



Importance of integrated care for the chronic obstructive pulmonary disease patient

A disease-driven management triggered by acute conditions as exacerbations is still the dominating approach in the management of chronic conditions such as chronic obstructive pulmonary disease (COPD). An acute care paradigm is no longer adequate for the changing health problems in today's world. Chronic conditions are health problems that require ongoing management over a period of years or decades. This healthcare program needs to be organized in a patient-centered approach: the patient being a partner in the healthcare process. A full cycle of chain management, based on value-based competition, understanding the complexity of the chronic conditions, and partnership in care are important components of an integrative medicine approach.

KEYWORDS: COPD ■ disease complexity ■ integrated care

Chronic obstructive pulmonary disease (COPD) is primarily characterized by the presence of air-flow limitation resulting from airway inflammation and remodeling often associated with parenchymal destruction and the development of emphysema. In many patients, the disease is associated with several systemic manifestations that can result in impaired functional capacity, worsening dyspnea, reduced health-related quality of life and increased mortality. For many years, a disease-driven management was advocated to modify disease-specific outcomes. In the development of the health workforce of the 21st century, WHO emphasizes the need to make patient-centered care a priority in the management of chronic conditions [1]. Instead of remaining passive recipients, patients suffering from chronic conditions such as COPD need to become active participants, and health professionals need to partner with their patients to co-manage their chronic problems on a day-to-day basis. Integrated, patient-centered care is considered the optimal way to achieve optimal, individualized management of patients suffering from chronic conditions, including COPD. Integrative medicine focuses on the orientation of the healthcare process to create this seamless engagement by patients and caregivers in the full range of physical, psychological, social, preventive and therapeutic factors known to be effective and necessary for the achievement of optimal health over the course of life of that individual patient. In the integrated care approach of COPD patients, effective self-management programs are promoted to improve COPD management [2]. It

was demonstrated that self-management programs reduce the probability of COPD-related hospital admissions, and that self-management holds promise of positive economic benefits in light of increased patient case loads and rising costs of hospitalizations [2,3]. Others reported that care coordination, including patient education and monitoring by nurses and offering the ability to communicate with physicians, holds little promise of reducing disease-related costs in the management of chronic illnesses [4]. Self-management interventions involve collaboratively helping the patient acquire and practice the skills needed to carry out disease-specific medical regimens, change their health behavior to adjust their roles for optimal function, improve day-to-day control of their disease and improve their well-being [2]. Offering an individually tailored care plan to a patient and creating accessibility to a specialized nurse manager is only a component of the integrated care management of COPD. An integrative care approach needs to consider healthcare organizational perspectives, the complexity and individualization of the disease condition and, finally, the caregiver perspectives, including a description of the core competencies to partners in care delivery.

Integrated care: fully cycle of chain management

A healthcare system has been defined by WHO as that system which encompasses all the activities whose primary purpose is to promote, restore or maintain health. Based on this definition, systems are remarkably expansive and include

Emiel FM Wouters^{1,2†} & Ingrid ML Vanderhoven-Augustin²

[†]Author for correspondence:
¹University Hospital Maastricht, Department of Respiratory Medicine, PO Box 5800, 6202 AZ Maastricht, The Netherlands
 Tel.: +31 433 877 046
 Fax: +31 433 875 051
 e.wouters@mumc.nl
²Centre of Integrated Rehabilitation and Organ failure (CIRO Horn), Horn, The Netherlands

future
medicine part of fsg

patients and their families, healthcare workers and caregivers within organizations and in the community, and the health policy environment in which all health-related activities occur. In the report 'Innovative Care for Chronic Conditions', the WHO concluded that healthcare systems have evolved around the concept of acute, infectious disease, and that these systems perform best when addressing patients' episodic and urgent concerns. Healthcare systems still use discrete, face-to-face visits with healthcare workers whose purpose is to diagnose and treat a patients' presenting complaint. Such an acute care paradigm is no longer adequate for the changing health problems in today's world. Healthcare systems have to evolve by moving toward a model of care that incorporates both acute problems and chronic conditions.

Chronic conditions are health problems that require ongoing management over a period of years or decades. Such chronic conditions are no longer viewed conventionally (e.g., limited to an organ system), considered in isolation or thought of as disparate disorders. The demands on patients, families and the healthcare system are similar, and, in fact, comparable management strategies are effective across all chronic conditions [5]. In order to achieve extended and regular healthcare contact for chronic diseases, the WHO put forward a paradigm shift to encompass care for chronic conditions. The concept of integrated care was introduced in order to bring together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion in order to improve the services in relation to access, quality, user satisfaction and efficiency [6]. Increased attention to patient behaviors and healthcare worker communications is considered paramount for improving care for chronic conditions. Care has to be coordinated for chronic conditions using scientific evidence to guide practice [5].

In order to achieve a value-based competition in healthcare, Porter and Teisberg introduced the concept of a care delivery value chain. Care needs to be tightly coordinated over the full cycle, and patient information needs to be extensively and seamlessly shared. Every care delivery chain begins with monitoring and prevention. The care delivery value chain progresses through diagnosing, preparing, intervening and rehabilitating, and ends with monitoring and managing. Porter and Teisberg described three additional types of care delivery activities cutting across the stages of the care cycle: accessing,

measuring and informing. Accessing refers to the steps involved in gaining access to the patient; measuring refers to the measurement of patients' medical circumstances; and informing encompasses the activities involved in notifying, educating and coaching the patient. Knowledge development is considered as a crucial enabler of value-based competition [7]. These authors advocate that value-based competition must take place over the full cycle of care, and that when measuring value, both outcomes and costs must be measured over the full cycle of care and not for discrete interventions or procedures.

An integrated care for chronic conditions can minimize redundancies and fragmentation in current healthcare systems. Comprehensive models for healthcare systems are helpful to broaden the way people think about problems. The WHO report 'Innovative Care for Chronic Conditions' [5] stresses the need for a change in current healthcare systems, largely dominated by the acute care model, to avoid inefficient and ineffective growth of health-related expenditures as the prevalence of chronic conditions rises.

■ Integrated care & disease complexity

Co-morbidity and systemic manifestations are now considered important manifestations in the natural history of many chronic respiratory diseases such as COPD. Otherwise, the extent of physiological impairment or organ system loss of function is still applied to classify the severity of illness: most guidelines are still based on stratification of patients based on the degree of airflow limitation. It has been reported that an integral assessment framework of health status in COPD, incorporating physiological functioning, complaints, quality of life, social functioning and functional impairment, improves conceptual insight in health status in COPD and offers avenues in individualizing treatment [8].

Co-morbidity is defined as the concurrent existence and occurrence of two or more medically diagnosed diseases in the same individual, with the diagnosis of each contributing disease based on established, widely recognized criteria [9,10]. It is important to realize that severity is more than the sum of the individual co-morbidities. In a disease-driven approach, the human body is considered as a machine, and illness as due to a malfunction of its parts. These linear models drive us to breakdown clinical care into smaller divisions and to express with great accuracy and precision the intervention to be undertaken for each malfunction [11,12].

However, biological and social systems are inherently complex and illness is the result from complex, dynamic and unique interactions between different components of the overall system [11]. A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that the action of one part changes the context of other agents [12]. In relation to human health and illness, several levels of such a system can be identified. The human body is composed of multiple interacting and self-regulating physiological systems, including biochemical and neuro-endocrine feedback loops. The behavior of any individual is determined partly by an internal set of rules based on past experiences, and partly by unique and adaptive responses to new stimuli from the environment. The web of relationships in which individuals exist contains many varied and powerful determinants of their beliefs, expectations and behavior, and individuals and their immediate social relationships are further embedded within wide social, political and cultural systems that can influence outcomes in entirely novel and unpredictable ways [11]. Illness and health result from these complex, dynamic and unique interactions between different components of the overall system. Boundaries in such complex systems are typically fuzzy, and such systems can adapt behavior over time, because the agents within it can change over time [11,12].

Effective clinical decision-making in a complex adaptive system requires a holistic or integrated approach that accepts unpredictability and builds on subtle, emergent forces within the overall system. Because the elements are changeable, the relationships nonlinear and the behavior emergent and sensitive to small changes, the detailed behavior of any complex system is fundamentally unpredictable over time [13]. Such an approach is the opposite of evidence-based care, which is based upon known, knowable and ideal experimental conditions [14]. In patients with multiple chronic conditions there is a permanent tension between the standard treatment of the disease and the individualized care of COPD patients with multiple composed pathology. Clinical judgment in such circumstances involves an irreducible element of factual uncertainty, rather than the uncritical adherence to rules and guidelines [11].

■ Integrated care: from multidisciplinary to partnership in care

Healthcare for patients with chronic conditions is a complex interaction of healthcare

providers and other factors around the patient. Individualization is considered a key factor in the management of chronic conditions such as COPD. Individualization requires that the workforce is organized to offer healthcare around the patient: the workforce needs to adopt a patient-centered approach. Individualization of the program in a patient-centered approach needs to consider the patient as a partner in the program: information about treatment, goals and outcomes is shared with patients to prepare them to take greater responsibility in healthcare decision-making [15].

Multidisciplinary or interdisciplinarity are generally considered as effective ways to organize such an individualized program. Multidisciplinary can be defined as a non-integrative mixture of disciplines, in that each discipline retains its methodologies and assumptions without change or development from other disciplines within the multidisciplinary relationship [101]. In a multidisciplinary relationship, cooperation may be mutual but not interactive. Multidisciplinary in the context of healthcare means that healthcare providers from different disciplines work together to collaboratively provide diagnoses, assessments and treatment within their scope of practice and areas of competence. The concept of multidisciplinary treatment fits very well with the traditional provider-oriented approach of healthcare organization.

Interdisciplinarity refers to an approach to organize intellectual inquiry. Interdisciplinarity involves attacking a subject from various angles and methods, eventually cutting across disciplines and forming a new method for understanding the subject. An interdisciplinary approach fits with the global dimension of the individual's health. Still, the patient is the subject, the recipient of the active involvement of the different disciplines [101].

Organization of a patient-centered integrated care approach needs to consider core competencies applying to all members of the workforce caring for these patients. Competencies are the skills, abilities, knowledge, behaviors and attitudes that are instrumental in the delivery of desired results, and, consequently of job performance [1]. Competencies add further definition to any job by their focus on how work is done and what work is done. Core competencies in the management of chronic conditions are part of the WHO report 'Preparing a Healthcare Workforce for the 21st century' [1]. Five core competencies are formulated to complement existing ones for caring for patients with chronic

conditions. First, the workforce needs to organize care around the patient. Second, providers need communication skills that enable them to collaborate with others. Third, the workforce needs skills to ensure that the safety and quality of patient care are continuously improved. Fourth, the workforce needs skills that assist them in monitoring patients across time. Finally, the workforce needs to consider patient care and the provider's role in that care from the broadest perspective, multiple levels of the healthcare system and the care continuum [1].

Partnering skills are considered as a core competency to enhance care coordination and health outcomes. Healthcare providers need to develop skills to set up partnerships with the patient and with other providers. Providers need communication skills that allow them to share power and involve patients in all aspects of healthcare decision making. Partnering requires that healthcare providers transform their core business in terms of relationships, behaviors, processes, communication and leadership. Partnering takes a collaborative approach to achieve shared objectives. The shared objective of healthcare providers involved in the management of COPD patients is to return the patient to the highest possible capacity and to contribute to achieve the individual's maximum level of independence and functioning in the community. Communication is considered as the essential element in successful partnership. Communication skills include the ability to negotiate, share decisions, solve problems collectively and establish goals, implement action, identify strengths and weaknesses, clarify roles and responsibilities and evaluate progress [1].

To realize added value for the individual patient, Porter and Teisberg identified that the provider experience, the scale of the offered medical activity and the learning in medical conditions are critical factors to drive success [7]. They describe that the combined effects of experience, scale and learning create a virtuous cycle in which the value delivered by a provider can improve rapidly. Better understanding of a medical condition leads to accumulating experience, rising efficiency, better information, more fully dedicated teams, increasingly tailored facilities, the ability to control more of the care cycle, efficiencies in medical practice, faster innovations and better results. This whole virtuous cycle is driven by competition on results in the medical condition [7]. The virtuous cycle to stimulate offering added value can be facilitated by setting up integrated practice units.

Conclusion

Chronic conditions are the principal cause of disability and use of health services in the Western world. Healthcare systems are still based on the management of acute, episodic disease conditions, but are not adapted to offer an integrative management of chronic conditions such as COPD over time. Continuity and integration of care are essential in the management of chronic conditions. Continuity creates a healing relationship and efficient value-based organization of care; integration of care provided by all professionals undergirds effectiveness. Patients suffering from chronic conditions need to become active participants and partners in the healthcare process. Integrated, patient-centered care is considered the optimal way to achieve optimal health and well-being for patients with chronic conditions such as COPD.

Future perspective

A disease-driven management of chronic conditions based on acute care paradigms is no longer adequate for the health problems in today's world. The current delivery system is not organized around value for patients. The focus of healthcare delivery needs to change from minimizing costs and limiting services to maximizing value over the entire care cycle. Care delivery needs to become organized around medical conditions, taking into account the demands of the patients and the identified individual phenotype. Clinical decision-making requires an integrated approach and accepts unpredictability, instead of the current evidence-based approach based upon known, knowable and ideal experimental conditions. A patient-centered approach must consider the patient as a partner in the individualized healthcare program. Patients need to take responsibility in daily management of the disease by adapting a healthy lifestyle and adequate self-management procedures. A full cycle of chain management must replace the current highly fragmented care delivery system, and outcomes of care must be measured over the full cycle of care and not separately for each intervention. The current reactive and piecemeal approach for reform of care delivery for chronic conditions will aggregate current inefficiency and ineffectiveness. The societal burden of chronic conditions worldwide must be the driver for healthcare reform to realize the final goal: offering optimal care for the patient suffering from COPD.

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes

employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

No writing assistance was utilized in the production of this manuscript.

Executive summary

- Chronic obstructive pulmonary disease (COPD) management is still dominated by a disease-driven management in order to modify disease-specific outcomes.
- Integrated, patient-centered care is a priority in the management of chronic conditions, including COPD.
- Self-management is only a component of an integrated care approach.

Integrated care: full cycle of chain management

- Healthcare systems have evolved around the concept of acute diseases. An acute care paradigm is no longer adequate for the changing health problems in today's world.
- Chronic conditions are health problems that require ongoing management over a period of years and decades.
- Care needs to be tightly coordinated over the full cycle of care, and patient information needs to be extensively and seamlessly shared.

Integrated care & disease complexity

- The classification of the severity of COPD only based on the degree of airflow limitation ignores the complexity of the disease and the care demand in the individual patient.
- Effective clinical decision-making in a complex system requires a holistic or integrated approach that accepts unpredictability.
- Clinical judgment in the individualized care of COPD patients with a multiple composed pathology involves an irreducible element of factual uncertainty.

Integrated care: from multidisciplinary to partnership in care

- Individualization of care requires an organization of the workforce around the patient: the workforce needs to adopt a patient-centered approach.
- The patient is a partner in the management process.
- Partnering skills between healthcare providers is a core competency to enhance care coordination and health outcomes.
- Critical drivers to create added value for the individual patient are the experience of the healthcare provider, the scale of the offered medical activity and the learning in medical conditions.

Bibliography

Papers of special note have been highlighted as:

- of interest
- 1 WHO: Preparing a health care workforce for the 21st century – the challenge of chronic conditions. WHO, Geneva, Switzerland (2005).
- **State-of-the-art review of chronic conditions.**
- 2 Bourbeau J, van der Palen J: Promoting effective self-management programmes to improve COPD. *Eur. Respir. J.* 33(3), 461–463 (2009).
- 3 Casas A, Troosters T, Garcia-Aymerich J *et al.*: Integrated care prevents hospitalisations for exacerbations in COPD patients. *Eur. Respir. J.* 28(1), 123–130 (2006).
- 4 Peikes D, Chen A, Schore J, Brown R: Effects of care coordination on hospitalization, quality of care, and health care expenditures among Medicare beneficiaries: 15 randomized trials. *JAMA* 301(6), 603–618 (2009).
- 5 WHO: Innovative care for chronic conditions – building blocks for action. WHO, Geneva, Switzerland (2002).

- 6 Grone O, Garcia-Barbero M: Integrated care: a position paper of the WHO European Office for Integrated Health Care Services. *Int. J. Integr. Care* 1, E21 (2001).
- 7 Porter M, Teisberg R: *Redefining health care*. Harvard Business School Press, MA, USA (2006).
- 8 Vercoulen JH, Daudey L, Molema J *et al.*: An integral assessment framework of health status in chronic obstructive pulmonary disease (COPD). *Int. J. Behav. Med.* 15(4), 263–279 (2008).
- 9 Akker M, van den Buntin F, Knottnerus JA: Comorbidity or multimorbidity: what's in a name? A review of literature. *Eur. J. Gen. Pract.* 2, 65–70 (1996).
- 10 Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G: Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. *J. Gerontol. A Biol. Sci. Med. Sci.* 59(3), 255–263 (2004).
- 11 Wilson T, Holt T, Greenhalgh T: Complexity science: complexity and clinical care. *BMJ* 323(7314), 685–688 (2001).
- **Theoretical framework of complexity in medicine.**
- 12 Plsek PE, Greenhalgh T: Complexity science: the challenge of complexity in health care. *BMJ* 323(7313), 625–628 (2001).
- **Theoretical framework of complexity in medicine.**
- 13 Lorenz E: *The Essence of Chaos*. University of Washington Press, WA, USA (1993).
- 14 Nardi R, Scanelli G, Corrao S, Iori I, Mathieu G, Cataldi Amatrian R: Co-morbidity does not reflect complexity in internal medicine patients. *Eur. J. Intern. Med.* 18(5), 359–368 (2007).
- 15 Grol R, de Maeseneer J, Whitfield M, Mokkink H: Disease-centred versus patient-centred attitudes: comparison of general practitioners in Belgium, Britain and The Netherlands. *Fam. Pract.* 7(2), 100–103 (1990).
- **Website**
- 101 Multidisciplinary definition <http://en.wikipedia.org/wiki/Multidisciplinary>