathering the essential formative and summative information as agreed upon by the consult team and hospital administration, would then be in place. If the service were to be expanded, altered, or eliminated, the impact of the change would be readily detectable.

Evaluation of the consult service depends on its objectives, and these may not be readily accessible. Depending on those goals, outcomes that may be affected include iatrogenic complications such as functional decline, delirium, falls, and perhaps mortality (Agostini, Baker, Inouye, & Bogardus, 2001a), length of stay and discharge rates to long-term care.

Conclusion

Consultations use up a good deal of geriatrician and geriatric nursing time, yet the evidence for their effectiveness is sparse. Those which have been found to be effective generally prevent in-hospital adverse events. They have clear goals, short turnaround times, careful patient targeting, structured assessment, and especially frequent follow-up. These factors generally result in higher levels of adherence to recommendations.

References

Agostini, J. V., Baker, D. I., Inouye, S. K., & Bogardus, S. T. (2001a). Multidisciplinary Geriatric Consultation Services. In A. J. Markowitz (Ed.), *Making Health Care Safer: A Critical Analysis of Patient Safety Practices.* Agency for Healthcare Research and Quality. Evidence Report/Technology Assessment, No. 43. Retrieved from http://www.ahrq.gov/clinic/ptsafety/chap29.htm

Agostini, J. V., Baker, D. I., & Bogardus, S. T. (2001b). Geriatric Evaluation and Management Units for Hospitalized Patients. In A. J. Markowitz (Ed.), *Making Health Care Safer: A Critical Analysis of Patient Safety Practices.* Agency for Healthcare Research and Quality. Evidence Report/Technology Assessment, No. 43. Retrieved from http://www.ahrq.gov/clinic/ptsafety/chap30.htm

Allen, C.M., Becker, P.M., McVey, L.J., Saltz, C., Feussner, J.R., Cohen, H.J. (1986). A randomized, controlled clinical trial of a geriatric consultation team. Compliance with recommendations. *Journal of the American Medical Association, 255(19),* 2617-21

Barker, W. H., Williams, T. F., Zimmer, J. G., Van Buren, C., Vincent, S. J., & Pickrel, S. G. (1985). Geriatric consultation teams in acute hospitals: impact on back-up of elderly patients. *Journal of the American Geriatrics Society, 33(6),* 422-428.

Becker, P. M., McVey, L. J., Saltz, C. C., Feussner, J. R., & Cohen, H. J. (1987). Hospital-acquired complications in a randomized controlled clinical trial of a geriatric consultation team. *Journal of the American Medical Association, 257,* 2313-2317.

Campion, E.W., Jette, A., & Berkman, B. (1983). An interdisciplinary geriatric consultation service: a controlled trial. *Journal of the American Geriatrics Society, 31(12),* 792-6.

Cefalu, C. A. (1996). Adhering to inpatient geriatric consultation recommendations. *Journal of Family Practice, 42(3),* 259-263.

Challiner, Y., Carpenter, G.I., Potter, J., & Maxwell, C. (2003). Performance indicators for hospital services for older people. *Age & Ageing, 32(3),* 343-6.

Darchy, B., Le Miere, E., Figueredo, B., Bavoux, E., & Domart, Y. (1999). Iatrogenic Diseases as a Reason for Admission to the Intensive Care Unit: Incidence, Causes, and Consequences. *Archives of Internal Medicine, 159,* 71-78.

Elliot, J. R., Wilkinson, T. J., Hanger, H. C., Gilchrist, N. L., Sainsbury, R., Shamy, S., et al. (1996). The added effectiveness of early geriatrician involvement on acute orthopaedic wards to orthogeriatric rehabilitation. *New Zealand Medical Journal. 109(1017), 72-73.*

Fallon, W.F. Jr, Rader, E., Zyzanski, S., Mancuso, C., Martin, B., Breedlove, L., DeGolia, P., Allen, K., & Campbell, J. (2006). Geriatric outcomes are improved by a geriatric trauma consultation service. *Journal of Trauma, 61(5),* 1040-6.;

Fretwell, M. D., Raymond, P. M., McGarvey, S. T., Owens, N., Traines, M., Silliman, R. A., & Mor, V. (1990). The Senior Care Study. A controlled trial of a consultative/unit-based geriatric assessment program in acute care. *Journal of the American Geriatrics Society, 38,* 1073-1081.

Gayton, D., Wood-Dauphinee, S., de Lorimer, M., Tousignant, P., & Hanley, J. (1987).Trial of a geriatric consultation team in an acute care hospital. *Journal of the American Geriatrics Society, 35,* 726-736.

Germain, M., Knoeffel, F., Wieland, D., & Rubenstein, L.Z. (1995). A geriatric assessment and intervention team for hospital inpatients awaiting transfer to a geriatric unit: a randomized trial. *Aging-Clinical & Experimental Research, 7(1),* 55-60.

Hébert R. (1997).Functional decline in old age. *Canadian Medical Association Journal, 157(8),* 1037-45.

Hoffman, J., Cetron, M.S., Farley, M.M., Baugham, W.S., Facklam, R.R., Elliott, J.A., et al. (1995). The prevalence of drug-resistant Streptococcus pneumoniae in Atlanta. *New England Journal of Medicine, 333,* 481-6.

Hogan, D. B., & Fox, R. A. (1990). A prospective controlled trial of a geriatric consultation team in an acute-care hospital. *Age Ageing, 19,* 107-113.

Hogan, D. B., Fox, R. A, Badley, B. W., & Mann, O. E. (1987). Effect of a geriatric consultation service on management of patients in an acute care hospital. *Canadian Medical Association Journal, 136,* 713-717.

Katz, P.R., Dube, D.H., & Calkins, E. (1985). Use of a structured functional assessment format in a geriatric consultative service. *Journal of the American Geriatrics Society, 33(10),* 681-6.

Kennie, D. C., Ried, J., Richardson, I. R., Kiamari, A. A., & Kelt, C. (1988). Effectiveness of geriatric rehabilitative care after fractures of the proximal femur in elderly women: A randomised clinical trial. *British Medical Journal, 297,* 1083-1086.

Keeler, E.B., Robalino, D.A., Frank, J.C., Hirsch, S.H., Maly, R.C., & Reuben, D.B. (1999). Cost-effectiveness of outpatient geriatric assessment with an intervention to increase adherence. *Medical Care, 37(12),* 1199-206.

Lautenbach, E., Bilker, W.B., & Brennan, P.J. (1999). Enterococcal bacteremia: risk factors for vancomycin resistance and predictors of mortality. *Infection Control and Hospital Epidemiology, 20,* 318–23.

Loeb M.Epidemiology of community- and nursing home-acquired pneumonia in older adults.Expert Rev Anti Infect Ther 2005; 3(2):263-70

Lichtenstein, H., & Winograd, C. H. (1984). Geriatric consultation: A functional approach. *Journal of the American Geriatrics Society, 32(5),* 356-361.

MacNeill, S.E., & Lichtenberg, P.A. (1997). Home alone: the role of cognition in return to independent living. *Archives of Physical Medicine & Rehabilitation, 78(7),* 755-8.

Marcantonio, E. R., Flacker, J. M., Wright, R. J., & Resnick, N. M. (2001). Reducing delirium after hip fracture: A randomized trial. *Journal of the American Geriatrics Society, 49,* 516-522.

McVey, L. J., Becker, P. M., Saltz, C. C., Feussner, J. R., & Cohen, H. J. (1989). Effect of a geriatric consultation team on functional status of elderly hospitalized patients. *Annals of Internal Medicine, 110,* 79-84.

NIH Consensus Statement (1987). Geriatric Assessment Methods for Clinical Decision making. Online 19-21 [cited 2008 June 11];6(13):1-21.

Palmer, R. M. (1995). Acute hospital care of the elderly: minimizing the risk of functional decline. *Cleveland Clinical Journal of Medicine, 62,* 117-128.

Plouffe, J. F., Breiman, R.F., & Facklam, R.R. (1996). Bacteremia with Streptococcus pneumoniae: implications for therapy and prevention. *Journal of the American Medical Association, 275,* 194–198.

Ray, W. A., Taylor, J. A., Meador, K. G., Thapa, P. B., Brown, A. K., Kajihara, H. K., et al. (1997). A randomized trial of a consultation service to reduce falls in nursing homes. *Journal of the American Medical Association, 278,* 557-562.

Reuben, D. B., Borok, G. M., Wolde-Tsadik G., Ershoff, D. H., Fishman, L. K., Ambrosini, V. L., Liu, Y., Rubenstein, L. Z., & Beck, J.C. (1995). A randomized trial of comprehensive geriatric assessment in the care of hospitalized patients. *New England Journal of Medicine, 332,* 1345-1350.

Saltz, C. C., McVey, L. J., Becker, P. M., Feussner, J. R., & Cohen, H. J. (1988). Impact of a geriatric consultation team on discharge placement and repeat hospitalization. *Gerontologist, 28,* 344-350.

Simor, A.E., Ofner-Agostini, M., Paton, S., McGeer A., Loeb, M., Bryce, E., & Mulvey, M. (2005). Canadian Nosocomial Infection Surveillance Program. Clinical and epidemiologic features of methicillin-resistant Staphylococcus aureus in elderly hospitalized patients. *Infection Control & Hospital Epidemiology*, 26(10), 838-41.

Stuck, A. E., Siu, A. L., Wieland, G. D., Adams, J., & Rubenstein, L. Z. (1993). Comprehensive geriatric assessment: A meta-analysis of controlled trials. Lancet, 342, 1032-1036.

Thomas, D. R., Brahan, R., & Haywood, B. P. (1993). Inpatient community-based geriatric assessment reduces subsequent mortality. *Journal of the American Geriatrics Society, 41,* 101-104.

Todd, M., Crawford, V., & Stout, R. W. (1993). Differences between "geriatric" and "medical" patients aged 75 and over. *Ulster Medical Journal, 62(1),* 4-10.

Trentini, M., Semeraro, S., Rossi, E., Giannandrea, E., Vanelli, M., Pandiani, G., et al. (1995). A multicenter randomized trial of comprehensive geriatric assessment and management: experimental design, baseline data, and six-month preliminary results. *Aging-Clinical & Experimental Research, 7(3),* 224-33.

Trentini M, Semeraro S, Motta M; Italian Study Group for Geriatric Assessment and Management.Effectiveness of geriatric evaluation and care. One-year results of a multicenter randomized clinical trial. *Aging (Milano)* 2001; 13(5):395-405.

Winograd, C. H. (1991). Targeting strategies: An overview of criteria and outcomes. *Journal of the American Geriatrics Society, 9,* 25-35.

Winograd, C. H., Gerety, M. B., Brown, E., & Kolodny, V. (1988). Targeting the hospitalized elderly for geriatric consultation. *Journal of the American Geriatrics Society, 36,* 1113-1119.

Winograd, C. H., Gerety, M. B., & Lai, N. (1993). A. A negative trial of inpatient geriatric consultation. Lessons learned and recommendations for future research. *Archives of Internal Medicine, 153,* 2017-2023.

Chapter 4

Geriatric Assessment and Rehabilitation Units

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Frail older patients commonly manifest illness by functional decline. Admission to acute care hospital may accentuate this functional loss by limited access to therapy services, by iatrogenic illness such as medication side effects and by misdiagnosis of illness in the elderly. Given the current bed shortage in many hospitals, older patients may be discharged as soon as the presenting medical problem is stable, with little recognition of functional limitations and other geriatric concerns. This means that many older patients in hospital and patients after discharge have problems that may benefit from geriatric rehabilitation.

Patients in the community may have difficulty recovering from an illness that did not necessitate admission. It is not unusual to see older patients at home several months after an episode of "flu" who are less mobile and less independent than before the illness. Even without a specific illness to precipitate functional decline, patients with multiple medical conditions often face challenges that could be lessened by inpatient rehabilitation. In addition to the emphasis on function, inpatient geriatric rehabilitation offers an opportunity to optimize medical conditions, to assess cognitive impairment and depression and to provide respite for caregivers.

We know geriatric rehabilitation is beneficial given the work done by the authors of this chapter. However, what their research does not reflect is the immense satisfaction that working in geriatric rehabilitation can provide. It is very gratifying to conduct a family conference where the family and patient comment that they cannot believe how much better the patient is than before admission. Geriatric rehabilitation provides health professionals with the intellectual challenge of medical complexity, the positive experience of interdisciplinary teamwork, and the real pleasure of working with older patients in a setting where you can get to know them while they are getting more independent and functional.

Geriatric rehabilitation units are also an excellent setting for introducing junior trainees to the world of geriatric care. On a rehabilitation unit they are exposed to complicated medical issues, get role modeling from experienced senior staff, and see true teamwork in action. They also see the older patient in a more positive light compared with some clinical experiences in acute care settings. An inpatient geriatric unit can act as the primary clinical exposure in geriatrics for medical students and learners in occupational and physical therapy, nursing and many other disciplines. Given the high rate of cognitive issues

and depression that are manifested by patients in these units, rehabilitation may be an opportunity to expose trainees to common geriatric psychiatry issues as well.

Despite these benefits, inpatient geriatric rehabilitation does not have a high profile in health care. This may be in part because there is little work to systematically measure outcomes as recommended in the chapter that follows. Many geriatric rehabilitation units are not funded as rehabilitation at all, and are instead funded from complex continuing care. This means that professional and non-professional services may be limited by funding, and the facilities available in a given district may not be optimal for providing rehabilitation. In consequence, equitable access to appropriate rehabilitation may be denied in some areas – what the British call "treatment by postal code" – thereby impairing quality of care.

Moreover, the issue of wait times for geriatric rehabilitation has not been included in any of the recent reports on wait times. A project funded by the Ontario Neurotrauma Foundation found that providers of rehabilitation services in Ontario view wait times as a concern. Despite this concern and the evidence provided in this chapter for effectiveness, hospitals and government sometimes do not appear to view geriatric rehabilitation as a potential strategy to decrease rates of Alternate Level of Care (ALC) patients in acute care hospitals, the so-called "bed blockers". Until stakeholders recognize the need to provide consistent funding for geriatric rehabilitation units and quick access to services for community and hospital patients, geriatric rehabilitation will continue to play a relevant, but limited role in health care in Ontario.

Executive Summary

Although there are various services providing geriatric rehabilitation, geriatric assessment and rehabilitation units have been associated with greater benefits including improved physical performance and mobility; improved independence with activities of daily living; reduced likelihood of being institutionalized; lower mortality rates; and improved quality of life. Based on the literature review, it is recommended that

- Patients are screened for rehabilitation potential before admission to a unit
    - Medical assessment should be an essential component of preadmission screening.
    - Assessing cognition, motivation and depression are important factors in determining rehabilitation potential. Comprehensive geriatric assessments (CGA) should also include a nutritional assessment (see Chapter 5).
- Further research is needed to determine specific screening criteria for geriatric rehabilitation.
- Well-defined, patient-focused goals for rehabilitation are established prior to admission/ transfer. These improve the likelihood of positive outcomes and possibly reduce net costs.

In addition:
- Designation of a standardized method to assess instrumental functionality would assist in objectively documenting physical, cognitive, emotional, and functional

conditions and aid in the diagnosis and measurement of rehabilitative outcome.
- Interdisciplinary teams increase patient satisfaction, lower length of stay in hospitals, lower hospital costs, and reduce declines in functional health. The evidence supports the following recommendations:
    o the team should be trained in care of the elderly and managed by a physician
    o the physician and pharmacist should complete a medication review

Some issues of caring for seniors in a rehabilitation setting are not well understood. More research is needed to identify which older persons will benefit most from CGA and geriatric rehabilitation. Further research is also needed to help define which rehabilitation settings are most appropriate and cost effective and to help define which benefits of rehabilitation are achieved and sustained.

Introduction

Geriatric rehabilitation has been defined as "evaluation, diagnostic, and therapeutic interventions whose purpose is to restore functional ability or enhance residual functional capability in elderly people with disabling impairments" (Boston Working Group, 1997, p. 4). In general, the benefits of geriatric rehabilitation are well documented (Ettinger et al., 1997; Goldstein, Strasser, Woodard, & Roberts, 1997; Joseph & Wanlass, 1993; Reid & Kennie, 1989). Although various services providing rehabilitation for frail older persons have been described in the literature, such as hospital based geriatric assessment and rehabilitation units (Applegate, et al., 1990b), inpatient geriatric consultation services provided to patients in non-designated units (Reuben et al., 1995; see Chapter 5), community-based geriatric assessment and intervention programs (Hendriksen, Lund, & Stromgard, 1984), and outpatient geriatric clinics (Cohen, et al., 2002; see Chapter 7), greater benefits have been associated with geriatric assessment and rehabilitation units (Applegate et al., 1990b; Rubenstein et al., 1984).

Outcomes associated with geriatric rehabilitation units (GRUs) include improved physical performance and mobility, improved independence with activities of daily living (Cohen et al., 2002; Liem, Chernoff, & Carter, 1986), reduced likelihood of being institutionalized, and lower mortality rates (Applegate et al., 1990b; Rubenstein et al., 1984), improved quality of life (Cohen et al., 2002), improved continence (Karppi, 1995; Liem, Chernoff, & Carter, 1986), and reduced time (subsequent to discharge) in nursing home or acute care facilities (Rubenstein, et al., 1984).

Much of the evidence supporting geriatric assessment and rehabilitation stems from the evaluation of geriatric assessment units (GAUs). GAUs and GRUs have many similarities. Both provide rehabilitation with an interdisciplinary team trained in the care of the elderly, with attention to medical, psychosocial, and functional issues. Treatment plans are established and reviewed in regular team meetings with therapeutic and rehabilitative goals (Rubenstein, et al., 1986). In GAUs, there is more emphasis on medical treatment and evaluation, and rehabilitation goals are usually short term. In GRUs, there is a greater emphasis on rehabilitation and achieving maximal function. Specialized GAUs and GRUs are designed to approach the medical evaluation of the frail elderly from an interdisciplinary

perspective. In geriatric rehabilitation, small gains in several areas may result in improved functional status. Attention is given to medical illnesses, as well as to the preservation and restoration of functional status.

Despite the support for geriatric rehabilitation, the practices that account for enhanced outcomes are not well described and there is no gold standard for rehabilitation of geriatric patients (Lokk, 1999). It has been suggested that there is a greater need for more research in geriatric rehabilitation to address best practices, as well as consensus on interventions and outcome measures (Hoenig, Nusbaum, Brummel-Smith, 1997; Lokk, 1999).

The objectives of this chapter are: 1) to identify evidence-based practices in geriatric rehabilitation and, based on this, to provide recommendations about some of the processes of geriatric rehabilitation; and 2) to describe current rehabilitation practices in GRUs in Canada and to determine whether these practices are consistent with the literature.

Literature Review

A comprehensive literature review was conducted to investigate evidence-based best practices in geriatric rehabilitation. The search strategy for this review included the systematic search of several computerized bibliographic databases (MedLine, CINAHL, and the Cochrane Library), using the following key words: geriatric, elderly, frail, geriatric rehabilitation, rehabilitation, inpatient and outpatient geriatric rehabilitation, assessment, outcomes, outcome measures, long-term care, home care, community, and geriatric day hospital. The search was limited to articles published between 1980 and 2005 and to English and French language journals. A second search strategy limited parameters to randomised control trials (RCTs), age over 65 years, used no language exclusion, and used the key word: geriatric rehabilitation. Articles were retained for review when they focused on geriatric rehabilitation and inpatient geriatric rehabilitation. Articles were excluded from review when they were unrelated to geriatric rehabilitation, were anecdotal or descriptive reports on a small number of patients, or were related to geriatric day hospitals (for a systematic review of geriatric day hospitals see Forster, Young & Langhorne, 1999; see also Chapter 7).

A total of 336 articles were retained for review and were assigned a standardized level of evidence consistent with those used in a Canadian consensus conference on dementia (Patterson, et al., 1999). These levels of evidence are described in Table 4.1. Systematic reviews and meta-analyses were assigned a level 1. Of the articles reviewed, 116 were level 1 evidence, 39 were level 2, and 189 were level 3 evidence.

The clinical themes derived from this literature were defined by the number and quality of published articles. These themes were organized to represent the clinical processes of geriatric rehabilitation from pre-admission assessment to clinical management (screening for admission, comprehensive geriatric assessment, assessment tools, interdisciplinary teams) and patient care of common clinical problems for frail older persons (hip fracture, stroke, nutrition, dementia, and depression).

Table 4.1: Levels of Evidence (Patterson et al., 1999)

Levels of Evidence
Level 1: Evidence from at least one randomized control trial
Level 2: Evidence from well-designed controlled trials without randomization or from well-designed cohort or case control analytic studies
Level 3: Evidence supported by consensus statements from experts, opinions from respected authorities, descriptive studies, or reports of expert committees.

Evidence-Based Clinical Processes of Geriatric Rehabilitation

Screening for Admission

Selecting appropriate patients for inpatient geriatric rehabilitation involves identifying individuals with complex problems but who may potentially benefit from rehabilitation. Although careful patient targeting has been advocated as a method of improving the outcomes of services for older persons, variations in targeting practices have lead to inconsistent results in studies of geriatric rehabilitation (Rubenstein, Stuck, Siu, & Wieland, 1991; Stuck, Siu, Wieland, Adams, & Rubenstein, 1993). When selecting patients for geriatric rehabilitation, the dimensions used to define frailty should be assessed: functional impairment, medical complexity, psychological functioning, and social support (Mosqueda, 1993). Patients who are too medically unstable or who are more appropriate for palliative care and those who can remain at home and be treated as outpatients should be excluded (Miller, Applegate, Elam, & Graney, 1994; Man-Son-Hing, Power, Byszewski, & Dalziel, 1997; Wieland & Rubenstein, 1996).

Comprehensive geriatric assessment consensus conferences have supported patient targeting for rehabilitation. Rubenstein, Josephson, Wieland and Kane (1986) described the categorization of patients into diagnostic and prognostic groups to target the most appropriate patients for specialized geriatric inpatient care. Patients over age 65 were classified in to five categories: (1) geriatric evaluation unit candidate (patient has medical, functional, or psychological problems preventing discharge home); (2) severely demented; (3) medical (patients with a single medical disease); (4) terminal, or palliative; and (5) independent. Several separate meta-analyses have defined targeting by whether the trials excluded "too healthy" subjects or "subjects with poor prognosis" (Stuck, et al., 1993; Wieland, Stuck, Siu, Adams, & Rubenstein, 1995). Studies that used targeting were more likely to show improved outcomes (Wieland, et al., 1995). Moreover, targeting patients for geriatric evaluation in inpatient units may improve cost effectiveness (Wieland & Rubenstein, 1996).

Medical assessment is an important component of preadmission screening. A cohort study of 507 acutely hospitalized male veterans aged 65 years and over showed that patients with greater numbers of targeting criteria at admission (e.g., polypharmacy, confusion, falls) were more likely to have poor outcomes, including nursing home

placement, longer hospital stays, and mortality at 12 months (Satish, Winograd, Chavez, & Bloch, 1996). Although targeting acutely ill, geriatric inpatients with potentially remediable geriatric syndromes (polypharmacy, confusion, falls) for geriatric services may prevent adverse outcomes, a recent study of 110 GRU patients suggested that there may be a threshold of severe comorbidity above which poorer rehabilitation outcome may be expected (Patrick, Knoefel, Gaskowski, & Rexroth, 2001). Further research is needed to refine the screening criteria for rehabilitation potential in geriatric rehabilitation.

Cognitive screening is also important in assessing rehabilitation potential (Ruchinskas, Singer, & Repetz, 2001). Inability to understand instructions or remember information may hinder therapy. Nonetheless, recent studies (Diamond, Felsenthal, Macciocchi, Butler, & Lally-Cassady, 1996; Goldstein et al., 1997; Heruti, Lusky, Barell, Ohry, & Adunsky, 1999; Patrick, Leber, & Johnston, 1996; Ruchinskas, Singer, & Repetz, 2001) suggest that some cognitively impaired patients may benefit from geriatric rehabilitation. One longitudinal study (Goldstein et al., 1997) of patients with hip fracture found that although cognitively intact patients had higher levels of mobility at discharge, both cognitively impaired and intact patients improved similarly in sphincter control, locomotion, self-care, and motor function. Thus, some cognitively impaired geriatric patients should be considered for rehabilitation.

Patient motivation is sometimes used in assessing potential for rehabilitation success. It has been suggested that patients with low motivation to participate in geriatric rehabilitation have lower rehabilitation potential than do patients with high motivation (Mosqueda, 1993). Depression can influence a patient's motivation level. Depressed patients may be less motivated to participate in therapy, which, in turn, may delay discharge. Treating depression, however, should improve motivation and outcomes (Teasell, Merskey, & Deshpande, 1999). Low motivation to participate in rehabilitation should not necessarily be grounds for exclusion. It is possible, for example, that a patient may be perceived as "poorly motivated" when the goals set by the interdisciplinary team are not patient-focused. When this occurs, blame is transferred to the patient when there is no substantial functional improvement (Resnick, 1996; See Chapter Five).

Motivation to participate in rehabilitation may be fostered. In a study of 77 GRU patients, 37 participants were randomly assigned to a treatment group (40 to a control group of usual geriatric rehabilitative care) of interventions consisting of verbal persuasion, role modeling, and physiologic feedback (Resnick, 1998). Motivation was assessed by four measures of self-efficacy and a participation index. Outcome measures included a functional measure and two pain measures. The treatment group experienced less pain, had greater participation and efficacy beliefs related to participation, and had improved functional performance compared with the control group at discharge.

Based on the literature evidence, it is recommended that: (1) patients should have preadmission screening for rehabilitation potential before admission to a GRU (level 3 evidence; Mosqueda, 1993; Patrick et al., 2001; Ruchinskas et al., 2001; Wieland & Rubenstein, 1996); and (2) the screening process should be used to establish well-defined, patient-focused goals for rehabilitation (level 3 evidence; Mosqueda, 1993; Resnick, 1996;

Wieland & Rubenstein, 1996). Table 4.2 presents a summary of all the evidence based recommendations for GRU best practices generated from this literature review.

**Table 4.2: Summary of Evidence-Based Recommendations for
Geriatric Rehabilitation Unit Best Practices**

Geriatric Rehabilitation Best Practices

Admission Screening
- Patients should have preadmission screening for rehabilitation potential prior to admission to a GRU (level 3 evidence).
  - Assess: functional impairment, medical complexity, psychological functioning, and social support.
  - Exclude: patients who are too medically unstable, more appropriate for palliative care, or can be treated at home as outpatients.
- The screening process should be used to establish well-defined, patient-focused goals for rehabilitation (level 3 evidence).

Comprehensive Geriatric Assessment (CGA)
- CGA is important for frail older persons with rehabilitation needs (level 3 evidence).
- Close medical supervision and concomitant treatment for intercurrent and comorbidities is important (level 3 evidence).

Assessment Tools
- Assessment tools should be used to aid in diagnosis and to measure outcome of rehabilitation (level 3 evidence).

Team Approach to Care
- Geriatric rehabilitation should have an interdisciplinary team approach (level 1 evidence).
- Medical care and rehabilitation should be managed by a physician and team trained in care of the elderly (level 1 evidence).
- The rehabilitation team physician and pharmacist should complete a medication review (level 3 evidence).
- Patients with complex medication regimes who are returning to community living may benefit from a self-medication program (level 1 evidence).

Hip Fracture
- Frail older persons with hip fracture should receive geriatric rehabilitation (level 1 evidence).

Nutrition
- Frail older rehabilitation patients should receive nutritional screening (level 3 evidence).
- Nutritional supplements should be provided to under-nourished frail older rehabilitation patients (level 1 evidence).
- Treatment plan and dietary interventions should be provided to for frail older patients with dysphagia (level 2 evidence).
- Gastrostomy tube feeding is superior to nasogastric tube feeding for older stroke patients with severe dysphagia (level 1 evidence).
- The nutritionally at-risk older patient with hip fracture may benefit from nutrition supplementation (level 1 evidence).

Depression
- Frail older rehabilitation patients should be screened for depression and treatment plans initiated when appropriate (level 3 evidence).

Cognitive impairment
- Frail older patients should be screened for cognitive impairment (level 2 evidence).
- Frail older rehabilitation candidates with mild to moderate dementia should not be excluded from rehabilitation (level 1 evidence).

Comprehensive Geriatric Assessment

As noted in Chapter 3, the best evidence for the efficacy of CGA has been produced for inpatient rehabilitation. CGA involves a multidimensional team approach that determines an older person's biomedical, psychosocial, and environmental needs so that an appropriate treatment and follow-up plan can be initiated. CGA involves a medical and rehabilitation approach, as well as an assessment of vision, hearing, cognition, depression, and functional status. It has been shown in the inpatient setting to improve cognition, improve functional status, prevent placement in a nursing home, reduce readmissions to hospital, and lower mortality (Applegate, et al., 1990b; Rubenstein, et al., 1991; Stuck, et al., 1993; Scott, 1999). A meta-analysis of CGA (total of 28 RCTs; CGA patients n = 4959; control group n = 4912) demonstrated that, for both inpatients and outpatients, CGA associated with long-term management is effective in improving survival and function (Stuck et al., 1993).

The results of cost effectiveness of geriatric evaluation and care are mixed. Miller and colleagues' analysis (1994) of a RCT by Applegate and colleagues (1990b; geriatric care n = 78; usual care n = 77) showed that the improved outcomes in the geriatric group were not associated with decreased cost of later medical service after one year of follow-up. In contrast, Rubenstein, Josephson, Harper, Miller and Wieland (1995) demonstrated reduced costs for institutional care, fewer hospital readmissions, higher morale and functional status, and lower mortality and nursing home placement in an RCT of geriatric assessment patients

compared with usual care (treatment group n = 63; control group n = 60). The cost of care in a geriatric unit was shown to be no different than standard care over three years and care in the geriatric unit resulted in lower mortality without compromising quality of life. Consistent with this, Trentini, Semearo, and Motta (2001), in an outpatient setting, showed that frail elderly patients randomized to CGA (n = 79) had improved mental status, morale, and function, and reduced hospital and nursing home admission. CGA patients received more homecare and outpatient service than usual care patients (n = 73), resulting in equivalent total health care expenditure.

While in rehabilitation, frail older persons often have active medical problems and comorbidities that require close medical management. Patrick and colleagues (2001) found that 66% of GRU patients had 6 or more co-existing illnesses. Felsenthal, Cohen, Hilton, Panagoes and Aiken (1984), documented in a rehabilitation setting that 3.7 medical interventions were required per patient (N = 82; M age = 74 years; M length of stay [LOS] = 28 days). Wilkinson, Buhrkuhl and Sainsbury (1997), reported that of 200 patients in a GRU (age range = 60-98 years; M age = 80.5 years; M LOS = 28 days), 86% required medical intervention and 49% had their rehabilitation course complicated by medical illnesses.

The CGA approach to geriatric rehabilitation assesses the contribution of multiple medical problems and has been shown to uncover new diagnoses that were previously unrecognized and untreated (Epstein et al., 1990; Winograd, 1987). Despite the multifactorial nature of disability and the burden of comorbidity, geriatric rehabilitation has improved the health and function of many frail older persons (Applegate, et al., 1990b; Harris, O'Hara, & Harper, 1995; Liem, et al., 1986; Mason & Bell, 1994; Rubenstein, et al., 1984; Straus, et al., 1997). A review of models of geriatric care from 1984 to 1998 concluded that inpatient geriatric units providing rehabilitation for selected older patients offer proven benefits and should be available in all general hospitals (Scott, 1999).

The literature supports the following conclusions for frail older persons receiving rehabilitation: (1) CGA is important for frail older persons with rehabilitation needs (level 1 evidence; Rubenstein, et al., 1984; 1991; Stuck, et al., 1993), and (2) because many patients in geriatric rehabilitation have intercurrent illnesses and comorbidities, close medical supervision and concomitant treatment is important (level 3 evidence; Felsenthal, et al., 1984).

Standardized Assessment Tools

The need for standardized assessment tools in geriatric assessment and rehabilitation stems from the development of CGA and the assessment of objective components of frailty. Physicians often underestimate the extent of disability that a patient has in basic activities of daily living (ADLs). Further, physician recording of the level of function in medical notes is poor (Rodgers, Curless, & James, 1993). Impairment in physical function, mental status, continence, emotional status, vision, and gait are notable examples that can be under-documented. By using standardized assessment tools, CGA can objectively document physical, cognitive, emotional, and functional conditions (Applegate, Blass, & Williams, 1990a; Miller, Morley, Rubenstein, Pietruska, & Strome, 1990; Pinholt, et al., 1987). Agreement on which tools should be used consistently would help facilitate multicentre

trials and the development of benchmarks in geriatric rehabilitation. Table 4.3 presents the most commonly used tools in the context of CGA and inpatient geriatric rehabilitation settings as reported in the literature.

Table 4.3: Commonly Used CGA and Geriatric Rehabilitation Assessment Tools

Assessment Tools

Individualized Assessment
    Goal Attainment Scaling (GAS)
 	
Functional Capability
    Barthel Index, Modified Barthel Index
    Functional Independence Measure (FIM™)
 	
Activities of Daily Living
    Katz Activities of Daily Living Scale
    Lawton-Brody assessment
 	
Gait and Balance
    Timed up and go (TUG) test
    Berg Balance Scale (BBS)
 	
Cognitive Functioning
    Folstein Mini-Mental State Examination (MMSE)
    Clock drawing test
 	
Depression
    Geriatric Depression Scale (GDS)
    Even Briefer Assessment Scale for Depression (EBAS-DEP)
    Cornell Scale for Depression in Dementia
 	
Medical Complexity (comorbidity)
    Cumulative Illness Rating Scale
 	
Health Status, Quality of Life
    Rand MOS Measures (SF-36, SF-12, SF-8)
    Duke 17
    Quality of Life in Alzheimer's Disease (QOLAD)
    Quality of Life in Dementia (QOLID)

Assessment and reassessment of a patient's individual functional problems monitor improvement during rehabilitation. The Barthel Index and the Functional Independence Measure (FIM™) instruments are commonly used functional measures (Pinholt et al., 1987). The Barthel Index was developed for people with neurological or musculoskeletal disabilities to assess performance before admission and after discharge from a rehabilitation program. A Modified Barthel Index comprises 10 items focusing on ADLs. It is easy to administer; scores correlate well with length of stay and it also has high intra- and interrater reliability. However, it is not particularly responsive to change, and falls short in sensitivity in the higher and lower ranges (Pinholt, et al., 1987). The FIM™ is based on the Barthel Index and is a valid, sensitive measure of functional status in the elderly. It rates 18 functional activities on scales of relative independence from 1 to 7. There are six domains including self-care, sphincter control, mobility, locomotion, communication, and social cognition (McDowell & Newell, 1996).

In the geriatric population, there are often multiple goals based on the individual patient's complex medical, social, and functional problems. One approach to address the complex and individualized nature of these problems for geriatric patients is the use of an individualized measure such as goal attainment scaling (GAS). GAS addresses complexity by identifying and scaling disparate, individualized goals for each patient (Kiresiuk, Smith, & Cardillo, 1994). Although GAS was developed in the 1960's for use in human service and mental health programs, it has more recently been applied to the geriatric rehabilitation setting (Stolee, Rockwood, Fox, & Streiner, 1992). It has been shown to be valid, reliable, responsive to change, and practical to use in a variety of settings in the care of the elderly (Stolee, et al., 1992; Rockwood, Joyce, & Stolee, 1997; Rockwood, Stolee, & Fox, 1993; Yip, et al., 1998). GAS is more responsive to change than other standardized measures, such as the Barthel Index, Nottingham Health Profile, and Mini-Mental State Examination (MMSE; Stolee, Stadnyk, Myers, & Rockwood, 1999).

ADLs and instrumental activities of daily living (IADLs) are carefully documented in CGA and in the geriatric rehabilitation setting. The Katz ADL scale is widely used. It has the advantage that it can be completed by the patient or caregiver. It is brief, reliable, and valid, but it is not very sensitive to change (Studenski & Duncan, 1993). The Lawton-Brody assessment is a scale for self-care ADL and IADL (Lawton & Brody, 1969). It has proven to be valid and reliable in the older population (Israel, Kozarevic, & Sartorius, 1984).

Tests of specific function are also commonly used in CGA and the geriatric rehabilitation setting. Assessment of gait and balance is one example. The Timed Up and Go (TUG) test involves timing a patient as he/she rises from a chair, walks 10 feet, turns around, walks back to the chair and sits down. The TUG test has been shown to be reliable, valid, easy to administer, and it correlates well with tests such as the Berg Balance Scale (BBS) and Barthel Index. It also predicts a patient's ability to walk safely alone outside (Podsiadlo & Richardson, 1991).The Berg Balance Scale (BBS) is a well-known tool for assessing balance that has been developed and validated for use in the elderly population (Berg, Wood-Dauphinee, Williams, & Grayton, 1989). It consists of 14 common movements required for balance and mobility in everyday life. The items are graded on a scale of 0 to 4, giving a total of 56 points, with higher scores representing better performance. The test is simple to

administer, safe to perform, and takes about 15 minutes to complete. Intra- and interrater reliability are high (Berg, et al., 1989).

A cognitive assessment is an essential part of a CGA. Luxenberg and Feigenbaum (1986) have noted that in non-geriatric inpatient rehabilitation settings physicians tend to be unaware of the cognitive problems of their patients unless cognitive impairment was documented before admission. They suggest that cognitive testing be administered routinely for patients in a rehabilitation ward. The best-known measure of cognitive functioning in older persons is the Folstein Mini-Mental Status Examination (MMSE; Folstein, Folstein, & McHugh, 1975). It has been extensively validated, is easy to administer, and has been standardized (Molloy, Alemayehu, & Roberts, 1991). The clock drawing test is a quick, valid cognitive test of executive function and spatial orientation that correlates well with general cognitive ability and rehabilitation outcome (Ruchinskas, et al., 2001).

Several assessment tools are commonly used to assess symptoms of depression. The Geriatric Depression Scale (GDS) is a brief self-administered questionnaire that has been proven to be valid and reliable in older persons who are not cognitively impaired (Yesavage, et al., 1982). The Even Briefer Assessment Scale for Depression (EBAS-DEP) is also valid and reliable and easy to use in the elderly (Allen, et al., 1994). Both of these tools are commonly used in geriatric assessment settings. Seniors with dementia usually lack the insight to provide reliable responses to the GDS and EBAS-DEP. The Cornell Scale for Depression in Dementia is more appropriate to assess depressive symptoms in those with cognitive impairment. The Cornell scale has been validated with both cognitively intact and impaired patients. It is also easy to administer and makes use of both patient assessment and caregiver reports (Alexopoulos, Abrams, Young, & Shamoian, 1988a; 1988b).

The Cumulative Illness Rating Scale (CIRS) has been designed specifically to assess medical comorbidities and complexity (Linn, Linn & Gurel, 1968). The CIRS measures 13 bodily systems to give a comorbidity index and total cumulative illness rating score. This tool has been validated as a measure of medical complexity for frail older persons (Parmalee, Thuras, Katz, & Lawton, 1995). The comorbidity index, in conjunction with other indices of function (e.g., FIM™ or Barthel Index) can capture a patient's level of frailty.

Based on the evidence, it is recommended that assessment tools be used to aid in diagnosis and to measure outcome of rehabilitation (level 3 evidence; Folstein, et al., 1975; Rockwood, Stolee, & Fox, 1993; Stolee, Rockwood, Fox, & Streiner, 1992; Stolee, et al., 1999; VanSwearingen & Brach, 2001).

Interdisciplinary Teams

There is much support for an interdisciplinary team approach to geriatric rehabilitation (Applegate, et al., 1990b; Hughes & Medina-Walpole, 2000; Lokk, 1999; Rubenstein et al., 1984; 1988; 1995; Toseland, et al., 1996; Williams, Williams, Zimmer, Hall, & Podgorski, 1987). A purely multidisciplinary approach merely implies that there are multiple disciplines working on the care of a patient (Weber, Fleming, & Evans, 1995). Key features of effective interdisciplinary geriatric rehabilitation teams are summarized in Table 4.4.

Nursing staff have been identified as key members of the rehabilitation team (Covinsky, et al., 1998). Nurses often spend significantly more time with patients than other

team members and can more directly assess their functional progress and psychosocial needs. Nurses in geriatric rehabilitation can also prevent muscle deconditioning by encouraging patients to strive for independence in activities (Harris et al., 1995). In a study of 251 geriatric rehabilitation patients, nursing interventions aimed at bladder retraining and self-administration of medication were found to decrease urinary incontinence and retention and to improve knowledge of medications (Resnick, Slocum, Lynn, & Moffett, 1996). Other evidence suggests that the empowerment of patients by nurses is essential in clinical management, and contributes to decreased hospital costs, length of stay, and improved short-term functional outcomes (Covinsky et al., 1998).

Table 4.4: Key Features of Effective Interdisciplinary Geriatric Rehabilitation Teams

Key Features
- Primary functions are assessment, treatment, and discharge planning   - Membership includes physicians, nurses, social workers, occupational therapists, physiotherapists, speech therapists, psychologists, and pharmacists (See Table 4.1)   - Primary goal is to maximize the patient's functional independence   - Joint decision making and responsibility with open communication, cooperation, and respect for each team members' expertise   - Negotiation of roles and tasks to accomplish mutually defined goals   - Leadership tends to be vested in the discipline with the highest status   - Nursing staff play a key role in the clinical management of patients, particularly assessment and fostering independence in activities   - Medication review by physicians and pharmacists to reduce drug interactions and complication in frail older persons   - Self-medication programs for patients with complex medication regimes   - Discharge planning, including a home visit(s) conducted by a team member   - Collaborative relationships between team members, patients, and family members, particularly around discharge planning

Pharmacists play an important role in the assessment of the frail elderly. A medication review by the team physician and pharmacist is considered a standard component of a CGA. Its role is to reduce drug interactions and complications in frail older persons (Seymour & Routledge, 1998). Recommendations from a pharmacist have been shown to help with discharge planning, to reduce the total number of medications, and to reduce readmission to hospital because of medication complications (Romonko & Pereles, 1992). Self-medication programs assess patients' ability to manage medications independently and involve a coordinated approach with input from both nurse and pharmacist. Self-medication programs in the geriatric rehabilitation setting have been shown to improve morale, independence, patient knowledge about their complex medication regimens (Platts, 1989), and compliance (Pereles et al., 1996).

The primary goal of interdisciplinary teamwork is to maximize patients' functional independence. In a RCT comparing the effectiveness of a team-oriented geriatric assessment and evaluation to traditional care by an internist, patients receiving the team approach had significantly fewer hospital days and lower annual hospital costs per patient after one year (Williams, et al., 1987). Another controlled trial comparing 205 older patients receiving geriatric team care in an outpatient geriatric clinic versus a general medical clinic found that patients receiving team care had significantly less decline in functional health on the total Sickness Impact Profile and its physical dimension (Yeo, Ingram, Skurnick, & Crapo, 1987).

Interdisciplinary teams appear to increase patient satisfaction with care. In a RCT comparing outpatient geriatric assessment and management to usual outpatient primary care, frail older patients receiving geriatric team assessment and management reported higher satisfaction with geriatric services (Toseland, et al., 1996).

In addition to assessment and treatment, interdisciplinary teams are also involved in the process of early discharge planning. Discharge planning should involve collaboration between the interdisciplinary team, patient, and family members (Simmons, 1986). Bull and Roberts (2001) conducted semi-structured interviews with health care professionals from two wards in a 78-bed geriatric rehabilitation hospital. Participants consistently noted the importance of geriatric teams and continuous communication as components of "proper discharge". Team coordinated geriatric discharge planning services have been found to decrease the percentage of beds for patients awaiting long-term care and increased the percentage of patients returning to community living (Brymer, et al., 1995).

The role of the team approach in geriatric rehabilitation discharge planning is generalized from other settings. In stroke patients, for example, early hospital discharge combined with home-based rehabilitation has been shown to be as effective as usual care (Anderson, et al., 2000; Mayo, et al., 2000; von Koch, Widen Holmqvist, Kostulas, Almazan, &de Pedro-Cuesta, 2000).

Discharge planning may involve a home visit(s) from a member of the interdisciplinary team. In a RCT of 530 older persons recruited from selected hospital wards, those patients receiving a home visit by an occupational therapist to assess environmental hazards and to make necessary home modifications were less likely to fall than the control group at one-year follow-up (Cumming, et al., 1999). This intervention reduced the number of falls in patients who had a history of falls.

The evidence from the literature supports the following recommendations: (1) geriatric rehabilitation should have an interdisciplinary team approach (level 1 evidence; Applegate, et al., 1990b; Rubenstein et al., 1984; 1988; Williams, et al., 1987; Yeo, et al., 1987); (2) medical care and rehabilitation should be managed by a physician and team trained in care of the elderly (level 1; Applegate et al., 1990b; Rubenstein, et al. 1984; Scott, 1999); (3) the rehabilitation team physician and pharmacist should complete a medication review (level 3; Romonko & Pereles, 1992: Seymour & Routledge, 1998); and (4) patients with complex medication regimes who are returning to community living may benefit from a self-medication program (level 1; Pereles, et al., 1996).

Geriatric Rehabilitation in Canada

As mentioned earlier, there is no gold standard for rehabilitation (Lokk, 1999), and it is not clear whether there is consistency in rehabilitation practices in GRUs across centers. Canadian academic Geriatric Medicine centres were surveyed to identify best practices in geriatric rehabilitation, to determine whether these are consistent with those described in the literature, and to determine whether there is any consistency in the use of assessment tools and outcome measures (Borrie, Stolee, Knoefel, Wells, & Seabrooke, 2005). A survey to identify practices and commonly used assessment tools and outcome measures in geriatric rehabilitation was developed based on the literature review described above. The rehabilitation process was divided into the following processes of care: preadmission screening, admission, team processes and interventions, tools for assessment, monitoring and outcome measurement, and discharge planning and follow-up. Outcome measures were defined as measurement tools that are completed on admission and discharge and reflect changes in function and cognition that may occur while on a rehabilitation service.

The survey was distributed electronically to the Chair or Head responsible for Geriatric Rehabilitation Units (GRUs), Geriatric Day Hospitals (GDHs), Chronic Care Units (CCUs), and outpatient facilities (OFs) at each of the 17 Canadian academic Geriatric Medicine Divisions and Departments. Data from the 17 Geriatric Rehabilitation Units will be the focus of this discussion[*]. The average age of patients in the GRUs was 81 years, and the gender distribution across the GRUs was relatively consistent. The mean number of admissions to the GRUs per year was 175. The average number of beds across the GRUs was 30, with an occupancy rate of 88% and average length of stay of 44 days.

Table 4.5 presents GRU preadmission and admission processes and practices. The majority of GRUs (N = 13; 76.5%) require a preadmission assessment for patients and all of these are completed by a specialist in geriatric medicine. Applications for "back-up" long-term care discharge options are not commonly required by GRUs. Potential to benefit, motivation and willingness to participate, endurance for therapy and medical stability were commonly identified admission criteria. Conversely, terminal illness, medical instability, cognitive impairment, and poor motivation were commonly identified exclusion criteria. While admission practices for almost all of the GRUs (N = 16; 94%) require physiotherapist completed mobility assessments immediately after admission, fewer GRUs require an admission medical history and physical examination completed by a specialist in geriatric medicine, or provide information packages prior to or at admission (N = 10; 58.8%, respectively).

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[*]This data reflects care provided in designated rehabilitation units and does not include rehabilitation care that is provided outside of these units (e.g., in complex continuing care units where rehabilitation may be provided in beds that are not specifically designated as rehabilitation beds)

Table 4.5: Geriatric Rehabilitation Unit (GRU) Preadmission, Admission, and Discharge Processes and Practices

Processes and Practices	GRUs (N = 17)
Preadmission	
Requiring preadmission assessment	13 (76.5%)
Preadmission assessments completed by Specialist in Geriatric Medicine	13 (76.5%)
Preadmission assessments completed by nurses	12 (70.6%)
Requiring LTC* discharge options before admission	4 (23.5%)
Admission selection committee	13 (76.5%)
Admission	
Providing information package prior/at admission	10 (58.8%)
Completing mobility assessment immediately after admission	16 (94.0%)
Physiotherapist completing mobility assessment	16 (94.0%)
Specialist in Geriatric Medicine completed admission medical history & physical examination	10 (58.8%)
Discharge	
Early discharge planning	17 (100%)
Discharge planning in 1st or 2nd week of admission	13 (76.5%)
Opportunities for self-medication programs	15 (88.0%)
Patient education by pharmacist	15 (88.0%)
Education to relatives by pharmacist	15 (88.0%)
Discharge information sent at time of discharge	13 (76.5%)
Satisfaction questionnaires	12 (70.5%)

*LTC – Long-Term Care

Table 4.6 presents the types of interventions offered by the GRUs. Almost all of the GRUs (N = 16; 94%) use an interdisciplinary team approach to geriatric rehabilitation, and many of these operate according to an interdisciplinary model of care coordination (N = 12; 70.6%). Nurses, physiotherapists, occupational therapists, social workers, and team physicians are the most common health disciplines that attend team rounds and report progress on patient goals. Team rounds commonly occur once per week. Primary Nursing is the most common nursing management model for GRUs. The setting of rehabilitation goals, which are influenced by each patient's desired level of function and discharge location, are usually established with patients in conjunction with baseline assessment information. Communication with family and caregivers usually occurs through the primary nurse or most

relevant team member at scheduled family conferences. Communication commonly occurs within the first week, when there is a change in a patient's medical condition or functional status, and as required prior to discharge. All of the GRUs conduct nutritional screening. Usual body weight, ideal body weight and serum albumin are the three most commonly used measures of nutritional status. Patients below ideal body weight are the most likely to receive oral or tube feeding nutritional supplements.

Table 4.6: Geriatric Rehabilitation Unit (GRU) Team Models and Intervention Practices

Team Model and Intervention Practices	GRUs (N = 17)
Interdisciplinary team approach	16 (94.0%)
Regular team rounds	17 (100%)
Team rounds once per week	14 (14.0%)
Review interval determined by consistent intervals	16 (94.0%)
Primary care by Specialist in Geriatric Medicine	10 (58.8%)
Consultation provided by Geriatric Psychiatrist	12 (70.6%)
Interdisciplinary model of care coordination	12 (70.6%)
Timing of communication: As necessary prior to discharge	14 (82.0%)
Goal setting in first week	11 (64.7%)
Nutritional screening	17 (100%)
Nutritionist/Dietician completion of nutritional evaluation	17 (100%)
Swallowing assessment by Speech-Language Pathologist	15 (88.0%)
Nutritional supplements	17 (100%)

The use of standardized tools for assessment, monitoring and/or outcome measurement by GRUs is presented in Table 4.7. While the majority of GRUs use the Mini-Mental Status Examination at the time of admission (N = 13; 76.5%), and some use it at discharge (N = 8; 47%), fewer GRUs are using standardized measures commonly cited in the literature as part of their admission or discharge practice. Some scales are used only as needed, as for example the Berg Balance Scale, the Timed Up and Go (TUG), and the Geriatric Depression Scale (used by 53%, 47%, and 53% of the GRUs, respectively). Very few GRUs (less than 5; 29%) use standardized measures of functional autonomy.

Discharge and follow-up practices across the rehabilitation services are presented in Table 4.5. All of the GRUs have early discharge planning, with most GRUs (N= 13; 76.5%) initiating this within the first or second week of admission. Self-medication programs and education to patients and families by pharmacists are common in GRUs. (N = 15; 88%). Most commonly physicians complete the discharge summaries for GRUs. Family physicians and Community Care Access Center (CCAC) case managers are the most likely to receive discharge information.

Table 4.7: Geriatric Rehabilitation Unit (GRU) Use of Common Assessment Tools and Outcome Measures upon Admission, At Discharge, and As Needed.

Assessment Tools and Outcome Measures	GRUs (N = 17)		
	Admission	Discharge	As needed
Goal Attainment Scaling (GAS; Kiresuk et al., 1994; Stolee et al., 1999)	5 (29.0%)	4 (23.5%)	5 (29.0%)
Functional Independence Measure (FIM; Keith et al., 1987)	5 (29.0%)	3 (17.6%)	2 (11.8%)
Barthel Index (Mahoney & Barthel, 1965)	4 (23.5%)	3 (17.6%)	0
Mini-Mental State Examination (MMSE; Folstein et al., 1975)	13 (76.5%)	4 (23.5%)	8 (47.0%)
Geriatric Depression Scale (GDS; Yesavage et al., 1982-83)	5 (29.0%)	2 (11.8%)	9 (53.0%)
Cornell Scale for Depression in Dementia (Alexopoulous et al., 1988a; 1988b)	0	0	1 (6%)
Lawton-Brody (Lawton & Brody, 1969)	1 (6.0%)	1 (6.0%)	3 (17.6%)
Canadian Occupational Performance Measure (COPM; Law et al., 1990)	1 (6.0%)	1 (6.0%)	1 (6.0%)
Minimal Data System (MDS; Hirdes & Carpenter, 1997; Hirdes et al., 1997)	1 (6.0%)	0	2 (11.8%)
Berg Balance Scale (BBS; Berg et al., 1989)	6 (35.2%)	3 (17.6%)	9 (53.0%)
Tinetti Balance and Mobility Scale (Tinetti, Williams, & Mayewski, 1986)	0	0	2 (11.8%)
Functional Autonomy Measurement (SMAF; Hébert, Carrier, & Bilodeau, 1988)	2 (11.8%)	2 (11.8%)	2 (11.8%)
Timed Up and Go (TUG; Podsiadlo & Richardson, 1991)	3 (17.6%)	3 (17.6%)	8 (47.0%)
Std. Levodopa	1 (6.0%)	1 (6.0%)	3 (17.6%)
Bladder Scanner	0	0	9 (53.0%)

Conclusion

Maintaining and restoring the health and independence of the growing population of older persons will be an increasingly important part of health care provision in the coming years. Geriatric rehabilitation is an emerging area in health care, and some issues of caring for seniors in this rehabilitation setting are not well understood. There are differences between the rehabilitation of young adults and that of frail older adults. The most salient difference relates to the higher burden of medical comorbidity experienced by frail older persons. Disability among seniors is often multicausal, requiring input from several subspecialties and professional disciplines to investigate and manage the medical issues and rehabilitation needs.

Frailty is the clinical state that makes the medical management and rehabilitation of the elderly complex. Frailty can be viewed as a multidimensional construct that

encompasses more than just simple dependence for activities of daily living. It is a complex interplay of a person's assets and deficits, including health and illness, attitudes, practices, resources, and dependence on others (Rockwood, Fox, Stolee, Robertson, & Beattie, 1994; Rockwood, Stolee, & McDowell, 1996).

Frailty is also seen as the loss of functional homeostasis. Functional homeostasis is the ability of an individual to withstand illness without loss of function (Carlson et al., 1998; Rozzini, Frisoni, Franzoni, & Trabucchi, 2000). It has been shown that older patients with poor functional homeostasis decline in functional status and have higher adverse outcomes and readmission to hospital (Carlson, et al., 1998). The assessment of functional homeostasis may provide a method to identify frail individuals for more intensive management strategies including rehabilitation.

Disease presentation in the elderly is atypical, and older persons often under-report symptoms and problems. The traditional medical model of illness presentation has been found to fit less than 50% of seniors presenting for geriatric outpatient assessment (Fried, Storer, King, & Lodder, 1991). For this reason, models that acknowledge the cumulative burden of multiple problems, as well as environmental, psychosocial, caregiver, and functional issues are important in assessing and caring for the elderly. When a person with chronic illnesses is treated in a disease-specific model of care, unrelated diseases are more likely to be left untreated (Redelmeier, Tan, & Booth, 1998).

Persons with multiple medical problems face a greater decrement in function than those with only a single problem. Concomitant cardiac, pulmonary, gastrointestinal, renal, musculoskeletal, and neurologic problems coupled with muscle deconditioning all contribute to a person's decline in function. The higher prevalence of cognitive impairment in older patients adds to comorbidity (Stewart, et al., 1989; Weber, et al., 1995). Geriatric syndromes such as falls, delirium, and incontinence are functional problems and are considered markers of frailty (Rockwood, et al., 1994). Geriatric assessment and rehabilitation acknowledge the heterogeneity of the frail older population and encompass the concept of prevention, management, and rehabilitation of all aspects of frailty, not just the treatment of medical illnesses in the acute setting. A CGA is a proven modality to decrease mortality and to increase the cognition and functional status of frail older patients with complex medical problems and multiple comorbidities (Rubenstein, et al., 1991; Scott, 1999).

This chapter has described current and emerging best practices in geriatric rehabilitation, particularly as provided in within GRUs. Based on our review, we recommend that older patients be screened for inpatient rehabilitation potential and that standardized assessment tools be used to aid in diagnosis, assessment, and outcome measurement. The team approach for geriatric rehabilitation should be interdisciplinary and should involve CGA. The use of self-medication programs and a medication review is supported. Medical care and rehabilitation of frail older patients should be managed by a physician and team trained in the care of the elderly.

Call for Research

Ongoing clinical research will increase our knowledge of this field because the rehabilitation needs of frail older persons will have increasingly important implications for the health care system. All physicians should be educated in care of the frail elderly. More research is needed in the area of screening and frailty to better identify which older persons will benefit most from CGA and geriatric rehabilitation. One of the challenges of future research will be to determine the degree of comorbidity and cognitive impairment that is compatible with successful outcomes in geriatric rehabilitation. Research in geriatric rehabilitation should address which selection criteria based on cognition are reasonable, and the optimal period for a trial period of rehabilitation if initiated. Although some studies have shown that moderately cognitively impaired patients show statistical improvement in rehabilitation, more research is needed to show clinical significance and duration of effect.

More research is needed to help define which rehabilitation settings are most appropriate and cost effective. One criticism of CGA is the resource intensity and the cost of care, particularly in the inpatient setting (Cefalu, Kaslow, Mims, & Simpson, 1995; Keeler, et al., 1999). Because the field of geriatric rehabilitation is new, there are limited studies on cost effectiveness. Rubenstein and colleagues (1995) were the first to document the cost effectiveness of inpatient CGA. Their study showed that survival and functional status were improved in the treatment group and that per capita costs did not differ significantly from usual care, both before and after survival adjustment. Further study on cost effectiveness is required.

Aside from inpatient rehabilitation units, rehabilitation and assessment of frail elderly with rehabilitation needs may occur in other settings. Recently it has been shown in a meta-analysis of 18 RCTs of 13,447 patients that preventive home visitation programs with a multidimensional assessment and follow-up can reduce nursing home placement, functional decline, and mortality (Stuck, Egger, Hammer, Minder, & Beck, 2002). Geriatric day hospitals have shown benefits in mortality and functional status and may offer cost benefits if the reduction in long-term care placement is considered (Forster, et al., 1999; see Chapter 7). In the United States, rehabilitation services are offered for the elderly in skilled nursing facilities. Von Sternberg and colleagues (1997), for example, describes a managed care model of subacute geriatric rehabilitation in nursing homes to facilitate early discharge from hospital. Care under this model resulted in fewer costs than usual care settings.

Economic evaluations are needed comparing orthopedic rehabilitation units (GORUs) and mixed geriatric assessment and rehabilitation units (MARUs) for community dwelling hip fracture patients who are too disabled for an early supported discharge. Another area in need of further study is early supported discharge and geriatric hip fracture programs (GHFPs) to establish evidence for best practice guidelines. Research should emphasize functional status, quality of life, and caregiver burden, as well as economic factors and societal perspectives (Cameron, et al., 2000). Moreover, research is needed to provide clinical practice guidelines for specialized treatment in geriatric rehabilitation. For example, there is a need for research to address whether non-drug and/or medication treatment of depression is helpful in the geriatric rehabilitation setting and to determine which patients benefit most from nutritional supplements.

One limitation of this review is that some of the recommendations are derived from level 3 evidence. Longitudinal case control, multicenter randomized control trials, and well designed cohort studies are needed to evaluate prognostic factors, to identify risk factors for continued disability, and to identify factors related to successful outcomes. More research about CGA, frailty, and disablement may help to establish which components of geriatric assessment and management of rehabilitation patients are critical (Jette, 1997).

Similarly, research in outcomes in geriatric rehabilitation is strongly encouraged to help define which benefits are achieved and sustained. There are many commonly used tools in geriatric rehabilitation. GAS and the CIRS look promising as measures that can address the complexity of geriatric rehabilitation. Consensus on assessment and outcome tools would facilitate multi-center comparisons of practices and patient outcomes to further advance best practices in geriatric rehabilitation. Agreement on selection criteria for targeting patients and common outcome measures will be necessary to make meaningful comparisons across centres and services. Our survey of GRUs across Canada found that although rehabilitation services are largely consistent with those found in the literature, in Canadian GRUs there was not widespread use of standardized assessment tools. A recent consensus conference on geriatric rehabilitation with researchers and clinicians from across Canada established agreement that further research on assessment tools and processes was a priority, particularly as related to goal setting processes, client needs and preferences, the detection of unmet needs, and the identification of best assessment tools (Stolee, Borrie, Cook, & Hollomby, 2004).

References

Alexopoulos, G. S., Abrams, R. C., Young, R. C., & Shamoian, C. A. (1988a). Cornell Scale for Depression in Dementia. *Biological Psychiatry, 23,* 271-84.

Alexopoulos, G. S., Abrams, R. C., Young, R. C., & Shamoian, C. A. (1988b). Use of Cornell scale in nondemented patients. *Journal of the American Geriatrics Society, 36,* 230-236.

Allen, N., Ames, D., Ashby, D., Bennetts, K., Tuckwell, V., & West, C. (1994). A brief sensitive screening instrument for depression in late life. *Age and Ageing, 23,* 213-218.

Anderson, C., Rubenach, S., Mhurchu, C. N., Clark, M., Spencer, C., & Winsor, A. (2000). Home or hospital for stroke rehabilitation? Results of a randomized controlled trial: I: Health outcomes at 6 months. *Stroke, 31,* 1024-1031.

Applegate, W.B., Blass, J.P., & Williams, T.F. (1990a). Instruments for the functional assessment of older patients. *New England Journal of Medicine, 322,* 1207-1214.

Applegate, W. B., Miller, S. T., Graney, M. J., Elam, J. T., Burns, R., & Akins, D. E. (1990b). A randomized, controlled trial of a geriatric assessment unit in a community rehabilitation hospital. *New England Journal of Medicine, 322,* 1572-1578.

Berg, K., Wood-Dauphinee, S., Williams, J. L., & Gayton, D. (1989). Measuring balance in the elderly: Preliminary development of an instrument. *Physiotherapy Canada, 41,* 304-311.

Borrie, M. J., Stolee, P., Knoefel, F., Wells, J. L., & Seabrooke, J. A. (2005). Current best practices in geriatric rehabilitation in Canada. *Geriatrics Today: Canadian Journal of Geriatric Medicine and Geriatric Psychiatry, 8,* 148-153.

Boston Working Group on Improving Health Care Outcomes through Geriatric Rehabilitation. (1997). *Medical Care, 35(6),* 4-20.

Brymer, C. D., Kohm, C. A., Naglie, G., Shekter-Wolfson, L., Zorzitto, M. L., O'Rourke, K., et al. (1995). Do geriatric programs decrease long-term use of acute care beds? *Journal of American Geriatrics Society, 43,* 885-889.

Bull, M.J., & Roberts, J. (2001). Components of a proper hospital discharge for elders. *Journal of Advanced Nursing, 35,* 571-581.

Cameron, L., Crotty, M., Currie, C., Finnegan, T., Gillespie, W., Handoll, H., et al. (2000). Geriatric rehabilitation following fractures in older people: A systematic review. *Health Technology Assessment, 4,* 1 -111.

Carlson, J. E., Zocchi, K. A., Bettencourt, D. M., Gambrel, M. L., Freeman, J. L., Zhang, D., et al. (1998). Measuring frailty in the hospitalized elderly: Concept of functional homeostasis. *American Journal of Physical Medicine and Rehabilitation, 77,* 252-257.

Cefalu, C. A., Kaslow, L. D., Mims, B., & Simpson, S. (1995). Follow-up of comprehensive geriatric assessment in a family medicine residency clinic. *The Journal of the American Board of Family Practice, 8,* 263-269.

Cohen, H. J., Feussner, J. R., Weinberger, M., Carnes, M., Hamdy, R. C., Hsieh, F., et al. (2002). A controlled trial of inpatient and outpatient geriatric evaluation and management. *New England Journal of Medicine, 346,* 905-912.

Covinsky, K. E., Palmer, R. M., Kresevic, D. M., Kahana, E., Counsell, S. R., & Forinsky, R. H. (1998). Improving functional outcomes in older patients: Lessons from an acute care for elders unit. *Journal of Quality Improvement, 24,* 63-76.

Cumming, R. G., Thomas, M., Szonyi, G., Salkeld, G., O'Neill, E., Westbury, C., et al. (1999). Home visits by an occupational therapist for assessment and modification of environmental hazards: A randomized trial of falls prevention. *Journal of the American Geriatrics Society, 47,* 1397-1402.

Diamond, P. T., Felsenthal, G., Macciocchi, S. N., Butler, D. H., & Lally-Cassady, D. (1996). Effect of cognitive impairment on rehabilitation outcome. *American Journal of Physical Medicine and Rehabilitation, 75,* 40-43.

Epstein, A. M., Hall, J. A., Fretwell, M., Fieldstein, M., DeCiantis, M.L., Tognetti, J., et al. (1990). Consultative geriatric assessment for ambulatory patients: A randomized trial in a health maintenance organization. *Journal of the American Medical Association, 263,* 538-544.

Ettinger, W. H., Jr., Burns, R., Messier, S. P., Applegate, W., Rejesk, W. J., Morgan, T., et al. (1997). A randomized trial comparing aerobic exercise and resistance exercise with a health education program in older adults with knee osteoarthritis. The Fitness Arthritis and Seniors Trial (FAST). *Journal of the American Medical Association, 277,* 25-31.

Felsenthal, G., Cohen, B. S., Hilton, E. B., Panagoes, A. V., & Aiken, B. M. (1984). The physiatrist as primary physician for patients on an inpatient rehabilitation unit. *Archives of Physical Medicine and Rehabilitation, 65,* 375-385.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-Mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12,*189-98.

Forster, A., Young, J., & Langhorne, P. (1999). Systematic review of day hospital care for elderly people. *British Medical Journal, 318,* 837-847.

Fried, L. P., Storer, D. J., King, D. E., & Lodder, F. (1991). Diagnosis of illness presentation in the elderly. *Journal of the American Geriatric Society, 39,* 117-123.

Goldstein, F. C., Strasser, D. C., Woodard, J. L., & Roberts, V. J. (1997). Functional outcome of cognitively impaired hip fracture patients on a geriatric rehabilitation unit. *Journal of the American Geriatrics Society, 45,* 35-42.

Harris, R. E., O'Hara, P. A., & Harper, D. W. (1995). Functional status of geriatric rehabilitation patients: A one-year follow-up study. *Journal of the American Geriatrics Society, 43,* 51-55.

Hébert, R., Carrier, R., & Bilodeau, A. (1988). The Functional Autonomy Measurement System (SMAF): Description and validation of an instrument for the measurement of handicaps. *Age and Aging, 17,* 293-302.

Hendriksen, C., Lund, E., & Stromgard, E. (1984). Consequences of assessment and intervention among elderly people: A three-year randomized control trial. *British Medical Journal, 289,* 1522-1524.

Heruti, R. J., Lusky, A., Barell, V., Ohry, A., & Adunsky, A. (1999). Cognitive status at admission: Does it affect the rehabilitation outcome of elderly patients with hip fracture? *Archives of Physical Medicine and Rehabilitation, 80,* 432-436.

Hirdes, J. P., & Carpenter, G. I. (1997). Health outcomes among the frail elderly in communities and institutions: Use of the Minimum Data Set (MDS) to create effective

linkages between research and policy. *Canadian Journal of Aging/Canadian Public Policy, Supplement,* 53-69.

Hirdes, J. P., Fries, B. E., Morris, J., Steel, K., Mor, V., Fritjters, D., et al. (1997). Integrated health information systems based on the RAI/MDS series of instruments. *Healthcare Management Forum, 12,* 30-40.

Hoenig, H., Nusbaum, N., Brummel-Smith, K. (1997). Geriatric rehabilitation: State of the art. *Journal of the American Geriatrics Society, 45,* 1371-1381.

Hughes, T. L., & Medina-Walpole, A. M. (2000). Implementation of an interdisciplinary behaviour management program. *Journal of the American Geriatrics Society, 48,* 581-587.

Israel, L., Kozarevic, D., & Sartorius, N. (1984). *Source book of geriatric assessment* (Vol 1.) Basel, Switzerland: Karger.

Jette, A. M. (1997). Disablement outcomes in geriatric rehabilitation. Medical Care, 35, 28-37.

Joseph, C. L., & Wanlass, W. (1993). Rehabilitation in the nursing home. *Clinics in Geriatric Medicine, 9,* 859-871.

Karppi, P. (1995). Effects of a geriatric inpatient unit on elderly home care patients: A controlled trial. *Aging-Clinical & Experimental Research, 7,* 207-211.

Keeler, E. B., Robalino, D. A., Frank, J. C., Hirsch, S. H., Maly, R. C., & Reuben, D.B. (1999). Cost-effectiveness of outpatient geriatric assessment with an intervention to increase adherence. *Medical Care, 37,* 1199-1106.

Keith, R.A., Granger, C.V., & Hamilton, B.B. (1987). The functional independence measure: A new tool for rehabilitation. *Advances in Clinical Rehabilitation, 1,* 6-18.

Kiresuk, T. J., Smith, A., & Cardillo, J. E. (Eds). (1994). *Goal attainment scaling: Applications, theory, and measurement*. Hillsdale, NJ: Erlbaum.

Law, M., Baptiste, S., McColl, M., Opzoomer, A., Polatajko, H., & Pollock, N. (1990). The Canadian Occupational Performance Measure: An outcome measure for occupational therapy. *Canadian Journal of Occupational Therapy, 57,* 82-87.

Lawton, M .P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist, 9,* 179-186.

Liem, P. H., Chernoff, R., & Carter, W. J. (1986). Geriatric rehabilitation unit: A three-year outcome evaluation. *Journal of Gerontology, 41,* 44-50.

Linn, B. S., Linn, M. W., & Gurel, L. (1968). The cumulative illness rating scale. *Journal of the American Geriatric Society, 16,* 622-626.

Lokk, J. (1999). Geriatric rehabilitation revisited. *Aging Clinical and Experimental Research, 11,* 353-361.

Luxenberg, J. S., & Feigenbaum, L. Z. (1986). Cognitive impairment on a rehabilitation service. *Archives of Physical Medicine and Rehabilitation, 67,* 796-798.

Mahoney, F. A., & Barthel, D. W. (1965). Functional evaluation: The Barthel Index. *Maryland State Medical Journal, 14,* 61-65.

Man-Son-Hing, M., Power, B., Byszewski, A., & Dalziel, W. B. (1997). Referral to specialized geriatric services. Which elderly people living in the community are likely to benefit? *Canadian Family Physician, 43,* 925-930.

Mason, M., & Bell, J. (1994). Functional outcomes of rehabilitation, in the frail elderly: A two-year retrospective review. *Perspectives, 18,* 7-9.

Mayo, N. E., Wood-Dauphinee, S., Cote, R., Grayton, D., Carlton, J., Buttery, J., et al. (2000). There's no place like home: An evaluation of early supported discharge for stroke. *Stroke, 31,* 1016-1023.

McDowell, I., & Newell, C. (1996). *Measuring health* (2nd ed.). New York: Oxford University Press.

Miller, S. T., Applegate, W. B., Elam, J. T., & Graney, M. J. (1994). The influence of diagnostic classification on outcomes and charges in geriatric assessment and rehabilitation. *Journal of the American Geriatrics Society,* 42,11-5.

Miller, D. K., Morley, J. E., Rubenstein, L. Z., Pietruszka, F. M., & Strome, L. S. (1990). Formal geriatric assessment instruments and the care of elderly general medical outpatients. *Journal of the American Geriatrics Society, 38,* 645-651.

Molloy, D. W., Alemayehu, E., & Roberts, R. (1991). A Standardized Mini-Mental State Examination (SMMSE): It's reliability compared to the traditional Mini-Mental State Examination (MMSE). *American Journal of Psychiatry, 148,* 102-105.

Mosqueda, L. A. (1993). Assessment of rehabilitation potential. *Clinics in Geriatric Medicine, 9,* 689-703

Parmalee, P. A., Thuras, P. D., Katz, I. R., & Lawton, M. P. (1995). Validation of the Cumulative Illness Rating Scale in a geriatric residential population. *Journal of the American Geriatrics Society, 43,* 130-137.

Patrick, L., Knoefel, F., Gaskowski, P., & Rexroth, D. (2001). Medical comorbidity and rehabilitation efficiency in geriatric inpatients. *Journal of the American Geriatrics Society, 49,* 1471-1477.

Patrick, L., Leber, M., & Johnston, S. (1996). Aspects of cognitive status as predictors of mobility following geriatric rehabilitation. *Aging Clinical and Experimental Research, 8,* 328-333.

Patterson, C. J., Gauthier, S., Bergman, H., Cohen, C. A., Feighther, J. W., Feldman, H., et al. (1999). The recognition, assessment and management of dementing disorders: Conclusions for the Canadian Consensus Conference on Dementia. *Canadian Medical Association Journal, 160(12),* 1-15.

Pereles, L., Romonko, L., Murzyn, T., Hogan, D., Silvius, J., Stokes, E., et al. (1996). Evaluation of a self-medication program. *Journal of the American Geriatrics Society, 44,* 161-165.

Pinholt, E. M., Kroenke, K., Hanley, J. F., Kussman, M. J., Twyman, P. L., & Carpenter, J. L. (1987). Functional assessment of the elderly: A comparison of standard instruments with clinical judgment. *Archives of Internal Medicine, 147,* 484-488.

Platts, S. (1989). A self-medication pilot program. Dimensions, 33-35.

Podsiadlo, D., & Richardson, S. (1991). The timed "Up and Go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society, 39,* 142-155.

Redelmeier, D. A., Tan, S. H., & Booth, G. L. (1998). The treatment of unrelated disorder in patients with chronic medical diseases. *New England Journal of Medicine, 338,* 1516-1542.

Reid, J., & Kennie, D. C. (1989). Geriatric rehabilitative care after fractures of the proximal femur: One year follow up of a randomized clinical trial. *British Medical Journal, 299,* 25-26.

Resnick, B. (1996). Motivation in geriatric rehabilitation. *Journal of Nursing Scholarship, 24,* 41-45.

Resnick, B. (1998). Efficacy beliefs in geriatric rehabilitation. *Journal of Gerontological Nursing, 24,* 34-44.

Resnick, B., Slocum, D., Lynn, R., Moffett, P. (1996). Geriatric rehabilitation: Nursing interventions and outcomes focusing on urinary function and knowledge of medications. *Rehabilitation Nursing, 21,* 142-147.

Reuben, D. B., Borok, G. M., Wolde-Tsadik, G., Ershoff, D. H., Fishman, L. K., Ambrosini, V. L., et al. (1995). A randomized trial of comprehensive geriatric assessment in the care of hospitalized patients. *New England Journal of Medicine, 332,* 2345-1350.

Rockwood, K., Fox, R. A., Stolee, P., Robertson, D., & Beattie, B.L. (1994). Frailty in elderly people: An evolving concept. *Canadian Medical Association Journal, 150,* 489-495.

Rockwood, K., Joyce, B., & Stolee, P. (1997). Use of goal attainment scaling in measuring clinically important change in cognitive rehabilitation patients. *Journal of Clinical Epidemiology, 50,* 581-588.

Rockwood, K., Stolee, P., & Fox, R.A. (1993). Use of goal attainment scaling in measuring clinically important change in the frail elderly. *Journal of Clinical Epidemiology, 46,* 1113-1118.

Rockwood, K., Stolee, P., & McDowell, I. (1996). Factors associated with institutionalization of older people in Canada: Testing a multifactorial definition of frailty. *Journal of the American Geriatrics Society, 44,* 578-582.

Rodgers, H., Curless, R., & James, O. F. (1993). Commentary: Standardized functional assessment scales for elderly patients. *Age and Ageing, 22,* 161-163.

Romonko, L., & Pereles, L. (1992). An evaluation of pharmacy assessment for geriatric patients. *Canadian Journal of Hospital Pharmacy, 45,* 15-20.

Rozzini, R., Frisoni, G. B., Franzoni, S., & Trabucchi, M. (2000). Change in functional status during hospitalization in older adults: A geriatric concept of frailty. Journal of the *American Geriatrics Society, 48,* 1024-1025.

Rubenstein, L. Z., Josephson, K. R., Harper, J. O., Miller, D. K., & Wieland, D. (1995). The Sepulveda GEU study revisited: Long-term outcomes use of services and costs. *Aging Clinical and Experimental Research, 7,* 212-217.

Rubenstein, L. Z., Josephson, K. R., Wieland, G. D., English, P. A., Sayre, J. A., & Kane, R. L. (1984). Effectiveness of a geriatric evaluation unit. A randomized clinical trial. *New England Journal of Medicine, 311,* 1664-1670.

Rubenstein, L. Z., Josephson, K. R., Wieland, G. D., & Kane, R. L. (1986). Differential prognosis and utilization patterns among clinical subgroups of hospitalized geriatric patients. *Health Services Research, 20,* 881-895.

Rubenstein, L. Z., Stuck, A. E., Siu, A. L., & Wieland, D. (1991). Impacts of geriatric evaluation and management programs on defined outcomes: Overview of the evidence. *Journal of the American Geriatrics Society, 39,* 8- 16.

Rubenstein, L. Z., Wieland, G. D., Josephson, K. R., Rosbrook, B., Sayre, J., Kane, R.L. (1988). Improved survival for frail elderly inpatients on a geriatric evaluation unit (GEU): Who benefits? *Journal of Clinical Epidemiology, 41,* 677-82.

Ruchinskas, R. A., Singer, H. K., & Repetz, N. K. (2001). Clock drawing, clock copying, and physical abilities in geriatric rehabilitation. *Archives of Physical Medicine Rehabilitation, 82,* 920-924.

Satish, S., Winograd, C. H., Chavez, C., & Bloch, D. A. (1996). Geriatric targeting criteria as predictors of survival and health care utilization. *Journal of the American Geriatrics Society, 44,* 914-921.

Scott, I. (1999). Optimizing care of the hospitalized elderly: A literature review and suggestions for future research. *Australian and New Zealand Journal of Medicine, 29,* 254-264.

Seymour, R. M., & Routledge, P. A. (1998). Important drug-drug interactions for geriatric patients. *Drugs and Aging, 12,* 485-495.

Simmons, W. J. (1986). Planning for discharge with the elderly. *Quality Review Bulletin, 12,* 68-71.

Stewart, A. L., Greenfield, S., Hays, R. D., Wells, K., Rogers, W. H., Berry, S. D., et al. (1989). Functional status and well-being of patients with chronic conditions. *Journal of the American Geriatrics Society, 262,* 907-913.

Stolee, P., Borrie, M.J., Cook, S., & Hollomby, J., and the participants of the Canadian Consensus Workshop on Geriatric Rehabilitation. (2004). A research agenda for geriatric rehabilitation: The Canadian consensus. *Geriatrics Today: Journal of the Canadian Geriatrics Society, 7,* 38-42.

Stolee, P., Rockwood, K., Fox, R. A., & Streiner, D. L. (1992). The use of goal attainment scaling in a geriatric care setting. *Journal of the American Geriatrics Society, 40,* 574-578.

Stolee, P., Stadnyk, K., Myers, A. M., & Rockwood, K. (1999). An individualized approach to outcome measurement in geriatric rehabilitation. *The Journal of Gerontology. Series A, Biological Sciences and Medical Sciences, 54,* 641-647.

Straus, S. E., Kirkland, J., Verwoerd, F., Hamilton, L., Gottfried, M., & Naglie, G. (1997). Discharges home following intensive inpatient geriatric rehabilitation. *Canadian Journal of Rehabilitation, 11,* 81-85.

Stuck, A. E., Egger, M., Hammer, A., Minder, C. E., & Beck, J. C. (2002). Home visits to prevent nursing home admission and functional decline in elderly people: Systematic review and meta-regression analysis. *Journal of the American Medical Association, 287,* 1022-1028.

Stuck, A. E., Siu, A. L., Wieland, G. D., Adams, J., & Rubenstein, L. Z. (1993). Comprehensive geriatric assessment: A meta-analysis of controlled trials. Lancet, 342, 1032-1036.

Studenski, S., & Duncan, P. W. (1993). Measuring rehabilitation outcomes. *Clinics in Geriatric Medicine, 9,* 823-830.

Teasell, R. W., Merskey, H., & Deshpande, S. (1999). Antidepressants in rehabilitation. *Physical Medicine and Rehabilitation Clinics in North America, 10,* 237-253.

Tinetti, M. E., Williams, T. F., & Mayewski, R. (1986). Fall risk index for elderly patients based on number of chronic disabilities. *American Journal of Medicine, 80,* 429-34.

Toseland, R. W., O'Donnell, J. C., Engelhardt, J. B., Hendler, S. A., Richie, J. T., & Jue, D. (1996). Outpatient geriatric evaluation and management: Results of a randomized trial. *Medical Care, 34,* 624-640.

Trentini, W., Semeraro, S., & Motta, M. (2001). Effectiveness of geriatric evaluation and care. One-year results of a multi-center randomized clinical trial. *Aging, 13,* 395-405.

VanSwearingen, J. M., & Brach, J. S. (2001). Making geriatric assessment work: Selecting useful measures. *Physical Therapy, 81,* 1233-1252.

von Koch, L., Widen Holmqvist, L., Kostulas, V., Almazan, J., & de Pedro-Cuesta, J. (2000). A randomized controlled trial of rehabilitation at home after stroke in southwest Stockholm: Outcomes at six months. *Scandinavian Journal of Rehabilitation Medicine, 32,* 80-86.

von Sternberg, T., Hepburn K., Cibuzar, P., Convery, L., Dokken, B., Haefemeyer, J., et al. (1997). Post-hospital sub-acute care: An example of a managed care model. *Journal of the American Geriatrics Society, 45,* 87-91.

Weber, D. C., Fleming, K. C., & Evans, J. M. (1995). Rehabilitation of geriatric patients. Mayo *Clinic Proceedings, 70,* 1198-1204.

Wieland, D., & Rubenstein, L.Z. (1996). What do we know about patient targeting in geriatric evaluation and management (GEM) programs? *Aging Clinical and Experimental Research, 8,* 297-310.

Wieland, D., Stuck, A. E., Siu, A. L., Adams, J., & Rubenstein, L.Z. (1995). Meta-analytic methods for health services research: An example from geriatrics. Evaluation and the *Health Professions, 18,* 252-282.

Wilkinson, T.J., Buhrkuhl, D.C., & Sainsbury, R. (1997). Assessing and restoring function in elderly people – more than rehabilitation. *Clinical Rehabilitation, 11,* 321-328.

Williams, M. E., Williams, T. F., Zimmer, J. G., Hall, W. J., & Podgorski, C. A., (1987). How does the team approach to outpatient geriatric evaluation compare with traditional care? A report of a randomized controlled trial. *Journal of the American Geriatrics Society, 35,* 1071-1078.

Winograd, C. H. (1987). Inpatient geriatric consultation. *Clinics in Geriatric Medicine, 3,* 193-202.

Yeo, G., Ingram, L., Skurnick, J., & Crapo, L. (1987). Effects of a geriatric clinic on functional health and well-being of elders. *Journal of Gerontology, 42,* 252-258.

Yesavage, J. A., Brink, T. L., Rose, T. L., Lumo, O., Huang, V., Adey, M., et al. (1983). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research, 17,* 37-49.

Yip, A. M., Gorman, M. C., Stadnyk, K., Mills, W. G., MacPherson, K. M., & Rockwood, K. (1998). A standardized menu for Goal Attainment Scaling in the care of frail elders. *Gerontologist, 38,* 735-742.

Chapter 5

Evidence Based Best Practices for Common Clinical Problems in Geriatric Rehabilitation

Jennie Wells, Michael Borrie, and Paul Stolee

Executive Summary

Several key diagnoses from among the "geriatric giants" are particularly relevant to rehabilitation, either as presenting problems or as factors confounding treatment (or both). These are hip fracture, stroke, nutrition issues, dementia, and depression. The literature supports the following recommendations: (1) frail older rehabilitation candidates with mild to moderate dementia should not be excluded from rehabilitation (level 1 evidence; Huusko et al., 2000); (2) frail older patients should be screened for cognitive impairment (level 2 evidence; Goldstein et al., 1997; Heruti, Lusky, Barell, Ohry, & Adunsky, 1999); and, (3) treatment for depression can improve rehabilitation outcomes. Moreover, based on the literature, we recommend that (4) frail older patients with hip fracture receive geriatric rehabilitation; (5) that frail seniors receive nutritional, cognition, and depression screening; and (6) that nutritional supplements be provided to undernourished frail older rehabilitation patients.

As already noted in Chapter 4, the benefits of geriatric rehabilitation have been documented, but the practices that account for enhanced outcomes have not been; there is no gold standard for rehabilitation of geriatric patients. Therefore, the objective of this Chapter is to review key clinical diagnoses relevant to geriatric rehabilitation (hip fracture, stroke, nutrition, dementia, depression), and, based on this, to provide evidence-based recommendations for care.

Hip Fracture

Hip fracture is a major cause of mortality and morbidity in older persons and is a diagnostic category in which the largest proportion of patients are aged 75 and over (White, Fisher, & Laurin, 1987). Hip fracture is a major burden on the health care system primarily because added comorbidities of patients in the older age group lengthen hospital stays. Many patients decline in function after hip fracture and require long-term care (Marittiku, Marottoli, Berkman, & Cooney, 1992). It is expected that the demand for hospitalization for hip fracture will continue to increase beyond the year 2020 (Jaglal, Sherry & Schatzker, 1996). The evidence-based best practices for hip fracture reviewed in this section are presented in Table 5.1.

Table 5.1: Summary of Evidence-Based Best Practices for Hip Fracture in Older Persons

Evidence-based Practices for Hip Fracture
• Comorbidity and clinical instability should not be a barrier to rehabilitation.
• Older persons with hip fracture should receive interdisciplinary care including orthopedic surgeons and geriatricians. These patients may benefit from specialized geriatric orthopedic rehabilitation units to reduce readmission to acute care, and geriatric hip fracture programs to reduce length of stay and increase return to community.
• Older persons with hip fracture should receive early inpatient rehabilitation to reduce length of stay, total costs of care and hasten functioning.
• Early supported discharge programs are most suitable for high functioning patients.

Although most hip fracture patients in North America are discharged from the acute care hospital to their homes in the community, about 40% require further rehabilitation or admission to nursing home (Papaioannou, 2000). These patients are often frail with multiple medical problems or have suffered in-hospital complications, requiring more intensive rehabilitation as in-patients. Bernardini and colleagues (1995) investigated comorbidity and adverse clinical events in patients over the age of 65 admitted to a geriatric rehabilitation unit after proximal hip fracture. These patients had complex, multiple, and interacting pathologies, with 78% having significant comorbidity. The mean age of these patients was 82.7 years and 85% were women; their average rehabilitation length of stay (LOS) was 68 days. The most common systems affected with comorbid diseases (other than musculoskeletal) were cardiovascular, gastrointestinal, urinary, respiratory, and neurologic. Eight% of these patients died, and 6% required rehospitalization for orthopedic complications. There was a significant reduction in comorbidity from admission to discharge. The Modified Barthel Index admission score was the key predictor of functional outcome (accounting for 46% of the variance in functional outcome) with cognitive scores, clinical instability, and Cumulative Illness Rating Scale score adding more predictive power (r^2 = .61, p <.0001). The authors described the burdens of comorbidity and clinical instability as dynamic components of frailty, which are treatable using a comprehensive approach such as geriatric rehabilitation, and are not an absolute barrier to rehabilitation.

Models of interdisciplinary care for orthopedic patients have been developed to shorten hospital stay and reduce institutionalization. For patients over the age of 60, collaborative supervision of geriatric rehabilitation beds by an orthopedic surgeon and a geriatrician has been shown to reduce LOS (Murphy, Rai, Lowy, & Bielawska, 1987). Similarly, a study of older women with proximal hip fracture postoperatively randomized to either routine orthopedic care or to geriatric care showed that the geriatric care patients were

significantly more independent in ADLs, had shorter LOS, and fewer discharges to institutional care (Kennie, Reid, Richardson, Kiamari, & Kelt, 1988).

To reduce costs of care, there is pressure to shorten LOS in acute care hospitals. However, a shorter LOS does not necessarily translate to an improved clinical outcome. In the United States, the trend toward shorter LOS was aided by the emergence of prospective payment systems in 1983. Following the implementation of this new payment system, the mean acute care stay for hip fracture patients fell from 21.9 days in 1981 to 12.6 days in 1986, the proportion of patients discharged to nursing homes rose from 38% to 60%, discharge walking distance fell from 27 to 11m, and physiotherapy sessions decreased from 7.6 to 6.3. (Fitzgerald, Moore, & Dittus, 1988). Compared with patients with other health care providers, 83% versus 55% were transferred to nursing homes and LOS was 7.3 days versus 14 days. As a result of the shorter LOS in hospitals, the model of a nursing home as a skilled nursing facility providing rehabilitation has emerged (Hoenig, et al., 1997).

Targeting patients for early inpatient rehabilitation is one method of reducing LOS. Munin and colleagues (1998) randomized elective hip and knee arthroplasty patients over the age of 70 who live alone or who had 2 or more comorbid illnesses to usual rehabilitation or early rehabilitation on hospital day three. The early treatment group had shorter LOS, lower total costs of care, more rapid attainment of functional goals, and equivalent 4-month functional status as compared to the usual care group.

Early discharge with outpatient rehabilitation may be one method to meet the needs of some older patients with hip fracture. A recent Canadian pilot study found that early rehabilitation in a day hospital was appropriate for the needs of women aged 59 to 91 years who were discharged from acute care (Papaioannou, Parkinson, Adachi, & Clarke, 2001). The authors of this study suggested that the day hospital model has advantages over a home-based model in that it may provide more efficient use of health care resources and therapists' time.

The results of a systematic review of geriatric rehabilitation for fractures of the lower limbs, pelvis, upper limbs, or spine suggests that the geriatric principles of care for frail elderly patients with hip fracture can be generalized to include the frail elderly with pelvis or other lower-limb fracture (Cameron, et al., 2000). Although there was no evidence that LOS in a geriatric orthopedic rehabilitation unit (GORU)[*] is shorter than in conventional orthopedic units, it is possible that geriatric patients may benefit from this intervention in other ways. Total LOS was reduced by the use of geriatric hip fracture programs (GHFPs)[†], early supported discharge[‡], and clinical pathways. Older people who participated in GHFPs and early supported discharge programs had a significantly higher rate of return to previous community living. The increased rate of return to residential status was also cost saving. The

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[*] A GORU is a specialized inpatient orthopedic rehabilitation unit dedicated to the geriatric population supervised by a geriatrician with a multidisciplinary team.
[†] A GHFP involves the geriatric team soon after admission; care begins in the surgical unit. Some higher functioning patients stay in the orthopedic until they are ready to go home. Others may be transferred to a rehabilitation unit or to early supported discharge programs.
[‡] Early supported discharge programs provide support and rehabilitation to the orthopedic patient at home (Cameron et al., 2000).

results of this review provided insufficient evidence to comment on the impact of any program on quality of life (QOL), mortality, caregiver burden, or level of function.

GORUs likely provide benefit to frail older persons who may otherwise require nursing home placement. They are also likely to reduce readmission rates to acute care. The early supported discharge is only suitable for high-functioning hip fracture patients. Early supported discharge should be a component of GHFPs to maximize the possibility of return to residential living. Alternative programs such as GORUs or mixed geriatric assessment and rehabilitation units (MARUs) are necessary to help provide care for the more disabled. Based on the results of their review, Cameron and colleagues (2000) suggested the need for economic evaluations comparing GORUs and MARUs for community-dwelling hip fracture patients who are too disabled for an early supported discharge and further study of early supported discharge and GHFPs to establish evidence for best practice guidelines. Moreover, they suggested that future research should emphasize functional status, quality of life, and caregiver burden, as well as economic factors and societal perspectives.

The literature supports the following recommendation: frail older patients with hip fracture should receive geriatric rehabilitation (level 1 evidence; Cameron, et al., 2000; Kennie, et al., 1988).

Stroke

Stroke is a common problem for the elderly. In fact, the risk of stroke doubles for each decade after age 55 (Rosenberg & Popelka, 2000). The Stroke Unit Trialists' Collaboration meta-analysis of 19 trials with 3249 patients has shown that organized stroke unit care is associated with lower mortality, dependency, and institutionalization without an increase in use of resources (Stroke Unit Trialist Collaboration, 1997). This benefit has been shown to be sustained for five years after treatment (Indredavik, Slordahl, Bakke, Rokseth, & Haheim, 1997).

Although stroke unit care has been shown to be beneficial across a range of stroke severity and for patients under and over the age of 75 (Stroke Unit Trialist Collaboration, 1997), older patients have poorer rehabilitation outcomes than younger patients due to other age-related comorbidities and frailty (Rosenberg & Popelka, 2000; Falconer, Naughton, Strasser, & Sinacore, 1994). The predictors of favorable outcome in geriatric stroke rehabilitation are similar to that of younger people, though it has been shown that comorbid coronary artery disease is an important predictor of poorer outcomes in older persons (Meins, Meier-Baumgartner, Neetz, & von Renteln-Kruse, 2001). In addition to age and medical comorbidity, the nature and severity of stroke, disability at entry into rehabilitation, cognitive impairment, perceptual deficits, depression, incontinence, and presence of a supportive caregiver all influence rehabilitation outcome (Bagg, 1998).

Falconer and colleagues (1994) evaluated the performance of older patients on a stroke unit, comparing the "young" (under 65 years), "young-old" (65-74 years), and older patients (75 years and over). There were no significant differences in cognitive functioning between the groups. There were significant differences in performance of motor function skills at discharge, with the oldest group performing least well. The older group also had lower motor function at admission. A greater percentage of the older group required paid

caregivers (64% vs. 40% and 31%, in the 65-74 and under 65 age groups, respectively). The older age group was also more likely to require nursing home placement on discharge (30% vs. 16% and 10%, in the other age groups, respectively). The authors attribute these differences to decreased physiologic reserve, no availability of a healthy spouse, comorbidities, tenuous finances, and other social support factors. The older group did make significant gains in therapy, but overall LOS was shorter for the oldest age group than in the younger age groups, the reason for which is not known. Falconer and colleagues (1994) suggest that future research in health delivery models may indicate that longer rehabilitation at home or in long-term care may provide optimal benefit in functional status as well as being cost effective.

Post-stroke rehabilitation has a longer history and a greater depth of research than does geriatric rehabilitation. Based on this extensive research, clinical guidelines for post-stroke rehabilitation were published in 1995 (Gresham, et al., 1995). These guidelines offer discussion and recommendations for the following areas: rehabilitation during acute care for stroke, screening for rehabilitation, and transition to community living. Some of the guidelines for screening include medical stability, presence of a functional deficit, and ability to learn and participate actively. Considerations in screening include the extent of the neurological deficits, comorbid illnesses, as well as nutrition and swallowing issues. Other important considerations are the functional status before stroke, current motivation and endurance, social supports, potential discharge environments, and previous living situation. Boult and Brummel-Smith (1997) and Rosenberg and Popelka (2000) provide a general summary and discussion of post-stroke clinical practice guidelines. Although geriatric rehabilitation addresses a greater heterogeneity of medical cognitive and functional problems, there are many similarities to these specialized treatments. Future research may lead to similar evidence-based guidelines for geriatric rehabilitation.

Nutrition

The older population is at risk for malnutrition and under-nutrition for many physiologic and medical reasons. Decreased physical activity and age-associated decreased muscle mass and increased body fat result in decreased nutritional intake. Community-dwelling older persons may have nutritional deficiencies that can influence immune function and increase risk of disease (Gariballa, 2000; Chandra, 1997). Hospitalized frail older persons are at an even higher risk for nutritional problems. Stress associated with illness causes catabolism with net losses of protein from muscle stores. When adequate protein and calories are not provided to meet this elevated energy expenditure, malnutrition and further muscle weakness result (Stahl, 1987). Poor nutritional status can lead to health complications and hospital readmissions (Stahl, 1987). In general, undernourished seniors have longer hospital stays, delayed wound healing, more medical complications, and higher readmission and mortality rates than the well-nourished (Hall, Whiting, & Comfort, 2000; Nourhashemi, et al., 1999). Under-nutrition is an independent risk factor for mortality of patients discharged from geriatric units, though it is a potentially correctable problem (Sullivan, Walls, & Bopp, 1995).

Malnutrition in older persons has been a largely under-recognized problem (Hall, et al., 2000; Nourhashemi, et al., 1999), in part because there are few validated tools available to assess and explain malnutrition in this population. The Mini-Nutritional Assessment for the Elderly, which was developed as a measure of nutritional status to be used in CGA, has been shown to be valid and clinically useful (Nourhashemi, et al.). This type of tool can be used to identify patients at high risk so that prompt interventions can be implemented to prevent further deterioration in nutritional status. It has been strongly recommended that a nutritional assessment be included in the comprehensive assessment of frail older persons (Hall, et al.; Nourhashemi, et al.).

Many geriatric rehabilitation patients have significant nutritional problems (Keller, 1997). In a study of the nutritional status of geriatric rehabilitation patients (N = 152), Keller found that 57% had protein-energy malnutrition and 12% had dysphagia; the average number of nutritional problems per patient was four. Moreover, nutritional problems, such as protein-energy malnutrition, weight loss, feeding impairment, and dysphagia, were associated with increased LOS, death, and greater likelihood of nursing home placement. With intervention, more than two thirds of these patients were able to meet their nutritional goals. Gariballa (2000), in a review of the literature, supported the conclusion that an aggressive nutritional intervention during geriatric rehabilitation can lead to improved nutritional status, better clinical outcomes, reduced readmission rates, and may improve quality of life.

Nutrition and swallowing problems are common in older persons recovering from stroke. Finestone and Greene-Finestone (1998) estimate the prevalence of malnutrition in stroke rehabilitation units to be 49% to 60%. They reported that 16% to 22% of stroke survivors present with malnutrition on admission for their acute stroke, and this increases to 35% by the 14th day of hospital stay. Aptaker, Roth, Reichardt, Dureden and Levy (1994) documented that older stroke patients with low serum albumin levels have higher medical complications rates and poorer functional outcomes. Moreover, dysphagia is a significant factor contributing to the nutritional state of the older stroke patient (Finestone & Greene-Finestone). Due to a variety of reasons related to normal aging and underlying medical conditions, seniors are predisposed to dysphagia, which is associated with a 13% mortality risk, as well as a risk of aspiration pneumonia and further muscle and protein loss (Hudson, Daubert, & Mills, 2000).

Early treatment and proper management of nutrition and swallowing is highly recommended to circumvent many of these complications. Identification of swallowing problems and dietary interventions have been shown to reduce the risk of aspiration pneumonia and to be associated with improved function, reduced LOS, and were also shown to be cost effective (Odderson, Keaton, & McKenna, 1995). Rehabilitation patients who received active intervention for dysphagia were less likely to have aspiration pneumonia than untreated patients (Kasprisin, Clumeck, & Nino-Murcia, 1989). More aggressive nutritional interventions during acute care and rehabilitation may favorably alter the patient's course. Norton and colleagues (1996) showed that gastrostomy-fed patients with dysphagia secondary to stroke had lower risk of aspiration pneumonia, earlier discharge from hospital and higher albumin levels than nasogastric tube-fed patients. Early

gastrostomy following stroke was associated with a significant reduction in mortality. Table 5.2 presents recommendations for the nutritional management of stroke patients developed by Finestone and Greene-Finestone (1998), and consistent with evidence based practice guidelines described by Boult and Brummel-Smith (1997).

Table 5.2: Recommendations for the Nutritional Management of Older Stroke Patients (Finestone and Greene-Finestone, 1998)

Nutrition Management
• monitor nutritional status with routine ongoing screens and assessment tools
• provide adequate nutrition
• use the services of a clinical dietician
• when dysphasia is suspected, involve a speech and language pathologist to provide recommendations for care and management
• observe and monitor patients regularly for signs of dehydration
• provide enteral nutrition when patients are unable to consume sufficient fluid or calories or for those who are at high risk of aspiration
• monitor and provide intervention for other stroke-related eating problems such as attention, cognitive changes, apraxias, visual neglect, paresis
• discuss dietary interventions with patient and family, especially during discharge planning.

Nutritional supplementation for hospitalized older persons can improve outcomes. A study of the nutritional status of patients hospitalized in an acute care geriatric unit, found that better nutritional states of older patients resulted in improved thermoregulation and improved clinical outcomes (Allison, Rawlings, Field, Bean, & Stephen, 2000). Larsson and colleagues (1990) randomized 501 geriatric inpatients to receive oral nutritional supplements or hospital meals only. This study showed the benefits of nutritional supplements in terms of mortality, hospital stay, mobility, and skin breakdown. Finally, Volkert and colleagues (1996) showed that undernourished older hospitalized patients randomized to nutritional supplementation were more likely to gain independence during their hospital stay and remain independent after 6 months than were those who did not receive supplementation.

Micronutrient malnutrition, in addition to protein-energy malnutrition, has been identified as a problem in older people. Chandra (1997) has shown that community-dwelling seniors who took multivitamin supplements had lower risk of infection and improved immunity compared with a placebo group. The incidence of deficiency for various micronutrients varied from 2.1% to 18.7%, but there was no significant difference in this rate between treatment and placebo groups. Gloth and colleagues (1995) showed that frail, community dwelling seniors have borderline or low vitamin D levels and that supplementation with vitamin D is associated with an improved functional status.

One of the earliest reports of nutritional supplementation in rehabilitation is the work of Bastow and colleagues (1983). In this study, 744 older women (age range, 68-92 years) with a fracture of the neck of the femur were screened for nutritional state. Persons at higher risk (n = 122) were randomized to receive overnight nasogastric nutritional supplementation. This intervention was associated with a reduction in mortality, shortened rehabilitation time, shorter acute care hospital stay, and improvements in anthropometric measurement and serum markers of nutrition. A subsequent study showed that oral nutritional supplementation resulted in lower death and complication rates, shorter hospital stays, and improved clinical outcomes in patients with hip fractures (Delmi, et al., 1990). In a Cochrane meta-analysis of 15 randomized trials of hip fracture patients (n = 1054), the five trials using oral supplements showed that nutritional intervention may reduce complications or death (14/66 vs. 26/73; Avenell & Handoll, 2000). In contrast, a recent randomized controlled trial in which hip fracture patients were randomized to receive a nutritional supplement or placebo, found that nutritional supplementation reduced in-hospital complications, but did not improve functional recovery or reduce mortality (Espaulella, et al., 2000). The results of the Cochrane meta-analysis (Avenell & Handoll, 2000) suggested that the quality of the studies reviewed were compromised by inadequate sample size and outcome assessments, and methodological problems, and thus, the authors concluded that more research is needed on the benefits of nutritional supplements for hip fracture patients.

The following recommendations are supported by the literature: (1) nutritional screening for frail older rehabilitation patients (level 3 evidence; Gariballa, 2000; Chandra, 1997; Stahl, 1987); (2) nutritional supplements for under-nourished frail older rehabilitation patients (level 1 evidence; Larsson et al., 1990; Volkert et al., 1996); (3) treatment plan and dietary interventions for frail older patients with dysphagia (level 2 evidence; Aptaker, et al., 1994; Finestone & Greene-Finestone, 1998; Kasprisin, et al., 1989; Odderson, et al., 1995); (4) if dysphagia in older stroke patients is severe, gastrostomy tube feeding is superior to nasogastric tube feeding (level 1 evidence; Norton, et al., 1996); and (5) the nutritionally at-risk older patient with hip fracture may benefit from nutrition supplementation (level 1 evidence; Avenell & Handoll, 2000; Bastow, et al., 1983; Delmi, et al., 1990).

Depression

Depression is very prevalent in the older population. About 15% of community dwelling elders and 15% to 25% of nursing home residents experience symptoms of depression (Montano, 1999). Similarly, studies report rates of depression ranging from 20% to 45% in hospitalized patients, including those in geriatric rehabilitation units (Diamond, Holroyd, Macciocchi, & Felsenthal, 1995; Harris, Mion, Patterson, & Frengley, 1988). Depression in the elderly can complicate illness, may be obscured by multiple comorbid illnesses, and is often under-treated (Wilson, Mottram, Sivanranthan, & Nightingale, 2001). In a study of the relationship between depression and physical functioning in patients in a geriatric rehabilitation unit, Harris and colleagues (1988) found that patients who failed to regain prior abilities following illness, regardless of degree of disability, experienced persistent depression. Few of these patients were diagnosed and treated for depression. Similarly, Diamond and colleagues (1995) evaluated 51 patients enrolled in inpatient geriatric

rehabilitation for depression to examine the relationship between depression and functional outcome. Although there were no differences in LOS, change in functional scores, Mini-Mental State Examination (MMSE) scores, or discharges to home versus nursing home between depressed and nondepressed groups, patients with depression had significantly lower functional scores at admission and discharge than the nondepressed subjects. Reduced motivation, as a result of depressive symptoms, may delay recovery and discharge (Teasell, Merskey, & Deshpande, 1999). It has been recommended that early diagnosis and treatment of depressive symptoms is essential for recovery and should involve both pharmacologic and nonpharmacologic therapies (Harris, et al., 1988).

Treatment for depression has been associated with better rehabilitation outcomes (Teasell et al., 1999). Harris and colleagues (1988) found that improvement in mood in geriatric rehabilitation patients was associated with improvement in physical and cognitive functioning. Slaets and colleagues (1997) randomized medically frail hospitalized patients over age 75 to psychogeriatric team care versus usual medical care. Patients receiving psychogeriatric team care (n=140) had a shorter LOS, became more independent in physical function, had fewer readmissions to hospitals, and were less likely to be admitted to nursing homes. Psychiatric comorbidity was an important risk factor for poorer clinical outcome. Similarly, Lopez and Mermelstein (1995) found that depressed geriatric rehabilitation patients who participated in a cognitive-behavioral treatment program made similar gains in rehabilitation as nondepressed patients.

The literature supports the following recommendation: frail older rehabilitation patients should be screened for depression and treatment plans initiated when appropriate (level 3 evidence; Diamond, et al., 1995; Harris, et al., 1988).

Cognitive Impairment

Cognitive impairment is a major challenge in the care of older persons. Thirty-one to 45% of patients in GORUs are reported to have cognitive impairment (Goldstein, et al., 1997; Heruti, et al., 1999; Seidel, Millis, Lichtenberg, & Dijkers, 1994). Although it has been a common stereotype that patients with lower levels of cognition are less likely to achieve independence in ADLs and ambulation, recent research has found that improvement in functional scores are independent of both age and cognition (Diamond, et al., 1996; Goldstein, et al., 1997).

A study of 52 geriatric rehabilitation patients (Diamond, et al., 1996) found that cognitively impaired patients tended to enter the program with lower functional scores and were more likely to be placed in a nursing home than cognitively intact patients, but a significant portion (38%) of the severely impaired and almost all (92%) of those with mild to moderate impairment were able to return home after rehabilitation. Similarly, Huusko and colleagues (2000) showed that hip fracture patients with mild and moderate dementia will be more likely to return to community living if they receive geriatric rehabilitation.

Goldstein and colleagues (1997) found that although cognitively intact older persons made greater gains in mobility than cognitively impaired older persons following inpatient rehabilitation for hip fracture, the cognitively impaired, who were mostly mildly to moderately impaired, were just as likely as the cognitively intact to return to community

living. Given that geriatric patients with cognitive impairment benefit from rehabilitation they should not be routinely excluded from rehabilitation (Diamond, et al., 1996; Goldstein et al., 1997). Patrick and colleagues (1996) suggest that, although cognitively impaired patients improve, they may not be able to maintain their improvement over time in comparison to the cognitively intact. It is possible that this may also be related to other comorbidities.

Heruti and colleagues (1999) evaluated rehabilitation outcomes of cognitively impaired (M age = 82.6 years; M MMSE score = 16) and cognitively intact (M age = 75.6 years; M MMSE score = 28.7) older patients with hip feature. Although all patients improved in functional abilities, the cognitively intact patients had better results. Motor function improved similarly in the two groups, but the relative functional gain (motor efficacy and efficiency) was lower for the cognitively impaired group. LOS was significantly longer for the cognitively impaired group. The analysis was adjusted for the significant difference in age between the 2 groups, but medical morbidity and complexity were not examined. Heruti and colleagues concluded that, given these differences, screening is crucial in order to select appropriate candidates.

Conclusion

The literature evidence supports the following recommendations: (1) frail older rehabilitation candidates with mild to moderate dementia should not be excluded from rehabilitation (level 1 evidence; Huusko, et al., 2000); (2) frail older patients should be screened for cognitive impairment (level 2 evidence; Goldstein, et al., 1997; Heruti, et al., 1999); (3) treatment for depression can improve rehabilitation outcomes. Moreover, based on the literature, we recommend that (4) frail older patients with hip fracture receive geriatric rehabilitation; (5) that frail seniors receive nutritional, cognition, and depression screening; and (6) that nutritional supplements be provided to undernourished frail older rehabilitation patients.

References

Allison, S. P., Rawlings, J., Field, J., Bean, N., & Stephan, A.D. (2000). Nutrition in the elderly hospital patient Nottingham studies. *Journal of Nutrition, Health and Aging, 4,* 54-57.

Aptaker, R. L., Roth, E. J., Reichhardt, G., Duerden, M. E., & Levy, C. E. (1994). Serum albumin level as a predictor of geriatric stroke rehabilitation outcome. *Archives of Physical Medicine and Rehabilitation, 75,* 80-84.

Avenell, A., & Handoll, H. H. (2000). Nutritional supplementation for hip fracture aftercare in the elderly. *Cochrane Database Systematic Review, 4,* CD001880.

Bagg, S. D. (1998). Outcome predictors and the effectiveness of stroke rehabilitation. *Physical Medicine and Rehabilitation, 12,* 581-592.

Bastow, M. D., Rawlings, J., & Allison, S. P. (1983). Benefits of supplementary tube feeding after fractured neck of femur: A randomized controlled trial. *British Medical Journal, 287,* 1589-1592.

Bernardini, B., Meinecke, C., Pagani, M., Grillo, A., Fabbrini, S., Zaccarini, C., et al. (1995) Comorbidity and adverse clinical events in the rehabilitation of older adults after hip fracture. *Journal of the American Geriatrics Society, 43,* 894-898.

Boult, C., & Brummel-Smith K. (1997). Post-stroke rehabilitation guidelines. *Journal of the American Geriatrics Society, 45,* 881-887.

Cameron, L., Crotty, M., Currie, C., Finnegan, T., Gillespie, W., Handoll, H., et al. (2000). Geriatric rehabilitation following fractures in older people: A systematic review. *Health Technology Assessment, 4,* 1-111.

Chandra, R. K. (1997). Nutrition and the immune system: An introduction. *American Journal of Clinical Nutrition, 66,* 460S-463S.

Delmi, M., Rapin, C. H., Bengoa, J. M., Delmas, P. D., Vasey, H., & Bonjour, J. P. (1990). Clinical practice: Dietary supplementation in elderly patients with fractured neck of the femur. *Lancet, 335,* 1013-1016.

Diamond, P. T., Holroyd, S., Macciocchi, S. N., & Felsenthal, G. (1995). Prevalence of depression and outcome on the geriatric rehabilitation unit. *American Journal of Physical Medicine and Rehabilitation, 74,* 214-217.

Espaulella, J., Guyer, H., Diaz-Escriu, F., Mellado-Navas, J. A., Castells, M. & Pladevall, M. (2000). Nutritional supplementation of elderly hip fracture patients: A randomized, double-blind, placebo-controlled trial. *Age and Ageing, 29,* 425-431.

Falconer, J. A., Naughton, B. J., Strasser, D. C., & Sinacore, J. M. (1994). Stroke rehabilitation: A comparison across age groups. *Journal of the American Geriatrics Society, 42,* 39-44.

Finestone, H. M., & Greene-Finestone, L. S. (1998). Nutrition and diet post-stroke. *Physical Medicine and Rehabilitation, 12,* 437-458.

Fitzgerald, J. F., Moore, P. S., & Dittus, R. S. (1988). The care of elderly patients with hip fracture. *New England Journal of Medicine, 319,* 1392-1397.

Gariballa, S. E. (2000). Nutritional support in elderly patients. *Journal of Nutrition, Health and Aging, 4,* 25-27.

Goldstein, F. C., Strasser, D. C., Woodard, J. L., & Roberts, V. J. (1997). Functional outcome of cognitively impaired hip fracture patients on a geriatric rehabilitation unit. *Journal of the American Geriatrics Society, 45,* 35-42.

Gresham, G. E., Duncan, P. W., Adams, H. P. Jr., Adel-man, A. M., & Alexander, D. N. (1995). Post-stroke rehabilitation. Clinical Practice Guideline No. 16. (AHCPR Report No. 95-0662). Rockville, MD: US Department of Health and Human Services, Public Service, Agency for Health Care Policy and Research.

Hall, K., Whiting, S. J., & Comfort, B. (2000). Low nutrient intake contributes to adverse clinical outcomes in hospitalized elderly patients. *Nutrition Review, 58,* 214-217.

Harris, R. E., Mion, L. C., Patterson, M. B., & Frengley, J. D. (1988). Severe illness in older patients: The association between depressive disorders and functional dependency during the recovery phase. *Journal of the American Geriatrics Society, 36,* 890-896.

Heruti, R. J., Lusky, A., Barell, V., Ohry, A., & Adunsky, A. (1999). Cognitive status at admission: Does it affect the rehabilitation outcome of elderly patients with hip fracture? *Archives of Physical Medicine and Rehabilitation, 80,* 432-436.

Hoenig, H., Nusbaum, N., Brummel-Smith, K. (1997). Geriatric rehabilitation: State of the art. *Journal of the American Geriatrics Society, 45,* 1371-1381.

Hudson, H. M., Daubert, C. R., & Mills, R. H. (2000). The interdependency of protein-energy malnutrition, aging and dysphagia. *Dysphagia, 15,* 31-38.

Huusko, T. M., Karppi, P., Avikainen, B., Kautiainen, H., & Sulkava, R. (2000). Randomized clinically controlled trial of intensive geriatric rehabilitation in patients with hip fracture: Subgroup analysis of patients with dementia. *British Medical Journal, 321,* 1107-1111.

Indredavik, B., Slordahl, S. A., Bakke, F., Rokseth, R., & Haheim, L. L. (1997). Stroke unit treatment: Long-term effects. *Stroke, 28,* 1861-1866.

Jaglal, S. B., Sherry, P. G., & Schatzker, J. (1996). The impact and consequences of hip fracture in Ontario. *Canadian Journal of Surgery, 39,* 105-111

Kasprisin, A. T., Clumeck, H., & Nino-Murcia, M. (1989). The efficacy of rehabilitative management of dysphagia. *Dysphagia, 4,* 48-52.

Keller, H. H. (1997). Nutrition problems and their association with patient outcomes in a geriatric rehabilitation setting. *Journal of Nutrition for the Elderly,* 17, 1-13.

Kennie, D. C., Reid, J., Richardson, I. R., Kiamari, A. A., & Kelt, C. (1988). Effectiveness of geriatric rehabilitative care after fractures of the proximal femur in elderly women: A randomized clinical trial. *British Medical Journal, 297,* 1083-1086.

Larsson, J., Unosson, M., Ek, A. C., Nilsson, L., Thorslund, S., & Jurulf, P. (1990). Effect of dietary supplement on nutritional status and clinical outcome in 501 geriatric patients. *Clinical Nutrition, 9,* 179-184

Lopez, M. A., & Mermelstein, R. J. (1995). A cognitive-behavioral program to improve geriatric rehabilitation outcome. *Gerontologist, 35,* 696-700.

Marittiku, R. A., Marottoli, R. A., Berkman, L. F., & Cooney, L. M., Jr. (1992). Decline in physical function following hip fracture. *Journal of the American Geriatrics Society, 40,* 861-866.

Meins, W., Meier-Baumgartner, H. P., Neetz, D., & von Renteln-Kruse, W. (2001). Predictors of favorable outcome in elderly stroke patients two years after discharge from geriatric rehabilitation. *Zeitschrift fur Gerontologie und Geriatrie, 34,* 395-400.

Montano, C. B. (1999). Primary care issues related to the treatment of depression in elderly patients. *Journal of Clinical Psychiatry, 60 Suppl 20,* 45-51.

Munin, M. C., Rudy, T. E., Glynn, N. W., Crossett, L. S., & Rubash, H. E., (1998). Early inpatient rehabilitation after elective hip and knee arthroplasty. *Journal of the American Geriatrics Society, 279,* 847-852.

Murphy, P. C., Rai, G. S., Lowy, M., Bielawska, C. (1987). The beneficial effects of joint orthopedic-geriatric rehabilitation. *Age and Ageing, 16,* 273-278.

Norton, B., Homer-Ward, M., Donnelly, M. T., Long, R. G., & Holmes, G. K. (1996). A randomized prospective comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding after acute dysphagic stroke. *British Medical Journal, 312,* 13-16.

Nourhashemi, F., Andrieu, S., Rauzey, O., Ghisolfi, A., Vellas, B., Chumlea, W. C., et al., (1999). Nutritional support and aging in preoperative nutrition. *Current Opinion in Clinical Nutrition and Metabolic Care, 2,* 87-92.

Odderson, I. R., Keaton, J. C., & McKenna, B. S. (1995). Swallow management in patients on an acute stroke pathway: Quality is cost effective. *Archives of Physical Medicine and Rehabilitation, 76,* 1130-1133.

Papaioannou, A., (2000). Mortality, independence in living and re-fracture: 1 year following hip fracture in Canadians. *Society of Obstetricians and Gynaecologists of Canada, 22,* 19-24.

Patrick, L., Lever, M., & Johnston, S. (1996). Aspects of cognitive status as predictors of mobility following geriatric rehabilitation. *Aging Clinical and Experimental Research, 8,* 328-333.

Rosenberg, C. H., & Popelka, G. M. (2000). Post-stroke rehabilitation: A review of the guidelines for patient management. *Geriatrics, 55,* 75-81.

Seidel, G. K., Millis, S. R., Lichtenberg, P. A., & Dijkers, M. (1994). Predicting bowel and bladder continence from cognitive status in geriatric rehabilitation patients. *Archives of Physical Medicine and Rehabilitation, 80,* 432-436.

Slaets, J. P., Kauffmann, R. H., Duivenvoorden, H. J., Pelemans, W., & Schudel, W. J. (1997). A randomized trial of geriatric liaison intervention in elderly medical inpatients. *Psychosomatic Medicine, 59,* 585-591.

Stahl, W. M. (1987). Acute phase protein response to tissue injury. *Critical Care Medicine, 15,* 545-550.

Stroke Unit Trialists' Collaboration (1997). Collaborative systematic review of the randomized trials of organized inpatient (stroke unit) care after stroke. *British Medical Journal, 314,* 1151-1159.

Sullivan, D. H., Walls, R. C., & Bopp, M. M. (1995). Protein-energy under-nutrition and the risk of mortality within 1 year of hospital discharge: A follow-up study. *Journal of the American Geriatrics Society, 43,* 504-512.

Teasell, R. W., Merskey, H., & Deshpande, S. (1999). Antidepressants in rehabilitation. *Physical Medicine and Rehabilitation Clinics in North America, 10,* 237-253.

Volkert, D., Hubsch, S., Oster, P., & Schlierf, G. (1996). Nutritional support and functional status in undernourished geriatric patients during hospitalization and 6-month follow-up. *Aging (Milano), 8,* 386-395.

White, B. L., Fisher, W. D., & Laurin, C. A., (1987). Rate of mortality for elderly patients after fracture of the hip in the 1980's. *Journal of Bone and Joint Surgery American Volume, 69,* 1335-1340.

Wilson, K., Mottram, P., Sivanranthan, A., Nightingale, A. (2001). Antidepressants versus placebo for the depressed elderly. *Cochrane Database Systematic Review, 2,* CD000561.

Part B: Outpatient Services

In this section, we review outpatient SGS. There is a wide variety of outpatient services, but we focus on geriatric day hospital (Chapter 6), "Geriatric Primary Care" which includes outpatient comprehensive geriatric assessment (CGA) and geriatric evaluation and management in Chapter 7, and "Outreach "in Chapter 8.

Geriatric day hospitals are controversial. They have not shown benefits in mortality and functional status and may or may not offer cost benefits

Geriatric primary care, by contrast, has shown some encouraging results: outpatient comprehensive geriatric assessment is effective and – compared to inpatient versions – reduces risk and burden to patients, and probably cost to the system. Multidisciplinary geriatrics primary care with follow-up – called GEM in the US – is also effective, and it may be that the follow-up required is not labour-intensive.

Outreach care has been the subject of few studies, yet it is still apparent that positive outcomes are less likely using a solo practitioner and more likely with a multidisciplinary approach, particularly when one of the disciplines involved is geriatric medicine. Outreach services play an important role in identifying patients appropriate for specialized geriatric services.

Chapter 6

Geriatric Primary Care

David Lewis

Clinician's Perspective: Patricia Woo, MD

The goal of geriatric primary care is to maintain health and functional ability in the elderly population. Older adults have multiple comorbid conditions which require a more comprehensive approach.   There have been persistent questions on the best approach to providing this care within the context of a busy outpatient practice where resources are usually quite limited. Few physicians are choosing careers that are focused on the care of older adults, and the same phenomenon is seen in other disciplines, such as nursing and physiotherapy. Various models of outpatient geriatric primary care have been proposed and studied and these are reviewed in this chapter. Of particular interest is the staff mix that commonly includes a gerontological nurse or nurse practitioner. Cost minimization strategies such telephones follow-ups may be beneficial in providing continuity of care. A natural next step is to understand whether our clinical practice contains components of services which have been demonstrated to be effective and, if not, why not? And what can we do about it? This chapter provides a guide to addressing these questions, and it is tailored specifically to the needs of students, and of the clinicians and managers who provide behavioral health services to older adults.

Executive Summary

There are few studies of geriatric clinic care, but several on geriatric evaluation and management , which combines a clinic assessment with follow-up. In addition, most outcomes measured are those available from routine review of databases: mortality, place of residence/ institutionalization, dependency, global 'poor' outcome (combining death, institutionalization or dependency) and resource use. A few studies have measured activities of daily living (ADL) scores, subjective health status, patient satisfaction, and resource use. Recommendations include**:**

- Targeting and screening of patients who are likely to benefit.
- A focus on clients with treatable chronic conditions that erode quality of life and that may require institutional care (Boult, Boult, Morishita, Smith, & Kane, 1998; Burns, Nichols, & Marshall, & Cloar, 1995; Silverman, et al., 1995).

> - Combining care with other special programs for older adults at risk, including case management, home care, sub-acute units, geriatric hospital units, advance directives, and well organized, guideline-driven primary care. Outpatient SGS is, at best, only marginally cost-effective, so it must be designed to maximize efficiency.
> - Combining assessment with sustained treatment in an interdisciplinary team approach. This means that clinics with large numbers of new clients may be less effective. Specific protocols for follow-up, possibly including telephone follow-up, and/or to increase adherence are needed. Programs may need to retain responsibility for complex outpatients indefinitely.

In health services research, there have been systematic reviews of comprehensive geriatric assessment, geriatric day hospital, inpatient geriatric consultation service, and recently of inpatient geriatric rehabilitation (Forster, Young, & Langhorne, 2003; Scott, 1999; Stuck, Siu, Whieland, Adams, & Rubenstein, 1993; Wells, Seabrook, Stolee, Borrie, & Knoefel, 2003a, 2003b). However, no review of the literature on how to organize geriatric outpatient care has been completed. It is not clear if there are optimal screening, assessment, staffing, treatment and/or follow up processes that maximize outcomes, effectiveness and efficiency in the outpatient setting.

The objective of this chapter is to identify components of outpatient geriatric services that have been demonstrated to be effective, but that have not been reviewed in earlier chapters. (Note that this chapter focuses on outpatient services; community (home)-based care offered through outreach services is discussed in Chapter 8). Based on this information, we intend to provide administrators and clinicians with evidence-based recommendations regarding protocols, screening criteria, assessment, treatment, follow-up strategies, and team make-up. Isolating those activities that have been demonstrated to enhance the quality of geriatric outpatient care will have particular value for those who need to choose and operationalize models of service.

DESIGN

To achieve the objectives of this chapter, a Medline search was performed. Selection criteria focused on randomized trials or other high quality research comparing specialized geriatric outpatient services with alternative forms of care and excluding geriatric medical day hospitals. Some reviewers, notably those in the Cochrane Collaboration, explicitly limit articles abstracted to randomized controlled trials (RCT); Oxman, 1994. However, this approach may not be as useful in health services research (Chalmers, Celano, Sacks, & Smith, 1983; Sacks, Berrier, Reitman, Ancona-Berk, & Chalmers, 1987), so other forms of research were included, but still reserved pride of place to RCTs. In addition, the weight of the evidence was considered, that is, the number of research articles which consistently support a given approach.

Medline was searched using two strategies. In the first search, the term "geriatric clinic" was selected and the results limited to any form of clinical trial including RCTs, consensus development conferences, evaluation studies, meta-analyses, any of the several forms of review permitted, or evidence based practice. Finally, the results were limited to articles with abstracts, in the English language, and using human subjects aged 65 or older. In the second search, we used the keywords geriatric (and variants) or gerontology (or variants). The results were combined with the keyword outpatient, then limited as described above. Similar searches of the Cochrane Register and Best Evidence (the ACP Journal Club) were conducted.

Each article was retrieved, scored for clinical quality, and summarized in terms of the substantive findings. In order to assess clinical quality, study size and duration, completion rates, exclusion criteria, and outcomes were considered (Mulrow, 1994; Oxman, 1994). Where available, numbers of subjects per arm, time span of the study, completion rates, admission/ exclusion criteria, main outcomes, changes reported, and statistical significance and clinical significance were recorded. This information was used to develop a quality score, in the form of an ordinal scale. The validity of the clinical quality score was assessed by having a random sample of 13 articles scored independently by blinded assessors and, despite the ordinal nature of the scores, average intraclass correlation coefficient values was calculated. The quality score supplemented Jadad scores (Moher, et al. 1995), which we also calculated. The Jadad scale is a widely-used method to quantify a study's quality; that is, to assess whether reported methodology and results are free of bias. However, its use is confined to randomized controlled trials.

Participants were confined to medical patients aged 65 or older, and to include only those sources reporting specific outcomes: deaths, place of residence/ institutionalization, dependency, global 'poor' outcome (a single score combining death, institutionalization or dependency), activities of daily living (ADL) scores, subjective health status, patient satisfaction, and resource use.

The Medline search using the keywords "geriatric clinic" yielded 16 articles, of which 7 were rejected by hand searching. The second search, using "geriatric" (and variants) or "gerontology" (or variants) and "outpatient" retrieved over 2,232 articles. Hand searching was used to reduce the number of articles to 27, including all from the first search. Similar searches of the Cochrane Register and Best Evidence (the ACP Journal Club) yielded two additional articles, for a total of 29. Eight of these were excluded because they did not deal with specialized geriatric outpatient care, because they included no measures of effectiveness, or because they repeated information found elsewhere.

Based on relevance and quality, 21 articles were retained, dealing with 10 sites. Table 6.1 contains a summary of these articles. A sample of 13 articles rated for quality independently by two raters achieved average intraclass correlation coefficient values of 0.85 (p<.001), indicating high reliability (not shown).

Of the 21 articles retrieved, 16 dealt with outpatient assessment or consultation, or with geriatric evaluation and management, while the remainder dealt with some other aspect of outpatient care, such as telephone follow-up.

Table 6.1: Study Results

Jadad Score	Quality Score	Author	N	Comparison	Cost	Mortality	HRQOL	Function	Social	Acute Care Utilization	Nursing Home Utilization	Other Utilization	Burden	Satisfaction	Mental health	Life Satisfaction	Diagnosis
2	175	Alessi, et al., 1997	215/199	inhome NP, CGA vs TAU													+
0	87	Aminzadeh et al., 2002	116/0	None (CGA)									+	+			
-	112	Boult et al., 1998	274/248	TAU vs Outpt				+		-	-	+ **	+	+			
3	199	Boult, et al.,1994	294/274	TAU vs Outpt	+*									+			
3	187	Burns, et al., 1995	60/68	TAU vs Outpt		+	+	+	+	-	-				+ ***	+	
2	176	Cohen, et al., 2002	696/692	TAU vs Outpt	-										+ ****		
2	186	Engelhardt, et al., 1996	80/80	TAU vs Outpt	-	-		-						+			
0	171	Jaatinen, et al., 2002	46/48	teleconsults vs TAU f/up						-	-	-		+			
3	186	Keeler, et al., 1999	180/183	TAU vs Outpt	+			+									
2	178	Morishita, et al., 1998	274/294	TAU vs Outpt										+			
0	177	Noel, & Vogel, 2002	10/9	teleconsults vs TAU f/up	-			-									

Jadad Score	Quality Score	Author	N	Comparison	Cost	Mortality	HRQOL	Function	Social	Acute Care Utilization	Nursing Home Utilization	Other Utilization	Burden	Satisfaction	Mental health	Life Satisfaction	Diagnosis
3	186	Reuben, et al., 1999	180/183	TAU vs Outpt			+	+									
3	192	Rubin, et al., 1993	97/97	TAU vs Outpt		-	-	-			-					-	
3		Schmader, et al., 2004	834	TAU vs Outpt	-					-	-	+					
1	120	Shah, 1997	n/a	outpt vs home ger psych	-												
2	194	Silverman, et al., 1995	239/203	TAU vs Outpt		-	-			-	-		+				+
1	185	Stuck, et al., 1995	215/199	annual f/up vs TAU				+		-	-	-					
3	170	Toseland, et al., 1996	80/	TAU vs Outpt	-	+	+	+	+	-	-	-		+			
2	187	Toseland, et al., 1997	80	TAU vs Outpt	+												
3	143	Weuve, et al., 2000	294/274	TAU vs Outpt									+				
0	188	Williams, et al., 1987	117	TAU vs Outpt	+			-									

+ results support intervention
- results do not support intervention   *may require initial subsidy
f/up: follow-up   ** Home care
NP: Nurse Practitioner   *** Depression
TAU: Treatment as usual   ****Mental health
Outpt: Out-patient   Jadad score: lower scores indicate higher quality   Quality score: higher scores indicate higher quality

Of those articles dealing with geriatric evaluation and management, six reported greater satisfaction among those receiving geriatric evaluation and management and/or stakeholders, four found reduced informal caregiver burden, two indicated improved mental health, two showed improved social functioning, one described improved case-finding, and one found fewer adverse drug reactions and fewer instances of suboptimal prescribing.

In contrast, two found reduced mortality with geriatric evaluation and management, while two showed no difference. Similarly, three reported improved quality of life and two found no difference; five reported improved function but three described no difference; one showed improved life satisfaction and one indicated no difference.

In terms of costs and service utilization, four found cost savings with geriatric evaluation and management while three did not (a fourth showing greater cost for this was superseded by a positive study). In addition, one study showed reduced home care utilization among geriatric evaluation and management patients. The remaining studies found greater utilization, or no difference, in acute service utilization (four studies), nursing home placement (five studies), and other utilization for geriatric evaluation and management patients (one study).

Of those dealing with other outpatient interventions, two studies examined telephone follow-up after treatment versus treatment as usual and found no difference in cost or patient function (a very small study) or in any form of health service utilization (a somewhat larger study). The latter study did find greater referral source and client satisfaction among those receiving telephone follow-up. A higher-quality study of annual in-person follow-up found improved function but no change in utilization in the intervention arm. A related study also found improved case finding in the intervention arm.

Process Recommendations

Although further study is certainly needed, as noted in several articles, we can conclude each of the following with some confidence.

- Targeting and screening of patients who are likely to benefit from geriatric outpatient care is crucial to success (Boult, et al., 1998; Boult, et al., 1994; Burns, et al., 1995; Cohen, et al., 2002; Silverman, et al., 1995; Williams, Williams, Zimmer, Hall, & Podgorski, 1987).
- Geriatric outpatient care is most likely to benefit those with treatable chronic conditions that erode quality of life and that may require institutional care (Boult, et al., 1998; Burns, et al., 1995; Silverman, et al., 1995).
- Geriatric evaluation and management is most effective in concert with other special programs for older adults at risk, including case management, home care, sub-acute units, geriatric hospital units, advance directives, and well organized, guideline driven primary care (Boult, et al. 1998; Reuben, Frank, Hirsch, McGuigan, & Marley, 1999; Touseland, et al., 1997).
- In order to be effective, geriatric outpatient care must combine assessment with sustained treatment (Alessi et al., 1997; Aminzadeh, Amos, Byszewski, & Dalziel, 2002; Boult, et al., 1994, 1998; Burns et al., 1995; Silverman, et al., 1995).

- o Specific protocols for follow-up and/or to increase adherence are needed (Aminzadeh, et al., 2002;Boult, et al., 1994; Reuben, et al., 1999; Touseland, et al., 1997). These may involve telephone consultation or follow-up (Boult, et al., 1998; Jaatinen, Aarnio, Remes, Hannukainen, & Koymari-Seilonen, 2002; Noel, & Vogel, 2000).
- Better outcomes may be achieved by geriatric evaluation and management programs that retain responsibility for complex patients indefinitely (Alessi, et al. 1997; Boult, et al., 1994, 1998; Burns, et al., 1995; Silverman, et al., 1995).
- Because geriatric evaluation and management programs are, at best, marginally cost-effective (Boult, et al., 1994, 1998; Burns, et al. 1995; Engelhardt, Toseland, O'Donnell, Richie, Jue, & Banks, 1996) they must be designed to maximize efficiency (Engelhardt et al.; Keeler, et al., 1999; Toseland, et al., 1996, 1997). This can be achieved by:
  - o Co-ordination of care with primary providers, along with use of well coordinated services that minimize redundancies (Aminzadeh, et al. 2002; Boult, et al., 1994, 1998; Cohen, et al., 2002; Morishita, Boult, Boult, Smith, & Pacala, 1998; Reuben, et al., 1999; Williams, et al., 1987). In particular, geriatric outpatient should not assume primary care responsibilities. If geriatric outpatient programs are designed to collaborate with primary care, they will be less resource intensive, and will not set up a parallel system of healthcare delivery (Keeler, et al., 1999; Morishita et al., 1998; Reuben, et al., 1999; Williams, et al., 1987).
  - o Emphasizing risk reduction strategies (e.g. falls prevention) (Englehardt, et al., 1996).
  - o Seeking to divert patients away from emergency or inpatient care (Englehardt, et al., 1996; Rubin, Sizemore, Loftis, & de Mola, 1993).
  - o Reducing the number of visits without compromising quality of care (Aminzadeh, et al., 2002). This is made more likely with more effective communication among the various disciplines involved in the assessment and treatment process, along with family conferencing (Aminzadeh, et al., 2002; Boult, et al. 1998; Williams et al., 1987).
  - o Efficient standardized techniques for assessment are needed, as are clinical guidelines (Aminzadeh, et al., 2002; Boult, et al. 1998).
- An interdisciplinary team approach providing continuity of care is key (Aminzadeh, et al., 2002; Rubin, et al., 1993; Williams et al., 1987).

These findings are summarized in Table 6.2, which shows the number of RCTs supporting each finding, along with the number of other studies reporting the finding.

Table 6.2: Key Recommendations

Strategy	Number of Studies	
	RCT	Other
Enrollment		
Targeting and screening of patients who are likely to benefit	4	1
Select those with treatable chronic conditions that erode quality of life and that may require institutional care	2	2
Combine assessment with sustained treatment	0	2
Introduce efficient standardized techniques for assessment, clinical guidelines	0	1
Treatment		
Work with other special programs for older adults at risk	0	1
Interdisciplinary team approach providing continuity of care	2	1
Because GEM* programs are, at best, marginally cost-effective, they must be designed to maximize efficiency	4	1
Co-ordination of care with primary providers, along with development of well coordinated services that minimize redundancies	4	1
Emphasizing risk reduction strategies (e.g. falls prevention)	1	0
Seeking to divert patients away from emergency or inpatient care	4	2
Reducing the number of visits without compromising quality of care.	1	2
More effective communication among the various disciplines involved in the assessment and treatment process	1	0
Family conferencing	0	2
Follow-up		
Specific protocols for follow-up and/or increase adherence	6	3
Telephone follow-up	2**	1
Better outcomes may be achieved by GEM* programs that retain responsibility for complex patients indefinitely	1	

* GEM = geriatric evaluation and management
**Small N's

Staffing

There were basic levels and mixtures of staff associated with interventions that were found to be effective; in the 20 articles reviewed, 18 described staff types (See Table 6.3):

- For outpatient assessments or clinics (Silverman, et al., 1995; Stuck, et al., 1993, 1995; Williams et al., 1987), all effective interventions included a consulting geriatrician and a gerontological nurse or gerontological nurse practitioner. Two also included a social

Table 6.3: Staffing Associated with Successful Interventions

Author	Staffing	Intervention	Favors Intervention
Alessi, et al., 1997	Geriatrician (consult), NP (Gerontological)	In-home CGA	Yes
Boult et al., 1998	Geriatrician, RN (Gerontological), NP, SW	SGS Clinic (GEM)	No
Boult et al., 1994	Geriatrician; NP (Gerontological), SW	SGS Clinic (GEM)	Yes
Burns, Nichols, Marshall, & Cloar, 1995	Physicians (geriatrician), NP, SW, psychologist, clinical pharmacist	SGS Clinic (GEM)	Yes
Cohen, et al., 2002	Geriatrician, RN, SW	SGS Clinic (GEM)	Yes
Engelhardt, et al., 1996	Geriatrician, NP (lead), SW	SGS Clinic (GEM)	No
Jaatinen, et al., 2002	Physicians (others unstated)	Teleconsults	Yes
Keeler, et al., 2002	Geriatrician, NP (Gerontological), SW, PT	SGS Clinic (GEM)	Yes
Morishita, et al., 1998	Geriatrician, NP (Gerontological), RN, SW	SGS Clinic (GEM)	Yes
Noel, & Vogel, 2002	RN, Physician (consult)	Telemedicine	No
Reuben, Frank, Hirsch, McGuigan, & Malay, 1999	Geriatrician, NP (Gerontological), SW, PT	SGS Clinic (GEM)	Yes
Rubin, Seizmore, Loftis, & de Mola, 1993	Geriatrician, CNS (Gerontological) , SW (Gerontological)	SGS Clinic (GEM)	Yes
Shah, 1997	Geriatric psychiatry clinic primary physicians (others unstated)	Psychiatry Clinic	Yes
Silverman, et al., 1995	Geriatrician, RN (Gerontological), SW	CGA	Yes
Stuck, et al., 1995	Geriatrician (consult), NP (Gerontological)	CGA	Yes
Toseland, et al., 12996	Geriatrician, NP, SW	SGS Clinic (GEM)	Yes
Toseland et al., 1997	Geriatrician, NP, SW	SGS Clinic (GEM)	Yes
Williams, Williams, Zimmer, Hall, & Podgorski, 1987	Geriatrician, family physicians (interest in geriatric), psychiatrists, RN, SW, Nutritionists	CGA	Yes

CGA = Comprehensive Geriatric Assessment; SGS = Specialized Geriatric Services; GEM = Geriatric Evaluation & Management; NP = Nurse Practitioner; SW = Social Worker; RN = Registered Nurse; PT = Physiotherapist;

worker, and one added family physicians with an interest in geriatrics, psychiatrists and nutritionists. An in-home assessment unit (Alessi, et al., 1997) was staffed by a consulting geriatrician and a gerontological nurse practitioner.

- The single article on a psychiatry clinic (Shah, 1997) mentioned geriatric psychiatry and primary physicians; other staff, if any, were not described.
- One article on teleconsultations mentions physicians only (Jaatinen, 2002). One on telemedicine reported results that did not favor the intervention; it was staffed by a nurse with a physician available for consults (Noel & Vogel, 2000).
- The remaining articles describe geriatric evaluation and management. Of these, one described a satisfaction study only (Morishita, et al., 1998), and two reported results that did not favor the intervention (Boult, et al., 1998; Englehardt, 1996). Of the remaining eight, all specified a social worker as a staff member (Boult, et al., 1994; Burns, et al., 1995; Cohen, et al., 2002; Keeler, et al., 1999; Reuben, et al., 1999; Rubin, 1993; Touseland, et al., 1996, 1997). Seven included a geriatrician (Boult, et al., 1994; Cohen, et al.; Keeler, et al., 1999; Reuben, et al., 1999; Rubin, et al., 1993; Touseland, et al., 1996, 1997) while the eighth mentioned a physician only (Burns, et al., 1995). Four specified a gerontological nurse practitioner or gerontological clinical nurse specialist (Boult, 1998; Keeler, et al.; Reuben, 1999; Rubin, 1993) while four mentioned a nurse practitioner without specifying a gerontological focus (Burns, et al., 1995; Cohen, et al.; Touseland, et al., 1996, 1997). Two included physiotherapy (Keeler, et al., 1999; Reuben, et al., 1999), and one a psychologist and a clinical pharmacist (Burns, et al., 1995).

One article with results that did not favour the intervention, was led by a nurse practitioner (Englehardt, et al., 1996), another with unfavourable results included *both* a nurse and a nurse practitioner (Boult, et al., 1998).

Conclusions

This research described the types of outpatient interventions in geriatric care for which there is supporting evidence. It provides strategies to enhance care, some of which are fairly easy to implement.

For example, research shows that seniors with complex health needs require staff who have specific training in geriatrics. However, those without complex needs may not. For those with complex needs, a staff mix that complements expertise in geriatrics makes good sense. The data suggest that the essential building block for staffing begins with a geriatrician and a gerontological nurse or, more commonly, a gerontological nurse practitioner. Many successful programs have other staff as well, and study authors support an interdisciplinary or team approach to care. However, data on staffing must be interpreted with caution, since the study authors were not testing personnel models in their studies.

In order to maximize success, team members need to have clear role descriptions and effective communication strategies within the team. They also need to communicate outside the team, to coordinate care planning with family and community partners, and to operate with a well communicated "handing off" plan to health care providers. Treatment plans must be understood and followed by patients and their significant others; strategies to

ensure that this happens should be in place. Specific protocols and strategies to increase the likelihood that patients will adhere to the treatment regimen should be put in place.

Like any other literature review, this one suffers from two major sources of error: the limitations in study scope, in what has been studied, in the research reviewed; and the possibility that the sample extracted is biased. There are substantial gaps in the available evidence surrounding the organization of specialized geriatric services. These gaps can be filled with new health services research. On the other hand, this study excludes literature that was not cited in Medline, (e.g., grey literature). In addition, literature in business and social science journals which might bear on the issue at hand was not examined.

The results described here indicate that geriatric outpatient services must carefully target only those patients who are likely to benefit, combine assessment with sustained treatment and follow-up, and pay close attention to cost minimization strategies, perhaps including telephone follow-up.

References

Alessi, C. A., Stuck, A. E., Aronow, H. U., Yuhas, K. E. Bula, C. J., Madison, R., et al. (1997). The process of care in preventive in-home comprehensive geriatric assessment. *Journal of the American Geriatrics Society, 45(9),* 1044-1050.

Aminzadeh, F., Amos, S., Byszewski, A., & Dalziel, W. B. (2002). Comprehensive geriatric assessment: Exploring clients' and caregivers' perceptions of the assessment process and outcomes. *Journal of Gerontological Nursing, 28(6),* 6-13.

Boult, C., Boult, L., Morishita, L., Smith, S. L., & Kane, R. L. (1998). Outpatient geriatric evaluation and management. Journal of the American Geriatrics Society, 46(3), 296-302.

Boult, C., Boult, L., Murphy, C., Ebbitt, B., Luptak, M., & Kane, R. L. (1994). A controlled trial of outpatient geriatric evaluation and management. Journal of the American Geriatrics Society, 42(5), 465-70.

Burns, R., Nichols, L. O., Marshall, J. G., & Cloar, F. T. (1995). Impact of continued geriatric outpatient management on health outcomes of older veterans. *Archives of Internal Medicine, 155,* 1313-1318.

Chalmers, T. C., Celano, P., Sacks, H.S., & Smith, H.J. (1983). Bias in treatment assignment in controlled clinical trials. *New England Journal of Medicine, 309,* 1358-1361.

Cohen, H. J., Feussner, J. R., Weinberger, M., Carnes, M., Hamdy, R. C., Hsieh, F., et al. (2002). A controlled trial of inpatient and outpatient geriatric evaluation and management. *New England Journal of Medicine, 346(12),* 905-912,

Engelhardt, J. B., Toseland, R. W., O'Donnell, J. C., Richie, J. T., Jue, D., & Banks, S. (1996). The effectiveness and efficiency of outpatient geriatric evaluation and management. *Journal of the American Geriatrics Society, 44(7),* 847-856.

Forster, A., Young, J., & Langhorne, P. (2003). Medical day hospital care for the elderly versus alternative forms of care . In: The Cochrane Library [Database on Disc and CDROM, Issue 2]. Oxford, UK: Update Software.

Jaatinen, P. T., Aarnio, P., Remes, J., Hannukainen, J., & Koymari-Seilonen, T. (2002). Teleconsultation as a replacement for referral to an outpatient clinic. *Journal of Telemedicine and Telecare, 8(2),* 102-106.

Keeler, E. B., Robalino, D. A., Frank, J. C., Hirsch, S. H., Maly, R. C., & Reuben, D. B. (1999). Cost-effectiveness of outpatient geriatric assessment with an intervention to increase adherence. *Medical Care, 37 (12),* 1199-1206.

Moher, D., Jadad, A. R., Nichol, G., Penman, M., Tugwell, P., & Walsh, S. (1995). Assessing the quality of randomized controlled trials: An annotated bibliography of scales and checklists. *Controlled Clinical Trials, 16(1),* 62-73.

Morishita, L., Boult, C., Boult, L., Smith, S., & Pacala, J. T. (1998). Satisfaction with outpatient geriatric evaluation and management (GEM). *Gerontologist, 38(3),* 303-308.

Mulrow, C. D. (1994). Rationale for systematic reviews. *British Medical Journal, 309,* 597-599.

Noel, H. C., & Vogel, D. C. (2000). Resource costs and quality of life outcomes for homebound elderly using telemedicine integrated with nurse case management. *Care Management, 6(5),* 22-31.

Oxman, A. D. (Ed.) (1987). Preparing and maintaining systematic reviews. In The Cochrane Collaboration Handbook . Oxford, UK: Cochrane Collaboration.

Reuben, D. B., Frank, J. C., Hirsch, S. H., McGuigan, K. A., & Maly, R. C. (1999). A randomized clinical trial of outpatient comprehensive geriatric assessment coupled with an intervention to increase adherence to recommendations. *Journal of the American Geriatrics Society, 47(3),* 269-276.

Rubin, C. D., Sizemore, M. T., Loftis, P. A. & de Mola, N. L. (1993). A randomized, controlled trial of outpatient geriatric evaluation and management in a large public hospital. *Journal of the American Geriatrics Society, 41(10),* 1023-1028.

Sacks, H. S., Berrier, J., Reitman, D., Ancona-Berk, V. A., & Chalmers, T. C. (1987). Meta-analysis of randomized controlled trials. *New England Journal of Medicine, 316(8),* 450-455.

Schmader, K. E., Hanlon, J. T., Pieper, C. F., Sloane, R., Ruby, C. M. & Twersky J. (2004). Effects of geriatric evaluation and management on adverse drug reactions and suboptimal prescribing in the frail elderly. *American Journal of Medicine, 116(6),* 394-401.

Scott, I. (1999). Optimising care of the hospitalized elderly: A literature review and suggestions for future research. *Australian and New Zealand Journal of Medicine, 29(2),* 254-264.

Shah, A. (1997). Cost comparison of out-patient and home-based geriatric psychiatry consultations in one service. *Aging and Mental Health, 1(4),* 372-376.

Silverman, M., Musa, D., Martin, D. C., Lave, J.R., Adams, J., & Ricci, E. M. (1995). Evaluation of outpatient geriatric assessment: A randomized multi-site trial. *Journal of the American Geriatrics Society, 3(7),* 733-740.

Stuck, A. E., Aronow, H. U., Steiner, A., Alessi, C. A., Bula, C. J., Gold MN., et al. (1995). A trial of annual in-home comprehensive geriatric assessments for elderly people living in the community. *New England Journal of Medicine, 333(18),* 1184-1189.

Stuck, A. E., Siu, A. L., Whieland, G. D., Adams, J., & Rubenstein, L. Z. (1993). Comprehensive geriatric assessment: A meta-analysis of controlled trials. *Lancet, 342,* 1032-1036.

Toseland, R. W., O'Donnell, J. C., Engelhardt. J. B., Hendler, S. A., Richie, J. T., & Jue, D. (1996). Outpatient geriatric evaluation and management. Results of a randomized trial. *Medical Care, 34(6),* 624-640.

Toseland, R. W., O'Donnell, J. C., Engelhardt, J. B., Richie, J., Jue, D., & Banks, S. M. (1997). Outpatient geriatric evaluation and management: Is there an investment effect? *Gerontologist, 37(3),* 324-332.

Wells , J. L., Seabrook, J. A., Stolee, P., Borrie, M. J., & Knoefel, F. (2003). State of the art in geriatric rehabilitation. Part I: review of frailty and comprehensive geriatric assessment. *Archives of Physical Medicine & Rehabilitation, 84(6):*890-7.

Wells, J. L., Seabrook, J. A., Stolee, P., Borrie, M. J., & Knoefel, F. (2003). State of the art in geriatric rehabilitation. Part II: clinical challenges. *Archives of Physical Medicine & Rehabilitation, 84(6),* 898-903.

Weuve, J. L., Boult, C., & Morishita, L. (2000). The effects of outpatient geriatric evaluation and management on caregiver burden. *Gerontologist, 40(4),* 429-436.

Williams, M. E., Williams, T. F., Zimmer, J. G., Hall, J., & Podgorski CA. (1987). How does the team approach to outpatient geriatric evaluation compare with traditional care? A report of a randomized controlled trial. *Journal of the American Geriatrics Society, 35(12),* 1071-1078.

Chapter 7

Geriatric Day Hospital

David Lewis and Marlene Awad

Clinician's Perspective: Irene Turpie

This is a useful review of the Geriatric Day Hospital. Day Hospitals have become an integral and accepted part of geriatric care despite the lack of compelling supportive evidence for them. In Ontario they have changed little in composition and purpose in the 20 years since their inception despite great changes in health care delivery. They are designed to provide rehabilitative services to those persons who would benefit from them and who are well enough to get to them. Day Hospitals elsewhere have evolved to fulfill additional and more focused purposes.

The problems with evaluating Day Hospitals, as the authors have described, is the great diversity of services offered and patients admitted. These can include home care services, with which they are properly contrasted in some studies.

This review will form a useful guide for anyone interested in establishing or evaluating a Day Hospital. It is a welcome addition to the literature on Day Hospitals and will also serve as a useful guide and perhaps a stimulus to provide more standardized and shortened assessments for the frail elderly persons who attend them. With the decreasing numbers of hospital beds and the increasing numbers of elderly persons, Day Hospitals play an important role in providing an efficient and useful bridge between community and hospital and it is up to those of us who work in them to work to this goal.

Executive Summary

Geriatric Day Hospital (GDH) is a hospital based ambulatory program that provides diagnostic, rehabilitative or therapeutic services to seniors living in the community. The intent is for GDH to serve as a bridge between acute care and community care. The core services are rehabilitative therapy, intended to improve function and quality of life, maintain independence, and alleviate care-giver burden.

GDH was introduced in Oxford in the 1950s and was rapidly replicated elsewhere. There is some evidence, however incomplete and heterogeneous, that GDH can have a positive impact on mortality, health status and function, and (at least) balanced cost.

More research is needed to identify the ways in which GDH are beneficial and which patients benefit most. This information will assist in the development of appropriate eligibility criteria to optimize the use of health care system resources.

Suggestions for GDH's
1. Ensure that GDH's use screening and enrolment measures to target frail patients to help avoid inpatient admissions and/or institutionalization.
2. Control costs: maintain shorter mean lengths of stay, avoid redundant questions and tests, streamline assessment time, and reduce clerical activities (e.g., charting) by specialized staff.
3. Control heterogeneity and inappropriate enrolments: standards for determining a treatment plan should be developed and used consistently, with measurable goals. Enrolment criteria should be used to include only complex elderly patients with at least two health issues, one of which must be amenable to rehabilitation.
4. Enhance education opportunities; for example, the treatment plan should be reviewed with patients and their caregivers.
5. Each discipline should prioritize care plan issues and treatments so as to focus on the essentials (i.e. those with a high burden of illness and a reasonable prospect of change).

Introduction

It is critical that the necessary data and information be made available to all those who need it (policy makers, health care providers and managers, patients and consumers) at a time when decisions are being made (National Forum on Health, 1996). Despite the fact that medical geriatric day hospitals have existed since 1952 (Anonymous, 1994), there is no clear evidence to indicate whether they work, or whether they are more effective than alternative forms of service delivery. This may be because there are no consistent standards for assessing what constitutes "success" in this context (Bach, Bach, Böhmer, Frühwald, & Grilc, 1995). This chapter provides an overview of geriatric day hospitals and a review of the evidence surrounding them.

Profile of the Geriatric Day Hospital

Geriatric Day Hospital (GDH) is a hospital based ambulatory program that provides diagnostic, rehabilitative or therapeutic services to seniors living in the community. The intent is for GDH to serve as a bridge between acute care and community care (Benson, 1992).

Typically, GDHs are large users of outpatient specialized geriatric services (SGS) resources.[*] Assessment and treatment may include "high tech" equipment as needed, but

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[*] However, this is a relative term: a GDHs resource use pales in comparison to any acute care unit, and even to some outpatient units.

often they do not, either because they are unnecessary or because the patient has already received such assessments prior to referral to GDH. Instead, GDH relies on comparatively large amounts of space (to house exercise and other rehabilitation equipment) and labour-intensive activities. Staffing includes medical and administrative functions, along with physiotherapy, occupational therapy, rehabilitation assistants, therapeutic recreation, and clerical. Many have social workers as well. Nursing is always involved and sometimes includes advanced practice nursing if available. Some use a multidisciplinary case management approach, while others confine case management to the nursing role. Geriatric medicine and perhaps geriatric psychiatry are also involved.

Our review of 6 local day hospitals' staffing (Table 7.1) and utilization indicated high variability, but on average GDHs operated with 1.2 patient hours for every 1.0 staff hour.

Table 7.1: Geriatric Day Hospital (GDH) Staffing

	Means
Spaces	22
Admissions*	120
Visits*	2273
ALOS (admission to discharge)	108
Average daily census	11
Mean FTEs for GDH	7.19
Mean staff hours per patient	840.5

ALOS = Average length of stay; FTE = Full time Equivalent
* per year

A day hospital provides an organized day program for the sick and elderly requiring rehabilitation and in some instances, diagnostic investigation/assessment (Black, 2005). Although day hospitals also provide some recreational/social activities, these are secondary. The "primary services" are usually rehabilitative therapy, notably occupational therapy and physiotherapy, with other specialties, like speech/language pathology, brought in as needed. Therefore, except for the psychiatric GDH, which is not a focus of this review, a GDHs orientation is likely to be physical and therapeutic, to:
- reduce the burden of illness or disability
- improve functional ability
- treat ancillary behavioural and affective problems
- reduce the risk of more serious conditions (and divert patients from more intensive treatment arrangements like acute care or long-term care) wherever possible
- alleviate care-giver burden as an ancillary goal (Eagle, et al., 1991).
- maintain community living as long as feasible (Bach, et al., 1995; Goeree, et al., 2005).
- improve quality of life

Usually, patients attend for at least two days per week, with the first few visits dedicated to assessment. On average, an assessment for GDH takes 6 hours plus medical time. In Hamilton, time in program averages 136 days or about 18 visits. A staff member

spends 3 hours in "hands-on patient care" per 7 hour day, with the remainder being devoted to family conferences, case conferences, charting, and the like.

Literature Search Strategy

A search was conducted using the Ageline, CINAHL, Ovid MEDLINE, and PsycINFO databases with the search term "Geriatric Day Hospital." The search was limited to journal articles in English, focused on those aged 65 or older, with abstracts and published between 1985 and 2006. The most fruitful of these searches was MEDLINE, which yielded 97 articles. Limiting the search to research works (i.e., any clinical trial including randomised controlled trials, evaluation studies, meta-analyses or reviews) in Medline reduced that number to 14. There are also a few studies which are not directly cited in this chapter, but have been included in Forster, Young, and Langhorne's (2004) systematic review.

A Review of Evidence

Evidence for the effectiveness of day hospitals is mixed (Anonymous, 1994; Bach, et al., 1995; Benson, 1992, Black, 2005). Many studies find little benefit (Cranswick, 1997; Eagle, et al., 1991; Goeree, et al., 2005) and those that do show benefit also show that patient inclusion criteria must be quite restrictive (Black, 2000; Guyatt, et al., 1993; Hui, Lum, Woo, Or, & Kay, 1995; Naylor, Anderson, & Goal, 1994). See table 7.2 for a summary of selected day hospital literature.

Lewis, Turpie, Cowan, Diachun, & MacLeod (2000) for example, found that GDH was effective in improving the health status (as indicated by the SF-12) of a subset of patients who: a) attended on a fairly regular basis, and b) were below the age-specific population average in health status on enrolment. The GDH in question then sought to reformulate inclusion criteria to restrict enrolment to those with two or more health or functional problems, at least one of which was an ameliorable condition, which was typically dealt with by a physiotherapist or occupational therapist.

A Canadian pilot study in 2001 (as cited in Webber et al., 2003), suggested that GDH has advantages over a home-based model for women discharged from acute care for hip fracture, in that it may provide more efficient use of health care resources and therapists' time. Likewise, Tousignant, Hebert, Derosiers and Hollander (2003), found that GDH not only improved patient outcomes, but "for every dollar invested in the geriatric day hospital programme, the benefit for the health system was $2.14." (p. 57).

By contrast, Forster and colleagues' (1999) systematic review of 12 randomised trials found no overall advantage for day hospital care, when compared to a range of alternative services. There was, however, a trend to improvement compared to no comprehensive care at all, in terms of death or poor outcome, disability, and use of resources. There was also a trend towards reduced use of hospital beds and institutional care, but insufficient to offset the cost of GDH itself.

Table 7.2: Summary of Selected Day Hospital Literature

Study Type	Author	Population	Inclusion criteria	N	Outcome Measure / Tool(s)	Intervention (study duration)	Outcome Measures	Result
RCT	Burch, et al., 2000	Referred elderly patients	No dysphasia; did not require nursing or medical care, more than twice a week care, or focused OT	50/55	Secondary outcomes: WHO Mobility subscale; Nottinghmam Extended ADL Scale; NHP	GDH vs Social service day centre with rehab; data collected at start, 6 weeks, 3 months	WHO Mobility NHF Mobility NHP ADL Mobility NHP ADL Leisure	ns ns ns ns
RCT	Eagle, et al., 1991	Referred elderly patients	Patients with deteriorating functional status believed to have rehabilitation potential	55/58	Barthel Index; Rand Questionnaire; Global Health Questionnaire; GQLQ	GDH vsTAU	Mortality Functional status GQLQ ADL GQLQ emotion	ns ns ns p<.009
Review	Forster, Young & Langhorne, 2000	Cochrane Library; MEDLINE; Sigle; Bids; Cinahl; Index Medicus; Inter-national Dissertation Abstracts	RCTs comparing geriatric day hospitals with alternative forms of care for elderly medical patients	12 studies were included involving 22 day hospitals and 2867 patients	Death; place of residence; dependency; global poor outcome; ADL; subjective health status; patient satisfaction; and resource use	3 independent reviewers assessed study quality	5 GDH vs Compre-hensive geriatric care 4 GDH vs Domiciliary care 3 GDH vs usual	Death ns; Disability ns; use of resources ns. Death or "poor" outcome, odds ratio =.72 (p<.005); functional deterioration, odds ration= .61 (p<0.05). Trends towards lower hospital bed use and placement in institutional care. Treatment costs higher.

Study Type	Author	Population	Inclusion criteria	N	Outcome Measure / Tool(s)	Intervention (study duration)	Outcome Measures	Result
Before and after	Harwood, & Ebrahim, 2000	GDH patients in an urban setting		37	Barthel Index; LHS	Effectiveness of 2 scales in GDH 3 months rehab	Barthel LHS	ns ns
RCT	Hui, et al., 1995	Elderly stroke patients	Diagnosis of cerebro-vascular accident	60/60	Barthel Index; Hospital, community, and GP services; Admissions; Satisfaction; Mood	GDH v Conventional medical management by neurologists; follow up at 3 and 6 months	Barthel at 3 months Barthel at 6 months Fewer outpt visits at 6 months Costs Well-being Comm services Satisfaction	p=.04 ns p=.03 - ns ns ns ns
Pro-spective cohort study	Lewis, et al., 2000	GDH patients in a community health centre	All patients admitted and discharged in 1998	68	SF-12; CBI	SF measured at adm & 3 months post d/c; CBI at adm and d/c	SF-12 CBI	ns ns Caregiver burden was reduced; SF-12 physical-domain scores improved for some patients.
Pro-spective; before and after	Malone, et al., 2002	Community dwelling patients d/c from GDH	At least 5 visits during GDH stay	41	Barthel Index; TUG Test; Berg Balance; MMSE; GDS	Adm, D/C, 3 months	ADM - D/C: TUG Berg GDS D/C - 3 months: Barthel GDS ADM - 3 mos: GDS	p<.002 p<.002 p<.002 - ns ns - p<.007

Study Type	Author	Population	Inclusion criteria	N	Outcome Measure / Tool(s)	Intervention (study duration)	Outcome Measures	Result
RCT	Roderick, et al., 2001	Elderly stroke patients in Poole area, East Dorset	Aged 55+ who required further rehabilitation after hospital discharge or after referral to geriatrician from the community	74/66	Barthel Index; Rivermead Mobility Index; Philadelphia Geriatric Centre Morale Scale; Frenchay Activities Index; SF-36	GDH v Domiciliary rehabilitation service; 6 month follow-up	Mortality Physical function Social activity Costs	ns ns ns ns
Retro Cohort	Siu, et al., 1994	GDH and Geriatric Clinics		468	Services received; hospitalization; ED visits; placement; death, health status measures	GDH v Clinic sites (12 months)	Mortality ED or hospital use Placement Health status	ns ns ns ns
Matched pairs Compar-ison	Spilg, et al., 2001	GDH patients	Patients completing a course of physiotherapy (mean age = 79)	83	EMS; Barthel Index; FAC	Effectiveness of 3 scales in a GDH following PT intervention	Barthel EMS FAC	p<.001; 42% p<.001; 83% p<.001; 35%
QED/ historical cohort	Tousignant, et al., 2003	GDH patients at a tertiary care facility	Consecutive patients	151 GDH	Functional Autonomy Measurement System change	SMAF measure at enroll and D/C	System cost-benefit	System savings Cdn $2.14 per GDH dollar

OT = Occupational therapy; NHP= Nottingham Health Profile; GDH = Geriatric Day Hospital; ADL = Activities of Daily Living; GQLQ = Geriatric Quality of Life Questionnaire; TAU = Treatment As Usual; RCTs= Randomized Controlled Trials; LHS = London Handicap Scale; CBI = Caregiver Burden Index; TUG = Timed And Go; MMSE = Mini-Mental Status Examination; Adm = Admission; D/C = discharge; ED = Emergency Department; EMS = Elderly Mobility Scale; FAC = Functional Ambulation Categor

Spilg, Martin, Mitchell and Aitchison (2001) assessed the sensitivity of the Elderly Mobility Scale (EMS) to detect improvements in mobility after physiotherapy in comparison with the Barthel Index (BI) and Functional Ambulation Category (FAC) in routine clinical day hospital practice. Using a matched-pairs comparison, they found that EMS was significantly more likely to detect an improvement in mobility following physiotherapy within the study group than the BI ($P<.001$) or the FAC ($p<.001$; Splig, et al.).

One of the weaknesses cited by several researchers is the choice of outcome measures. Roberts, Khee and Philp (1994) and Roberts and Philp (1996) used Delphi analysis of British "purchasers" (referral sources), "providers" (clinical service and nursing, physiotherapy and occupational therapy managers), geriatricians and cognitively intact patients of day hospitals to establish exactly what they viewed as priorities for evaluation. They found striking agreement on measuring quality of life and reducing disability above all. Patients sought reduced care-giver burden and avoiding institutionalization more than did others studied; providers and geriatricians looked for efficiency and effectiveness more than others, and geriatricians looked more for patient satisfaction. No group, explicitly including administrators (Chief Executive Officers of "Health Commissions," and "business managers"), found the most common measures (mortality, and indicators of activity such as number of visits) to be useful. The measures advocated in the British studies agree quite well with those contained in more academic works (e.g. Goeree, 1994) which advance a model for evaluation that includes factors ranging from cost through satisfaction to quality of life. In addition, the complexity of cases brought before GDH makes "goal displacement" possible. For example, one study showed that between a third and a quarter of patients who are admitted do not show benefit from rehabilitation (Lewis, et al., 2000). This raises the possibility that many GDH patients could be diverted away from GDH and into more focused interventions such as medical interventions, geriatric mood disorders programs, seniors' day centers for respite.

Although there has been limited high quality research on the effectiveness of GDH, there is some evidence that specialized geriatrics services can have a positive impact on mortality, health status and function, and (at least) balanced cost (Fowler, Congdon, & Hamilton, 2000; Gladman, Lincoln, & Barer, 1993; Guyatt, et al., 1993; Harwood & Ebrahim, 2000; Roderick, et al., 2001; Siu, Morishita, & Blaustein, 1994), provided that restrictive inclusion criteria are met (Gladman, et al.; Harwood & Ebrahim, 2000; Guyatt, et al.). More rigorous research is needed on effectiveness of GDH. Methodological issues related to lack of appropriate targeting of patients and inconsistent use of standardized assessment tools limits our understanding of the potential benefits of GDH. Program evaluation, both formative and summative, is needed to identify the ways in which GDH are best implemented and beneficial and to identify which patients benefit most. Evidence-based eligibility criteria that are strictly adhered to, with carefully prescribed assessment and treatment planning will optimize the use of health care system resources.

Recommendations

Large-scale, high-quality comparative studies with appropriate measures of both the effectiveness and cost-effectiveness of GDH compared to other forms of care are needed.

Based on existing evidence to date, the following recommendations regarding GDH can be made:

1. The British Geriatric Society (2006), among others, notes that GDH occupy a midpoint between primary and secondary care. They "prolong independent living by the specialist assessment and treatment of frail and disabled older people enabling them to remain in their own homes as well as having a favourable impact on impairment, disability and handicap." In order to achieve these aims, it is necessary that GDH services be targeted to those most likely to benefit. Since others may be directed elsewhere, it may be useful to:
    a. Purchase services at or establish a seniors' day center in order to maintain or improve current levels of burden reduction.
    b. Direct some patient care to outpatient occupational therapy/ physiotherapy, and/or to other targeted programs such as a mood disorders program.

2. Cost containment: The Forster and colleague's (1999) review finds higher costs for GDH, and finds that outcomes are significantly different than no SGS treatment at all; it is possible that these can be achieved with a less intensive intervention. The British Geriatric Society (1996) recommends that GDH aim in part at "preventing hospital admission or promoting subsequent early discharge," and "rapid access admission avoidance clinics,". In addition, Hebert and colleagues did find an impact on system utilization has yet been detected. Thus it is necessary to reduce labour costs, for instance by maintaining shorter mean lengths of stay, potentially to 90 days or less. This could be accomplished in part by reducing the "upward straggle" of patients who are enrolled for very long periods. Other options are to streamline assessment time (e.g., by using electronic charting so as to avoid redundant questions and tests) and using self-administered assessment tools wherever feasible. This is especially true of screening.

3. Comprehensive geriatric assessments are delivered via GDH, but as noted elsewhere in this work, they can be provided in other venues. There is also evidence (Lewis, et al., 1999) that at least some of the difficulty in demonstrating efficacy is due to a heterogeneous patient population: if the frail are targeted, then improvement is clearer. Clear standards for determining a treatment plan should be developed and used consistently; treatment goals must be measurable.

4. The British Geriatric Society (1996) recommends "health education for the third age." Care plans should be shared with patients and their caregivers as they are integral to successful implementation.

5. The British Geriatrics Society (1996) also suggests that GDH should focus on "treatment and rehabilitation, in particular for complex multi-faceted problems, as part of community based rehabilitation and intermediate care." Enrolment criteria should include only complex elders: patients with at least two health issues, at least one of which must be amenable to rehabilitation (i.e. treatment by physiotherapy and/or occupational therapy). Therefore, each discipline should prioritize care plan issues and treatments so as to focus on the essentials (i.e., those with a high burden of illness and a reasonable prospect of change).

References

Anonymous. (1994). Canadian study of health and aging: Study methods and prevalence of dementia. *Canadian Medical Association Journal, 150(6),* 899-913

Bach, D., Bach, M., Böhmer, F., Frühwald, T., & Grilc, B. (1995). Reactivating occupational therapy: A Method to improve cognitive performance in geriatric patients. *Age & Ageing, 24(3),* 222-226.

Benson, D. (1992). Measuring outcomes in ambulatory care. Chicago, IL: American Hospital Publishing, Inc.

Black, D. A. (2000). The modern geriatric day hospital. *Hospital Medicine, 61(8),* 539-543.

Black, D. A. (2005). The geriatric day hospital. *Age & Ageing, 34(5),* 427-429.

Burch, S., Longbottom, J., McKay, M., Borland, C., & Prevost, T. (2000). The Huntingdon Day Hospital Trial: Secondary outcome measures. *Clinical Rehabilitation, 14(4),* 447-453.

Cranswick, K. (1997). Canada's Caregivers. Canadian Social Trends, 47, 2-6.

Eagle, D. J., Guyatt, G. H., Patterson, C., Turpie, I., Sackett, B., & Singer J. (1991). Effectiveness of a geriatric day hospital. *Canadian Medical Association Journal, 144(6),* 699-704.

Malone, M., Hill, A., & Smith, G. (2002). Three-month follow up of patients discharged from a geriatric day hospital. *Age & Ageing, 31(6),* 471-475.

Forster, A., Young, J., & Langhorne, P. (1999). Systematic review of day hospital care for elderly people. *British Medical Journal, 318,* 837-847.

Fowler, R. W., Congdon P., & Hamilton, S. (2000). Assessing health status and outcomes in a geriatric day hospital. *Public Health, 114(6),* 440-445.

Gladman, J. R., Lincoln, N. B., & Barer, D. H. (1993). A randomised controlled trial of domiciliary and hospital-based rehabilitation for stroke patients after discharge from hospital. Journal of Neurology, *Neurosurgery and Psychiatry, 56(9),* 960-966.

Goeree, R., Farahati, F., Burke, N., Blackhouse, G., O'Reilly, D., Pyne, J., et al. (2005). The economic burden of schizophrenia in Canada in 2004. *Current Medical Research and Opinion, 21(12),* 2017-2028.

Guyatt, G. H., Eagle, D. J., Sackett, B., Willan, A., Griffith, L., McIlroy, W., et al. (1993). Measuring quality of life in the frail elderly. *Journal of Clinical Epidemiology, 46(12),* 1433-1444.

Harwood, R. H., & Ebrahim, S. (2000). Measuring the outcomes of day hospital attendance: A comparison of the Barthel Index and London Handicap Scale. *Clinical Rehabilitation, 14(5),* 527-531.

Hui, E., Lum, C. M., Woo, J., Or, K. H., & Kay, R.L. (1995). Outcomes of elderly stroke patients. Day hospital versus conventional medical management. *Stroke, 26(9),* 1616-1619.

Lewis, D., Turpie, I., Cowan, D., Diachun, L., & MacLeod, J. (2000). A prospective evaluation of geriatric day hospital. *Annals of the Royal College of Physicians and Surgeons of Canada, 33(6),* 348-352.

Malone, M., Hill, A., & Smith, G. (2002). Three-month follow up of patients discharge from a geriatric day hospital. *Age & Ageing, 31(6),* 471-475.

Naylor, C. D., Anderson, G. M., & Goal, V. (Eds.). (1994). *Patterns of health care in Ontario. The Institute for Clinical Evaluative Sciences in Ontario, Practice Alas* (1st ed., pp. 1, 30-32, 62,108). Ottawa, ON: Canadian Medical Association.

Roberts, H., Khee, T. S., & Philp, I. (1994). Prioritising measures of performance of geriatric medical services. *Age &Ageing,* 23, 154-157.

Roberts, H., & Philp, I. (1996). Prioritising performance measures for geriatric medical services: What do the purchasers and providers think? *Age & Ageing,* 25, 326-328.

Roderick, P., Low, J., Day, R., Peasgood, T., Mullee, M. A., Turnbull, J. C., et al. (2001). Stroke rehabilitation after hospital discharge: A randomized trial comparing domiciliary and day-hospital care. *Age & Ageing, 30(4),* 303-310.

Siu, A. L., Morishita, L., & Blaustein, J. (1994). Comprehensive geriatric assessment in a day hospital. *Journal of the American Geriatrics Society, 42(10),* 1094-1099.

Spilg, E. G., Martin, B. J., Mitchell, S. L., & Aitchison, T. C. (2001). A comparison of mobility assessments in a geriatric day hospital. *Clinical Rehabilitation, 15(3),* 296-300.

Tousignant, M., Hebert, R., Desrosiers, J., & Hollander, M. J. (2003). Economic evaluation of a geriatric day hospital: Cost-benefit analysis based on functional autonomy changes. *Age & Ageing, 32(1),* 53-59.

Webber, C. E., Papaioannou, A., Winegard, K. J., Adachi, J. D. Parkinson, W., Ferko, N. C., et al. (2003). A 6-month home-based exercise program may slow vertebral height loss. *Journal of Clinical Densitometry, 6(4),* 391-400.

Chapter 8

Specialized Geriatric Outreach Services: An Overview of the Randomized Controlled Trials

David Ryan and Jacquelin Esbaugh

Clinician's Perspective: Barbara Liu, MD

The geriatric outreach team is a unique service with roots in the long tradition of physician house calls. As the number of physician-performed house calls has declined, outreach teams have increasingly stepped in, literally and figuratively, bridging the gap between the hospital, primary and community care.

Maximizing function and enabling seniors to remain in their own homes is the cornerstone of specialized geriatric services. In-home assessment is an important adjunct to comprehensive geriatric assessment and for homebound seniors may be the sole avenue for interaction with health care professions. Outreach teams have many supporters, as well as critics. This chapter provides some valuable insights into the evidence that supports outreach teams, as well as the limitations of that evidence.

Evidence does suggest that multidisciplinary outreach services are more effective than outreach by solo practitioners. Targeted multidisciplinary service models are also effective, although the relevant outcomes for different types of targeted services must be weighed carefully when comparing studies. Geriatrician involvement adds value to outreach teams, and while each team member makes specific contributions to the skill mix, the relative contribution of each team member to the cost effectiveness of the service is not clear. The ideal team model and the definition of the functional roles of members is still evolving and further development and evaluation of service models is needed.

Research on the cost effectiveness of outreach teams is also needed. It has been pointed out that outreach services should be evaluated within a spectrum of services rather than as a stand-alone service. Similarly, cost-effectiveness evaluations of resource intensive teams should be systemic rather than focused on a single episode of care.

The balance of evidence supports the value of outreach teams in reducing rates of institutionalization and preserving the ability to perform activities of daily living. As in other forms of geriatric services, identifying the appropriate target population is critical. Despite advances in the definition of frailty, we still need to refine the selection process of appropriate patients. Operationalizing frailty so that others, who are not expert in geriatric care, can easily identify the appropriate candidate for geriatric outreach services is a priority here as it is for all comprehensive geriatric services.

Consumers are demanding a stronger emphasis on prevention, wellness promotion and the inclusion of the broader determinants of health in service planning. Shifting expectations as well as the changing demographic may make the assessment of patients in their home environment a more frequent necessity. Evaluation of these services provides some answers but future research and evaluation need not focus on whether we should deliver outreach services, but rather on how should we deliver those services and to whom.

Executive Summary

Outreach services are considered an important link between hospital and community based care and an essential component in the continuum of services provided to frail seniors by specialized geriatric service providers. The evidence from randomized, controlled trials of outreach services is compromised, however, by diverse service models, selection criteria and outcome variables. These methodological issues are explored and several suggestions are provided to improve our understanding of service effectiveness.

Introduction

Specialized geriatric outreach services are one of a continuum of services focused on the health care needs of frail seniors. Ideally, the continuum provides a seamless continuum of services that bridge home and hospital based care and preserves the quality of life and community living status of frail seniors threatened by complex bio-psychosocial and functional challenges. In this chapter we consider outreach service as that part of the continuum of services that are provided in the senior's home.

Outreach services would then be distinguished from the other elements of the continuum including ambulatory care clinics that provide comprehensive geriatric assessment and clinics in such areas as continence, cognition and falls, acute geriatric units for short term in-patient assessment and treatment, internal consultation services providing geriatrics expertise across all hospital inpatient wards, "slow-stream" geriatric rehabilitation or reactivation units, geriatric day hospitals and geriatric emergency management services.

Despite the ideal of a "seamless continuum of service", with few exceptions, research on the effectiveness of specialized geriatric services has focused on examining the value of each service component rather than the continuum itself. As a result, the present chapter will examine the randomized control trials (RCT) of the effectiveness of primarily "stand alone" home-based, outreach services for seniors rather than outreach embedded in and adding value to a continuum of services because the research does not presently allow us to examine this issue.

The RCTs were selected from the English language literature identified by a search of Medline with the following keywords: geriatric outreach, home visit, home AND variants of "geriatric" such as "aged" or "seniors" or "frail" AND "RCT". The Cochrane Register of trials and reviews was also searched.

The search process identified two meta-analyses. One by Ward and colleagues (2003) sought to compare the effectiveness of nursing home, hospital and own home environments but was discontinued because there were insufficient numbers of studies

Table 8.1: Characteristics of the Trials

Style*	Authors, date (location)	Source of population	Inclusion Criteria and (mean age)	N intervention / control	Intervention personnel	Intervention (study duration)	Follow-up
1.	Dalby, et al. 2000 (Canada)	HSO family practice roster	>70 yrs, functional decline, hospital admission (79.1yrs)	73/69	Primary care nurse	Assessment, care plan, MD liaison, case management, Follow-up phone or visit (14 months)	By phone or visit as necessary
1.	Hébert, et al., 2001 (Canada)	Health insurance roster	>75 yrs (80.3)	250/253	Nurse	Assessment, care plan, case management (12 months)	12 telephone calls
1$_b$	Stevens, et al., 2001 (Australia)	Seniors living independently on electoral role	>70 (76)	570/1,167	Research Nurse	Home hazard assessment, hazard reduction education, safety devices installed	1 visit, mailed follow-up survey at 11 months
2.	Fabacher, et al., 1994 (USA)	Regional veterans register	>70 yrs (72.7)	131/123	MD Asst/nurse geriatrician consult, trained volunteers	CGA, geriatrician consult, Quarterly visits (12 months)	4 visits
2.	Stuck, et al. 1995 (USA)	Voter registration lists	>75 yrs (81.2)	215/199	Geriatric nurse practitioner, consulting geriatrician	CGA, care plan, teaching quarterly visits (36 months)	12 visits
2.	Stuck, et al. 2000 (Switzerland)	Health insurance roster Berne	>75 yrs (81.7)	264/527	Geriatric nurse, team consultation	CGA, care-plan, communications quarterly visits (36 mos)	12 visits

Style*	Authors, date (location)	Source of population	Inclusion Criteria and (mean age)	N intervention / control	Intervention personnel	Intervention (study duration)	Follow-up
2.	Byles, et al. 2004 (Australia)	Veterans Affairs roster	>70 years	942/627	GNP SGS team, geriatrician consult	CGA, annual visit & phone follow-up or 6 monthly visit and follow-up both with and without letter to GP (36 months)	3 or 6 follow-up visits
3.	Rockwood, et al. 2000 (Canada)	Frail seniors referred by family physician	Frailty (81 years)	95/87	Full specialized geriatric services team	Mobile geriatric assessment team (3 months)	Median 2 (range 1-27) 3, 6, 12 month follow-up
3.	Caplan, Williams, Daly, & Abraham 2004 (Australia)	Seniors discharged home from an Emergency Department	>75 years (82.2)	369/369	Geriatric nurse, access to a multidisciplinary geriatrics team	CGA and 4 weeks of multidisciplinary intervention	Mean 2.29 3, ,6,12 & 18 month follow-up telephone calls
4.	van Haastregt, et al. 2000* (Netherlands)	Seniors with history of falls, mobility problems referred by GP's	>70 (77.2)	159/157	Community Nurse	Structured geriatric assessment protocol and home safety checklist (12 months)	5 visits
4.	Tinetti, et al. 1994 (USA)*	HMO enrollees with and at least one falls risk factor	>70 (78)	153/148	Nurse practitioner and physiotherapy	Comprehensive falls risk assessment. Weekly physiotherapy home visits for 3 months and 3 monthly maintenance visits	15

Style*	Authors, date (location)	Source of population	Inclusion Criteria and (mean age)	N intervention / control	Intervention personnel	Intervention (study duration)	Follow-up
4.	Hogan, et al. 2001 (Canada)	Seniors with a history of falls	>65 Fall within 3 months (77 years)	77/75	One assessor from a multidisciplinary geriatrics team	Falls assessment. Recommendations 3 exercise training sessions home exercise prescription	2 visits and 3 exercise training sessions mail follow-up 6 & 12 months
5.	Gagnon, et al., 1999 (Canada)	frail seniors discharged home from emergency departments	>70 and at risk of hospital readmission (81 years)	202/215	Nurse	Nurse case management, structured assessment protocol. Monthly phone, home visit every 6 weeks. Geriatric consultation team available (10 months)	10 phone contacts 7 home visits
5.	Nikolaus, et al., 1999 (UK)	Seniors admitted to hospital but living at home	living at home, at risk, multiple chronic or functional decline (81.4)	181/179/185	Multidisciplinary geriatrics team	1. CGA + home Intervention team. 2. CGA and usual home care. 3. Usual care (3 months)	Mean 7.6 visits Follow-up assessment 12 months.

* Where 1 = Preventive nursing outreach** Indicates studies included in the Stuck, Egger, Hammer, Minder, and Beck (2002) meta-analysis that we have assigned to different styles of outreach than indicated by Stuck et al.

1_b = targeted preventive nursing outreach

2 = preventive multidisciplinary outreach

3 = multidisciplinary outreach

4 = targeted multidisciplinary outreach

5 = case management outreach service

meeting selection criteria. A second meta-analysis by Stuck and colleagues (2002) identified 18 RCTs examining the extent to which home visiting prevented nursing home admission and functional decline for people aged 70 years or older. Eight additional studies met the search criterion for the present review that were not included in the Stuck and colleagues' meta-analysis. These studies were either published after 2001, or did not meet Stuck and colleagues' definition of preventive home-based service. The characteristics of these 14 RCTs are outline in Table 8.1.

Stuck and colleagues (2000) concluded that preventive home visitation programs appear effective when they are based on multi-dimensional geriatric assessment and multiple follow-up visits. They report that more pronounced benefits are found for "young-old" than "old-old" populations of seniors.

Diverse Styles of Outreach Service

The differences in outreach service definitions prompted a review of the 8 additional studies and those used by Stuck and colleagues (2000) from a definitional perspective. In this initial review we identified five styles of outreach service. Two styles of outreach are preventive in nature. In preventive outreach, patients are recruited without pre-identified problems from age-stratified populations such as county census areas or HMO registrants. One style of preventive outreach provides only nursing service while the second provides multidisciplinary service. Two additional styles of outreach are problem triggered. Patients are referred for outreach service by family physicians or upon discharge from emergency or other hospital departments. A variant of this problem-triggered outreach is targeted in which patients are referred for very specific home-based services, primarily falls related (Note: one study that fit both targeted and preventative nursing outreach styles was included in the latter category). Case management is the final style of outreach we identify in which referred patients are referred for continuing management of home-based health care. The five outreach styles are outlined in Table 8.2.

These distinct styles of outreach provide the framework for the present review. The review focuses on the 8 RCTs that are new or not previously included in the Stuck and colleagues' (2000) meta-analysis and 6 studies that were included in that analysis which we have assigned to our new categories of outreach.

Table 8.2: The Styles of Outreach Services and Their Definitions

Outreach format	Definition
Preventive home visiting. (3 studies)	Participants are selected on the basis of age from voters' lists, HMO or insurance company registries, rather than through the presence of problems. The intervention is typically educational nursing visits
Preventive multidisciplinary home visiting (3 studies)	Participants are recruited as above but the intervention is multidisciplinary and often involves a comprehensive geriatric assessment

Outreach format	Definition
Problem-triggered multi-disciplinary outreach(2 studies)	Participants are selected by referral from a family physician, discharge from an acute care hospital of Emergency Department. Intervention is typically a comprehensive geriatric assessment and multidisciplinary treatment
Targeted problem triggered multi-disciplinary outreach (5 studies)	Participants are referred by family physicians or hospital discharge lists for specific home based services usually falls related. Intervention is comprehensive geriatric assessment and targeted in home treatment
Case management outreach services (2 studies)	Participants are selected from physician caseloads or hospital discharge lists and home based care is coordinated by a case manager with access to a multidisciplinary team

Service style and outcomes

Is there evidence that one style of outreach is more effective than another? From Table 8.3 it seems evident that there is less likelihood of achieving positive outcomes using the preventive, sole practitioner style of outreach. Multidisciplinary styles of outreach are more likely to have positive effects and this seems most likely to be the case when a geriatrician is part of the multidisciplinary mix.

This observation of better outcomes arising from outreach intervention delivered by multi-disciplinary teams rather than single discipline services is consistent with the conclusion arising from Stuck and colleagues' (2002) meta-regression analysis of primarily preventive home visiting service.

From the available evidence it seems impossible to determine whether multidisciplinary preventive outreach is more successful than the other multidisciplinary service styles.

Table 8.3: Styles of Outreach, Outcome Measures and Outcomes of Home Based Intervention

Style of out-reach*	Author, date (location)	Outcome measures	Outcomes
1	Dalby, et al. 2000 (Canada)	Death rates Institutional admission Health services utilization	ns ns ns
1	Hébert, et al., 2001 (Canada)	Death SMAF disability score Hospital admission Use of health services General Well-Being Scale Perceived Social Support (Social Provisions Scale)	ns RR = 1 (0.82-1.23) ns ns ns

Style of out-reach*	Author, date (location)	Outcome measures	Outcomes
1b	Stevens, et al., 2001 (Australia)	Falls calendar/ frequency of falls	ns
2	Fabacher, et al., 1994 (USA)	Death rate Immunization rates Prescription usage Over the counter drug usage Activities of Daily Living Instrumental Activities of Daily Living nursing home admission hospital usage	ns $p<.05$ ns $p<.05$ ns $p<.05$ ns ns
2	Stuck, et al. 1995 (USA)	Activities of Daily Living Instrumental Activities of Daily Living Nursing Home admissions	$p<.05$ ns $p<.05$
2	Stuck, et al. 2000 (Switzerland)	Activities of Daily Living Instrumental Activities of Daily Living Nursing Home admissions	ns increased ns
2	Byles, et al. 2004 (Australia)	Health related quality of life Admission to Hospital Admission to Nursing Home Death rate	$p<.05$ ns negative $p<.05$ ns
3	Rockwood, et al. 2000 (Canada)	Goal Attainment Scaling Activities of Daily Living Barthel Instrumental Activities of Daily Living Cognition (MMSE) Quality of Life (Spitzer Wolf index) Death Rate Time to Institutionalization	$p<.05$ ns ns ns ns ns ns
3	Caplan, et al., 2004 (Australia)	Hospital admissions Rate of ED admission Time to first admission Nursing Home Admissions Death Rate Activities of Daily Living (Barthel Index)	$p<.05$ $p<.05$ $p<.05$ ns ns $p<.05$
4	van Haastregt, et al. 2000* (Netherlands)	Falls frequency Mobility Control Scale Sickness Impact Profile (short form) No. of physical complaints (RAND 36) Perceived gait problems (a Likert scale) Frenchay Activities Index	ns ns ns ns ns ns

Style of out-reach*	Author, date (location)	Outcome measures	Outcomes
		Falls Efficacy Scale	ns
		Items 4/5 of Social Activities Battery	ns
		A 6 point Loneliness Scale	ns
4	Tinetti, et al., 1994 (USA)*	Falls Calendar	
		Length of time to first fall	$p<.05$
		Falls Frequency	$p<.05$
		Falls efficacy Scale	$p<.05$
		Tinnetti Risk Factor Screen	$p<.05$
4	Hogan et al., 2001 (Canada)	Frequency of falls	ns
		Rate of falls in following year	ns
		Time between falls	$p<.05$
		ED visits	ns
		Hospital admissions	ns
5	Gagnon, et al., 1999 (Canada)	Medical Study Short Form (SF36)	ns
		Client Satisfaction Questionnaire	ns
		OAS Multidimensional Functional Assessment Questionnaire (OARS)	ns
		Hospital Admissions	ns
		Length of Hospital Stay	ns
		ED admission	$p<.05$
5	Nikolaus, et al., 1999 (UK)	Barthel Index	$p<.05$
		Lawton-Brody Scale	$p<.05$
		Hospital Admission	ns
		Length of Admission	$p<.05$
		Nursing Home Admission	$p<.05$
		Death Rate	ns

MMSE = Mini-Mental Status Examination; Ed = Emergency Department

* 1 = Preventive nursing outreach

1_b = targeted preventive nursing outreach

2 = preventive multidisciplinary outreach

3 = multidisciplinary outreach

4 = targeted multidisciplinary outreach

5 = case management outreach service

The outcomes of outreach services

Table 8.3 reveals the wide span of outcome variables examined in studies of outreach. These can be sorted into the following categories: health services data such as death, hospital/Emergency Department admissions, and long-term care admission or nomothetic measures such as Activities of Daily Living/ Instrumental Activities of Daily Living, falls frequency/efficacy, and a variety of measures of well-being. None were found to be reliable outcomes of outreach interventions though reductions in institutional admissions and improvements in ADL were the most frequently positive outcomes.

In contrast, Rockwood and colleagues (2000) used health systems data and nomothetic measures together with the more idiopathic measurement technique of goal attainment scaling. Positive outcomes were not observed on the former methods but significant positive outcomes were obtained using goal attainment scaling in which participants own goals are scaled into measures that are relevant to them.

Age and frailty as inclusion criteria

An examination of Table 8.1 reveals that age was an inclusion criterion in all but one RCT. In these two instances, Rockwood and colleagues (2000) and Nickolaus and colleagues (1999) focused on frailty rather than age itself. Frailty, which has various definitions, might best be understood as the co-occurrence of complex bio-psychosocial and functional difficulties sufficient to compromise quality of life and threaten the capacity for independent living.

For geriatric service providers, frailty rather than age itself is the core characteristic of the patients that they best serve. Typically, frail seniors tend to be older patients. In the Rockwood and colleagues (2000) study, for example, the average age of the sample was 81 years. Geriatric service providers often feel that their specialized skills are not needed by seniors in the 65 to 75 year age range. Thus, including the "young-old" in research examining the effectiveness of geriatric services will lead to an underestimation of geriatrics effectiveness, because seniors in the young-old age group usually do not need and will not benefit from the specialized services designed for older and frail seniors. Across the 14 studies in this review, age ≥ 65 was an inclusion criteria in 2 studies, age ≥ 70 was the criteria in 7 studies, in 4 studies the age inclusion criteria was ≥ 75, one used "frailty" as the inclusion criteria and one combined both age > 65 years and frailty as inclusion criteria. This later combination of age and frailty accommodates the possibility of younger seniors becoming frail by virtue of their complex co-morbidities.

When the age related inclusion criteria is scaled (65 = 1, 70 = 2, 75 =3, frailty = 4) a correlation of .64 (p<.05) is obtained between this scale and an outcome scale comprising the proportion of significant outcomes under study. This suggests the importance of advanced age and frailty as inclusion criteria in studies.

Interestingly though, it is not the age of participants themselves that seems of primary importance. While the mean age of study participants is correlated significantly with our age/frailty related inclusion criteria (r = .59 p < .05), mean age of participants is not itself correlated with the proportion of significant primary outcomes achieved. Perhaps this coincides with our expectation that the frailty status of service recipients, rather than age itself is a primary determinant of who benefits from outreach services.

Team-based outreach and outreach effectiveness

The proportion of successful outcomes is also significantly correlated with the style of service delivery. A correlation of 0.59 (p < .05) was observed in the relationship between our outcome proxy variable and whether or not the service was delivered by a team or by a sole, typically nursing, practitioner.

This finding of better outcomes arising from outreach intervention delivered by multi-disciplinary teams rather than single discipline services is consistent with the conclusion

arising from Stuck and colleagues' (2002) meta-analysis of primarily preventive home visiting service.

Outcomes and the number of visits

The number of outreach visits seems to be unrelated to outreach outcomes. Stuck and colleagues' found in their meta-analysis an OR of essentially 1 in outreach for trials with 4 or fewer visits, and noted the importance of follow-up. On the other hand, the average 2.9 home outreach service visits of Caplan and colleagues (2004) and the 15 visits of Tinetti and colleagues (1994) appear equivalent in terms of the proportion of significant outcomes. However, it must be pointed out that the outcomes were quite different in these two studies. In Tinetti and colleagues' study outcomes focused on falls (frequency, self efficacy), while Caplan and colleagues focused on systems outcomes (e.g., hospital admissions, rate of Emergency Department admissions and time to first admission)

In summary

Using the approach of conducting research on outreach service independent of the continuum of specialized geriatric services in which it is embedded, the results arising from the RCTs are both inconsistent and compelling. In some instances outreach has been found to reduce falls, hospital and ED admissions, and long term care admissions while improving ADLs. But there are as many instances in which outreach failed to achieve these same outcomes. In some instances, interventions requiring a modest number of visits have had positive outcomes. At the same time however, the most consistently positive outcomes were achieved by the service that provided the greatest number of patient visits.

Given this variability, researchers and health service decision makers will need to examine those outreach service characteristics which moderate the relationship between service provision and service outcomes. Two important moderating variables are evident. The first is the style of outreach service provided. Preventive outreach delivered by sole practitioners is less effective than multidisciplinary styles of service. Patient characteristics are a second important moderator. Service effectiveness seems more positive when patients are defined by the presence of frailty rather than by age alone.

Finally, there is great diversity in the presumed outcomes of outreach services. From among the range of indicators that have been used, institutional admissions seem the most significant outcome. In fact, the use of targeted outcomes is essential, though perhaps only in combination with rates of admission. From amongst the range of nomothetic measures that can be taken directly by an outside observer, activities of daily living is the most reliable, but it may be that the best outcome measures for outreach, as for other specialized geriatric services, is an idiopathic approach using individualized patient focused scales such as those generated by the goal attainment scaling method.

References

Byles, J. E., Tavener, M., O'Connell, R. L., Nair, B. R., Higginbotham, N. H., Jackson, C.L., et al. (2004). Randomized controlled trial of health assessments for older Australian veterans and war widows. *Medical Journal of Australia, 181(4),* 186-190.

Caplan, G. A., Williams, A. J., Daly, B., & Abraham, K. (2004). A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department - The DEED II Study. *Journal of the American Geriatrics Society, 52(9),* 1417-1423.

Dalby, D. M., Sellors, J. W., Fraser, F. D., Fraser, C., van Ineveld, C., Howard M. (2000) Effect of preventive home visits by a nurse on the outcomes of frail elderly people in the community: A randomized controlled trial. *Canadian Medical Association Journal, 162(4),* 497-500.

Hébert, R., Robichaud. L., Roy, P. M., Bravo, G., & Voyer, L. (2001). Efficacy of a nurse-led multidimensional preventive programme for older people at risk of functional decline. A randomized controlled trial. *Age and Ageing, 30(2),* 147-153.

Hogan, D. B., MacDonald, F. A., Betts, J., Bricker, S., Ebly, E.M., Delarue, B., et al. (2001). A randomized controlled trial of a community-based consultation service to prevent falls. *Canadian Medical Association Journal, 165(5),* 537-543.

Fabacher, D., Josephson, K., Pietruska, F., Linderborn, K., Morley, J. E., & Rubenstein, L. Z. (1994). An in-home preventive assessment program for independent older adults: A randomized controlled trial. *Journal of the American Geriatrics Society, 42(6),* 630-638.

Gagnon, A. J., Schein, C., McVey, L., & Bergman, H. (1999). Randomized controlled trial of nurse case management of frail older people. *Journal of the American Geriatrics Society, 47(9),* 1118-1124.

Nikolaus, T., Specht-Leible, N., Bach, M., Oster, P., & Schlier, G. (1999). A randomized trial of comprehensive geriatric assessment and home intervention in the care of hospitalized patients. *Age and Ageing, 28,* 543-550.

Rockwood, K., Stadnyk. K., Carver, D., MacPherson, K. M., Beanlands, H. E., Powell, C., et al. (2000). A clinimetric evaluation of specialized geriatric care for rural dwelling, frail older people. *Journal of the American Geriatrics Society, 48(9),* 1080-1085.

Stevens, M., Holman, C. D. J., Bennett, N. & deKlerk, N. (2001). Preventing falls in older people: Outcome evaluation of a randomized controlled trial. *Journal of the American Geriatrics Society, 49(11),* 1448-1455.

Stuck, A.E., Aronow, H. U., Steiner, A., Alessi, C. A., Bula, C. J., Gold, M. N., et al. (1995). A trial of annual in-home comprehensive geriatric assessments for elderly people living in the community. *New England Journal of Medicine, 333(18),* 1184-9.

Stuck, A. E., Egger, M., Hammer, A., Minder, C. E., & Beck, J. C. (2002). Home visits to prevent nursing home admission and functional decline in elderly people: Systematic review and meta-regression analysis. *Journal of the American Medical Association, 27(8),* 1022-1030.

Stuck, A. E., Minder, C. E., Peter-Wuest, I., Gillmann, G., Egli, C., Kesselring, A., et al. (2000). A randomized trial of in-home visits for disability prevention in community-dwelling

older people at low and high risk for nursing home admission. *Archives of Internal Medicine, 160(7),* 977-986.

Tinetti, M. E., Baker, D. I., McAvay, G., Claus, E. B., Garrett, P., Gottschalk, M., et al. (1994). A multifactorial intervention to reduce the risk of falling among elderly people living in the community. *New England Journal of Medicine, 29, 331(13),* 821-827.

van Haastregt, J. C. M., Diederiks, J. P. M., van Rossum, E., de Witte, L. P., Voorhoeve, P. M., Crebolder, H. F. J. M. (2000). Effects of a programme of multifactorial home visits on falls and mobility impairments in elderly people at risk: Randomised controlled trial. *British Medical Journal, 321,* 994-998.

Ward, D., Severs, M., Dean, T., Brooks, N. (2003). Care home versus hospital and own home environments for rehabilitation of older people. *Cochrane Database of Systematic Reviews,* Issue 2. Art. No.: CD003164. DOI: 10.1002/14651858.CD003164.

Chapter 9

Setting an Agenda for Future Research in Delivery of Specialized Geriatric Medicine Services

William Molloy and David Lewis

Introduction

In health care, there is ongoing emphasis on evidence-based practice, defined by the Centre for Evidence-Based Medicine at the University of Toronto as:

"the integration of best research evidence with clinical expertise and patient values. By best research evidence we mean clinically relevant research … especially from patient centered clinical research into … the efficacy and safety of therapeutic, rehabilitative, and preventive regimens." (2004, para. 1).

This hand book reviewed the research that has been done in delivery of Specialized Geriatric Services (SGS). The studies were reviewed and the evidence in support of or against different delivery models was assessed. In summary,

1. There is good evidence to support comprehensive Geriatric Assessments (CGA) with follow up of older adults targeted for conditions amenable to Geriatric interventions.
2. These assessments can be done effectively in a variety of different settings such as in inpatient and out patients.
3. There is good evidence supporting the use of inpatient Geriatric Rehabilitation Units (GRU) or Geriatric Assessments Units (GAU).

The evidence supporting day hospitals and in-hospital geriatric consultation services is less consistent. To be effective,

- Patients must be screened to assess their eligibility.
- CGA has to be carried out by a trained interdisciplinary team, which is specialized.
- Patients with specific complaints or risk factors must be targeted.
- A medical assessment is essential.
- There must be adequate follow up.
- The assessment must be standardized (covering cognition, ADL, motivation, depression, nutrition and rehabilitation potential).
- The assessment must try to match care needs with the appropriate resources (e.g., physical therapy with a physiotherapist).

The GRU and Geriatric Assessment and Rehabilitation Units (GARU) have the most evidence supporting their use, perhaps because they have received the most attention in terms of clinical trials and because they have the greatest control over patient selection. Consultation services, outreach services and day hospitals are more heterogeneous in organization and in their patient population, so the data supporting the use of these services is mixed. These services may also be more heterogeneous in their goals, targeting and outcomes. In the case of Inpatient GRUs and Outpatient Geriatric Clinics, there is some evidence supporting the conclusion that leadership of the interdisciplinary teams should be a physician, although not necessarily a Geriatrician. In the Consultation Services, there is some evidence supporting the effectiveness of an advance practice nurse operating under the supervision of a physician. In outpatient services, telephone follow up may be adequate in some cases.

It is less clear what staffing is optimal in these different services, the mode and lines of communication and personnel mix and volumes. It is less clear who should be targeted and what outcomes should be paramount. The cost benefit ratios and therapy mix is not so clear. Having said this, it is not clear specifically what patients should be targeted for each service, how long the assessments should take and what instruments should be used to evaluate change over time.

So given this level of uncertainty and heterogeneity, where does one start to initiate research now to clarify these issues and move the field forward?
We can say a few things with certainty.

1. First, health services in general tend to be under-researched.
2. Second, specialized geriatric medicine has also received even less attention, so there is a paucity of convincing research.
3. Together, these two accentuate the deficits in knowledge about the provision of services in this area.
4. Given the amount of resources this population consumes and the increasing number of older adults, it is important to study this area to look back and see where we have come from, and just if not more importantly to look ahead and see where we are going.

We have reviewed this data to try to develop a blue print for future research in this area.

It seems to us that one big issue here is the assessment of frailty in this population. Frailty is a key concept in SGS and yet remains poorly understood and vaguely conceptualized. We need clear definitions and assessment instruments to assess and weigh frailty for a number of reasons.

Frailty Index

We need a short simple, valid and reliable instrument that screens and measures frailty. Although several tools are currently available (e.g., Hébert, Durand, & Tourigny, 2003; Rockwood, et al., 2005), generally there is little research in this area. More research is needed to determine how simple reliable and valid instruments to measure frailty can be used to weigh individual frailty and possibly more importantly to screen the older adults in different settings to determine the prevalence of frail older adults, the type of frailty and the need for clinical services to target these deficits and provide adequate and appropriate care

to this population. Similarly, more research is needed to determine the effectiveness of these types of tools for quantifying frailty, determining who qualifies for different services, setting and evaluating treatment goals, measuring the natural history and the effects of treatment on frailty and costs associated with frailty rather than on proxy measure like grip strength. Moreover, more knowledge is needed about these tools can be used to compare different types of services to compare their cost effectiveness and their effects on the burden of illness in this population.

Properly Controlled Trials in Health Services Research in Older Adults

An expert panel in Ontario noted, "The aging of the population and its impact on health and social services is the single most important issue of the next decade." Demographic shifts will lead to a rapid expansion in the elderly as a proportion of the population. As "baby boomers" experience transitions from middle to older age and from old age to advanced old age, they will encounter transitions in work and family life, in health status, in physical function and so on. Even so, little is known about the impact of aging or of old age on population health, on health system costs, or on outcomes of care. There is a dearth of health services research in Canada, and a particular shortage in geriatrics.

Understanding the incidence and prevalence of health conditions is an essential first step to health services research. Prevalence is a measure of the proportion of individuals within a population who have a specific health problem at a particular point in time. Incidence is a subcategory of prevalence, in that it is the number of new cases in a population at risk during a specified time period (Neutens & Rubinson, 2002: 241; Rosner, 1990). In most cases, estimates of incidence and prevalence are sparse, or use inconsistent definitions, or both. Diagnostic criteria and threshold points are tailored to individual authors' purposes, making comparisons difficult. For example, the absence of a consistent definition of "frailty" has often been noted. This absence means that it is impossible to determine the extent of the phenomenon, or whether incidence is increasing or declining. As a result, planning must use the data that does exist, such as statistics on population aging.

Some Ontario administrative data are derived from the registries for specific conditions, those with more consensus around definitions, such as cancer or diabetes. Registries may well understate incidence and prevalence, since they must rely on diagnosis and reporting; thus the actual prevalence of diabetes is often thought to be about double the "official" rate. We suspect this because there are research studies which report higher rates. That is obviously impossible for frailty. In addition, they fail to consider the whole person; this is of particular concern in health research on the elderly, who may be subject to a variety of conditions.

There are also data from the Institute for Clinical Evaluative Sciences (ICES), and the Canadian Institute for Health Information (CIHI). ICES has access to health insurance, drug benefit and similar data; however, codes surround activities by practitioners rather than health conditions. For example, there are codes for geriatric assessment but not for diagnoses. CIHI databases do include diagnostic codes. Outcomes of hospitalization – death, readmission, and discharge residence type – are also included (Lewis et al.,).

CIHI data refer to post-illness information, which is clearly less useful for identifying trends and early stages of a phenomenon. These data may count the same person two or three times, and miss everyone who is not hospitalized. They may capture many infectious diseases and injuries, such as hip fracture or heart attack, which commonly result in acute care, but they are less effective at identifying chronic conditions that are diagnosed in an outpatient setting, or which are aggravating or contributing factors, or of course those that are undiagnosed. Similarly, registries of patients, such as the diabetes registry, do not capture the undiagnosed. It is therefore a truism that "epidemiological conclusions (on risk) cannot be drawn from purely clinical data (on the number of sick people seen)" (Coggon, Rose, & Barker, 1997). In other words, only population studies can be used to derive incidence and prevalence estimates.

In Canada, relatively few population studies have been conducted. There are exceptions, including the Risk Factor Surveillance Surveys (RFSS) conducted by some Ontario Public Health districts, the Canadian Community Health Survey (CCHS) and its predecessors and variants like CTUMS usually conducted by Statistics Canada. The CCHS surveys 130,000 people biennially about health determinants, health status and health system utilization. In Ontario, some Public Health districts also conduct Risk Factor Surveillance Surveys (RFSS).

Unfortunately, all of these information sources have proven to be inadequate: the RFSS is very brief and rarely accessible; the public surveys are sporadic and results are available long after they could be useful for planning. For example, the CCHS takes place every two years; the most recent CCHS data available are from 2004 and area hospitals often plan on the basis of 1996 data. In addition, it takes 45 minutes to complete, so it must gloss over several health issues, and it addresses only the community-dwelling population.

In the US, the Centres for Disease Control (CDC), the Bureau of the Census, and the Agency for Healthcare Research and Quality (AHRQ) collect huge amounts of population health surveillance data including an annual SF-36 for five million Medicare/Medicaid beneficiaries. The AHRQ also conducts an annual Medical Expenditure Panel Survey (MEPS) which contains individual data on health insurance, disability, illness, risk factors such as smoking and body mass index, and access, utilization, demographic and socioeconomic data. The CDC's collect the Brief Risk Factor Surveillance Survey (BRFSS), and the list goes on.

Data for ongoing health conditions among the elderly in Ontario are based on insufficient information. Individual studies employ categories that may not match medicalized diagnoses. For instance, there are no questions in CCHS on multiple sclerosis or Parkinson disease. The section on depression begins as follows:

"During the past 12 months, was there ever a time when you felt sad, blue, or depressed for 2 weeks or more in a row? (Yes, No)."[8]

Dementia has been identified as a major health threat to the elderly, with a high burden of illness and substantial associated costs (Fillit, & Hill, 2005). One Canadian review asserted that "dementia has reached epidemic proportions." (Molnar & Dalziel, 1997). A literature review (Loney et al. 1998) found prevalence rates for dementia ranging from 2% to

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[8] Available at: (http://www.statcan.ca/english/concepts/health/pdf/depression.pdf)

9%. Only one of these, the Canadian Study of Health and Aging was from Canada, and only it was rated as sufficiently rigorous for the purpose. That study estimated the prevalence at 8% or more, ranging from 2.4% among persons aged 65-74 years, to 34.5% among those aged 85 and over. Study authors estimated 60,150 new cases of dementia per year in Canada (Canadian Study of Health and Aging Working Group, 2002). By extrapolation, rates of cognitive impairment will increase, as the percentage of people aged 85 or older grows; that group is the fastest growing in Canada.

This estimate would certainly justify the word "epidemic." However, it is based on a single study now almost ten years old. The problem is twofold: point prevalence estimates are generally flawed in design and biased in execution, and trends estimates use extrapolation, often from such a single point.

Similarly, in the case of hip fracture, predictions were of "exponential growth" rates of new hip fractures in the future. More recent findings suggest that fracture rates are on the decline, despite the aging of the population, perhaps because of increased patterns of diagnosis and treatment for osteoporosis. (Jaglal, et al., 2005; Jemal, Ward, Hao, & Thun, 2005).

Over the last five years, the need for better evidence has become manifest in the health sector. Forward-looking discussions on population health research needs have taken place at the National Forum on Health and the Federal, Provincial and Territorial Advisory Committee on Population Health. These discussions have lead to the creation of various projects and infrastructures to support the development of population health evidence, notably the proposed Canadian Longitudinal Study of Aging.

A population health approach recognizes that any analysis of the health of the population must extend beyond an assessment of traditional health status indicators like death, disease and disability. A population health approach establishes indicators related to mental and social well-being, quality of life, life satisfaction, income, employment and working conditions, education and other factors known to influence health

Information is essential to effective planning; research is essential for information. In health care, planning for future population needs must begin with knowledge about the incidence and prevalence of health risks and risk avoidance; about disease, injury and other health events; about patterns of behaviour and preference; and about patterns of utilization of health services. Even so, the information currently available in Canada is fragmented, partial, and unreliable (Coulas, Abernathy, & Lewis, 2003).

Much more could be done; for example, Statistics Canada conducts a monthly Labour Force Survey (LFS) of 54,000 households or about 100,000 persons. A foundation stone of economic planning in Canada, LFS data are used to identify trends in employment, unemployment, occupations, workforce composition, and so on. Results are available to economists and other users in less than 14 days.

Study Designs

One of the problems in this area is that it is almost impossible to randomize different interventions. It is impossible to blind them. So given these limitations, it is important to set up these trials rigorously to compare individual interventions. Some of the outcomes in this population need special attention. For example, death, which might be considered a

negative outcome in younger individuals, may not be in a palliative care unit, or where an advance directive has been completed. Many of these patients have significant functional impairment and in many cases it may not be possible to improve outcomes, if the outcomes are improperly determined. It may be possible to improve patients over all health, independence and their quality of life. Yet, often times we do not collect these data. We need meaningful outcomes that are appropriate for the elderly and we need to construct the trials as rigorously as possible. As was noted in Chapter Four one limitation of this review is that some of the recommendations are derived from level III evidence. Longitudinal case control, multicentre randomized control trials, and well designed cohort studies are needed to evaluate prognostic factors, to identify risk factors for continued disability, and to identify factors related to successful outcomes. More research about CGA, frailty, and disablement may help to establish which components of geriatric assessment and management of rehabilitation patients are critical.

Inclusion (Screening)

For screening we need consensus not only what this means (as distinct from a case finding), but also what instruments to use, who to target, what actions to take.

Heterogeneity of Different Instruments

One of the big problems in this area is that different services will use different instruments. For example, rehabilitation units will use the Functional Independence Measure; Community services use the MDS RAI and acute care settings use a whole variety of different instruments depending on the setting. The data is not transferable and it is often hard to follow people through the system in different settings because they get a different assessment tool at every turn.

Health Care or Social Services

We need to tease out the effects of health care and social services on patient outcomes. These interventions are often mixed together. For the elderly, the choice is often a stark one: should elders have better access to SGS care, which may help forestall declines in mobility; or to accessible transportation, which might help lessen the impact of declining mobility? One answer is "both," but the economic resources available to do both will always be limited.

Demand

In economic terms, demand is that quantity of a good or service that consumers (patients, clients) are both willing and able to obtain (assuming that it is available). Demand can be greater or less than supply, or it can match supply perfectly. Typically, efforts at health policymaking in Ontario focus on "need." This is done by trying to tie together a number of pieces of data about trends in health and in incidence and prevalence and to propose a policy solution.

The level of demand in a theoretical "free market" is predictable by economic formulae, except that the value placed on the service is a given. But in Ontario, there is in the main a single payer for health care services. It is an "insurance market" or risk pool, in

which those using the service are supported by those not using it. If the number of nonusers contracts and the number of users expands, the pool can be destroyed.

Information about things like costs and the usefulness of health care services products is not readily available (it would derive from program evaluation) and there are barriers (like licensure, gatekeeper roles including family physicians, and so on) which prevent the free market from operating.

To prevent destruction of the insurance pool, efforts to manage demand (for instance, using primary prevention programs) and supply (for instance, by offering incentives for professionals to locate in designated underserviced areas) are put in place. Strategic planning exercises attempt to forecast future service demands as well.

Health services research is beset with resource issues. In response, it often relies on analysis of very large databases, such as those maintained by ICES and CIHI. These databases have been created for administrative purposes, not for research, but even so they include several widely-accepted outcome measures, such as mortality and readmission (CIHI DaD) and function (CIHI NRRS).

Choice

Much policy research emphasizes an individual choice model, suggesting for instance that elders need health promotion or other kinds of education so that they will make better individual choices. In such a model, ill-health is the consequence of poor personal choices (also known as "risk behaviours"). Ill-health is, therefore, an individual "trouble" rather than a social "problem" (Mills; see also Lewis et al., 2006).

Even so, policy documents tend to include recommendations without much comment about what elderly Ontarians want. One way to find out what people want is to ask them. The RGPs of Ontario did a literature review of the extent to which seniors are involved in planning their own care, and found it to be rather low. There are mechanisms – surveys, focus groups – which have been used for this purpose in the past. For instance, Roberts, Khee and Philps used Delphi analysis to establish elderly patient, provider, and executive preferences for day hospital treatment outcomes in Britain, but we are not aware of similar exercises on this side of the Atlantic.

Choices are difficult to make without information, and, while there is a great deal of data in health care, there is not much information. For instance, administrators, insurers, and providers collect extensive standardized data on activity (e.g., patient or client visits, procedures and lengths of stay) and costs (per weighted patient day, outlier costs, wait times, benchmark costs, and so on) but rather less on diagnoses and very little on results. Results or outcomes data that are collected tend to be negative outcomes avoided, such as mortality rates, readmission rates, and placements in long-term care. Thus, they tend not to reflect the experience of the typical client in a typical setting, and they cannot answer the question "were these people better off because of their encounter with health care than they would have been otherwise?" If we record what is important to us, then the absence of these data is telling.

As Mosteller reported in 1989, those "talented lay people" who are responsible for allocating resources between alternative medical technologies, "wanted to know what different technologies will produce ... what the benefits and losses would be, but they do

not like to have these complicated problems summed up in single numbers" (as cited in Richardson, 1990).

Health Related Quality of Life

As already noted, outcomes measures in SGS vary between individual studies, which can create the impression that researchers are "shopping" for the most favourable tools. We have also noted, health services for the elderly are delivered in a variety of settings, and SGS claims to differ from other forms of health care in that it is "holistic." If so, then it is crucial to have meaningful outcome measures that can be used from one study to the next and that allow for comparison between settings of care. These standard tools would allow us to compare services and to link cost with benefit. Thus, they must measure a socially desirable outcome, such as health; they must be clear, comprehensible, and with a meaningful interval, and it must be possible to map the health service being studied into the measured outcome (Richardson, 1990).

Money has these qualities, and policymakers must often choose between a more-expensive and a less-expensive intervention. In the absence of an unambiguous non-monetary benefit, the choice can boil down to cost-minimization. This tends to work against SGS, since it is usually a labour-intensive operation.

Death, or avoidance of death, is usually a clear outcome with wide agreement about social desirability. But life expectancy has risen steadily for the population as a whole for many generations now; while health care is certainly a factor in this phenomenon, it is not the only factor or even the most important one. Indeed, many health interventions, especially for the frail elderly, are not intended to prolong mortality but rather to improve function, reduce disability, and/ or enhance quality of life. This is most obvious for palliative care, but applies elsewhere as well.

Richardson (1990) suggested that since "the quality of life is indisputably relevant to the allocation of resources, few would argue that the adjustment of life years for quality represents a methodological advance." Therefore, it has become common to use an outcome which "adjusts" life expectancy with some other measure to produce "quality adjusted life years (QALY)," "disability adjusted life years (DALY)," "healthy life expectancy (HLE)" and so on[9]. Increasingly, the adjustment is based on patient-reported outcomes (PRO), of which two of the more popular are the Rand system (SF-36, SF-12, SF-3d) and the Health Utilities Index (HUI).[10] The SF-3d is recommended by the Institute for Healthcare Improvement, while the HUI was designed to be completed by self-report or by a proxy. This latter feature is especially useful for persons who are cognitively impaired.

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[9] Note that use of these adjustments does not resolve ethical or distributional issues. For instance, it may be argued that a gain of one healthy year for a ninety-year old differs in value from the same gain for a five-year-old.

[10] There are also a few quality of life measures aimed at hospice or palliative care. See Lua, P. L., Salek, S., Finlay, I., Lloyd-Richards, C. (2005). The feasibility, reliability and validity of the McGill Quality of Life Questionnaire-Cardiff Short Form (MQOL-CSF) in palliative care population. Quality of Life Research, 14(7), 1669-1681.; McMillan, S. (1996.) Quality-of-Life Assessment in Palliative Care. Cancer Control Journal, 3,(3).

Both instruments are included in national surveys of health conducted biannually by Statistics Canada. Because of this, it is possible to compare PROs of individuals admitted to a day hospital (for example) with those of the population at large. Risk adjustment by age, sex, geographical location, and by some risk behaviours and pre-existing conditions could also be made (however, the data are confined to community-dwelling individuals). Subsequent PROs for the same patients would produce a metrics which could show that patients' average health status at enrolment was (presumably) below the population norm, and that it significantly improved (i.e., became closer to the norm) by de-enrolment. Using such an approach, it would be easier to advance the investigation of service-specific issues.

Service Specific Research

Geriatric Assessment and Rehabilitation Unit
What is the optimal mix of staff, what patients or clients should be targeted and can they be diverted to less expensive interventions without sacrificing care. Who should get into ICU? What outcomes should we pick? Who benefits who does not. Which rehab settings are the best? Should we use Stroke units or GARUs, and for what population?
Which benefits of rehabilitation are sustained and cost effective? Keep out of nursing home, keep at home, and improve quality of life. Which co-morbidities have the greatest effects? What effects of ethnicity and class on these outcomes?

Consultation Teams
Outcomes research on consultations – not just geriatric consultations – is not common. An effective consult should have sustained impact; in aggregate, that impact can be enormous because so many consults are done, but it may be slight or even undetectable if the focus is on a few patients over the short term. Resources to evaluate outcomes are scarce in any event, so most of what does occur is partial and inconclusive; the fact that it occurs at all is a testament to the determination and ingenuity of the researchers. Thus, the lack of evidence does not imply that consults are necessarily ineffective, only that there is a need for more evidence.

Day Hospital
In contrast, day hospital suffers, not from a lack of evidence, but from heterogeneous evidence. Questions remain about who (if anyone) to target, what outcomes, length of stay and goals are appropriate, how much patients and caregivers should be involved in the care plan, and which discipline and how much should make up the geriatric day hospital team.

Conclusion
Reuben (2002) noted that there are two kinds of organizational intervention to improve the care of the elderly. In "component models," no fundamental organizational change is required; instead, the intervention is "superimposed upon an intact system." He reviews a variety of these but finds that there is heterogeneous evidence about their effectiveness, little impact on health costs, and "formidable" barriers to their

implementation. By contrast, systematic models involve basic alteration in organizational structure or culture or both.

Reuben's review is echoed in this work. In Ontario as in other areas worldwide, the numbers of elderly are increasing. This has led to substantial interest in meeting elders' needs for healthcare. Thus, in addition to the organizational types described in this Handbook, there is a plethora of interventions which are promising, but which are too new for much evidence to have accumulated. Among these are:

- Acute Care for the Elderly (ACE) units, which aim to prevent delirium and other decline in the hospitalized elderly. A new ACE unit is in operation in London, Ontario, but no impact data has yet been disseminated.
- Geriatric Emergency Management (GEM) programs. These involve placement of an advance practice nurse in the Emergency Room. Hastings and Heflin (2005) performed a systematic review finding generally positive results, but caution that more study is needed. The RGPs of Ontario are evaluating 9 GEM programs in five cities.
- Senior friendly hospital strategies aimed at altering the hospital system to prevent iatrogenic and nosocomial effects (e.g., altering the physical layout of the hospital to reduce the risk for falls).

New questions will soon arise concerning the impact on computerization and standardization on a service whose cost savings or benefits were marginal at best. More broadly, given the shortage of specialists in this area and the costs of running these services, all could be assessed using alternative delivery methods like telemedicine. Teleconsults in geriatrics already occur, but they remain uncommon and their impact unknown. Yet, if people can do surgery long distance, then surely they can assess and rehabilitate by telemedicine. In addition to these, there may be a number of interventions in the home care and outreach areas that are simply unknown to us. These are potentially powerful methods, which should be shared.

References

Canadian Study of Health and Aging Working Group. (2002). Patterns and health effects of caring for people with dementia: the impact of changing cognitive and residential status. *Gerontologist, 42(5),* 643-52.

Centre for Evidence-Based Medicine at the University of Toronto. (2004). *What is evidence-based medicine?* Retrieved May 1, 2008, from http://www.cebm.utoronto.ca/intro/whatis.htm

Coggon, D., Rose, G., & Barker, D. J. P. (2007). *Epidemiology for the Uninitiated* (4th ed.). London: British Medical Journal Publishing Group.

Coulas, G. C., Abernathy, T., & Lewis, D. L. (2003). A*ging of Vulnerable Populations. RGPc/CWHPIN Report.* Retrieved, November, 13, 2006, from www.cwhpin.ca

Fillit, H., & Hill, J. (2005). Economics of dementia and pharmacoeconomics of dementia therapy. *American Journal Geriatric Pharmacotherapy, 3(1),* 39-49.

Hastings, S.N., & Heflin, M.T. (2005). A systematic review of interventions to improve outcomes for elders discharged from the emergency department. *Academic Emergency Medicine, 12(10),* 978-86.

Hebert, R., Durand, P., & Tourigny, A. (2003). Frail elderly patients:New model for integrated service delivery. *Canadian Family Physician, 49,* 992-997.

Jaglal, S.B., Weller, I., Mamdani, M., Hawker, G., Kreder, H., Jaakkimainen, L., & Adachi, J.D. (2005). Population trends in BMD testing, treatment, and hip and wrist fracture rates: are the hip fracture projections wrong? *Journal of Bone & Mineral Research, 20(6),* 898-905.

Jemal, A., Ward, E., Hao, Y., & Thun, M. (2005). Trends in the leading causes of death in the United States, 1970-2002. *Journal of the American Medical Association, 294(10),* 1255-9.

Loney, P.L., Chambers, L.W., Bennett, K.J., Roberts, J.G., & Stratford, P.W. (1998). Critical appraisal of the health research literature: prevalence or incidence of a health problem. *Chronic Diseases in Canada, 19(4),* 170-6.

Lua, P. L., Salek, S., Finlay, I., Lloyd-Richards, C. (2005). The feasibility, reliability and validity of the McGill Quality of Life Questionnaire-Cardiff Short Form (MQOL-CSF) in palliative care population. *Quality of Life Research, 14(7),* 1669-1681.

McMillan, S. (1996.) Quality-of-Life Assessment in Palliative Care. *Cancer Control Journal, 3,(3).*

Molnar, F.J., & Dalziel, W.B. (1997). The pharmacoeconomics of dementia therapies. Bringing the clinical, research and economic perspectives together. *Drugs & Aging, 10(3),* 219-33.

Reuben, D.B. (2002). Organizational interventions to improve health outcomes of older persons. *Medical Care, 40(5),* 416-28.

Richardson, J. (1990, September). *Cost Utility Analysis: What Should be Measured; Utility, Value or Healthy Year Equivalents?* Paper presented to the 1990 Second World Congress on Health Economics. Zurich, Switzerland.

Rockwood, K., Song, X., MacKnight, C., Bergman, H., Hogan, D.B., McDowell, I., & Mitnitski, A. (2005). A global clinical measure of fitness and frailty in elderly people. *Canadian Medical Association,Journal, 173(5),* 489-95.