Health-care restructuring has increased the focus on integrating health care. Therefore the study purpose was to quantify patient movement from hospital to home care before restructuring occurred in a health planning district. Hospital discharge abstracts and home care records identified patients with a hip fracture who used home care (n=353). Patients from acute care were more likely than rehabilitation or convalescent in-patients to wait >3 days for home care after hospital discharge (RR 1.54, 95% CI 1.18, 2.00). Institution-dwellers were more likely than community-dwellers to wait >3 days for home care (RR 2.35, 95% CI 1.86, 2.97). Home care rehabilitation clients were more likely than non-rehabilitation users to wait >3 days for home care (RR 2.10, 95% CI 1.42, 3.09). Waiting time for home care is associated with hospital care setting and the home care service utilized. Evaluations of restructuring efforts should consider accounting for these relationships.

A B R É G É

La restructuration des soins de santé a braqué les projecteurs sur la question de l'intégration des soins. Nous avons cherché à quantifier les mouvements de patients entre l'hôpital et les soins à domicile avant la restructuration d'un district de planification sanitaire. Le registre des sorties des hôpitaux et les dossiers de soins à domicile recensent les cas de fracture de la hanche où les patients ont reçu des soins à domicile (n=353). Les patients des soins actifs étaient plus susceptibles que les patients hospitalisés en réadaptation ou en convalescence d'attendre plus de trois jours avant de recevoir des soins à domicile après leur sortie de l'hôpital (RR 1,54, 95 % IC 1,18, 2,00). Les patients hospitalisés étaient plus susceptibles que les patients dans la communauté d'attendre plus de trois jours avant de recevoir des soins à domicile (RR 2,35, 95 % IC 1,86, 2,97). Les clients des soins de réadaptation à domicile étaient plus susceptibles que les usagers d'autres soins d'attendre plus de trois jours avant de recevoir des soins à domicile (RR 2,10, 95 % IC 1,42, 3,09). Le délai d'attente des soins à domicile est lié au fait d'être hospitalisé ou non et au service reçu à domicile. Dans les évaluations des efforts de restructuration, il faudrait songer à tenir compte de ces liens.

Home Care After Hip Fracture in a Health Planning Region

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The demand for home care in Ontario by patients with a hip fracture has been increasing. From 1981 to 1992, home care use by this group increased from 8% to 15%.¹ By the mid 1990s, 25% of Ontarians hospitalized with a musculoskeletal diagnosis received home care after discharge.² However, for health planning purposes, large data sets may not always apply to smaller geographic regions.³ One such health planning area in Ontario is the Thames Valley (TV) District Health Council. Prior to this study, TV had a slightly higher percentage of people over 65 years of age (11.9-14.3%) than the rest of the province (11.7%).⁴ While the absolute number of hip fractures in TV increased by 14% between 1991/92 and 1994/95, hip fracture rates (females: 4.8, males: 1.8 per 1,000 persons) were similar to the province.⁵

At the time this study was planned, recommendations for health care restructuring in the area were ready to be carried out.^{6,7} Three acute-care, urban tertiary hospitals were to merge into one acute and one ambulatory care institution, while some outlying hospitals would need to merge certain aspects of their operations. Institutionalized rehabilitation was to merge and the provision of home care services were to be coordinated by a newly created Community Care Access Centre.

Health-care restructuring has increased the focus on the integration of health care,^{8,9} highlighting the importance of patient transfers between treatment settings. Provincial data reveal that 1) some patients with a hip fracture receive home care after acute care while others go to a rehabilitation hospital, and 2) institutional practice plays a role in this decision.¹⁰ Thus characterizing transfers to home care should address the hospital care setting from which the patient has been discharged. The purpose of the study was to quantify patient movement from hospital to home care after a hip fracture, before any implementation of restructured health care in the TV health planning area.

METHODS

The data source, selection of the study cohort and methods for identification of post-acute care are illustrated in Figure 1. Exclusion criteria are summarized elsewhere.¹² Age, gender, length of stay (LOS), fracture type (transcervical or pertrochanteric), patient residence (institution or community-dweller), comorbidity (no Charlson^{13,14} comorbidity or one or more comorbidities) during the index admission and prior year of hospitalization, and hospital teaching status (teaching or non-teaching)¹⁵ were available from the Canadian Institute for Health Information (CIHI).

Home care utilization was quantified as the proportion of patients receiving nursing, occupational therapy, physiotherapy and homemaking services. The total number of home care visits by nursing, occupational therapy and physiotherapy personnel were calculated for the index home care admission. Occupational therapy and physiotherapy defined home care rehabilitation.

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A 3-level variable described the hospital care setting from which patients were discharged: 1) acute, 2) sub-acute in-patient rehabilitation, or 3) convalescent care. Patients in both post-acute categories were transferred directly from acute to post-acute care. 'Sub-acute in-patient rehabilitation' included patients with a rehabilitation MRDX (V57.1, V57.8, V57.9) on the second admission, or when the second facility was a rehabilitation facility with a hip fracture or rehabilitation MRDX. 'Convalescent care' included hospitalizations with related MRDX's (orthopedic aftercare V54.8, waiting for admission to another facility V63.1, or receiving convalescent care V66.0 - V66.5). Waiting time for home care was the number of days between hospital discharge and the first home care visit by a nurse, occupational therapist or physiotherapist. Home care admission date indicated if a home care referral was made 'in hospital' or 'after discharge'. Categorical variables were compared using the Chi-square test and relative risk ratios. The independent t-test and Wilcoxon rank-sum test were used for 2-level comparisons of age and LOS, respectively. Three-level comparisons of age and LOS were made with ANOVA and Kruskal-Wallis tests, respectively.¹⁶ Analyses were performed using SAS-PC.¹⁷

RESULTS

Sixty-six percent (n=229) of the cohort resided in Middlesex County. The remainder lived in Elgin (n=56) and Oxford (n=68). Sixty-four percent (n=226) received home care following acute-care discharge. Thirty-six percent (n=127) went directly to a post-acute hospital before receiving home care.

Table I lists characteristics of home care recipients by hospital care setting. A greater proportion of home care patients from hospital-based rehabilitation were community-dwellers and received acute care in a teaching hospital. The median post-acute LOS was shorter for home care patients coming from hospital-based rehabilitation. The median waiting time between hospital discharge to receipt of home care was 3-4 days (minimum: 0, maximum: 29).

TABLE I
Home Care Recipients by Hospital Care Setting, for Thames Valley Health Planning Area, FY 92/93 - 93/94 (n=353)

	Acute (n=226)	Hospital Care Setting Post-acute Rehabilitation (n=91)	Convalescence (n=36)
Patient Characteristics			
Age, mean years (sd)	80.1 (9.4)	81.7 (7.2)	79.8 (7.5)
Gender (% female)	81	85	83
Comorbidity (% 1+) [†]	29	21	22
Fracture type (% pertrochanteric)	52	63	56
Residence (% community)	74	93**	78
Length of stay, untrimmed (days)			
Acute mean (sd)	19.0 (14.7)	17.5 (10.1)	15.0 (9.2)
median	14.5	15	12
Post-acute mean (sd)		30.5 (22.9)	39.4 (19.1)
median		25	39**
Hospital Characteristic			
Teaching status (% teaching)	57	82**	39
Transfer Variable			
Home care waiting time‡ (days)			
mean (sd)	7.1 (7.4)	5.5 (6.9)	4.5 (6.5)
median	4	3	3

† ≥1 Charlson comorbidity¹⁴ vs 0 at index event or hospital in prior year

‡ Time from hospital to first home care service: nursing, occupational therapy, physiotherapy

** p < 0.01

Table II shows home care use by hospital care setting. More patients from hospital-based rehabilitation used homemaking and nursing services. For patients who received home care rehabilitation (n=289), home care use was greater among patients who came from post-acute hospital-based rehabilitation.

Figure 2 illustrates home care waiting time by hospital care setting. Fifty percent

of patients had their first home care visit within three days of discharge. After this point, the pattern of waiting time appears different for patients transferred to a second hospital site compared to those coming to home care directly after acute care (see Figure 2). By four days after discharge, 75% of clients from post-acute care had received their first home care visit. In comparison, 75% of patients discharged from

TABLE II
Home Care Utilization by Hospital Care Setting, for Thames Valley Health Planning Area FY 92/93 - 93/94 (n=353)

Home Care Utilization	Hospital Care Setting		
	Acute	Post-acute Rehabilitation	Convalescence
Service Type			
n	226	91	36
		Percent Using Service	
Homemaking	44	64**	42
Nursing	53	71**	50
Occupational Therapy	20	31	20
Physiotherapy	77	75	69
Service Intensity			
Patients Receiving Rehabilitation†			
n	188	73	28
		Number of Visits	
mean (sd)	5.9 (4.1)	6.9 (4.1)	5.2 (3.9)
median	5	6*	4
Patients Receiving Nursing			
n	119	65	18
		Number of Visits	
mean (sd)	13.0 (13.3)	13.3 (10.2)	11.8 (9.9)
median	9	12	8

† Defined as occupational therapy and physiotherapy visits
* p < 0.05 ** p < 0.01

acute care received home care after 12 days.

Fifty-six percent of patients (n=196) received their first home care service within three days of hospital discharge and were significantly younger than those who wait-

ed more than three days, mean (sd)=78.8 (8.1) versus 82.5 (9.0) respectively, t (351, n=353)=-4.0967, p=0.0001. Table III shows the risk of a longer wait (i.e., >3 days) for home care. Patients who received home care more than three days after leav-

ing the hospital were more likely to have a pertrochanteric fracture and to live in an institution. More patients from acute care (73%) waited longer for home care. Patients referred to home care after discharge from hospital were more likely to wait longer for home care compared to patients referred to home care while in-hospital.

Table III also shows an association between the type of home care service used and the risk of a longer wait for home care. Patients who used home care rehabilitation services were twice as likely as non-rehabilitation users to receive home care in more than three days. Conversely, those patients who used nursing and homemaking services were more likely than non-users to receive these services within three days of hospital discharge.

Finally (not illustrated), compared to home care clients from acute care, a greater proportion of home care patients from post-acute rehabilitation or convalescence were referred to home care while they were still in hospital, χ^2 (1, n=353)=6.995, p=0.008. Among home care patients with a hip fracture, the unadjusted relative risk (95% confidence interval) of an in-hospital home care referral while in a post-acute versus an acute care hospital was 1.17 (1.04, 1.31).

DISCUSSION

The majority (64%) of home care recipients came from acute care. This is slightly lower than province-wide data where 71% of patients received home care services after acute care.¹⁰ Thus provincial estimates of home care use by these patients should be appropriate for planning purposes. In TV, more home care clients from post-acute rehabilitation (82%) received acute care in a teaching hospital and most (93%) were community-dwellers. This is consistent with the current practice in the area – a decreased likelihood of teaching hospitals to discharge community-dwellers to home care rehabilitation, and an increased likelihood of community-dwellers to be discharged to hospital-based rehabilitation.¹²

Examination of home care use after post-acute hospitalization shows that more clients from post-acute rehabilitation

required homemaking and nursing services as well as more visits from rehabilitation personnel. This could be due to an increased level of clinical complexity or insufficient family support that was not captured in the administrative data base. Furthermore, younger patients were more likely to be seen in less than three days. They may have had a spouse or family member who could support them at home or their functional level may have been higher to begin with. Thus, the need to describe functional and cognitive ability is clear, reinforcing the importance of quantifying prefracture function, changes in physical or mental capacity and level of informal support for this patient population.

Home care recipients from acute care were more likely to wait longer for home care than patients from a post-acute hospital. This may be due to a difference in the stage of recovery reached by patients in the two treatment settings or the need of acute hospitals to free up beds for incoming patients. A larger proportion of patients from acute care may not have been ready for rehabilitation even though they satisfied the requirements for acute-care discharge. Alternatively the team focus in sub-acute care settings may have been more closely aligned with post-acute treatment issues. This is consistent with the increased likelihood (RR=1.17) of an in-hospital referral to home care during sub-acute rehabilitation or convalescent care compared to patients receiving home care following acute care. One of the limitations of administrative data is that it does not capture reasons for discharge. In future studies, it would be helpful to identify and control for the reason for discharge. Knowing if the reason for hospital discharge was because a patient was medically stable, or s/he could get out of bed independently or ambulate a certain distance, or had caregivers at home would identify important patient-specific factors that may affect patient movement between hospital and home care.

Patients who resided in an institutional setting were more likely to receive home care more than three days after hospital discharge. Since the very nature of their living environment means that nursing care and homemaking services are provided in-house, the primary home care need of

TABLE III Relative Risk of Waiting >3 Days for Home Care, Thames Valley Health Planning Area FY 92/93 - 93/94 (n=353)	
	Unadjusted RR†
Patient Characteristics	
Gender (female)	1.13 (0.82, 1.55)
Comorbidity (1+)‡	0.80 (0.61, 1.06)
Fracture type (perthrochanteric)	1.29 (1.02, 1.64)*
Residence (institution)	2.35 (1.86, 2.97)**
Hospital Characteristic	
Teaching status (teaching)	1.20 (0.94, 1.53)
Transfer Variables	
Hospital care setting (acute)	1.54 (1.18, 2.00)**
Home care referral setting (after discharge)	2.45 (1.95, 3.08)**
Home Care Service Utilization	
Rehabilitation (used rehabilitation)	2.10 (1.42, 3.09)**
Nursing (used nursing)	0.21 (0.16, 0.27)**
Homemaking (used homemaking)	0.31 (0.24, 0.40)**
† Relative risk of home care >3 days after hospital discharge for category in parentheses ‡ ≥1 Charlson comorbidity ¹⁴ vs. 0 at index event or hospital in prior year * p < 0.05 ** p < 0.01	

this group may have been rehabilitation. Since this need should be based on functional ability and potential for rehabilitation potential, the wait for home care by this group should be evaluated with a multivariate analysis. This was not possible in the current study because of the small number of patients who lived in an institutional setting.

The small number of explanatory variables, modest cohort size and descriptive nature of the analysis means these results should be viewed as preliminary findings. Homemaking hours were not available, limiting the ability to quantify use of homemaking following discharge from hospital. Limited use of occupational therapy and physiotherapy services required the combination of these providers in the analysis. While this facilitated comparison with Ontario data, meaningful utilization statistics for these two providers could not be obtained. However, the results suggest that: 1) home care use after a hip fracture in the TV health planning region may be lower than in the province, and 2) for half of all home care recipients, it may be difficult to improve upon the waiting time for home care. With three days as the median time between discharge and home care, improvement may be more realistic in patients who received home care 3-29 days after discharge.

In conclusion, prior to restructuring in the TV health planning area, there was a relationship between the waiting time for home care and 1) the type of hospital care setting, and 2) the kind of home care ser-

vice utilized. This provides useful insight into patient movement between hospital and home care before the implementation of any restructuring initiatives in the area. Since acute-care patients were more likely to wait longer for home care than patients from sub-acute rehabilitation or convalescence, restructuring that affects patient referrals in these care settings should affect this relationship as well. Since the availability of home care rehabilitation was associated with the time between hospital discharge and the receipt of rehabilitation, changes to the provision of home care via Community Care Access Centres could be expected to modify this relationship. The link between home care waiting time and treatment outcome should be established.

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B O O K R E V I E W R E C E N S I O N

Health Promotion Planning: An Educational and Ecological Approach (3rd ed)

L.W. Green, M.W. Kreuter (Eds.) Mountain View, CA: Mayfield Publishing Company, 1999; 621 pp.

Dramatic changes in the field of health promotion and widespread application of the PRECEDE-PROCEED model provided impetus for Green and Kreuter to launch the 3rd edition of their text. Their aim is to document changes within the field but also to capture some of the diverse applications of the model. Revisions to the subtitle of the text are reflective of some of those changes in the field; a shift away from an educational focus (1st edition), to an environmental (2nd edition) and more recently an ecological approach to health promotion planning.

The authors describe the historical context of health promotion and the basis for the PRECEDE-PROCEED model (Chapter 1), the phases of the model (Chapters 2-7) and its applications (Chapters 3-11), and an overview of public health informatics as well as technological applications of the model (Chapter 12). There are subtle but significant changes from the 2nd edition that reflect the

authors' change in orientation. They attempt to shift from using the language of "diagnosing" problems to "assessing" problems and assets but remnants of a problem-focused clinical orientation continue to surface. The emphasis throughout the book is on developing reciprocal relationships and partnerships with community and distinguishing between real or symbolic community participation. There are also more concise descriptions of assessment methods and somewhat more emphasis on strategies for utilization of the data generated from the phases of assessment.

The PRECEDE assessment phases direct initial attention to outcomes rather than inputs, and thus encourage planners to critically examine why a given initiative should be implemented. The framework reflects the multidisciplinary nature of health promotion and as such is a valuable tool for people engaged in health promotion planning regardless of their disciplinary background. It is assumed that those who apply the model have grounding in

the scientific foundations of health promotion (i.e., social and behavioural sciences, biomedical sciences, economics, and management sciences). The need for a working knowledge of these areas is reflected in the PRECEDE phases of assessment (i.e., social, epidemiological, behavioural and environmental, educational and ecological, and administrative and policy phases) and the PROCEED phases of implementation and evaluation.

As with previous editions, this text is a valuable resource for those engaged in implementing and planning health promotion programs. Revisions made in this edition reflect the need to remain responsive to social, political and economic contexts.

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