



# Management of care transition and hospital discharge

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## Abstract

Current demographic and epidemiological trends highlight a growing task in surgical departments by elderly patients, characterized by high prevalence of comorbidity, complexity, and functional disability. Of consequence, discharge of an elderly patient must be considered in a new cultural perspective and should be imagined as a well-structured process starting from admission to surgical department and finishing with the patient discharge in a setting able to support her/him in the best possible way. The lack of a suitable discharge planning and of a proper transition program in the elderly subjects increases the risk of quick re-admission and may negatively affect the functional and the status quality of life of patients and caregivers. To reduce the risk of negative outcome it is essential a hospital organization dedicated to the discharge of frail older patients considering: (1) adequate attention to assess the comprehensive clinical/social/care conditions; (2) respect of the expectations of the patient and her/his relatives; (3) formalization of institutional roles or teams designated to the planning and coordination of discharge; (4) good knowledge of management programs of transitional care, and (5) strong communication/information ability in patients transition between hospital, home care and community settings.

**Keywords** Care continuity · Comprehensive geriatric assessment · Discharge planning · Transitional care · Community settings · Hospital organization

## Abbreviations

DP	Discharge planning
TC	Transitional care
CGA	Comprehensive geriatric assessment
BRASS	Blaylock risk assessment screening score
ADL	Activities of daily living
ASA	American society of anesthesiologists

## Introduction

Elderly hospitalization is becoming more and more common in surgical settings, especially in some (orthopedics, cardiac surgery, abdominal and vascular surgery) and demographic trends highlight a growing task of these elderly patients. Currently, almost two out of five surgical interventions are

performed on patients over 65 years of age, whereas some reports show that between 2013 and 2015 general surgery requirements increased by 18% and those of vascular surgery by 31% during the same period [1], mainly due to an increased impact of the elderly population. It is well known that the period immediately following hospital discharge is particularly critical for the elderly patients, especially for those older than 75 years. Actually approximately 20% of medical patients experience an adverse effect after discharge, and must be readmitted within 30 days of hospital discharge [2]; 30–50% of older patients experience a loss of essential activities of daily living (ADLs) [3].

Very similar effects can be found in surgical departments, in which the percentage of patients over 70 years admitted has become triple than 20 years ago, and the percentage of octogenarians is ten time [4]. The consequence is that surgeon's duty now must involve both "old" primary points (i.e., correct diagnosis, patient interest, true surgical treatments, discharge as soon as possible) and "new" targets, including multimodal management, proper evaluation of the comprehensive needs of the elderly patients, management of pathways of transitional care and follow-up post discharge.

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## The elderly in-hospital patient

Elderly hospitalized population is characterized by high prevalence of comorbidity, complexity and functional disability. There are consistent data on literature demonstrating a potential frailty in elderly people admitted in hospital:

1. high prevalence of subjects chronically ill by complex severe or multiple medical and psycho-social issues;
2. high prevalence of disability > 65 years of age, in some studies up to 25% in males and 34% in females [5];
3. high risk of developing new disabilities following acute medical illness and hospitalization, with a prevalence of disability > 50% in subjects discharged over 70 years [6].

Likewise, a significant proportion of elders hospitalized in surgical wards experience, in relation to the acute surgical pathology or as a consequence of the surgical procedure (both urgent and programmed) a series of complications or consequences that make them particularly at risk of compromising functional autonomy or worsening of pre-existing disability, both motor type (e.g., hypokinetic state and sarcopenia) and cognitive/behavioral (e.g., post-operative delirium, depression). Particularly, hospitalized elders need a patient-centered approach focused on three main aspects: fragility assessment, functional status, and quality of life. The most complex and older patients are rarely discharged after a full psychological–physical recovery, and still need care and assistance in other social/health settings or at home. To avoid negative outcomes, the discharge of an elderly patient cannot be considered as a routine event of hospital management, to be planned the day before (or the day of) release, but should be imagined as a well-structured process starting from the admission of the patient and finishing with the discharge of the patient in a setting able to support her/him in the best possible way.

## The “new culture” of a proper hospital discharge for the elderly

The proper management of elderly discharge from a surgical department implies a different organizational approach compared to the young/adults, and must lead to a strategy that includes ability to intercept early predictive signs of discharge difficulty, a proper discharge planning, and a structured transition path of the patient towards home care or in the setting of intermediate care for the cases requiring an extension of treatment and care process.

These two processes (planning for discharge and transitional care) are consequential in chronological sense but

constitute a continuum in the approach; they are part of the same work methodology as a new “culture” of the discharge, and use complementary activities for each other so that one (transitional care) cannot be properly conducted without having previously adequately dealt with the other (discharge planning). Geriatric methodology has been studying this issue since many years, and the opportunity that this particular approach becomes a common asset of the whole Medicine, including surgical settings, is a priority in the interests of patients, families, and the entire healthcare system, also and above all in view of its economic sustainability.

## First of all: “discharge planning”

Taking into account the characteristics of the elderly patients described above, we can obviously consider that there is a high need for care-continuity, both inside the hospital wards and between hospital and the post-hospital setting (home, nursing home, others). It has been calculated that about 40% of hospitalized patients over 85 years of age in USA are discharged to a skilled nursing facility [7]; therefore, the appropriateness of the setting has to be guaranteed to avoid frequent and unsuitable readmissions to hospital. For these reasons, discharge planning (DP) is a clinical/organizational method which, by means of a multidimensional analysis of the patient’s needs, generates a discharge project defining the proper setting and the type of interventions useful for the achievement of the maximum health target for the single patient. To reduce the risk of negative outcomes due to a not well organized discharge, it is essential a hospital organization dedicated to the discharge, considering: (a) adequate attention to the overall clinical/social/care condition of the older patient (information about unmet needs, dependence/independence, self-management); (b) respect of the expectations of the patient and her/his relatives; (c) formalization of roles or teams designated to the planning and coordination of discharge; (d) good knowledge of the local network of transitional care, and (e) strong communication/information ability between hospital and community health providers and post-hospital settings.

## Risks and negative consequences of the discharge of hospitalized elderly patient

The lack of a suitable discharge planning or a correct management of transition of elderly patients across healthy care settings:

1. poses a risk of unjustified extension of hospital stay with possible complications related to healthcare practices (hospital is a dangerous place for the elderly!);
2. increases the risk of re-admission if the discharge is performed despite the patient's clinical condition is not compatible with her/his management in the post-hospital setting, but even if the social/care situation at home is not congruent with the possibility to meet basic needs by patient's caregivers (if at home) or residential facilities;
3. may negatively affect quality of life and functional status of patients and caregivers;
4. may prejudice the economic sustainability of the hospital system; indeed, it is essential to limit the hospital stay to the time necessary to take care of the current acute disease (not more but not less!).

## The post-hospital syndrome

In the last few years, evidences have emerged about the existence of a period of time, after hospital discharge for surgery, characterized by increased chance for illness, often leading to re-admission and negative outcome in the elderly patients. This condition, known since many years in the field of geriatric medicine [8], has been recently referred as post-hospital syndrome [9], and is commonly characterized by: (a) high prevalence of hospital readmission within 30 days (1/5 of discharged patients, Jencks 2009) [2]; (b) transient and generalized clinical vulnerability (started during hospitalization but worsened after discharge) with variable duration, depending on the overall quality of hospital care and other factors; (c) close relationship with different types of stressors (physical, environmental, psycho-emotional) during hospital stay including sleep deprivation, protein–energy malnutrition, stillness, devices (e.g., Foley), pain, discomfort, and fear of hospital re-admission; (d) risk of developing problems in surgical scar healing with risk of infections and bedsores (through weight reduction, hyper-catabolism, immune-suppression, hypercoagulation, anemia and low albumin levels); (e) deconditioning in muscular strength with worsening in functional performance, hypomobility, reduction of neuro-motor coordination, increased risk for falls and fractures.

The first way of avoiding all these effects is certainly to provide the patient, during the stay in hospital, with all the interventions for disability preventions, well known to the geriatricians (mobilization, rehabilitation when needed, particular attention to all aspects of comorbidity and pharmacotherapy). However, one of the chief interventions to prevent such a syndrome is to intervene from the organizational point of view, identifying early high-risk patients for negative effect of discharge, and reserving to them, based on the risk level: (a) a correct planning for discharge; (b) structured

pathways of transitional care in post-hospital care settings before discharge for patients requiring more intensive care; (c) appropriate and efficient home care service, in case of “fit” old patients, that allows community re-adaptation during first risky weeks post-discharge.

## Corner-points of discharge planning

### When? (Early)

We could say the DP starts at the time of admission to hospital. Indeed, since the time of drawing clinical history and interviewing the elderly patient and her/his caregivers, some elements might emerge suggesting the possible need of specific interventions or itineraries for care-continuity after discharge. Conventionally, we could assert that within 72 h from admission to hospital the clinical staff should have sufficient data on the patient conditions (clinical, health care, functional, psychological, cognitive, social, familial) to plan an “approximate” pathway after hospital discharge. Of course, the DP could be progressively re-elaborated depending on the evolution of the acute disease and the progressive stabilization of health conditions of the patients. Immediately after admission, both patient and caregiver should be engaged through a continuous and appropriate information about the care plan and a sharing of the discharge planning.

### How?: the DP process is typically

- *Multi-dimensional* The definition of the care project for an elderly patient must be based on the evaluation of his/her most significant areas of life (clinical, health care, cognitive, psychological, social);
- *Multi-professional* In a modern hospital system, the nursing staff should have sufficient competences to identify social and care needs of the elderly patient. This should be obtained: (1) in an informal way, based on the knowledge of the functional status directly evaluated during hospitalization, and (2) in a structured way, by utilizing specific rating scales or questionnaires for the assessment of needs, which help the staff to make an “objective” evaluation about the possibility to discharge the patient at home or in another post-hospital setting;
- *Multi-disciplinary* DP is an essential part of the Comprehensive Geriatric Assessment, which is the base of the geriatric methodology.

Thus, it is evident that in all hospital settings, the participation of the specialist in Geriatrics (co-management or consultation) makes available his ability, experience, and competence in the overall evaluation of the patient and his/her needs [10].

Some specific aspects of the older patient provide strategic information for the definition of the most adequate DP for each single patient. Generally, the critical elements are:

1. social-care condition before admission; such as possible lacking or unavailability of relatives able to take care of the patient at home (for economical and/or organizational reasons) [11, 12];
2. cognitive functions before admission;
3. patient clinical complexity and needs for treatment;
4. functional status at discharge, and especially its relationship with functions before admission;
5. indication to prolonged and complex therapeutical programs;
6. indication to structured rehabilitation/re-activation plans.

For these reasons, there are some properties which specifically characterize the efficacy of the DP [13]:

- A) ability to communicate among the staff personnel involved in developing the DP, both inside the hospital (transitioning from critical-care units to medical-surgical care area) and between this and extra-hospital settings of transitional care, through phone/computer information channels or simply writing of a document depicting the individual care project for each single older patient;
- B) collaboration within the medical and assistance staff about the proper transmission of patient information;
- C) involvement of the patient and her/his family to the realization of the DP; otherwise, elderly patients and relatives often report that they were discharged prematurely or they were not ready to safely return home and perform daily activities;
- D) competence to coordinate and integrate the DP activities, utilizing institutional roles with a specific responsibility on this function (case/team manager of DP).

Basically, four steps for the concrete realization of the DP may be identified:

multidimensional evaluation of the elderly patient, preliminary step for the identification of the cases requiring a “safe pathway” after discharge;

identification of the most suitable extra home care setting; the proper selection of a setting to which submit information on clinical and care characteristics of the patient, accompanied by a personalized care project (“the proper patient in the proper setting”).

Accommodation of home environment and of informal domestic familial/care resources for the reception of the patient after discharge, intended as education and training to the appropriate care for the single patient (i.e., use of devices

and medical instruments, the way of drug administration, simple and complex dressings...).

Home liability of all care actions needed to guarantee the real prospect of care-continuity for the single patient (recommendations about mobilization and nutrition, prescription and practical indications about the use of devices and medical aids, information about fall prevention, ...) as well as the elaboration of a suitable plan of pharmacological therapy.

### By whom? (Skills and professionals)

As already mentioned, geriatricians are the most competent and expert specialists in evaluating clinical implications and care needs of frail elderly hospitalized patients. Their involvement (as consultants or as organizational referrals of DT and TC institutional processes in hospital) is an added value of these activities, especially if included in team dynamics with other specialists (i.e., oncologists, palliative carers, psychiatrists), experienced nurses, and social workers, to create a multidisciplinary team particularly experienced in comprehensive geriatric assessment (CGA).

On the other hand, if the Geriatrician is not available in hospital organization, original experiences reported in literature suggest that sufficiently experienced nursing personnel may oversee, through the creation of organizational *ad hoc* roles (“nurse care manager”, “DP Coordinator”, “nurse case manager”), to the realization of the DP [11–13].

The employment of these professional roles makes it necessary the implementation of hospital organizations which formalize this figures and its tasks using codified procedures and a structured interface with post-hospital care settings.

### Instruments for older patient assessment

Variety of clinical and care elements to be analyzed to plan the discharge and the transitional care process makes it necessary for the application of reliable instruments, validated for the analysis of the overall needs of elderly frail individuals, which are an integral part of CGA. In this context several scales are available; one of the most tested, useful, and simple is the Blaylock Risk Assessment Screening Score (BRASS) [14]. BRASS index [14], developed for subjects > 65 years by authors expert in geriatric problems, analyzes some important factors for the need of care of patients admitted to hospital, including age, caregiver availability, functional state, cognitive functions, presence of behavioral disturbances, motor competence, sensorial deficits, admission to Emergency Room and/or to hospital during the three previous months, number of active medical problems, and current therapy (number of drugs) (Table 1). The index should be evaluated at the time of admission to the ward; it is easy to be completed and needs a minimal

**Table 1** Functions evaluated on Blaylock Risk Assessment Screening Score

Brass scale framework	
Age	0–3
Living situation/social support	0–5
Functional status	0–11
Cognition	0–5
Behaviour pattern	0–1
Mobility	0–3
Sensory deficits	0–2
Number of previous admissions/ emergency room visits	0–3
Number of active medical problems	0–2
Number of drugs	0–2

Score 0–10=low risk subjects for discharge problems. Disability is limited. It is not required a particular dedication for discharged planning

Score 11–19=medium risk subjects for discharge problems. There are problems related to complex clinical conditions requiring an extended discharge planning but, probably, without risk of institutionalization

Score greater than 20=high risk subjects for discharge problems. There are considerable problems requiring the continuity of care, probably in rehabilitative settings or institutions

training by the staff. This instrument identifies three classes of risk for the need of discharge intervention with increasing complexity. The BRASS has been widely utilized in different clinical studies, especially in medical and orthopedic fields. The BRASS has shown a high predictive value about length of staying, both when used singularly or together with other parameters such as age, ASA score, body mass index, and type of surgical intervention [15–17], in comparison to which it has anyway a higher predictive power about discharge problems.

### Management of discharge after planning: the transition at home or across healthcare settings

We can define transitional care (TC) as a set of actions, both pre- and post-hospital discharge, designated to ensure the continuity and coordination of healthcare when there is the need of patients transfer between different levels of care and across multiple care settings [18]. To avoid negative outcomes, the discharge planning process very often requires a model of care able to manage the patient's transition to post-hospital care settings. Transitional care is carried out in continuity with the management of planning for discharge, when it has been demonstrated the need of a pathway of prolonged care.

The best target is to support older people, affected by multiple chronic health conditions, to remain living in their

own home in accordance with their wishes; nevertheless, in the last decade resorting to out-of-hospital residential care settings for elderly frail patients is becoming increasingly widespread in Western countries. While discharge planning is a process performed at the place of care (operative unit or department) usually by the patient reference team with the support of consultants, transitional care is a complex practice requiring a well-planned discharge and/or a follow-up support post-discharge.

It involves both hospital and outpatient facilities and functions, where the skills have to be specific and the ability to relate to multiple interfaces requires a centralized and unified management in the organizational structure of a modern hospital. The management of transitional care from hospital requires a standardized organization and a personalized approach. The most important elements of this process regards: accuracy of identification of all needs, determining the process flow of transitional care for every single patient and her/his caregivers (patient- and family-centered approach), appropriateness of the interventions, and capacity of monitoring outcomes data.

To obtain the conclusion of a proper DP, the hospital organization must provide a linkage to networks of structured care pathways (between hospital and territorial/residential structures), able to take responsibility on the problems of the elderly patients. The availability of services and type of facilities vary significantly across geographic areas, anyway the most common residential settings generally are:

**Post-acute Hospital Units**, dedicated to problematic medical or post-surgery elderly patients with significant clinical comorbidity or with complications, and thus requiring typically hospital standards of care;

**Recovery Units**, placed in the district, and characterized by lower care intensity and rehabilitative interventions;

**Long-term nursing and residential care facilities**: for elderly subjects that cannot return in a family context for medical and non-medical reasons;

**Home care**, for more “fit” elderly patients, still requiring clinical or care monitoring (mainly nursing) after coming back home.

A large part of the activities and methods of transitional care is common with those previously considered about a correct planning of the discharge, and involves various healthcare professionals working as a team or in cooperation to discuss the plan of care after discharge. Furthermore, the effectiveness of transitional care process expects also activities and ability to provide formally the discharge project with patient's relatives or settings of patients destination, so it would be moreover desirable the prospect of a monitoring of the discharge, to be realized by:

pro-active telephone/computer contacts (pre-discharge interventions), with relatives or professional caregivers in the transitional care destination settings at discharge,

realized by the operative unit discharging the elderly patient or, when present, by institutional care/case manager or the team responsible for the DP and TC;

after discharge, through structured contacts (telephone, fax, e-mail) or tele-health programs between the post-hospital setting and the clinical departments or the institutional transitional team/unit responsible of the discharge (post-discharge interventions).

The simple transmission of a complete written documentation between hospital and the different settings seems to be less effective for the quality of the DP and TC processes.

To be more effective for the transition between different care settings, hospital organization should have professional staff or structured functions (such as Transitional Care Manager or Transitional Care Team / Units) with continuous relationship and interface capability with the outpatient elderly care system network, able to connect the DP process, carried out within the hospital, with home or residential care settings and functions activated after discharge.

The best results can be probably obtained by integrating the two organizational functions (DP and TC) and making them related to a central multidisciplinary hospital function (“team for continuity of care”) in which work geriatricians, other reference specialists (physiatrists, oncologists, pharmacists), social workers and nursing figures experienced in the transition process and its main aspects: comprehensive geriatric assessment, cooperation and communication ability across different settings and health care providers and possibility to continuously dialogue with the context of territorial and residential resources in a network system.

A recent study conducted by Patient-Centered Outcomes Research Institute (PCORI) in USA has identified and recommended eight essential components for the conduction of a successful transitional care plan: patient engagement, caregiver engagement, complexity and medication management, patient education, caregiver education, patients’ and caregivers’ well-being, care continuity, and accountability [19].

## Evidences about efficacy of discharge planning and transitional care programs

Currently, randomized clinical trials show heterogeneous results as regards the principal outcomes (i.e., overall mortality, length of admission, re-admissions to hospital, satisfaction and quality of life) of structured programs of discharge planning, [20–22]. In medical field, the most consistent experiences concern patients with congestive heart failure [23] while in the surgical field the most significant contributions regards older subjects with hip fracture [24], who experienced multiple handoffs during care transitions across settings, on average, 6 months after hip fracture [25].

Starting from the year 2000, a large number of meta-analyses has been published about structured protocols for discharge planning [26–29]. The Cochrane meta-analysis conducted by Shepperd et al. in 2013 [30] (twenty-four RCTs, 8098 patients) found not conclusive but suggestive results for the efficacy in at least three areas, including length of hospital stay, re-admission rates, and satisfaction of the patients.

Another meta-analysis published in 2013 by Fox et al. [31] (nine trials, 1736 participants) showed that DP programs allow, compared to usual care, a lower risk of re-admission at 30 days (22% reduction) and a shorter length of stay in case of re-admission within 1 year (almost 2.5 days); no differences emerged as regards length of first admission, mortality or patient’s satisfaction.

Similarly, the recent review conducted by Ong et al. on remote monitoring (telephone calls and tele-monitoring) of older patients with heart failure discharged from hospital [32] has not confirmed a reduction for any cause of 180-day readmissions, but revealed a significant difference in 180-day quality of life between the intervention and usual care groups.

As regards the methods of care transition, conflicting results have been reported on the impact of TC interventions on hospital readmissions, depending on the variety of settings of transitions considered, the methods of hospital organizations, and the characteristics of patients (especially affected by chronic disease such as chronic obstructive pulmonary disease—COPD, congestive heart failure—CHF or stroke). A recent review by Le Berre about the impact of transitional care interventions from hospital to primary care in older patients with chronic diseases highlights sensible effectiveness of this practice compared to usual care, with lower mortality at 3, 6, 12 and 18 months post-discharge, lower rate and a lower mean of readmissions at 3, 6, 12, 16 months, whereas no effects were demonstrable in quality of life [33].

At present time, very few studies have focused on the effects of discharge planning and transitional care programs on surgical patient population; the review published in 2016 by Jones et al. demonstrated that discharge planning programs can be able to reduce the rate of readmissions and home visits after the discharge of patients from surgical departments [34].

## Conclusions

The increase in length of hospital stay and in frequency of re-admissions provoked by medical and non-medical reasons cause adverse effects both on health of older patients hospitalized for surgical diseases (increased risk

of iatrogenic complications, functional decline, and mortality) and on costs of health systems.

The paucity of evidences about the efficacy of the DP and TC programs coming from literature is still affected by the large variety of transitional care measures considered: coordinated discharge planning by a team or a nurse, individualized educational programs, post-discharge follow-up interventions (phone calls, home visits, outpatient clinics, others). Other unclear aspects are related to the different typology of post-hospital settings of healthcare organizations in various countries, and to the lack of data coming from clinical settings not sufficiently explored. This is due to inexistence of mandatory structured ministerial programs in many states or to lack of guidelines on DP, developed by Health Departments.

After all, the existing meta-analyses show a lack of data about important outcomes for the geriatric population, like quality of care detected by the caregiver, satisfaction of the community healthcare providers, functional status of patients, rate of institutionalization after discharge, costs of hospital assistance and community care, costs of drugs consumption.

On the other hand, it could be relevant, the effect of DP on outcome-related complications typically associated with hospital re-admission, including delirium, functional decline, pressure ulcers, hospital infections, best rest syndrome, that are actually unrecognized.

The possibility to analyze quickly and early the clinical/care needs of elderly patients hospitalized for both medical and surgical diseases, and to organize care projects to be immediately activated after acute phase towards transitional care, has a cardinal role to increase efficiency and economic sustainability of healthcare systems and to improve quality of life of vulnerable elderly subjects needing continuity of care.

The positive effects of techniques of transitional care mentioned in literature testify the effectiveness of a new approach to managing the discharge of elderly patients from hospital; this indirectly confirms the great value of a proper discharge planning, understood as a preliminary practice essential to the ongoing transition of older patients to other care settings.

## Compliance with ethical standards

**Conflict of interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

**Statement of human rights** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Statement on the welfare of animals** This article does not contain any studies with animals performed by any of the authors.

**Informed consent** For this type of study, formal consent is not required.

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