

# Chapter 1

## Overview of Psychological Considerations in the Management of Patients with Chronic Respiratory Conditions

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### Introduction

Mood disorders are often eclipsed by the primary task of respiratory management in those with chronic respiratory diseases. This is likely for a variety of reasons, including that it is not the forte of the primary respiratory provider to identify and/or manage these symptoms, that the presenting problem *is* the respiratory illness itself and that resources to identify and manage quality of life issues and mood disorders are often lacking. Though pharmacological options are generally readily available, identification of the mood disturbance is, in itself, time-consuming and requires some expertise to properly identify. Additionally, resources of psychotherapists with expertise in behavioral medicine are lacking.

The largest of psychosocial problems faced by those with respiratory illnesses might be the same issues as those faced by any patient facing significant medical challenges. Though there may be some common psychosocial difficulties between the patients who share specific medical disorders, to some degree, individual differences with regard to resilience, coping strategies, comorbid complications, disease manifestation, hardiness, meaning attributed to the disease, and psychosocial supports all influence the direction and toll the disease itself may take on the individual. Lazarus describes a pattern of appraisal which is critical to any stressors; this involves the person evaluating the threat of the stress as well as the resources they need to minimize, tolerate, or eradicate the stressor. This appraisal process is critical to the patient's future steps of how to rally resources to address the needs for

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managing the illness. It is at this stage that the patient is in vital need of resources to facilitate decision making and that they are vulnerable to decompensation in decision processing if they cannot rally these resources.

In order to create a sensitive picture of how medical disorders affect psychological status as well as how psychological functioning can drive the course and progression of medical conditions, we need to consider several factors. This include not only how the social circumstances of the disease and fears related to prognosis and disability affect one, but how the disease process itself can affect mood and coping resources, and how the disease modifying treatments themselves may also drive psychosocial factors. This is particularly important in diseases such as asthma which are known to have a direct physiological effect on the generation of anxiety. Recognition of mood disorders with chronic illness is further critical as depression and/or anxiety may interfere with adherence to treatments, though this relationship has interestingly not been clearly shown [1]. Overall, those with respiratory disease have higher prevalence of concurrent depression or anxiety disorders compared with those without respiratory disease. However, a history of respiratory disease does not appear to be associated with increased risk of new onset of depression or anxiety disorders [2]. This would suggest that the disease process itself does not significantly drive the development of mood disorders.

One factor, becoming more difficult to control in research, is that newer disease-modifying drugs as well as CAM are more accessible, and are being more rapidly developed. This makes progression and direction of disease in some patients dramatically different than those of others, who may have either been sick longer, had less access to care at critical times of their treatment, or accessed additional therapeutics into their care. Thus, generalization about how specific medical conditions affect mood and psychosocial status is far more complex.

## **Psychological Basis for Depression and Anxiety in Chronic Medical Condition**

Mood disorders can be broadly examined as those features which are depressive and those which are more anxiety-focused experiences. Unipolar depression is most likely to take the form of unhappiness and lethargy of thought and action, loss of interest or pleasure, decreased energy, disturbance of sleep and/or appetite, and concentration difficulty. More serious symptoms include the following: feelings of guilt or low self-worth, helplessness, and hopelessness. Depression is often associated with anxiety as well, particularly in the active stages of treatment, when patients are more vulnerable to acting upon suicidal impulses. Anxiety disorder symptoms are most often exhibited as overly activated feelings or unease, and sensations of being unable to wind down and/or hyperarousal emotionally, cognitively, and/or physiologically. Overall, anxiety is represented by a feeling of diminished control over one's self or surroundings.

The 12-month prevalence of a depressive episode in the USA in 2010 was 6.9% [3]. Causes for depression, however, are multifactorial, and there are very few population-based studies examining how these factors predispose one to depression or how they influence the course of the disease.

Depression and medical disorders are increasingly recognized as being bidirectional. Patients with unipolar depression have been found to die 5–10 years earlier than patients without depression [4]. Patients with depression and other psychiatric illnesses often develop illnesses such as vascular disease, diabetes, chronic obstructive pulmonary disease (COPD)/asthma, and cancer at an earlier age than others. Across the board, those with bipolar illness have been found to have a greater number of medical complications as well as increased mortality [5, 6]. One study showed a dose–response-type relationship between panic and asthma, and bidirectional longitudinal associations between the two conditions [7]. These associations have been attributed not only to maladaptive health behaviors which are more common in those with psychiatric illnesses, but also to the physiologic effects of psychiatric illness.

The role of depression as an overall health risk is becoming more widely accepted. The American Heart Association (AHA) has released a statement elevating depression to the status of a risk factor for those with acute coronary syndromes “the preponderance of evidence supports the conclusion that depression after acute coronary syndrome is a risk factor for all-cause and cardiac mortality, as well as for composite outcomes including mortality or nonfatal cardiac events. As such, depression should be elevated to the level of a risk factor for poor prognosis after acute coronary syndrome by the American Heart Association and other health organizations” [8].

One study reviewed 16 studies on depression or anxiety as predictors of COPD outcomes. These studies suggested that the presence of depression or anxiety consistently increased the risk of having poor COPD outcomes [9]; comorbid depression increased the risk of mortality [9]. The authors noted that psychologic distress increased the risk of COPD outcomes/mortality in most of the studies they reviewed. With regard to causation, COPD consistently increased the risk of depression [9], indicating a directional factor to the psychological status and health condition.

## Dysphoria Associated with Diagnosis

Perhaps the most salient response to diagnoses with a distressing illness is often not the specific illness but individual differences with regard to resilience and how one perceives the meaning and challenges of the illness. In some ways, the most important aspect of how one experiences illness may be whether the existential question is framed as *why me* versus *why not me*. Both issues may be expressions of adaptive or maladaptive coping depending upon how the individual answers this question for themselves.

*Why me* is a common question from those facing a newly diagnosed medical illness. The question is often associated with disbelief and sadness that there may be spiritual reason that illness develops. However, such a question may also be protective in that it could suggest that the person recognizes that the health condition may in part be bad luck and/or unfair. Thus, as a diminishing component to one's identity, it is not readily accepted. Rather, the illness is given a controlled space in the individual's life where it can be monitored and kept at bay. Dangers of grappling with this question are that the individual may become stuck in a search for meaning where there is none to be found. There is also a risk that he/she may fail to integrate the necessary steps to manage the illness.

*Why not me* often arises less acutely, and sometimes not at all rather than a question the fairness of a medical diagnosis, asking this question could be seen as a diminutive acceptance that the illness is just. However, it more likely arises as a way of accepting the challenge as reasonable, given one's risk factors or lifestyle. This question may also serve to reinforce that the illness may be random or unfair, and thus equally distributed. On a more sophisticated level, it may also be a way through which the patient reinforces to him/herself their ability to take on, manage, overcome, and/or integrate the disease into his/her life.

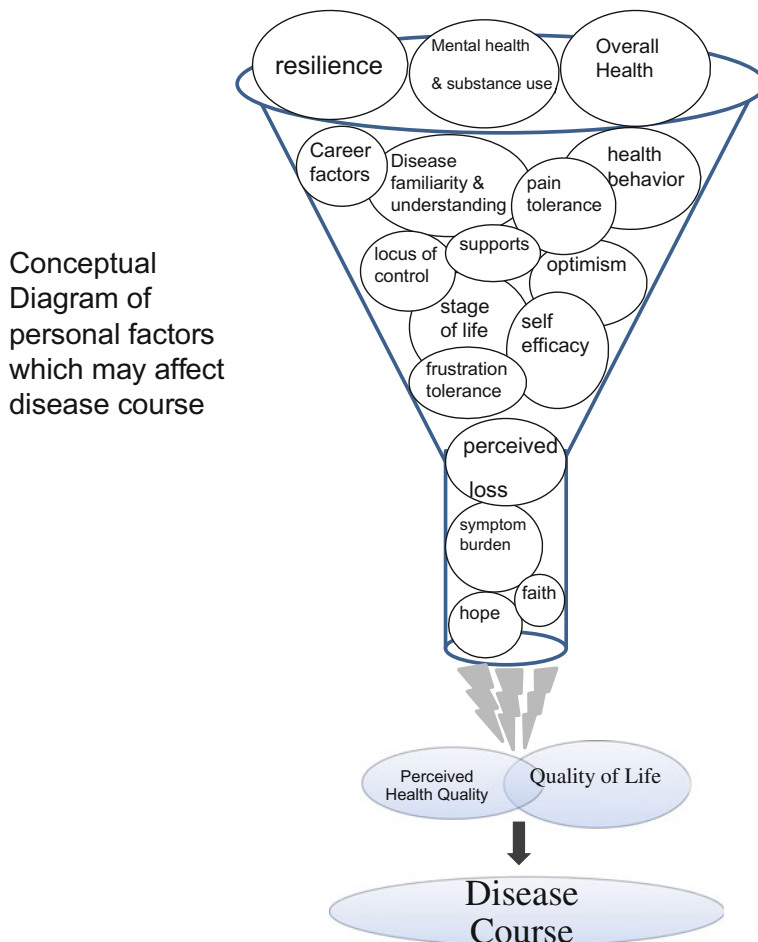
The biobehavioral and social factors which affect the course of a serious health condition and the ways in which lifestyle, coping, and longevity are likely to be impacted are likely modified by numerous factors.

Individual-specific factors include the following: resilience, presence or absence of psychopathology, medically comorbid conditions, general health behavior, optimism level, comprehension of the disease, previous exposure to the illness (familiarity), substance reliance (alcohol, tobacco, and illicit substances), stage of life when the illness develops or is diagnosed, locus of control, pain tolerance, self-efficacy, ability to utilize care (adherence), career, faith (religion, in others, etc.), frustration tolerance, and the burden of specific symptoms such as fatigue, degree to which the illness physically or mentally impacts the patient or threatens identity or is associated with pain (e.g., change in strength, physical appearance, and vision). We conceptualize these factors visually as a funnel through which the individual characteristics are squeezed to determine perceived health quality and quality of life, and ultimately the disease course (see Fig. 1.1).

The presence of more serious symptoms of depression such as feelings of helplessness and hopelessness is also likely to negatively impact coping and outcomes.

External or social factors would include the following: access to care, social supports, *social status* of the disease being faced, understanding by care providers of the etiology of the disease, how the family reacts to the disease, limitations on the disease, how its treatments or the diagnosis itself impinges on career/job performance, and ability/resources to follow through with care (insurance benefits and transportation).

The above may dramatically drive the course of a disease in the individual. For example, a patient diagnosed with multiple sclerosis with significant Uhthoff-related disability (heat intolerance) would be expected to face the



**Fig. 1.1** Conceptual diagram of personal factors which may affect disease course

anticipation of disease management better if she lived in a cool climate, worked in an air-conditioned building, with low perceived psychosocial stress, resources to work part-time and access to physical exercise options, than would a steel worker who is the sole income earner for her family and with minimal resources. However, it is critical to remember that the weight of each of these factors will differ and despite all risk factors pointing to a patient being high or low risk, any single factor may tip one to an adaptive or maladaptive coping response, disease course and outcome.

Older people are often less dramatically impacted by new medical diagnosis, apparently because they have had more extensive history with health-related problems than the young, and because new health problems are less likely to be perceived as dramatically altering activities of daily living than for the young.

Some research suggests that the concept of unmet needs may affect this, as older cancer patients appear to cite unmet needs as less impactful to them than do younger patients [10].

There are several sources of mood disturbance in those struggling with chronic respiratory illnesses. Patients may have preexisting mood disorders, but they may also develop a reactive mood disorder consequent to the limitations caused by their respiratory illness.

In patients hospitalized for COPD, 30-day mortality rates were significantly higher in those with depression and anxiety diagnosis [11]. Willgoss et al. reviewed 10 studies (out of 410 examined) which met criteria for review if prospective, included diagnosed anxiety disorders from a clinical interview using an established psychiatric format, and published in English. Their review suggested that the presence of clinical anxiety was quite high in those with COPD ranging from 10 to 55% (median 17%) in all subject samples [12]. They note that social phobia and specific phobia were particularly prevalent.

Neither the presence of a significant medical condition nor its severity is necessarily associated with the experience of grief, anxiety, or dysphoria. Numerous studies have examined the presence of mood disorders in medically compromised populations but getting to the answer of why some patients are more vulnerable and a reliable model for identifying at-risk patients has been notoriously elusive. It appears that no single factor consistently dictates the course of medical illness. This suggests that it is imperative to carefully evaluate patient risk and protective factors and to tailor treatment to the individual.

## **Physiological Basis for Depression and Anxiety in Chronic Medical Condition**

A properly functioning respiratory system maintains a constant supply of  $O_2$  in the cells and removes  $CO_2$  to assist in the regulation of blood acidity. Chronic medical conditions not only affect these functions but also negatively affect other body systems that work in coordination with the respiratory system. Disruption of proper respiratory function may negatively impact central nervous system (CNS) function and promote depression and anxiety beyond the effect that any chronic condition has on mood due to impaired quality of life.

Chronic respiratory conditions specifically predispose one to low levels of blood oxygen. Delivery of  $O_2$  to cells, including brain cells, is compromised when arterial partial pressure of oxygen declines below 58 mmHg. With the progression of chronic respiratory conditions, oxygenation declines initially during exertion and sleep. However, with progression of the disease, patients remain hypoxic constantly with worsening hypoxia during sleep and exertion. Further, with worsening respiratory disease, gradual chronic retention of  $CO_2$  occurs.

In addition to several functional and psychological reactionary bases for depression in patient with chronic respiratory condition (see prior section), physiological derangements resulting from chronic respiratory conditions may cause structural changes in CNS and promote depression due to organic causes. Giltay and colleagues in a longitudinal follow-up of a large cohort showed that low lung volume was associated with increased risk of depressive symptoms in future [13]. Similarly, the prevalence of depressive symptoms was higher in COPD patients with severe lung function impairment [14].

The main question that is not answered is to what degree organic issues related to chronic respiratory conditions promote depression versus the quality of life and nonorganic issues resulting from chronic respiratory conditions.

Hypoxia (both chronic and intermittent) affects the production of various neurotransmitters at the level of central and peripheral nervous systems [15]. Among respiratory conditions associated with hypoxia including sleep-disordered breathing, lower airway diseases, and lung parenchymal diseases, hypoxia is a unifying phenomenon. One of the phenomena examined in the depression literature is “vascular depression.” As an individual ages, the prevalence of MRI-defined subcortical hyperintensities rise as the prevalence of depression rises. Considering that patients with chronic respiratory conditions usually are older and have higher prevalence of cardiovascular and metabolic conditions (diabetes and obesity), it is likely that hypoxia (continuous or intermittent) on the background of cerebrovascular diseases will intensify the local hypoxic conditions and produce more structural changes (MRI-defined subcortical hyperintensities), and thus more predisposition to vascular depression. Interestingly, Van Dijk and colleagues, after adjustment for common risk factors of cerebrovascular disease, identified low O<sub>2</sub> and COPD as major risk factors for the presence of periventricular white matter change in a large sample of patients [16]. Role of hypoxia in causing depression is also shown in patients with sleep-disordered breathing [17]. In contrast to hypoxia, it is not clear whether hypercapnia exerts additional detrimental effect on cognition and mood despite higher prevalence of depressive symptoms in severe COPD.

Other potential organic mechanisms linking chronic respiratory conditions to depression are oxidative stress at the level of microvasculature. Forlenza and colleagues showed increased oxidative damage correlating with the severity of depression [18]. Similarly, oxidative stress was higher in patient with COPD [19]. Thus, it is likely that the exposure to a milieu with higher oxidative stress will promote depression in patients with COPD. However, effects of anti-oxidants on depression in patients with COPD are not known.

With advancement of pharmacotherapy, chronic medical conditions are managed with various combinations of medications. The medications improve symptoms and functionality. In many situations, they may also improve sleep quality and reduce hypoxia. Thus, lack of proper pharmacotherapy can contribute to depression in chronic respiratory conditions. In contrast, some of the therapies for respiratory conditions may result in jitteriness and disturb sleep, and thus may indirectly contribute to mood problems. However, optimization of medical therapy improves patient’s quality of life and reduces symptoms, thus improving overall quality of life and mood.

## Summary

Chronic medical conditions, through various mechanisms, may result in mood disorders. The higher prevalence of the mood disorders in these patients is multifactorial and includes the effects of chronic illnesses on quality of life and on ability of the affected individuals to function. In addition, severity of hypoxia plays a crucial role in promoting mood disorders. Some major questions which remain to be explored on the relationship between medical illness and psychological functioning include the following: what if any physiological component to the disease process itself increases risk for mood disorder, is there a kindling effect from dyspnea or air hunger, what are the protective or resilience factors against development of anxiety or depression with comorbid respiratory disease, and how can we provide intervention early on to prevent the development of mood disorders in patients who are vulnerable. An additional question is if we treat mood disorder symptoms more proactively and routinely, is the course of the disease itself altered. We believe that the likely answer to this will be yes.

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