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Discharge planning and home care for end-stage COPD patients

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ABSTRACT: Discharge support for the most seriously ill chronic obstructive pulmonary disease (COPD) patients is a key issue in minimising the impact of the acute episode and preventing future relapses.

Alternatives to hospitalisation are crucial in the cost minimisation of COPD care. However, besides efficiency, there are clinical reasons for promoting alternatives to conventional hospital admission. Hospital stay itself conveys a risk to patients.

The discharge process is a key element in the healthcare continuum. Hospital at home is a safe alternative to hospital admission, but it is not the only means of supporting discharge. Some home care schedules, mainly supported by nurses, have been proven to be good alternatives.

Home care is also useful in the prevention of hospital admission. Integrated care is a comprehensive response to the needs of severely affected COPD patients achieved through models of shared care utilising all relevant health providers and promoting self-management. The framework for integrated care is the so-called chronic care model, centred on the promotion of self-management, the holistic appraisal of the patient, the most appropriate design of healthcare delivery responding effectively to the needs of the patient and a good system of shared and accessible information.

KEYWORDS: Home care, hospital at home, self-management

Chronic obstructive pulmonary disease (COPD) is one of the most important causes of morbidity in many western healthcare systems [1]. The impact of the illness is related to its symptoms, the progressive deterioration in lung function and frequent exacerbations.

Exacerbations of COPD are important in the course of the illness, and as significant as acute events in other chronic conditions (*e.g.* acute coronary pathology). The impact of hospitalisation for acute exacerbation is significant; mortality during admission is >10% and mortality during the year after discharge following treatment for acute COPD exacerbation is 25–40%. The majority of patients make a quick recovery following an acute episode, but only 75% have

recovered their basal pulmonary function at 5 weeks and 7% have not recovered it at 3 months [2].

An acute exacerbation of COPD is not an exceptional or unique event. The risk of successive exacerbations and readmissions is raised in this type of patient; the Risk Factors of COPD Exacerbation Study (EFRAM) found that 63% of patients were readmitted during the year following an exacerbation [3].

For this reason, discharge support for the most seriously ill patients is a key issue in minimising the impact of the current acute episode and preventing future relapses.

Discharge plans for more severe COPD patients require careful identification of suitable candidates,

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a precise definition of the care needed and a realistic plan for ensuring provision of that care.

COPD SEVERITY EVALUATION

It can be difficult to provide an individualised prognosis for a COPD patient. The progression of a chronic illness follows an identifiable pattern [4]: a progressive decline in function, episodes of serious acute exacerbation from time to time, and periods when the patient is practically symptom-free. This pattern is easy to describe retrospectively but is of little predictive value. Some estimates suggest that the percentage of patients with severe COPD could be 15 [5].

Given frequent exacerbations, the patient, as much as the doctor, has a tendency to underestimate the impact of each one. It is very difficult to know whether an exacerbation will be the last exacerbation. Data exists, such as that found in the body mass index, airflow obstruction, dyspnoea and exercise capacity (BODE) index [6], that provides information on subgroups of patients with the same lung function and different prognosis and risk of death. Besides the pulmonary pathology of COPD, the effects occurring outside the lungs, the systemic effects (measured indirectly in the BODE index by the 6-min walking distance or the body mass index) and comorbid conditions play a crucial role in the prognosis. In COPD, there is no accepted definition of the final stage of the disease and so it is difficult to compare different studies [7]. Moreover, the use of a cancer model in predicting the need for palliative care of COPD patients is unhelpful [8].

Technology improves the life expectancy of patients with COPD. In the case of home oxygen therapy, for example, several studies seem to show a progressive improvement in survival with time, compared to Nocturnal Oxygen Therapy Trial (NOTT) and UK Medical Research Council outcomes [9]. Improving life expectancy does not avoid discussion of the chances of survival at any given time. As HABRAKEN *et al.* [10] show, patients with end-stage COPD do not actively express a wish for help because they do consider their limitations to be normal and suppose that there is no effective therapy for improving their situation. These difficulties can be resolved only through a deliberative process with the patient regarding life expectancy and the patient's preferences for the end-stage period [11].

IMPACT OF HOSPITALISATION

Analysis of the alternatives to hospitalisation in the care of patients with acute COPD exacerbation usually highlights the economic benefits. The cost of hospital admission is the most important direct cost in the economic evaluation of COPD [12]. Hospitalisation represents >40% of the overall cost of COPD care [13], and, in the most severe patients, it can be >60% [14]. Besides the cost, the impact of an acute exacerbation on the patient, in terms of deterioration in quality of life and risk of death, is important and should not be neglected. There is wide variation in outcome between hospitals regarding the care of COPD patients [15]. The more appropriate place to care for a COPD patient depends upon accessibility, the skills and knowledge of health professionals, and the need for continuous monitoring. There is a broad spectrum of possibilities, from home to the intensive care unit, but, in all cases, patients need care following an exacerbation.

The hospital admission has a very important impact on the patient. Hospitalisation, in some cases, results in functional decline despite cure, and, in other cases, there are complications unrelated to the problem that caused admission [16]. Clinical arguments exist that support the need to find alternatives to hospital admission (or to reduce the length of stay) in acute exacerbation of COPD.

Hospital admission can contribute to immobility or an increasingly sedentary lifestyle through the loss of independence and risk of falls in older people [17]. Admission of a COPD patient increases immobility, as much by the severity of the exacerbation as by the habit of health professionals to confine patients to bed. In most cases, hospital admission for acute COPD exacerbation is synonymous with the intravenous administration of drugs and the requirement of remaining bedbound. Intravenous line and pyjamas do not favour a quick recovery as they promote, directly or indirectly, immobility.

Cognitive disturbances frequently affect hospital in-patients. Depression can affect 10–30% of hospitalised patients, especially the elderly [18]. Following discharge, a high percentage of patients continue to present with anxiety and depression [19]. Furthermore, hospital admission accentuates the social isolation frequently observed in COPD patients [20].

Of patients admitted to hospital, 15% suffer an adverse event related to their in-patient stay [21]. The risk increases with length of stay. Moreover, administration of medications in the hospital environment can differ to that in the outpatient setting, in terms of both dosage and route of administration. Some type of error occurs in 50% of intravenous drug administrations in hospital and a potentially serious error occurs in 1% of cases [22]. The use of sedatives is another potential risk to hospitalised patients, leading to either lack of balance that can cause falls or to alterations in the respiratory centre in COPD patients.

Hospitalisation can result in the discharge of some patients with less ability to carry out the activities of daily life than prior to admission [23]. Maintaining patient independence should be a key focus of the care plan on admission to hospital.

DISCHARGE RISK

Patient discharge is not a simple administrative procedure. Research in two London (UK) hospitals has shown that 18% of adverse effects suffered by in-patients occurred during the discharge process [24]. The discharge process (which always includes a written report) is a key element in the healthcare continuum. Due to shortened in-patient stays, results of investigations are often received when the patient has already gone home. A tertiary hospital in Boston (MA, USA) found that, in 41% of cases, results arrived after patient discharge and, of those, 9% required immediate action. It is recommended that discharge planning commences as soon as the patient is admitted [25].

Patients have needs other than those directly related to the care of an acute exacerbation, *e.g.* psychological problems, such as anxiety and depression [26]. This fact is important as patients with anxiety show an increased risk of readmission [27]. Issues of concern to patients include filling in forms to obtain relevant

services (e.g. oxygen supply), when it is appropriate to contact the doctor and treatment of comorbid conditions.

Thus the discharge plan for a COPD patient should cover all elements related to the respiratory illness itself, as well as any comorbid conditions, and address issues such as anxiety and depression. In addition, it should list other healthcare providers (especially the family doctor) relevant to the patient and specify clearly how they can contact members of the healthcare team. In order to ensure good coordination with community services, a written report should be forwarded to the family doctor, or, at the very least, the family doctor should be informed by telephone of the patient's discharge. Ideally, a health professional, typically a nurse, should be responsible for the entire discharge process, including relationships with other healthcare providers.

The patient should receive both written and verbal information about COPD, the therapeutic recommendations that have been made and the contact details of relevant health professionals [28].

HOSPITAL AT HOME

Hospital at home is a safe alternative to hospital admission for COPD patients with an acute exacerbation [29]. A certain terminological confusion may exist around the term hospital at home. It is important to distinguish between episodic home care, generally provided in response to an acute illness, and the long-term home care offered to patients with chronic diseases [30]. In a strict sense, the hospitalisation at home would be fitted in within the episodic home attention that substitutes for the stay in hospital in circumstances in which admission is mandatory. In other words, if hospital at home teams do not exist, the patient should be admitted to hospital.

As a viable alternative to admission, the hospital at home must be able to guarantee a rapid response, with the capacity of evaluating a patient in hospital and visiting them at home on the same day. The team must have the means of responding adequately in both intensity (daily visits) and duration. Prior to accepting a patient into a hospital-at-home programme, both patient and caregiver should feel competent in dealing with the technical aspects of the care (such as ventilation). Equally, there should not be any diagnostic uncertainties. The team should have the capacity to respond to urgent demands and provide coverage 7 days per week. Table 1 summarises the characteristics of the hospital at home.

In practice, hospital at home is safe for well-selected patients who have a competent caregiver. In addition to achieving clinical benefits comparable to those accruing to hospital admission, hospital at home reduces costs, especially for the most ill group of patients [32]. Comparisons are difficult as the available studies are not homogenous, especially regarding the severity of the exacerbation, the intensity of the intervention and whether or not the patient was admitted prior to starting the hospital-at-home programme. Table 2 provides basic data from the first four controlled studies of hospital at home in the UK and Spain [33–36]. In order to evaluate the impact of hospital at home, it is necessary to know the coverage of the programme (the number of patients cared for at home as a percentage of the total number of patients admitted for acute COPD exacerbation), the percentage of patients that were readmitted to hospital due to deterioration during home care (this reflects, in part, the efficacy of the selection criteria) and the percentage of readmissions following discharge. Qualitative hospital-at-home service data relate to the mechanisms guaranteeing the continuity of care with other care levels, particularly primary and community care.

Some studies suggest that the hospital-at-home programme provides advantages over conventional hospitalisation, as evidenced by the reduction in cognitive disorders in patients cared for at home [37].

It can sometimes be difficult to distinguish between the care provided by a hospital-at-home programme and that delivered by home care following discharge [38]. Discharge support and follow-up interventions are generally short term and based on visits by nurses to reinforce education and promote compliance with therapy. Despite their low-intensity nature compared with what is offered by the hospital-at-home programme, discharge support interventions have been shown to be useful in shortening length of hospital stay [39].

The hospital-at-home team comprises at least one doctor and one nurse [40]. This team has daily contact with the patient, through either a telephone call or a home visit. Since the ultimate goal is to return patients to the community, the team must interact with several health professionals, mainly community nurses or the general practitioner. It is very difficult to establish precisely the responsibilities of each professional and each institution in hospital at home. As a general rule, it is considered that hospital at home is a care option that the

TABLE 1 Characteristics of hospital at home

The hospital-at-home team is composed of doctors and nurses that are dedicated exclusively (or almost exclusively) to this activity
Identification of a specific group of suitable candidates
Defined geographical area
Hospital at home is feasible only if a competent caregiver assumes the responsibility of care
Hospital at home starts only when patients fulfill clinical criteria, live in a geographical area and both patient and caregiver accept home care
Hospital-at-home team can visit the patient daily
Hospital-at-home team can visit the patient on the day of discharge after hospital admission or a visit to the emergency department
Hospital-at-home team care for patients for a short period of time (generally not >10–15 days)
There is a report at the end of care (or a joint visit with a general practitioner or community nurses)
Hospital-at-home outcomes should be analogous to conventional admission care

Data from [31].

TABLE 2 Experiences of hospital at home

	UK			Spain
	Glasgow	Edinburgh	Liverpool	Barcelona
First author [ref.]	COTTON [33]	SKWARSKA [34]	DAVIES [35]	HERNÁNDEZ [36]
Subjects n	81	184	150	222
H@H/CC n	41/40	122/62	100/50	121/101
H@H Adms %	19.7	18.3	25.7	35.3
Age yrs				
H@H	68.0±1.2	68.5 [#]	70±8	71.0±9.9
CC	65.7±1.6	69.9 [#]	70±8	70.5±9.4
FEV₁ L				
H@H	0.94 [#]	0.77 [#]	0.82 [#]	1.2 [#]
CC	0.95 [#]	0.66 [#]	0.76 [#]	1.1 [#]
Females %				
H@H	60	48.4	55	
CC	54	61.3	40	
Length of stay days				
H@H	3.2 (1–16)	5 [†]		1.71±2.33
CC	6.1 (1–13)	7 [†]	5 (4–7)	4.15±4.10
LTOT %	16.04	6.1	13.3	15.3
Follow-up days	60	56	90	56
Mortality %	3.7	5.4	8.7	4.95

Data are presented as mean±SD or median (range) unless otherwise indicated. #: mean; †: median. H@H: hospital-at-home; CC: conventional care in the hospital; Adms: admissions; FEV₁: forced expiratory volume in 1 s; LTOT: long-term oxygen therapy.

patient may refuse. Therefore, in practice, the hospital at home is an agreement between the patient, the caregiver and the team for a short period of time.

Home care teams can be compatible with other alternatives to hospitalisation. In response to overcrowded emergency departments, many hospitals in Spain have designed short-stay units for medical patients with an acute exacerbation of their condition. These heterogeneous units, with mean stays of 2–4 days, aim to be more flexible than conventional acute care units [41]. This strategy can be used to stabilise and treat acute episodes in some COPD patients [42]. However, it is not the answer in all cases of acute exacerbation. SIN and TU [43] observed that older patients discharged after a stay of <4 days have a 39% chance of being readmitted. The authors also showed that the risk of readmission increases with stays of >15 days. Some patients require a longer length of care than others for their acute episode, but this does not mean that they must remain in an acute care setting for all of their treatment. It is possible that convalescence centres have a role in the care of the most fragile patients who require longer recovery times.

PREVENTION OF HOSPITAL ADMISSION

Given the negative impact of hospital admission on COPD patients, it seems reasonable to design early intervention strategies for preventing hospital stays. FARRERO *et al.* [44] evaluated the impact of home visits on patients receiving long-term oxygen therapy in the home. All of the patients received a quarterly visit from a physical respiratory therapist, in

addition to monthly telephone contact and easy access to an outpatient clinic. During the first year, this strategy resulted in a reduction in the number of admissions and visits to the emergency department. Although it might be easy to estimate the overall impact of this type of intervention, it is less easy to evaluate the impact of individual components, *e.g.* health education and self-management. Some reviews suggest that education and self-management elements reduce the number of COPD admissions; however, the studies are heterogeneous and it is difficult to draw this conclusion with certainty [45].

BOURBEAU *et al.* [46] have demonstrated the benefits of a programme of education implemented through a weekly home visit by a health professional over 2 months to patients who have had a prior admission for COPD exacerbation. Subsequent monitoring was carried out by telephone. This programme resulted in a 39% reduction in admissions and a 41% reduction in visits to the emergency department. The benefits of education and self-management were maintained in the medium term [47]. These interventions demonstrate some common factors: the role of the nurse, and intervention in the patient’s home.

Preventive strategies seek to obtain improved results through the early detection of an acute episode. WILKINSON *et al.* [48] showed that the median time that elapsed between the start of an exacerbation and the commencement of treatment was 3.69 days. The median time for recovery was >10 days, but this could be reduced given early detection of the acute episode. In addition, although preventive strategies may not avoid all hospital admissions related to acute exacerbation, it is possible that early detection can contribute to improved patient flow through the health system, and a reduction in the number of visits to the emergency department.

Preventive strategies require realistic planning with regard to communication and resources, easy access to a specialised team and good coordination between the different health disciplines providing support to patients.

INTEGRATED CARE

Significant advances have been made since the late 1990s in the design of models of care for chronic illnesses. One of the best known is that proposed by WAGNER *et al.* [49], the chronic care model (CCM). The elements of this model are centred on the promotion of self-management, the holistic appraisal of the patient, the most appropriate design of healthcare delivery responding effectively to the needs of the patient and a good system of shared and accessible information. ADAMS *et al.* [50], in a review of the CCM, verify that, from the scarce data available, a reduction in hospital admissions was observed, as well as a reduction in the length of stay and number of visits to the emergency department, in those care models that included at least two elements of the CCM: self-management (education, support for behavioural modification and motivation), design of the care delivery system (accessible 24 h per day and 7 days per week and team working), decision support tools, and a clinical information system.

Technological support is one of the most important aspects of the CCM. The technological support represents not only a tool for improving performance but also a deep change in the way of working. The intensive use of information and communication

technologies is cost-effective [51], and can permit the follow-up of larger number of patients, the devotion of more effort to the most severe and information-sharing anywhere and at any moment.

CASAS *et al.* [52] propose a model of integrated care based on shared care arrangements among different levels of the health system, emphasising the crucial role of the specialised nurse in the management of cases and utilising a web-based call centre, which collects patients' calls and permits access to clinical information from the hospital, the primary care centre or the patient's home. After 12 months, the patients cared for using this model showed a significant reduction in hospital admissions and readmissions.

SEEMUNGUAL and WEDZICHA [53] point out that these flexible models are a good approach to adopt for the care of COPD patients. In the study of CASAS *et al.* [52], only 19% of patients admitted for COPD fulfilled the criteria for inclusion in the integrated care group. Further work needs to be done in order to develop the best strategy for expanding the number of candidates, especially among those COPD patients in a poor clinical situation.

It is clear that home care is appropriate for carefully selected patients [54]. Within the care model, the role of the specialised nurse is key, as is the fact that their work must be well coordinated with that of other healthcare providers; the specialised nurse should not work in isolation [55]. The integrated care of severely ill patients depends upon efficient communication based on the telephone [56], but also supported by technological platforms that permit the easy exchange of information.

The role of the chest physician is very important in advanced stages of the disease, especially in relation to the difficulties in establishing a prognosis, but there is no doubt that the patient also benefits from the care offered by general practitioners and health resources within the community. There are important methodological shortcomings in the literature regarding the influence of generalist *versus* specialist care on outcomes for patients with a single condition [57]. The role of the specialist and the generalist are variable according to circumstances. In patients living far from hospital, the specialist plays a supporting role for the general practitioner. In some places, there are generalists with a special interest in respiratory diseases [58] and, in that case, the distribution of roles is also different. The model and the health professionals involved determine the characteristics of the patients. Hospital at home or home care following discharge is, in general, more related to acute care. For that reason, the selection criteria are determined by the circumstances, such as severity of the exacerbation, availability of caregiver or preferences of the patient. The selection criteria for home care are not the same in the acute-on-chronic situation of patients with severe chronic respiratory failure [59]. In these cases, home care is feasible because the team knows both the patient and the characteristics of the disease.

A comprehensive response to the needs of severely affected COPD patients with acute exacerbations can only be achieved through models of shared care utilising all relevant health providers in efforts to treat the exacerbation and also prevent

readmission, providing the best possible pharmacological therapy available and integrating all nonpharmacological elements: smoking cessation, education, self-management, and physical exercise [60].

STATEMENT OF INTEREST

None declared.

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