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Returning Home after Acute Hospitalization in Two French Teaching Hospitals: Predictive Value of Patients' and Relatives' Wishes

MAHMOUD ZUREIK, THIERRY LANG, JEAN-LOUIS TROUILLET, ALAIN DAVIDO, BÉATRICE TRAN, ALBERT LEVY, PIERRE LOMBRAIL

Summary

Identifying elderly patients who are unable to return home immediately after acute hospitalization is difficult. For these patients, early planning of discharge might reduce the length of hospitalization. We conducted a cohort study to investigate the roles of patients' characteristics and patients' and principal carers' wishes about patients returning home in predicting the outcome of hospitalization for 510 patients aged 75 years or more admitted to acute medical care units via the emergency departments of two teaching hospitals in Paris (France). Patients' characteristics and patients' and principal carers' wishes were investigated within 24–48 hours of admission. The outcome of hospitalization was defined as discharge to home or residential/nursing home.

The opposition of the principal carer to a patient returning home was the most powerful predictor of discharge to a residential/nursing home. Advanced age, living alone, disability in Activities of Daily Living, altered mental state and presence of a chronic condition fatal within 4 years were also independently associated with discharge to a residential/nursing home. The patient's wishes were predictive in univariate but not in multivariate analysis. These results suggest that the principal carer's wishes about a patient returning home might be taken into consideration early in a hospital stay for more effective discharge planning.

Introduction

A major problem for those involved in discharge planning is the difficulty in identifying elderly patients in need of special planning efforts early in the course of hospitalization [1]. The hospital is a major source of all placements after a debilitating acute illness, and hospitalization is an intermediate step before entering a nursing home or other special-care setting [2–4]. Better identification of the elderly patients at risk of discharge to institutional care might lead to more effective discharge planning [5, 6] and reduce the length of hospitalization for elderly patients who cannot be discharged home [7]. Prolongation of hospital stay for non-medical reasons was reported in a French study to be 1 day if the patient returned home, but 5 days when discharge was to a long-term care facility [8].

Several studies have evaluated the characteristics of patients discharged to nursing home and other special-care settings [9–21]. Glass and Weiner used continence, ambulation, age, social background, admission source, and thought processes as predictive variables in the CAAST Index [9]. In a study in a 290-bed county-funded community hospital in California, the most important predictors of level-of-care changes from admission to discharge were older age and abnormal mental status [11]. Using data from an urban Professional Standards Review Organisation in Los Angeles, Kane *et al.* examined the pattern of discharges for persons aged 65 years and older from an acute hospital. Four variables were significantly related to institutionalization in a nursing home: older age, being female, diagnosis of a mental condition and being hospitalized in a community hospital [12].

Besides the patients' characteristics, two factors might affect the possibility of returning home or the need of placement after an acute hospitalization: the wishes of the patient and of the relatives and friends, who share primary responsibility for his or her care. The wishes of the principal carers might indeed be a good indication of the social support available to an elderly patient.

The aim of this prospective study was to identify the roles of patients' characteristics and patients' and principal carers' wishes in predicting the outcome of hospitalization and planning for discharge after acute hospitalization of patients aged 75 years and over, admitted to an acute medical care facility through an emergency department.

Table I. Characteristics of the 417 patients aged 75 years or older admitted through the emergency department of each of two teaching hospitals in Paris (France)

Variables†	Bichat (n = 245)	Pitié-Salpêtrière (n = 172)	Total (n = 417)
Sex (% women)	72.2	75.0	73.4
Age: mean (SD) years	84.9 (5.5)	83.1 (5.5)*	84.3 (5.5)
Living alone (%)	59.7	59.1	59.4
Receiving home-care services (%)	36.9	33.9	35.7
Patient's wish about returning home (%):			
Agreement	78.5	83.5	80.8
Without opinion	17.2	15.9	16.5
Opposition	4.3	0.6	2.7
Principal carer's wish about patient returning home (%):			
Agreement	59.7	64.1	61.1
Without opinion	22.2	16.4	20.7
Opposition	18.1	19.5	18.2
Type of principal carer (%):			
None	5.3	9.2*	7.2
Spouse or child	63.3	71.4	66.7
Friend	31.4	19.4	26.1
ADL score at admission (%)			
0	28.7	22.7	26.4
1–3	21.7	17.7	20.6
4–6	49.6	59.6	53.0
IADL score at admission (%)			
0	20.2	21.4	20.6
1–3	18.9	16.4	17.8
4–7	60.9	62.2	61.6
Mental alteration (%)			
None	49.8	40.7	46.1
Mild	17.9	19.8	18.6
Moderate	13.1	14.0	13.5
Severe	19.2	25.5	21.8
Acute condition (%)			
None	9.5	3.7	7.2
Yes, non-fatal within 1 month	78.7	82.2	80.2
Yes, fatal within 1 month	11.8	14.1	12.6
Chronic condition (%)			
None	11.1	10.4*	10.9
Yes, non-fatal within 4 years	57.0	72.4	63.1
Yes, fatal within 4 years	31.9	17.2	26.0
Outcome of hospitalization (%)			
Home	59.2	59.9	59.5
Residential/nursing home	40.8	40.1	40.5
Length of stay: mean (SD) days			
Home	13.5 (10.5)	13.0 (11.1)	13.3 (10.7)
Residential/nursing home	21.5 (12.3)	23.3 (13.6)	22.3 (13.3)

† Missing data: 8, living arrangement; 11, receiving home-care services and patient's wish; 6, type of principal carer; 16, principal carer's wish; 19, ADL score and IADL score; 9, mental alteration and 13, chronic and acute conditions.
* $p < 0.05$ (tests for significance comparing the patients' characteristics of the two hospitals).
ADL Activities of Daily Living; IADL Instrumental Activities of Daily Living; SD Standard Deviation.

Methods

Data were prospectively collected for each person 75 years and older admitted from home to acute medical care units through the emergency departments of two teaching hospitals in Paris (Pitié-Salpêtrière and Bichat hospitals) during 2-month periods 1 December 1991 to 1 February 1992 and 1 May to 1 July 1992. The choice of two hospital sites and two periods of time (winter and summer) was to ensure that factors related to the outcome of hospitalization were consistent over time and place. Elderly patients were interviewed within 24 h of admission by specially trained research assistants. In addition to demographic data, indicators of physical asnd mental disability were recorded. The pathological status at admission was assessed by the physician in charge of the emergency department. Patients

Table II. Characteristics of the patients according to outcome of hospitalization

Independent variables†	Discharge home No (n = 169) %	Discharge home Yes (n = 248) %	Odds ratio* (95% CI)
Age:			
≤85 years	54.4	67.3	1
>85 years	45.6	32.7	1.7 (1.2–2.6)
Living alone:			
None	31.3	46.7	1
Yes	68.7	53.3	1.9 (1.3–2.9)
Receiving home-care services:			
None	53.1	68.4	1
Yes	44.9	31.6	1.8 (1.2–2.7)
Patient's wish about returning home:			
Agreement	64.2	88.4	1
Without opinion	28.4	9.4	2.0 (1.3–3.1)
Opposition	7.4	2.2	3.9 (2.7–5.9)
Principal carer's wish about patient returning home:			
Agreement	28.8	58.7	1
Without opinion or without principal carer	55.1	37.9	3.0 (2.2–4.4)
Opposition	16.1	3.4	9.2 (6.5–17.1)
ADL score at admission:			
0	14.5	34.5	1
1–3	19.7	20.5	1.8 (1.4–2.4)
4–6	65.8	45.0	3.3 (2.5–4.7)
IADL score at admission:			
0	10.8	27.2	1
1–3	13.9	20.5	1.4 (1.1–1.7)
4–6	75.3	52.3	1.9 (1.5–2.4)
Mental alteration:			
None	34.9	53.6	1
Mild	18.9	18.6	1.4 (1.2–1.7)
Moderate	17.2	10.9	2.0 (1.7–3.2)
Severe	29.0	16.9	2.8 (2.4–4.6)
Acute condition:			
None	10.5	5.0	1
Yes, non-fatal within 1 month	70.4	86.8	1.6 (1.3–2.1)
Yes, fatal within 1 month	19.1	8.2	2.5 (1.9–3.8)
Chronic condition:			
None	6.4	13.7	1
Yes, non-fatal within 4 years	62.4	63.9	1.6 (1.1–2.4)
Yes, fatal within 4 years	31.2	22.4	2.6 (1.8–4.1)

† Missing data: 8, living arrangement; 11, receiving home-care services and patient's wish; 16, principal carer's wish; 19, ADL score and IADL score; 9, mental alteration and 13, chronic acute conditions.
ADL, Activities of Daily Living; IADL Instrumental Activities of Daily Living; CI Confidence Interval.
* Odds ratio and confidence interval were calculated by univariate logistic regression for each independent variable; only the variables statistically significant at $p < 0.05$ are shown.

were excluded from the study if they were admitted from a skilled nursing facility, a long-term care facility or an intermediate care facility. Patients admitted to an intensive care unit were also excluded.

Indicators of social support collected by the emergency department's social workers included information on living arrangements; frequency of visits by friends or family to patients living alone, community-living patients receiving home care services, level of education, patient's wishes about going back home and wishes of the patient's principal carer about the patient returning home after acute hospitalization. The closest relative or friend (the principal carer) of each patient was identified by the patient or by the staff for unconscious or mentally impaired patients. Identification of a principal carer was impossible for 25 patients. The wishes of the principal carer were investigated by the emergency department's social workers within 24–48 h of admission by direct interview or by telephone.

Physical disability was evaluated by the Activities of Daily Living (ADL) [22] and Instrumental Activities of Daily Living

Table III. Relationships between the principal carer's wish and patient's wish and patient's characteristics

	Principal carer agrees with patient returning home		
	Yes (n = 245) %	No (n = 73) %	p
Sex (% of women)	69.8	72.7	NS
Patient's wish about returning home:			
Agreement	99.2	87.7	< 0.01
Opposition	0.8	12.3	
Age:			
⩽ 85 years	66.4	50.9	< 0.02
> 85 years	33.6	49.1	
Living alone:			
None	51.3	29.7	< 0.001
Yes	48.7	70.3	
ADL score at admission:			
0	32.1	18.4	< 0.05
1–3	19.8	24.5	
4–6	48.1	57.1	
IADL score at admission:			
0	22.2	9.6	< 0.001
1–3	24.4	3.9	
4–7	54.4	86.5	
Mental alteration:			
None	40.1	12.7	< 0.001
Mild	28.0	32.7	
Moderate	8.6	14.6	
Severe	23.3	40.0	
Acute condition:			
None	4.9	17.7	< 0.01
Yes, non-fatal within 1 month	83.6	68.6	
Yes, fatal within 1 month	11.5	13.7	
Chronic condition:			
None	7.7	13.2	< 0.03
Yes, not-fatal within 4 years	66.7	47.2	
Yes, fatal within 4 years	25.6	39.6	

ADL Activities of Daily Living: IADL Instrumental Activities of Daily Living.

(IADL) scores [23]. The ADL global score at admission was obtained by summing the elementary score (dependence = 1; independence = 0) for each activity (bathing, toileting, eating, dressing, walking in home, continence). A global score of 0 indicated independent performance for all activities and a global score of 6 indicated total dependence. Patients in need of human assistance in performing an activity were scored as dependent for that activity. Three stages of ADL physical disability were defined: independent in all activities (global score = 0), dependent in 1 to 3 activities (global score = 1–3) and dependent in 4 to 6 activities (global score = 4–6).

The IADL score represented the amount of dependence or independence of patients in seven areas (using telephone, shopping, preparing food, using public transport, taking medications, housekeeping, handling finances). A global score of 0 indicated independent performance for all instrumental activities and a global score of 7 indicated total dependence. Patients in need of human assistance in performing one of the instrumental activities were scored as dependent for that activity. Three stages of IADL physical disability were defined: independent in all instrumental activities (global score = 0), dependent in 1 to 3 activities (global score = 1–3) and dependent in 4 to 7 activities (global score = 4–7).

Mental disability at the time of interview was measured using the 10-item Short Portable Mental Status Questionnaire (SPMSQ) [24], adjusted for level of education. Four levels of performance were defined by the Pfeiffer scale for: (1) no deterioration (8 to 10 correct answers); (2) borderline or mild deterioration (6 or 7 correct answers); (3) moderate deterioration (4 to 5 correct answers); and (4) severe deterioration (0 to 3 correct answers). Where information was not available because of impaired consciousness, the SPMSQ score was 0 (28 patients).

The presence of a chronic condition, fatal or non-fatal within 4 years, and of an acute condition, fatal or non-fatal within 1 month, was assessed and recorded by the physician in charge of the emergency department according to a modified McCabe score [25]. The International Classification of Diseases, 9th version [26] was used initially to classify the main reasons for hospitalization. Following a consensus of

Table IV. Factors associated with discharge to a residential/nursing home (multivariate logistic regression)

Independent variables	β Coefficient	β/SD‡	Odds ratio (CI 95%)
Principal carer's wish about patient returning home:	1.05	5.0***	
Agreement (= 0)			1
Without opinion or without principal carer (= 1)			2.9 (1.9–4.3)
Opposition (= 2)			8.2 (3.5–18.9)
Chronic condition:	0.73	3.2**	
None (= 0)			1
Yes, non-fatal within 4 years (= 1)			2.1 (1.3–3.3)
Yes, fatal within 4 years (= 2)			4.3 (1.7–10.7)
Mental alteration:	0.28	2.3*	
None (= 0)			1
Mild (= 1)			1.4 (1.0–1.7)
Moderate (= 2)			1.8 (1.1–2.8)
Severe (= 3)			2.3 (1.3–4.8)
Age:	0.57	2.2*	
⩽ 85 years (= 0)			1
> 85 years (= 1)			1.8 (1.1–2.9)
Living alone	0.65	2.3*	
None (= 0)			1
Yes (= 1)			1.9 (1.2–3.3)
ADL score at admission:	0.36	2.1*	
0 (= 0)			1
1–3 (= 1)			1.5 (1.0–2.0)
4–6 (= 2)			2.1 (1.5–3.9)
n = 354			

* $p < 0.02$; ** $p < 0.001$; *** $p < 0.0001$.
ADL Activities of Daily Living; CI Confidence Interval; SD Standard Deviation.

chiefs of the two emergency departments, diagnoses were grouped into seven categories: (1) cardiovascular diseases; (2) respiratory diseases; (3) confusion or dementia; (4) falls or debility; (5) infectious diseases, cancers and metabolic diseases; (6) neurological diseases; and (7) other diseases.

The outcome of hospitalization and date of discharge were collected by the social workers of the medical units. The outcome of hospitalization was classified as 'Home' or 'Residential/nursing home'. 'Home' categorized those patients discharged home with or without home-health services and those discharged to the homes of relatives. 'Residential/nursing home' comprised discharges to a skilled nursing facility, a long-term care facility, or an intermediate care facility.

The informed consent of each patient or a responsible person was obtained upon entering the study and no patient refused to enter the study. This project was approved by the National Committee for Data Processing and Freedom.

Statistical Methods

The characteristics of the patients in the two hospitals were compared by t tests and χ^2 tests for continuous and categorical variables, respectively. The association of each factor with outcome of hospitalization was assessed using a univariate logistic regression model. The maximum likelihood ratio test for significance, the estimated β coefficients and the standard deviation of the coefficient for a given variable were obtained. Unadjusted odds ratios (ORs) were then calculated from the estimated coefficients. For the multivariate analysis, a stepwise logistic regression was applied. Adjusted ORs were computed from the estimated coefficients in the model. The fit of the logistic model was assessed by the Hosmer–Lemeshow goodness-of-fit χ^2 test and by examining the distributions of the predicted probabilities within each group of type of discharge [27]. The SAS statistical package was used for statistical analysis [28].

Results

A total of 510 patients was included in the study. Of these, 93 were excluded from the analysis, 71 who died during the acute hospitalization and 22 who were transferred into other acute-care facilities. Thus 417 patients were included, 245 patients at the Bichat hospital and 172 at the Pitié-Salpêtrière hospital. The characteristics of the 22 transferred patients did not differ from those of the 417 patients included in the analysis.

The mean age of the patients was 84.3 years (range: 75–98). Three hundred and six (73.4%) were women. Over half (55.5%) were widowed, nearly a fifth were married. The main reasons for admission at the time of initial assessment were cardiovascular diseases (18.3%), falls and/or debility (22.1%), neurological diseases (17.6%), confusion and/or dementia (9.2%), infectious diseases, cancers and metabolic diseases (14.5%) and respiratory diseases (7.4%).

The patients' characteristics differed little between the two study sites (Table I). The only statistically significant differences were: the patients of Bichat hospital were older, identified more frequently a principal carer and were judged more often to have a chronic condition fatal within 4 years.

Eleven patients (2.7%) were opposed to going back home after hospitalization and 68 patients (16.6%) expressed no opinion. Seventy-three principal carers (18.2%) were opposed to the patient returning home, 55 (13.7%) stated no opinion (Table I).

At discharge, 248 (59.5%) of the patients went home. The average length of stay for patients sent to a residential/nursing home was about 9 days longer than for patients who went back home (22.3 vs. 13.3 days, respectively, $p < 0.001$ (Table I).

Ten variables were associated significantly ($p < 0.05$) with discharge destination in univariate analysis: age, living arrangement, receiving home-care services, patient's and principal carer's wishes about the patient returning home, ADL status, IADL status, mental alteration and presence of an acute condition fatal within 1 month and of a chronic condition fatal within 4 years (Table II).

When analysing the data stratified by hospital site or by period of time, odds ratios did not differ between hospital sites or periods of time (data not shown).

The wish of the principal carer about the patient returning home was the most important indicator of discharge to a residential/nursing home in the univariate analysis. In a search for variables potentially confounding the relation between the principal carer's wish and the outcome of hospitalization, we compared the characteristics of the patients according to their principal carers' wishes. Age, living arrangement, ADL status, IADL status, mental disability and presence of a chronic condition fatal within 4 years or of an acute condition fatal within 1 month were significantly related to the principal carer's wish (Table III).

Owing to the small number of patients opposed to going back home after acute hospitalization (11 patients), the relationships between the patient's wish and other factors are not reported. When both the patient and principal carer were opposed to the patient returning home (nine cases), no patient was discharged to home. Two patients were opposed to returning home and their principal carers were not. Of these, one went home and the other was discharged to a nursing home.

All variables that were significant in univariate analysis were included in the stepwise logistic regression, as well as the non-significant variables suggested to be important in the literature (sex, level of education, marital status, and hospital site). The wish of the principal carer about the patient returning home was found, in multivariate analysis as well as in univariate analysis, to be the most important indicator of the outcome of hospitalization (Table IV). Where the principal carer was opposed to a patient returning home, the patient had a probability of discharge to a residential/nursing home that was more than eight times that of a patient with a principal carer agreeing to the patient returning home (Odds ratio = 8.2, 95% CI: 3.5–18.9). If the principal carer expressed no wish, the patient was about three times as likely to go to an institution (Odds ratio = 2.9, 95% CI: 1.9–4.3).

Advanced age was the only demographic characteristic significantly associated with the discharge to a residential/ nursing home. Living alone, poor ADL status at admission, mental disability and presence of a chronic condition fatal within 4 years were the other variables significantly associated with the discharge to a residential/nursing home in multivariate analysis (Table IV).

Analysis stratified by the type of the principal carer (e.g. spouse, child, friend) showed similar odds ratios for the relationships of principal carer's wish with institutionalization in univariate and multivariate analyses. The results of analysis did not indicate any interaction between the independent factors and the outcome of hospitalization (data not shown).

Table V. Summary of factors associated with discharge to a residential/nursing home in five studies using multivariate analysis

Characteristics	Reference 10	16	14	17	Present study
Advanced age	+	0	0	0	+
Female	0	+	+	0	0
Not married (single or widowed)	0	–	+	–	0
Living alone	+	+	0	–	+
Mental disability	+	+	0	0	+
Functional disability	+	0	+	–	+
Chronic condition fatal within 4 years	–	–	–	–	+
Carer's or referent's opposition to patient returning home	–	–	+	+	+
Patient's opposition to returning home	0	–	+	+	0

+ = Factor positively related to institutionalization; 0 = Factor unrelated to institutionalization; – = The variable was not included in the study

Discussion

Several factors were associated with an increased probability of elderly patients aged 75 and more not directly returning home after an acute hospitalization: advanced age, living alone, dependence as measured by ADL at the time of admission, altered mental status, risk of death within 4 years due to a chronic condition, and opposition of the principal carer to the patient returning home. Findings are consistent over time (winter or summer) and place (Bichat or Pitié hospital). The sample under study was representative of the population of elderly patients admitted to these two hospitals through the emergency department [29, 30]. The results may therefore provide an accurate picture of university hospitals in Paris, since unplanned admissions through the emergency department are frequent among elderly people. However, some caution is necessary when generalizing to other urban settings.

In other studies in which a multivariate analysis was performed, a range of variables were reported to differentiate institutionalized and non-institutionalized elderly people (Table V). The roles of age and sex were not consistent. Physical disability and mental status were not consistently related to disposition at discharge but this may be due to measurement methods differing between studies [10, 14, 16, 17]. Living alone or not being married were found to be associated with discharge to a residential/nursing home but this may be due to colinearity as found in our study. Keeping these limits in mind, our results are in agreement with another large French study [16]. Barberger-Gateau *et al.* [16] found that the only independent predictors of institutionalization, in a study of 1695 elderly persons, living in the community in Aquitaine (France) and admitted to acute care medical units, were: being female, living alone, having altered mental status and hospital type. Functional disability was not significant. Principal carer's wish and presence of a chronic condition fatal within 4 years were not investigated [16]. However, comparison with the literature is difficult because of the differing designs of the studies. Features of the health care system differ greatly between France [16, 17]. Canada [20, 21]. Britain [18, 19], and the USA [9–15]. Furthermore, the reviewed studies had different sample populations in terms of age, sex and medical conditions. These are important considerations because outcomes were related, in our study, to both age and medical conditions. The aim of the studies varied from predicting nursing-home entry [8, 12, 13, 15, 21], to long-term care institutionalization [10]. Our purpose was quite different: the aim was to identify, as soon as possible, the patients with the greatest need of early medical-social intervention because of their inability to return home immediately after an acute hospitalization.

We were unable to find any association between the outcome of hospitalization and the nature of the acute condition or the main reason for admission. This may be due to the difficulty in characterizing the physical condition of elderly patients with multiple diseases. Functional status measured by ADL may be a better reflection of the impact of illnesses [31]. We found that the presence of a chronic condition fatal within 4 years was associated with the discharge placement. This was assessed by a modified McCabe indicator [25] which proved to be reproducible during previous field testing [29].

In our study, the most important predictor of discharge to a residential/nursing home was the opposition of the principal carer to the patient returning home. This is in keeping with the work of Roudot-Thoraval *et al.* who reported that family support was the most important factor determining patient discharge [17]. In their study, the initial wish of the patient and/or family, about the need for subsequent transfer to long-term care was taken into account, when stated either personally by the patient him(her)self or by the family, or both. The wishes of the patient and the family were not studied separately [17]. When studied separately, as in our study, only the wish of the principal carer about the patient returning home was found to be a predictive factor. The absence of an independent association with patient's wish may be due to the fact that only about 3% of patients were opposed to returning home, and about 35% of patients exhibited moderate or severe alteration of their mental status. The patients' and principal carers' wishes were investigated early in the course of hospitalization by social workers. Conditions that were not present at the beginning of hospitalization, but occurred during the hospitalization, might change the wish of the patient and/or the principal carer. We have no information about this.

In conclusion, the wish of the principal carer about a patient returning home after an acute hospitalization, as expressed during the first 48 hours, seems to be a major predictive factor of discharge to a residential/nursing home. This wish might be a simple and reliable field assessment of the social support available to an elderly patient. Investigation regarding the principal carer's wish, early in the course of the hospitalization, may be useful for more effective discharge planning.

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Authors' addresses

M. Zureik*, T. Lang, B. Tran
Service d'Informatique Médicale, Hôpital Pitié-Salpêtrière, 91 Bd de l'hôpital, 75013 Paris, France

J-L. Trouillet
Service des Urgences Médicales, Hôpital Bichat, 46 rue Henri Huchard, 75018 Paris, France

A. Davido, A. Levy
Services des Urgences Médicales, Hôpital Pitié-Salpêtrière, 47 Bd de l'hôpital, 75013 Paris, France

P. Lombrail
Departement de Santé Publique, Faculté Xavier Bichat, 16 rue Henri Huchard, 75018 Paris, France

* Present address: INSERM U258, Hôpital Broussais, 96 rue Didot, 75014 Paris, France.

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