

EARLY ACTIVATION FOR ACUTELY ILL ELDERLY PATIENTS

Kerstin Hulter Åsberg

From the Department of Social Medicine, University Hospital, Uppsala and the Department of Internal Medicine, Enköping Hospital, Enköping, Sweden

ABSTRACT. In order to describe both the process and the impact of introducing a program of early activation for acutely admitted elderly patients in medical wards, two populations, one before and the other after the intervention of the program, were followed up. The program was implemented in cooperation with the nursing staff, who were integrated in the rehabilitation work. Population I (219 admissions) was collected in 1981 and Population II (272 admissions) during a corresponding period in 1983. Survival, type of residence and ADL status 5 months after hospital admission were recorded as outcome measures. There were no differences between 1981 and 1983. In 1983 the mean length of stay was 4.7 days shorter than in 1981. The program cannot be shown to have caused the difference in length of stay. The study shows that such a program of early activation was easy to apply in clinical practice for aged and disabled patients in general medical wards.

Key words: Activities of daily living, aged, disability, early ambulation, internal medicine, length of stay, patient outcome assessment, prognosis, rehabilitation

The panorama of internal medicine has changed in Sweden during this century. Engel (6) showed, that the proportion of patients 65 years of age and older increased from 6% in 1904 to more than 50% in 1970. In 1983, it was 63% (21). The main diagnoses changed from infectious diseases to circulatory diseases, which are now in the majority.

Elderly patients may develop disabling conditions due to acute illness, chronic disease, and/or imposed bed rest. The most important and distinguishing aspect of good health care for the elderly is, as Kennie (16) stated, the switch in emphasis away from dealing strictly with pathology and organ-specific disease towards restoring the patient's function. These aspects imply that rehabilitation must be an integrated part in the care of elderly patients.

The purpose of this article is to describe the process of introducing a simple program of early activation for acutely ill elderly patients in a hospital department of internal medicine, and to discuss the impact of the program on the patients and on their length of hospital stay.

Early activation is defined as early onset of rehabilitation, which means that the program is initiated during the acute phase of the disease, if there are no medical restrictions. An important part of the activation is to expose the patient to gravitation stress, which has been shown to be crucial for maintenance of physical working capacity, orthostatic tolerance and psychosocial well-being (5, 13, 17, 18).

Early activation requires an early medical diagnosis, a physical and psychosocial assessment, and a cooperation between physicians, nurses, physiotherapists, occupational therapists and social workers. It also requires a change in attitude among the nursing staff towards the best way of helping the patients. Rather than doing the activities for them, the staff will instruct and support patients in the performance of activities. Early discharge planning is essential. This has, for instance, been shown with respect to patients with hip fractures, where the final part of the rehabilitation should not take place in the hospital but in the patient's own home (4).

EARLIER STUDIES

In this study the program of early activation was supposed to imply a shortening of hospital stay, but the results from other studies in departments of internal medicine are not unanimous in this respect.

Feigenson (8) concluded from four studies on factors influencing outcome and length of stay in a stroke rehabilitation unit, that the type and severity of functional and neurological disorders were much more directly related to eventual outcome and length of stay than were the associated medical diagnoses. The patients who were admitted to the stroke unit had more concurrent medical problems and neurological disorders, but they walked better and went home more frequently than patients admitted to other units (9). There was no statistically significant difference in length of stay between patients treated in the stroke unit and patients treated in general medical wards.

Arbin et al. (1) made a similar study of two groups of stroke patients, who were comparable with respect to age, previous diseases and neurological disorders. They, too, did not find any statistical difference in length of stay.

Garraway (10) reported from a randomized controlled experiment, that patients in a stroke unit more often returned to functional independence compared with patients in general medical wards, and that the delay before starting treatment was significantly shorter in the stroke unit. These patients were also discharged somewhat earlier.

Strand et al. (20) also found in a randomized controlled experiment that the patients in a stroke unit had a shorter length of stay compared to the control group in general medical wards (mean of 21 and 31 days, respectively). The length of stay was also shorter in the stroke unit than in the general medical wards before transferring to the geriatric department (mean of 43 and 58 days, respectively) and before transferring to other departments (mean of 13 and 22 days).

Hamrin (11) studied the effects of early activation in daily nursing care in an experimental group of patients with acute stroke. She reported an improvement of functional capacity in the experiment group after 3 months but also a longer length of stay compared with the control group (29.5 and 22.7 days, respectively). This may be explained by a higher frequency of more seriously ill patients in the experimental group, but the longer length of stay may also imply that the presence of a rehabilitation program may lengthen the hospital stay. One year after the stroke (12) there was no significant difference in functional capacity, but about 40% of the surviving patients in the experimental group had spent more than 6 months in hospital compared with about 20% in the control group.

Finally, Burley et al. (3) found in an experimental study of the impact of the introduction of geriatric consultants for elderly patients in general medical wards that the length of stay was markedly shorter and that more patients were discharged to their homes compared with two years earlier, when there was no geriatric consultant, who participated in the planning of early rehabilitation and of after-care.

METHODS

Data for this study were collected at the Department of Internal Medicine at Enköping Hospital, Sweden, during two

periods of 12 weeks each in winter 1981 and 1983, respectively. Enköping Hospital is a general county hospital and serves an area with a population of about 48 000 people of which about 13% were 65 years of age and older both in 1981 and in 1983.

The hospital had 68 beds for short-term medical and 67 beds for surgical care both in 1981 and in 1983, while the number of beds in the geriatric department increased from 192 to 220 in 1982. The number of nursing home beds and home-care patients was the same.

The Department of Internal Medicine had two acute wards with 30 beds each, and almost all of the patients were admitted because of diseases with acute onset. Most of the planned medical care was carried out in a third ward, which did not participate in this study.

The number of personnel per 100 beds was 43.4 in 1981 and 48.4 in 1983, which was due to a slight increase of the number of nursing auxiliaries in the daytime staff.

All patients 65 years of age and older were admitted to the two wards because of an acute illness within the periods of 12 weeks during November 1980 to January 1981 and December 1982 to February 1983 were included in the study. The following procedures were unchanged between the two study periods.

At admission to the hospital, the patient's medical and social status and needs were systematically recorded on a special form by the physician on duty at the Department of Internal Medicine, who also made a preliminary overall assessment. Every day there were two physician rounds, one of which was conducted by a specialist in internal medicine. An individual rehabilitation round was carried out once a week on Wednesdays with physician, nurses, occupational therapist, physiotherapist, and social worker as participants. Before the discharge from the hospital, the resident physician had a personal talk with the patient about the disease and the results of investigations and treatments and about a follow up. The author did not participate in the daily work in the wards during the two periods of study.

Licensed practical nurses assessed the functional ability of the patients on Wednesdays, before the rehabilitation round, by Katz' Index of ADL (15). This instrument defines whether a person is dependent or independent of assistance from another person in performing six activities of daily living: bathing, dressing, going to the toilet, transferring, continence, and feeding. The results are summarized in a cumulative scale by increasing dependency from grade A to G, where A means independent and G dependent of assistance in all six activities. Reliability and validity of the instrument had earlier been studied with licensed practical nurses as observers with satisfactory results (2).

Survival, length of stay, and type of hospital discharge were recorded as short-term outcome measures. Patients who were alive 5 months (plus or minus one week) after admission to the hospital were called by telephone by the author, and the type of residence was recorded. A rough estimate of their current ADL status was arrived at by asking the patients and/or their relatives about the dependence or independence of assistance in performing the six activities included in Katz' Index of ADL.

A presupposition for this study was that the program of early activation should be an integrated part of the daily work carried out by the ordinary staff. In order to imple-

Table I. Major differences in patient care between the two study periods in 1981 and 1983, respectively

	1981	1983
Early activation	No	Yes
Education in geriatric medicine	Not formal	Yes
Rehabilitating staff as teachers for the nursing staff	Variable	Intense
Nursing staff integrated in rehabilitation work	Occasional	Regular
Early discharge planning	Occasional	Regular

ment the program for most elderly patients in the wards, it was necessary to involve the nursing staff in the rehabilitation work. Two steps were taken in order to prepare them for the program.

First, one month before the program was started in December 1982, the whole staff, including the night staff, had a three hour lecture about geriatric medicine and early activation. The simple motto of the program was: "Sitting is better than lying; standing or walking is better than sitting." This was derived from studies giving evidence of gravitation stress as a main factor for maintenance of physical working capacity and for prevention of bed rest-induced effects on physiological and psychosocial functions (5, 13, 17, 18). It was emphasized, that patients for whom bed rest was prescribed by the responsible doctor should be excluded from the program until they were able to participate. Certain patients were too frail to be activated, but they were all included in the material. The importance of starting discharge planning within the first 24 hours was also emphasized and discussed with the registered nurses, who were responsible for the planning of nursing care.

Second, two occupational therapists at the hospital started a program for the nursing staff in ADL training in-

cluding lectures for six hours. In 1981 as well as in 1983 one occupational therapist and one physiotherapist worked full-time with individual patients in the two wards, but during the activation period in 1983 they also acted as teachers in rehabilitation techniques in the wards for all kind of nursing and caring staff. However, they did not spend more time in the wards during the activation period.

Table I shows the major differences in patient care between 1981 and 1983. The effects of education upon the nursing staff in rehabilitation attitudes and techniques are difficult to measure. It was supposed, however, that the early discharge planning included in the program of early activation could contribute to a shorter length of stay. Therefore, the results are reported mainly with respect to length of stay. Other end-points were survival and degree of functional independence 5 months after admission to the hospital.

Due to the design of the study, including a historical control population, the activation program cannot be shown to have caused any differences in average length of stay, in fatality rate, or in functional independence. The use of statistical tests would therefore be misleading and inappropriate in this feasibility study. Thus, the result will be reported and discussed without an analysis of statistical significance.

MATERIAL

During the period of 12 weeks in 1981 there were 347 admissions to the two acute medical wards compared with 427 in 1983. Admissions of patients 65 years of age and older amounted in 1981 to 63% compared with 64% in 1983. Population I (1981) thus consisted of 219 patient admissions (203 persons) and Population II (1983) of 272 admissions (229 persons). The proportion of re-admissions was 7.3% in 1981 and 15.8% in 1983. Most of the re-admissions were made more than 10 days after discharge and were due to new episodes of illness or due to transfers between different

Table II. Distribution of patients in Population I (1981) and in Population II (1983) by four groups of diagnosis, by orientation status and by ADL grade

Category	1981				1983			
	Men N	Women N	Total N	%	Men N	Women N	Total N	%
Diagnosis								
Cardiovascular	38	48	86	39.3	55	48	103	37.9
Cerebrovascular	9	20	29	13.2	11	12	23	8.5
Respiratory	20	21	41	18.7	24	19	43	15.8
Other	30	33	63	28.8	52	51	103	37.9
Disorientation at admission								
Yes	16	28	44	20.1	30	32	62	22.8
No	81	94	175	79.9	112	98	210	77.2
ADL grade								
A	32	32	64	29.2	50	53	103	37.9
B to F	32	52	84	38.4	44	36	80	29.4
G	10	13	23	10.5	15	14	29	10.7
Not assessed	23	25	48	21.9	33	27	60	22.0
Total	97	122	219	100.0	142	130	272	100.0

Table III. Average length of stay (median and mean) in the ward during the two study periods (1981 and 1983) by age

Age group (years)	1981				1983			
	N	Median stay (days)	Range (days)	Mean stay (days)	N	Median stay (days)	Range (days)	Mean stay (days)
65-74	81	9	1-96	12.7	119	7	1-51	8.9
75-84	104	11	1-165	18.4	109	7	1-82	12.2
85-w	34	8.5	1-94	15.7	44	9	1-112	15.0
Total	219	10	1-165	15.9	272	7	1-112	11.2

hospital departments, which were counted as new admissions.

The proportion of men was higher in 1983 (52% compared with 44% in 1981). The median years of age was equal for men in both populations (76 years) and for women 78 and 77, respectively. The proportion of patients aged 85 and older was the same (about 16%).

Both in 1981 and in 1983 most men lived together with another person (66 and 63%) compared with the women (36 and 41%). Almost the same proportion of both populations lived in apartments (54 and 51%) or in private houses (32 and 31%), or in old age homes (14 and 18%).

Table II shows the distribution of patients in the two populations by four groups of main diagnoses, by mental status (orientation) at admission and by ADL grade within the first week after admission to the hospital. There were about the same proportions of cardiovascular diseases (39 and 38%), while the proportions of respiratory and cerebrovascular diseases were somewhat lower in 1983. The group "other diagnosis" included a variety of diagnoses like endocrinological diseases, infections and tumours.

Disorientation was defined as disablement in orientation as to person, place or season, and the proportion of disorientated patients at admission was about the same in 1981 and 1983 (20 and 23%). The proportion of patients who were independent of assistance with respect to primary ADL (grade A) was somewhat lower in 1981 than in 1983 (29 and 38%, respectively) due to a higher proportion of women in grade A. The proportion of men in grade A and in grade B-F, respectively, was about the same (33 and 35% in grade A, and 33 and 31% in grade B-F). The proportion of very dependent patients (grade G) was exactly the same (11%). The proportion of patients who were admitted and discharged between two Wednesdays, and who were therefore not assessed as to ADL status, were also exactly the same (22%).

RESULTS

Table III shows the median and mean length of stay in the ward during the two study periods by age. The total mean value was 4.7 days shorter in 1983 than in

Table IV. Average length of stay (median and mean) in the ward during the two periods of study (1981 and 1983) by diagnosis, orientation status and ADL grade

Category	1981				1983			
	N	Median stay (days)	Range (days)	Mean stay (days)	N	Median stay (days)	Range (days)	Mean stay (days)
Diagnosis								
Cardiovascular	86	11	1-165	15.9	103	7	1-45	9.9
Cerebrovascular	29	12	1-109	25.8	23	9	1-112	22.2
Respiratory	41	8	2-38	11.5	43	8	1-51	12.2
Other	63	9	1-160	14.3	103	6	1-66	9.7
Disorientation								
Yes	44	11	1-160	20.8	62	6.5	1-112	14.3
No	175	9	1-165	14.7	210	7	1-66	10.3
ADL grade								
A	64	10	2-38	12.0	103	7	1-40	9.8
B to F	84	12.5	1-165	18.2	80	11	1-82	15.7
G	23	28	6-160	40.0	29	11	1-112	18.3
Not assessed	48	4	1-22	5.6	60	4	1-24	4.5
Total	219	10	1-165	15.9	272	7	1-112	11.2

Table V. Average length of stay (median and mean) by type of hospital discharge during the two study periods (1981 and 1983)

Type of discharge	1981				1983			
	N	Median stay (days)	Range (days)	Mean stay (days)	N	Median stay (days)	Range (days)	Mean stay (days)
Dead	33	7	1-165	18.0	29	7	1-25	9.2
To home	167	10	1-96	13.2	199	7	1-82	9.8
To geriatric department	9	46	1-160	65.0	15	30	1-112	35.0
To other department	10	10	1-17	9.4	29	2	1-66	10.9
Total	219	10	1-165	15.9	272	7	1-112	11.2

1981, and the total median value was 3 days shorter. The length of stay was shorter in 1983 for patients aged 65 to 84 years, but was unchanged for older patients.

Table IV shows the median and mean length of stay in the ward by type of diagnosis, orientation status at admission, and ADL grade. The median length of stay was shorter in 1983 than in 1981 for most categories except for patients with respiratory diseases and for those who were not ADL assessed. The mean length of stay seems also to be shorter, mainly for patients with cardiovascular diseases.

The proportion of patients who died in the ward tended to be lower in 1983 (15.0 and 10.7%, respectively), but within 5 months after hospital admission survival rate was about the same in both populations, 76.4% in 1981 and 77.3% in 1983.

Most patients were discharged to their own homes, or to homes for the aged and other forms of sheltered housing (76% in 1981 and 73% in 1983). Few patients were discharged to the geriatric department (9 and 15 persons, respectively). The proportion of patients who were discharged to other hospital departments—mainly the surgical department in Enköping or to highly specialized units in Uppsala—was higher in 1983 than in 1981 (4.6 and 10.6%, respectively). This will explain some of the more frequent re-admissions in 1983, since 11 of the 43 re-admitted patients were admitted from other hospital units compared with only 2 of the 16 re-admitted patients in 1981. Most of the other re-admissions were due to new episodes of illness. Eight persons were re-admitted within 3 days in 1983 compared with 2 patients in 1981, which may be an indication of too early discharges.

Table V shows the average length of stay by type of hospital discharge. The median length of stay tended to be shorter in 1983 with respect to all types of discharges, except for patients who died in the ward. The most evident difference concerned patients who were discharged to the geriatric department, but the median length of stay before such a transfer was still about 30 days in 1983. The mean length of stay seems to be shorter with respect to all types of discharges, except for discharges to other departments.

About 90% of the surviving patients were living in their homes 5 months after hospital admission. Five and 7%, respectively, stayed in the geriatric department. About the same proportion stayed in other hospital departments including the Department of Internal Medicine in Enköping. The distribution of patients in the three groups of ADL grades was the same in 1981 and 1983; 65% was assessed as belonging to grade A, 32% to grade B to F, and 3% to grade G.

DISCUSSION

It was supposed, that one indicator of both program implementation and program effect would be a shorter average length of stay in 1983. The relation between the process of program implementation and the outcome or the effects of the program can be made clearer by answering or discussing the following fundamental questions (14):

1. Was the program implemented with sufficient effort to warrant an impact assessment?
2. Did a change occur, when the program was implemented?

3. Did the program cause the observed change?

Question 1. Was the program implemented with sufficient effort to warrant an impact assessment?

The study was carried out without any extra resources, except for nine hours of education of the nursing staff, in order to show what kind of rehabilitation would be feasible for elderly patients regardless of diagnosis in clinical practice today. All of the staff participated in the training, and they expressed a positive attitude to the program during the lectures and later in the daily work.

At the evaluation discussions, the licensed practical nurses stressed the difficulty in implementing the program during the weekends, when the number of nursing staff was lower than in the weeks. This can be seen as an indication of a responsible attitude to program implementation at least during Monday to Friday. Another indication is the effort, which was made by the occupational therapist and the physiotherapist to work as instructors in the ward for the nursing staff, thereby activating a high number of patients.

Question 2. Did a change occur, when the program was implemented?

As mentioned earlier, a strict statistical comparison of the differences is not meaningful. However, the observed length of stay was shorter during the activation period in 1983 for patients 65 to 84 years of age, for patients with cardiovascular diseases, and for patients who were discharged to their own homes. There was no change as concerns patients 85 years of age and older and groups of patients with a shorter length of stay than 9 days in 1981. The latter groups were not expected to change, because it is, of course, difficult to shorten an already short hospital stay.

The prognosis of the patients with respect to survival did not change, which is in accordance with earlier stroke studies (1, 9, 12, 20). More patients were discharged to other hospital units in 1983, and the number of re-admissions was also higher. The important question when the changes did occur cannot be answered definitely. Theoretically, they could have taken place any time between the 1981 study and the implementation of the program of early activation.

Question 3. Did the program cause the observed effect?

Due to the design of the study, including a historical control population, it is impossible to make any conclusive statements about the effects of the program. In order to answer this question, it would have

been necessary to compare, for example, one experimental ward with another contemporary control ward. Such a design was not possible in Enköping, because some physicians, the physiotherapist, the occupational therapist and the social worker had their duties in both wards, and an intervention in one ward would no doubt have influenced the daily work in the control ward.

Instead, a comparison was made between the activation period in 1983 and a corresponding period in 1981, which showed that a difference in average length of stay, which was expected after the intervention, was attained without any change in survival or use of longterm hospitalization but possibly with a higher proportion of re-admissions.

It is obvious, that the shorter length of stay for certain patient categories in 1983 may be explained by other factors than the early activation program. The two populations, who were rather similar with respect to age, social status and residence, differed in other respects. In 1983 there was a higher admission rate, more men, less cerebrovascular and respiratory diseases, and more grade A-patients, which could have affected the result. A higher admission rate may contribute to a shortage of beds and thereby necessitating earlier discharges. The higher proportion of males in 1983 can be of importance because it is well known, that even very disabled men living together with a wife may be discharged home earlier than disabled single women.

The number of beds at the geriatric department did also increase between 1981 and 1983, but the patients who were transferred there were few (4.1% in 1981 and 5.5% in 1983). The slight increase of nursing auxiliaries between 1981 and 1983 could not reasonably have affected the results.

Possible side-effects of the early activation program might be premature discharges and an increased risk of dying due to the activation of patients with cardiovascular diseases. These risks were emphasized both by the physicians and the nursing and rehabilitating staff.

The number of re-admissions was higher in 1983, which may be explained by some premature discharges, e.g. by those who were re-admitted within 3 days after discharge. Most re-admissions were, however, found to be caused by new episodes of illness or by transfer between different hospital departments. The death rate tended to be lower in 1983 at hospital discharge and was unchanged 5 months after hospital admission.

Usually the day of discharge was decided together with the patient and/or the family. This policy was unchanged between 1981 and 1983, but during the activation period, discharge planning started within the first 24 hours.

In this context, it is important to state, that a shortening of length of stay requires after-care, which may contribute to further improvement or at least prevent a deterioration. After-care was not studied particularly, but was supposed to be of similar kind both in 1981 and 1983.

Swedish hospital statistics have shown, that there was a general shortening of the mean length of stay of 2.3 days in departments of internal medicine between the years of 1977 and 1983 (21). A further analysis was made of the average length of stay in Enköping compared to about 85% of all departments of internal medicine in Sweden during the whole years of 1981 and 1983 (7). The difference in mean length of stay between 1981 and 1983 was 1.8 days for Enköping and 1.0 for other Swedish departments of internal medicine. The corresponding figures for patients 75 years of age and older were 2.1 and 1.3 days, respectively. Thus, a possible effect of the early activation program may have been extended also after the initial 12 weeks of the program, which took place in early 1983.

The program cannot be shown to have caused the change in length of stay. The study shows that such a program of early activation was easy to apply for aged and disabled patients in clinical practice in general medical wards. It did not show any recognizable negative effects of the program. Attempts to shorten length of stay should not, however, be carried out without particular consideration to the family and other after-care resources.

The motto of "Sitting is better than lying" was based on well known and documented effects of bed-rest on physiological and psychosocial functions (5, 13, 17, 18). Levine (17) emphasized already in the fifties that a patient in a chair "need never view himself as hopelessly ill but as an aware and active participant in the healing process".

The following passage was written 20 years ago, and is still more valid today with the increasing number of acutely ill elderly people in general hospitals: "The earlier a program of rehabilitation is started, the better are the chances of success. Disabilities in the elderly usually begin with an acute illness. It follows that the best place to begin successful geriatric rehabilitation is the general hospital where

the elderly sick receive their initial medical care" (19).

For those interested in the detailed tables the author is willing to send them on request.

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Address for offprints:

Kerstin Hulter Åsberg
Dept. of Social Medicine
University Hospital
S-751 85 Uppsala
Sweden