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Integrated Care: What does this Mean for the COPD Patient?

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Abstract

Despite remarkable advances in medicine and technology, the management of the patient with COPD is often inefficient and fragmented. Optimizing care for these individuals requires that a proactive, patient-centered, de-fragmented and integrated plan of care. Integrated care, which draws heavily from the chronic care model, incorporating holistic, self-management and care coordination principles to meet the needs of the complex COPD patient, is a desirable approach to improving medical management. The relationship of integrated care to other, similar conceptual models, including self-management, disease management, care coordination, and patient centered medical home is discussed.

Keywords: COPD; Integrated care; Chronic care model

Introduction

Despite remarkable scientific and technological advances in medicine, the current management of Chronic Obstructive Pulmonary Disease (COPD) remains woefully inadequate. On a patient level, health-related quality of life remains substantially impaired across all spirometric stages, adherence across multiple aspects of therapy (including smoking cessation, physical exercise and activity, and maintenance medications) remains disappointingly low [1], and only about 40% become successful self-managers despite educational efforts [2,3]. On a health care provider level, comorbidities – which often contribute substantially to total disease burden [4] - are frequently underestimated or even ignored [5], adherence to practice guidelines for COPD is suboptimal [6,7], and referral to standard-of-care pulmonary rehabilitation is unacceptably low [1]. On a system level, COPD remains a leading cause of mortality, and health care utilization, as reflected by a 30-day hospital readmission rate hovering around 20% [8-10], remains unacceptably high.

While the absence of curative or substantial disease modifying strategies for COPD is a fact of life, the Global Initiative for Obstructive Lung Disease (GOLD) characterizes COPD as treatable, supporting an optimistic framework that emphasizes that much can be done to reduce disease burden [11]. As stated above, we obviously fall short in this area.

How can we improve on our clinical treatment of the COPD patient? COPD management must move away from the conceptual and systemic deficiencies of the acute care model, which only addresses the “...sudden, often unexpected, urgent or emergent episodes of injury and illness that can lead to death or disability without rapid intervention” [12]. In doing so, we must appreciate the fact that COPD has systemic consequences and frequent comorbidities, and these contribute substantially to total disease burden and mortality [5,13]. Focusing simply on treating the airflow limitation (which narrowly defines the disease) is insufficient to achieve optimal outcomes: combining classes of long acting bronchodilators is not multidimensional care! On another level, we must be more proactive in our approach to provide the preventative, educational and social services to optimize outcomes. For example, responding to the COPD exacerbation is, by necessity, reactive. Taking measures to prevent the exacerbation, such as optimization of pharmacologic and nonpharmacologic interventions, and to minimize the exacerbation effects, such as improving communication and self-efficacy, are indeed proactive. Perhaps most importantly, optimal management of the patient with COPD requires a team approach centered on the patient and family.

Health care systems must move from fragmented, single-disease-centered services to a seamless integration of care addressing medical, social, psychological, and cognitive needs of the COPD patient. This integration must occur throughout the trajectory of the disease (giving the right treatment to the right patient at the right time [14]) and across the system. This approach has, by no means, been outlined to everyone's satisfaction - hence, the variety of names it has been given (Table 1). Furthermore, the scientific evidence that a proactive, patient-centered, de-fragmented and integrated plan of care

works in COPD – if indeed it does – is still in its infancy. In this paper we review the concept of integrated care for COPD, practical approaches to its implementation, outcomes from selected studies available to date, and our views on moving forward in this area.

Definitions and Concepts

Language matters, and some of the confusion over conceptualizing integrated care results from ambiguous or overlapping definitions, resulting in the same term being used somewhat differently across scientific studies and the medical literature. This general problem with language had been appreciated by the prominent twentieth-century philosopher, Ludwig Wittgenstein, who quipped, “*Philosophy is a battle against the bewitchment of our intelligence by means of language*” [15]. This is indeed pertinent to this discussion on integrating care for COPD, since multiple terms with considerable overlap exist. Some of these terms are listed in Table 1. For the purposes of our review, we consider the chronic care model and integrated care to be nearly synonymous, with the latter putting more emphasis on communication and coordination [14]. Similarly, we consider self-management, (chronic) disease management, patient-centered medical home, coordinated care and planned care to be part of integrated care.

Table 1: Some commonly-used and somewhat overlapping terms.

Chronic care model
Integrated care (proactive integrated care), integrated health care networks
Self-management
Chronic disease management
Care coordination, coordinated care
Patient-centered medical home

Background: The Chronic Care Model

The chronic care model, which was originally developed as a model for primary care of patients with chronic illness, was detailed in two landmark publications in the *Journal of the American Medical Association* [16,17]. The impetus behind it was the increasing number of individuals with chronic illness in the United States and recognized deficiencies in chronic disease management at that time.

This model, which has survived the test of time, has six components: 1) self management support; 2) clinical information systems; 3) delivery system redesign; 4) decision support (guidelines); 5) health care organization; and 6) community resources [16,17]. This approach is designed to tailor therapies to the individual patient and integrate services across settings. The chronic care model, although certainly not fully implemented at the present time, has served as the basis for other models designed to optimize the management for the challenging patient with chronic illness, such as COPD.

Integrated Care

A commonly-used definition of integrated care is provided by the World Health Organization: “*Integrated care is a concept bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion. Integration is a means to improve the services in relation to access, quality, user satisfaction and efficiency*” [18].

This definition, in our opinion, does not stress the patient-centered aspect of integrated care that is now considered a key component of this approach. The requirement for optimal health services to be both integrated and person-centered was later stressed by the World Health Organization [19].

An American Thoracic Society workshop on integrated care of COPD incorporated both elements in its proposed definition: “*The continuum of patient centered services organized as a care delivery value chain for patients with chronic conditions with the goal of achieving the optimal daily functioning and health status for the individual patient and to achieve and maintain the individual's independence and functioning in the community*” [14].

Integrated care has system, organizational and clinical levels [20-22]. The system level includes both vertical and horizontal integration. Vertical integration describes care across sectors, for example, primary care with tertiary care. Horizontal integration describes peer-based and cross-sectorial collaboration, for example, primary care and public health. Organizational level integration requires that professionals have collective responsibility to provide a continuous, comprehensive, and coordinated continuum of care for the patient. Clinical level integration refers to coordination of the of care delivery for the individual patient [21].

Integrated Care for the COPD Patient

For the health care provider treating the COPD patient, clinical integration is paramount. In this setting, clinical integration is very broad in scope, beginning with addressing symptoms and disability from the respiratory disease, its systemic manifestations and the frequently-present co-morbid conditions.

Strategies over the long trajectory of the disease range from interventions aimed at smoking cessation, promoting regular exercise and activity, optimizing pharmacotherapy and collaborative self-management, to palliative and hospice care.

Coordination of care among health care providers is particularly important in the peri-hospitalization period for the exacerbation, when there is high morbidity and health care utilization and fragmentation of care.

Coordination through greater collaboration among healthcare professionals in the hospital and the community is particularly important at this time.

Practical Application of Integrated Care in COPD

Randomized trials and systematic reviews of integrated care for COPD can give insight into prevailing concepts of this complex management strategy as well as assess efficacy. For example, a large, 24-month, randomized controlled trial of what the authors called integrated disease management and implemented by general practitioners involved training of clinicians on the diagnosis and management of COPD, motivational interviewing, self-management action plans, web based decision support and fostering of networks [23]. In general, this intervention was not successful in its primary outcome, which was health status, or in most of its secondary outcomes, including hospital days.

A 2014 systematic review of integrated disease management for COPD included the following rather liberal criteria for inclusion in the review: 1) Two or more health care providers; 2) Two or more treatment components; and 3) Duration of at least three months, with 12 months of follow-up [24]. Despite its watered-down inclusion criteria, this review of 26 studies showed improvement in quality of life and exercise tolerance as well as reduction in hospitalization and hospital-days.

In 2008, the European Union began the NEXES project to assess the implementation of four integrated care services for patients with COPD, heart failure, and type II diabetes across three locations: Spain (Barcelona), Norway (Trondheim) and Greece (Athens) [25].

The developers of the project hypothesized that the transfer of care from hospital-based to community-based care would improve both health outcomes and health costs. The project was supported by information and communication technology platforms that allowed for health information sharing or exchange.

The four elements of their intervention included:

- 1) Home based maintenance of rehabilitation effects (wellness and rehabilitation);
- 2) Enhanced care for frail patients to prevent hospitalizations;
- 3) Home hospitalization and early discharge program; and
- 4) Support to remote diagnosis in primary care (spirometry for COPD).

While the original aim was to assess information technology in integrated care, it evolved toward the evaluation of the effects and barriers to the adoption of the four services. In the authors' assessment the intervention showed high potential to enhance clinical outcomes with cost containment.

In another study of what the authors called proactive integrated care, the intervention had four key elements: 1) Disease-specific education; 2) Self-management education; 3) Study coordinators to enhance communication; and 4) Remote home monitoring [26]. This trial demonstrated improvement in quality of life and reduced health care costs.

Practical Components of IC for the COPD Patient

Self-management

Self-management, sometimes called supported or collaborative self-management, is a key component of the integrated care of the COPD patient. In brief, self-management refers to formalized, patient-centered education aimed at teaching skills and promoting behaviors that enhance health [27]. Self-management interventions include disease-specific education, proper medication management (including adherence and inhaler technique), smoking cessation support, proper use of action plans, exercise and physical activity, breathing management, knowledge of bronchial hygiene techniques, respiratory muscle training, proper nutrition, and stress management [28]. Since patient self-management is not always adaptive (non-adherence to prescribed therapy can be considered a maladaptive form of self-management), [2] "supportive" or "collaborative" are commonly added as qualifiers, emphasizing the interaction with the health care professional in the process. When utilized at the time of the exacerbation, self-management typically centers around an action plan, with education on its implementation. Recent multicenter studies using this latter approach have used the terms, "disease management" or "comprehensive care management," to describe this collaborative self-management process [29,30].

Self-management has had inconsistent results in randomized COPD trials. One study (called disease management by the authors, but focusing on self-management) took place in five Veterans Affairs (VA) hospitals [29]. Patients assigned to the treatment group received a single, 1 to 1.5-hour group education session given by a respiratory therapist; this session included general COPD education plus an individualized, written action plan for the exacerbation, prescriptions for prednisone and an antibiotic along with directions on when to start them. In addition, patients were given contact information for a case manager and the telephone number for a 24-hour VA helpline. A case manager made monthly calls to the patient during the study. This rather simple self-management intervention supplemented by some increase in communication resulted in significantly reduced health care utilization.

Another VA trial of what might be considered self-management for COPD (called a comprehensive care management program) was similar to the above study, but appeared to be more intensive: it included four 90-minute educational sessions and enhanced communication, in addition to a similar type action plan for the exacerbation [30]. This study had disturbingly negative results, with the study being terminated prematurely because of a mortality signal in the treatment group and no health care utilization benefit. The reason or reasons behind these vastly different results remain undetermined.

A systematic review of self-management in COPD provides insight into the authors' concept of this intervention as well as its outcomes [31]. Their concept required collaboration between

the health care professional and the patient aimed at increasing the patient's knowledge and skills necessary to manage his/her treatments, improve control of the disease and improve well-being. The interventions in the review were considered heterogeneous by the authors, including structured, group-based pulmonary rehabilitation fostering self-management skills, one-on-one educational self-management, integrated, multidisciplinary disease management, often with some disease monitoring (looking much like integrated care), and exercise interventions. They determined that health status was improved, but little effect was observed in health care utilization.

Pulmonary rehabilitation

Pulmonary rehabilitation is defined as, "...a comprehensive intervention based on a thorough patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education, and behavior change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors" [32]. Although pulmonary rehabilitation has no demonstrable effect on respiratory function or physiology, it generally provides substantial improvements in exercise capacity, dyspnea, health status, and health care utilization in individuals with COPD [33]. These benefits probably result from its positive effects on systemic manifestations, comorbidity and maladaptive behaviors in individuals with chronic respiratory disease. With its interdisciplinary, patient-centered approach and its emphasis on addressing multiple aspects of patient morbidity (such as exercise intolerance, physical inactivity, suboptimal self-management skills, and nutritional abnormalities) [32], provides a good platform for integrated care. Pulmonary rehabilitation as it is currently delivered, however, typically falls short of meeting the coordination of care in the integrated care concept. Thus, it is within, not synonymous, with integrated care. However, even with this constraint, it nevertheless appears to reduce subsequent health care utilization in COPD patients when given in the peri-exacerbation period [34].

Care coordination

Care coordination has been defined as "*The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshaling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care*" [35]. Although, there is certainly overlap with self management, the focus of care coordination on organizational aspects of patient care [36] gives it a different spin. Continuity of care, a goal of care coordination, has three aspects: 1) Continuity of clinical management; 2) Continuity of information; and 3) Relational continuity [22]. Like self-management, care coordination can be considered a component of integrated care. Combining the patient-centered aspects of self-management and the

organizational aspects of care coordination comes close to what could be considered integrated care.

A recent, large study [37] (n=676) compared a highly-structured, single home visit by a nurse practitioner (not necessarily COPD) to usual care in high-risk adult patients recently discharged from a community hospital. The home visit was designed to assess ongoing clinical improvement, assure medication understanding and adherence and resolve discrepancies, provide referrals, when necessary and adjust the clinical care plan, when required. This intervention was also supported by an electronic medical health record that allowed for real-time communication with the patient's consistent providers. While it is difficult to categorize this intervention, care coordination was a prominent component. Those with the comprehensive intervention had a 54% relative reduction in acute care returns.

Patient-centered medical home

The patient-centered medical home model originated in the pediatric literature and emphasizes the importance of the primary care provider. Considered an extension of the chronic care model [38], it includes five general principles: 1) comprehensive care; 2) patient-centered, holistic care; 3) coordination of care; 4) greater accessibility of services; and 5) system based approach to quality and safety [39,40]. As a broad concept, this comes close to integrated care.

A systematic review of 19 studies of patient-centered medical home interventions (in primary care, not necessarily of COPD patients) showed small positive effects on patient experiences, small to moderate effects on the delivery of preventative care services, and small to moderate improvement in staff experiences, and small reduction in emergency department visits [40].

Putting it Together: Integrated Care for the COPD Patient

Optimal management of the COPD patient must address the following:

- A holistic approach to patient care, including managing the common systemic and co-morbid conditions.
- Preventative interventions, such as smoking cessation and maintaining a healthy lifestyle, immunizations, promotion of adherence, proper nutrition, weight management, and regular exercise and physical activity.
- Pharmacologic and non-pharmacologic therapy, such as optimizing bronchodilators and implementing comprehensive pulmonary rehabilitation.
- Exacerbation prevention and management strategies.
- Enhanced communication across all levels of care, including patient to provider, provider to patient, and provider to provider directions.
- Coordination of care, especially at the time of the serious COPD exacerbation, utilizing a multidisciplinary team approach and providing a seamless transition from the hospital, into the home and community.

- A stronger focus on palliative care in patients with advanced disease and substantial symptom burden.

Based on the above, we conceptualize integrated care for the COPD patient to follow the six elements of the chronic care model as originally outlined, but with a stronger emphasis on care coordination.

While the patient centered medical home comes very close to integrated care in concept, a proper balance between primary and subspecialist management for the COPD patient would be optimal, especially in the individual with advanced disease or in the throes of an exacerbation. This partnership recognizes the desirability of including both the practitioner, who knows the patient and family well, and the subspecialist, who knows the disease well [14,41]. Thus, in our opinion, while a primary care focus is important, the often overwhelming requirements of the complex COPD patient requires subspecialist input. This becomes moot with fully implemented integrated care, which assures the right care to the right patient is given at the right time by the right health care provider in a team setting.

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