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Occupational Therapy Interventions for COPD



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Introduction

Occupational therapists who work in home health, outpatient, and acute care settings will treat clients impacted by chronic obstructive pulmonary disease. With the variety of environmental factors that can cause COPD, it's possible that more rehabilitation providers will see individuals affected by this chronic condition. Occupational therapists should firstly be knowledgeable about intervention strategies, such as breathing exercises, that can assist in symptom management and quality of life for those living with this condition. However, it's also essential for OTs to know how to apply those strategies within their scope of practice in order to support a client's occupational performance.

Section 1: COPD Background Information

References: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Chronic obstructive pulmonary disease (COPD) is a chronic condition that affects a person's respiratory function. There are several lung-related changes someone may experience as a result of COPD. These include decreased elasticity within the air sacs and airways of the lungs; destruction of air sac walls, which leads to misshapen air sacs that are larger in size but fewer in number; inflamed, thick airway walls; and increased production of mucus.

COPD Symptoms

These anatomical changes often lead those with COPD to experience the following symptoms:

- Heaviness in the chest
- Chest tightness

- Chronic fatigue
- Productive cough, often with green- or yellow-tinged mucus
- Whistling and wheezing when breathing
- Shortness of breath during both strenuous and regular daily activities
- Recurring lung infections that take a long time to recover from
- Decreased muscular endurance (this symptom is more common in later stages)
- Weight loss (this symptom is more common in later stages)
- Chronic edema in the lower body (this symptom is more common in later stages)

Similar to those with other chronic conditions, individuals with COPD may experience exacerbations or flare-ups, which are periods when their symptoms worsen. Exacerbations of this condition may be caused by illness (most often pneumonia, allergies, influenza, and bacterial or viral infections) or environmental factors. Common environmental factors that tend to trigger COPD exacerbations include exposure to air pollution (smoke, pollen, dust, etc.), smelling certain strong odors, and being outdoors in cold temperatures.

Exacerbations can come on relatively quickly, sometimes within a matter of hours after being exposed to an irritant. These episodes often last from a few days to a few weeks, since their duration and severity are dependent on the magnitude and length of exposure to the trigger. Some individuals may require hospitalization during a COPD exacerbation to help medically manage their symptoms, which may include:

- Fever (this symptom is present in more serious exacerbations)

- Increased frequency of coughing
- Increased mucus production, thickness, or color changes (often a darker yellow or green than usual, but may also be bloody or brown)
- Increased shortness of breath
- Shallow, rapid breathing
- Headache
- Increased fatigue, potentially also paired with disorientation
- Decreased blood oxygen (SpO2) levels

OTs and other healthcare providers should be aware of the clinical indications that are considered an emergency. For patients with COPD, these include:

- Grey or blue-ish lips and fingernails (this is an indication of severe oxygen loss)
- Low level of alertness
- Increased heart rate, or tachycardia
- Severe dyspnea
- All-around worsening of COPD symptoms

There are four severity levels of COPD: 1 (mild), 2 (moderate), 3 (severe), and 4 (very severe). Individuals with mild COPD typically experience very few of the above symptoms on a daily basis, though they are likely to become short of breath with exercise or strenuous activity. However, this may not negatively impact their life very much, especially if they avoid those activities. Moderate COPD brings about even more shortness of breath, usually occurring with some daily activities such as ADLs or IADLs. Severe and very severe COPD will both cause a person

increasing difficulty completing daily activities due to shortness of breath, fatigue, and low blood oxygen levels.

COPD is progressive, meaning individuals can expect to move through these stages over time. There is no distinct timeline to the stages, as each person's condition and lifestyle are different. Medical treatments and rehabilitation such as OT and PT can help someone manage their symptoms and maintain function, which allows the progression to somewhat slow.

COPD Types

COPD is considered a broad condition and manifests in two main subtypes: chronic bronchitis and emphysema. It is possible for individuals with COPD to have both of these subtypes, each of which can vary in severity. These terms are not used as much as they used to be, meaning people nowadays are given a COPD diagnosis if they have the above symptoms.

There are some differences between the COPD types. Chronic bronchitis differs from acute bronchitis and emphysema mostly in duration. The chief symptoms of chronic bronchitis are shortness of breath and a severe cough that lasts three or more months out of the year for at least two years. These symptoms stem from significant inflammation in the airways (called bronchial tubes), which is where the condition gets its name from.

Emphysema, on the other hand, more so affects the air sacs in the lungs. The changes in these air sacs makes it more difficult to bring new oxygen into the lungs and, therefore, into the bloodstream. This is what leads to symptoms such as shortness of breath, fatigue, and confusion (in later stages).

COPD Risk Factors

Several extrinsic and intrinsic factors place someone at a higher risk of developing COPD. The most predominant risk factor is cigarette smoking. Anyone who presently smokes or formerly smoked cigarettes is more likely to develop COPD than individuals with no history of smoking. However, this condition can also develop in non-smokers, as there are a range of other risk factors.

Extrinsic risk factors are modifiable, meaning someone can usually change them and other aspects of their lifestyle to lower their risk of COPD. Intrinsic, or unmodifiable, risk factors cannot be changed. These risk factors include:

- Exposure to secondhand smoke
- A history of recurrent childhood respiratory infections or childhood asthma
- A weakened respiratory system, which may occur as a result of chronic infections and conditions such as tuberculosis, certain forms of cancer, pneumonia, or HIV
- Being a woman
    - Due to their average size, women have smaller airways than men. This makes the respiratory system less efficient at fighting off irritants and infections, making them more likely to develop chronic breathing problems such as COPD. In addition, hormones such as estrogen play a part in the progression of conditions such as this.
- A history of maternal smoking during their pregnancy
- Deficiency in a protein called alpha-1 anti-trypsin (AATD), which is a genetic deficiency of a protein that protects the lungs from infection and disease
- Deficiency in Vitamin D

- Having a lower education level
- Being unable to work
- Being over the age of 40 (with an especially high risk for people over the age of 65)
- Being of a low socioeconomic status
- Living in a rural area
- Having airway hyperresponsiveness, which is commonly associated with asthma and makes the respiratory system increasingly sensitive
- Exposure to indoor or outdoor air pollutants such as smoke, chemical fumes, allergens (dust, pollen, pet dander, etc.)
    - This exposure may come from burning coal, kerosene, wood, or other combustible materials; cooking, cleaning, or doing other similar activities without proper ventilation; and exposure to chemical fumes in the workplace or the home.
- Having low or irregular access to healthcare services

COPD Prevalence

As of 2023, 3.8% of adults over the age of 18 were living with COPD. In the same year, 0.4% of adults ages 18 to 24 had the condition, whereas 10.5% of those over the age of 75 had the condition. This supports the evidence that older individuals are at a greater risk of this condition than younger individuals.

While women tend to be at a higher risk of COPD as a whole, there are some differences in gender prevalence between the two types of COPD. Rates of chronic bronchitis are higher in women than in men, while rates of emphysema are higher

in men than in women. We mentioned earlier that individuals with a past or present history of smoking are at a higher risk of COPD than non-smokers. Statistics support this – as of 2022, COPD rates were 7 times higher in current smokers than never smokers and 4 times higher in former smokers than never smokers.

In addition, non-Hispanic Asian adults were considered the least likely of all ethnic and racial groups to develop COPD. Understandably, data shows that death rates due to COPD tend to be higher in the older age groups than the younger age groups. However, mortality for older adults with COPD is declining overall, which is likely due to medical advances and greater life-sustaining treatment options.

One study found the global prevalence of COPD is projected to be near 600 million cases by 2050. This suggests condition-specific growth of nearly 23% compared to 2020 prevalence data. Researchers also found the largest growth is expected to take place within females and individuals from middle- or low-income households within poorer countries. This lends further support to OTs remaining well-versed in the treatment of this condition in order to better serve the range of clients they may encounter.

COPD Comorbidities

Individuals with COPD may develop some conditions that stem from the respiratory changes they experience. These comorbidities are delineated by an asterisk (*). Other conditions are known to potentially develop in individuals with COPD, though there is no evidence to show that they are directly related to the condition. In general, systemic inflammation presents itself as the link between many COPD comorbidities. Comorbidities include:

- Cardiac disease

- Diabetes mellitus
- Hypertension
- Pulmonary artery disease*
- Osteoporosis
- Malnutrition*
- Major depressive disorder
- Anxiety disorders
- Arrhythmia
- Heart failure
- Acute coronary syndrome
- Obstructive sleep apnea
- Gastro-esophageal reflux disease
- Venous thromboembolism
- Osteoarthritis
- Skeletal muscle dysfunction
- Frailty
- Lung cancer

Some experts believe that severe or late-stage COPD can reduce the amount of oxygen to the brain, causing mental health concerns such as depression and anxiety disorders to develop. However, there is not enough evidence to show a

direct connection between the two, though they are still considered common comorbidities.

COPD Outcomes

Due to the nature of their condition, individuals with COPD are likely to experience certain adverse functional effects. These stand to impact a person's independence, quality-of-life, and overall well-being. While these differ from person to person based on COPD stage, level of assistance available, and support systems in place, occupational therapists are justified in addressing any of the following occupational deficits that may result from COPD:

- Difficulty managing household tasks and home maintenance, especially those that are essential to their personal safety such as thoroughly cleaning, cooking nutritious meals, and keeping the home free from health hazards
- Poor sleep, including frequent sleep interruptions, low duration of sleep, and decreased sleep quality
- Difficulty completing basic self-care tasks due to symptoms such as shortness of breath, low endurance, and fatigue; for those with COPD who rely on supplemental oxygen, ADLs such as dressing, eating, toileting, and bathing may all be impacted by needing to transport a tank and navigate around their nasal cannula
    - Therapists should be aware that morning ADLs may especially be difficult for patients since this is often when sputum and mucus production peak, leading to worsening symptoms. In addition, this is when someone may experience decreased levels of alertness due to sleep disturbances.

- Impaired performance in employment roles, especially those that involve manual labor or other physical tasks
- Difficulty with socialization due to activity restrictions (resulting from exacerbations or trying to avoid exacerbations)
- Variable mental wellness, which can stem from various factors; symptoms such as chronic fatigue can negatively affect one's mental health, but later-stage COPD can directly impact brain health, leading to the development of conditions such as anxiety disorders and depression

COPD Treatment Settings

Individuals with COPD may be treated in various practice settings. OTs may encounter someone with an acute COPD exacerbation in the hospital or someone in the sub-acute phases of an exacerbation in a skilled nursing facility or outpatient clinic. Individuals with late-stage COPD or those who have several comorbidities and have become homebound may receive rehabilitation through home health.

Depending on the person's admitting diagnosis and main health concerns at the time, the rehabilitation process can take many forms. Let's say a home health OT is treating someone who recently experienced diabetic ketoacidosis but also has osteoporosis, hypertension, and COPD. This patient may receive education and training on disease maintenance, wellness plans, and symptom management to address each of their chronic conditions. If an outpatient OT is treating someone with COPD after a recent hospitalization, they may provide pulmonary rehabilitation.

As we mentioned, pulmonary rehab is most often provided in a group outpatient setting, either through an independent or a hospital-affiliated clinic. Someone can

also participate in pulmonary rehab via telehealth or home health, if the circumstances allow. The specifics vary from location to location, but most interprofessional teams providing pulmonary rehabilitation consist of physical therapists, occupational therapists, respiratory therapists, doctors, nurses, dietitians, and exercise specialists. The duration of pulmonary rehabilitation varies, but it tends to be more fixed than most therapy plans of care. Pulmonary rehabilitation can last between 6 and 12 weeks in outpatient settings, but the exact length is based on the specific skills addressed, the patient's insurer, and clinic resources.

Pulmonary rehab consists of a structured, modified exercise program focused on improving endurance and strength along with education about managing one's condition. Depending on a patient's symptoms, they may or may not use supplemental oxygen during these exercises. Pulmonary rehab providers also offer home programs so that patients can continue exercising safely and consistently outside of sessions. Pulmonary rehab consists of the following:

- Support programs, such as those to assist with smoking cessation, weight loss, and other lifestyle changes
- Weight training (this is often alongside an exercise specialist)
- Breathing retraining exercises
- Emotion regulation training and stress management
- Use of exercise machines
- Medication management education
- Nutritional counseling

As we mentioned, occupational therapists certainly have a place in many pulmonary rehab programs. However, there are a lot more specifics to their role in

the evaluation and treatment of individuals with COPD. We will detail those aspects of OT's role in the coming sections.

Section 1 Personal Reflection

Which of the pulmonary rehabilitation services we outlined appear to be within OT's scope of practice? Which, if any, are explicitly not within an OT's scope?

Section 1 Key Words

Dyspnea - Shortness of breath

Nasal cannula - The two-pronged end of tubing that is inserted into the nostrils to provide supplemental oxygen

Section 2: OT Assessment of COPD

References: 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37

In order to understand what assessments are most useful for COPD, therapists should know what the main aim of occupational therapy treatment is for people with this condition. Across any practice setting, OTs will assist individuals who have COPD in building muscular and cardiorespiratory endurance along with managing symptoms in a way that preserves function and safety.

As with any condition, functional observation is key to understanding how a person with COPD currently goes about daily activities. These insights should be supplemented with other data, as occupational therapists rely on a range of standardized assessments to evaluate these areas. It is important to remember that other assessments may prove beneficial based on a therapist's judgment and

a patient's presenting concerns. However, the following assessments have been identified in the literature for their utility:

- Metabolic Equivalent (MET) levels
- 6-minute walking test (6-MWT) (also known as the 6-minute walking distance, or 6-MWD)
- Chronic Obstructive Pulmonary Disease Lower Respiratory Tract Infection Visual Analogue Score (c-LRTI-VAS)
    - Research shows this modified VAS is reliable for assessing individuals experiencing acute COPD exacerbations.
- Baseline Dyspnea Index (BDI)
- Transitional Dyspnea Index (TDI)
    - Studies have proven the TDI and BDI are both effective measures of dyspnea in those with COPD. More recent research suggests these tools can also be helpful for other respiratory conditions such as sarcoidosis.
- Oxygen Cost Diagram (OCD)
- Endurance Shuttle Walking Test (ESWT)
    - Evidence has found the ESWT to be responsive to various aspects of pulmonary rehabilitation in individuals who have COPD.
- 6-minute Stepper Test (6MST)
    - One study used the 6MST to determine that 59 or more steps may predict a person's likelihood of COPD exacerbation.
- Sit-to-Stand Test (STST)

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    - The 1-minute Sit-to-Stand Test has been noted as particularly useful for this population due to its ability to pinpoint exercise-triggered oxygen desaturation.
- Modified British Medication Research Council (mMRC) Questionnaire
- COPD Assessment Test (CAT)
    - Literature shows this test is not used very often, though higher scores on the CAT have been linked to greater COPD exacerbation likelihood and increased need for medication management.
- Hospital Anxiety and Depression Scale (HADS)
- Canadian Occupational Performance Measure (COPM)
- Chronic Respiratory Disease Questionnaire
- Goal Attainment Scaling (GAS)
- BORG Rate of Perceived Exertion (BORG RPE) Scale
- Modified Rate of Perceived Exertion (RPE) Scale
- Vital signs
    - Evidence shows that the duration of abnormal vital sign readings in patients with acute exacerbations of COPD is longer for those who experience serious adverse events. One study continuously monitored hospitalized patients for unusual changes in oxygen saturation levels, heart rate, blood pressure, and respiratory rate. Results showed that 25% of patients who received this monitoring experienced a serious adverse event. Of the participants who experienced these events, they had vital sign abnormalities for 455 minutes within a 24-hour period. Individuals without adverse events

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experienced these abnormalities for 292 minutes within the same time frame. Patients with adverse events experienced an average of 48 minutes of abnormal respiratory rates as opposed to 30 minutes in patients without events. These changes could potentially be used to predict risk of serious adverse events in patients within acute hospital settings.

    - Certain vital signs associated with dyspnea are considered a medical emergency. These include a respiratory rate above 30 breaths per minute, blood oxygen saturation levels below 90% (SpO2), and a heart rate over 120 beats per minute (bpm). If a patient demonstrates these vital signs along with confusion, crackling breathing, arrhythmia, blue skin or lips, asymmetrical breathing, and difficulty verbalizing complete or comprehensible sentences, this is considered a medical emergency.

- Multi-Stage Fitness Test (also known as the Beep Test or Multi-Stage Shuttle Run Fitness Test)
- Incremental Shuttle Walk Test (ISWT)
    - Literature demonstrates that the ISWT is more strongly correlated with measuring peak oxygen uptake (VO2) levels than similar tests such as the 6MWT.
- Dynamometry
    - Handheld dynamometers have been found as valid and reliable methods of measuring maximum voluntary isometric strength of upper body musculature in those who have COPD. Specifically, muscles of note included elbow flexors, elbow extensors, and shoulder abductors.

- BODE (Body Mass Index, Airflow Obstruction, Dyspnea, and Exercise Capacity) Index
    - Evidence shows the BODE Index offers a multidimensional perspective when evaluating COPD patients. This tool utilizes FEV1 to measure airflow obstruction, the mMRC scale for dyspnea, and the 6-MWT for exercise capacity. The BODE Index has been viewed as clinically significant when it comes to determining both systemic and pulmonary-specific disease characteristics, even more so than traditional tests such as spirometry. These components allow the BODE Index to effectively categorize COPD risk, progression, and mortality.
- Sniff Nasal Inspiratory Pressure (SNIP) and Reverse-Sniff Nasal Expiratory Pressure (RSNEP)
    - The SNIP and RSNEP were found to effectively complement the scores of the maximum mouth inspiratory pressure (MIP) and maximum mouth expiratory pressure (MEP) when used in patients recovering from COPD exacerbations. The SNIP and RSNEP were also significantly correlated with BODE scores. This shows they are good predictors of poor life expectancy when used in tandem.
- St. George's Respiratory Questionnaire (SGRQ)
    - Evidence shows the SGRQ can be used to screen patients for COPD if they are at risk of this pulmonary condition. The SGRQ is especially useful alongside the Peak Expiratory Flow (PEF) or when spirometry is inaccessible.
- Clinical COPD Questionnaire (CCQ)
- COPD Assessment Test (CAT)

- Chronic Respiratory Questionnaire (CRQ)
- Numeric rating scale (NRS)
    - While typically used to assess pain, this scale can be modified to score COPD patients on shortness of breath. For instance, the range can be 0-10 to where 0 represents no breathlessness at all and 10 stands for the worst breathlessness imaginable. This type of test can also be used in visual form for patients with lower health literacy or comprehension skills.

A dated longitudinal study found frailty and COPD to be strongly associated. Specifically, patients with COPD who are considered medically frail are more likely to experience changes in mobility skills, dyspnea symptoms, endurance for and ability to participate in physical activity, grip strength, and strength of quadriceps muscles than individuals with COPD who are not considered frail. This same study found that the occurrence of COPD exacerbations and ability to complete five repetitions of sit-to-stands were independent (and strong) predictors of a person's ability to improve their status as a frail individual. Such evidence indicates that use of outcome measures in each of the aforementioned skill areas is also medically justifiable to offer a comprehensive assessment for patients with COPD.

Therapists treating patients with COPD in a hospital setting should also be aware of the more medically-based assessment process for this condition, which is the Global Initiative for Chronic Obstructive Lung Disease (GOLD) combined COPD assessment. The GOLD was last updated in 2023 and consists of several components, leading it to be quite a comprehensive test. The GOLD consists of spirometry (to determine the severity of the patient's airway inflammation), a dyspnea evaluation (most often measured by the mMRC or CAT), and a medical history review that determines how many moderate or severe exacerbations a patient has had (and which have led to hospitalizations for COPD or related

concerns). In addition, providers must rank a patient's airflow limitations on a scale of 1 to 4 as well as their exacerbation risk and symptom burden on a letter scale between A and D. Patients who are classified as either 1 or 2 are those that have fewer symptoms and higher quality of life while patients who are given a 3 or 4 have more severe exacerbations two or more times yearly. The exact classifications are as follows:

- **GOLD 3-4 (c)**: 2 or more exacerbations per year; CAT score less than 10; mMRC score of 0-1
- **GOLD 3-4 (d)**: 2 or more exacerbations per year; CAT score of 10 or more; mMRC score of 2 or more
- **GOLD 1-2 (a)**: 1 or more exacerbation per year; CAT score less than 10; mMRC score of 0-1
- **GOLD 1-2 (b)**: 1 or more exacerbation per year; CAT score of 10 or more; mMRC score of 2 or more

While therapists do not participate in the completion of the GOLD itself, its results are important to know since symptom severity and exacerbation risk will factor into an OT's treatment determination.

Section 2 Personal Reflection

Which of the assessments we discussed may be the most appropriate for inpatient settings? Outpatient settings? What is the reasoning behind those selections?

Section 2 Key Words

Maximum mouth expiratory pressure (MEP) - The maximum amount of pressure exerted by the respiratory muscles that is used when someone forces an outward breath (expiration); also known as maximal expiratory pressure

Maximum mouth inspiratory pressure (MIP) - The maximum amount of pressure exerted by the respiratory muscles that is used when someone takes an inward breath (inspiration); also known as maximal inspiratory pressure

Peak Expiratory Flow - A medical test that measures the amount of air flow leaving the lungs

Section 3: Literature on OT Intervention for COPD

References: 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51

Several research studies outline the efficacy of OT intervention (provided in various formats and settings) when provided to individuals with COPD. For instance, a scoping review from Goubeau et al. (2022) looked at patient outcomes after individuals participated in pulmonary rehab groups led by OTs. Results found that participants experienced an improvement in occupational performance in this setting. Finch et al. (2022) also explored the role of OT in pulmonary rehab programs. These researchers found that OTs most often provided education on energy conservation strategies, training on breathing techniques, and task modification pertaining to ADL completion. Findings also showed positive patient outcomes as a result of OT participation, especially when it came to improved dyspnea management, pulmonary function, quality of life, ADL function, and lower mortality risk. OTs are not always considered a fixture in pulmonary rehabilitation programs, and Finch et al. discovered this since respondents reported highly variable amounts of participation in such programs with some

therapists operating independently of these programs altogether. These studies and similar research can serve as clinical justification for our integration into such a setting.

A study from McCowan et al. (2023) explored what therapists targeted through their interventions. Findings showed that OT interventions provided to people with COPD addressed body functions/structures and activities/participation in almost equal parts. Environmental factors were also addressed, but to a somewhat lesser extent. While the impact of these interventions was not studied as closely in this research, investigators did find that enhanced quality of life and improved physiological symptoms were among the benefits. These study findings use OT Practice Framework terminology to highlight the shared importance of each area for providers treating this population.

Other studies looked into more specific concerns that were addressed most frequently by OT intervention. A dated randomized controlled trial found that mobility, active recreation, and household management were the chief presenting deficits for patients with COPD. Koolen et al. (2021) found that productivity and mobility were the most commonly addressed areas as well as those that improved the most as a result of home-based OT. Leisure and self-care were addressed the least frequently in this setting. Kaptain et al. (2021) looked even further into the mobility, ADL, and IADL domains. Their research found the most salient concerns were related to functional mobility (both indoors and within the community), lower body dressing, shopping, cooking, bathing, cleaning the house, doing laundry, and performing lower body nail care/hygiene. Upon further exploration, these researchers found these functional deficits most often stemmed from impaired motor and process skills. In addition, there were major differences noted between observed ADL deficits and self-reported ADL deficits. This highlights a need for therapists to assess and address impairments in self-awareness and insight to provide the most effective care.

A dated study investigated the efficacy of a personalized pulmonary rehabilitation program or PPR, which included OT along with cardiopulmonary exercise testing. The main aim of the program was to minimize the occurrence of sympathetic nerve activation and oxygen desaturation throughout ADLs and other daily activities. The study explored the impact this program had on COPD prognosis and exercise-related complications such as respiratory acidosis, hypoxemia, and sympathetic overactivity. Results found the program improved mortality rates from any cause. Furthermore, program participant mortality rates from any cause were termed extremely low when measured 5 years and 7 years after the program started. Lastly, patients who experienced life-threatening pathophysiological conditions during this time frame also saw greater survival rates.

Kaptain et al. (2024) looked into the use of assistive technology with people who have COPD. This literature review found that assistive technology was applicable and useful across nearly all OT domains: socialization, health management, ADL function, IADL function, rest/sleep, and leisure. However, most of the research pertaining to assistive technology and COPD was surrounding its use for health management. The research that does exist on this topic demonstrated how crucial everyday technology was to help those with COPD preserve their independence and conserve energy.

Wilde et al. (2023) explored the use of one technology by people with COPD: activity trackers. This research highlighted benefits and barriers to using trackers to assist with health management. Researchers found that patients frequently need to gain experience with and skills in using activity trackers for this purpose. However, objective physical activity parameters can be useful in helping improve activity levels and adhere to provider-recommended exercises. Since there is a high level of variability and accessibility across different activity monitors, it is important that therapists and COPD patients alike have support when using such trackers in practice.

A randomized controlled trial from Cazorla et al. (2023) looked at the effectiveness of breath control exercises in avoiding COPD exacerbations when provided by occupational therapists in a group setting. The study added breath control exercises to typical exercise programs (consisting of strength training, endurance training, and patient education) provided in an inpatient hospital. Over a course of 6 weeks, participants received 20 sessions lasting 30 minutes. Results showed the experimental group experienced significant improvements in quality-of-life, grip strength, and sit-to-stand times.

Lastly, OT researchers Fields & Smallfield (2022) set forth practice guidelines that OTs should utilize when treating individuals with specific chronic conditions: kidney disease, diabetes, heart disease, and chronic lung diseases. These guidelines heavily emphasized therapists teaching self-management skills through a combination of goal-setting, education, and problem-solving. These skills along with a preventive approach can assist individuals with COPD and similar chronic conditions in developing routines and habits to manage their symptoms in the long term.

Section 3 Personal Reflection

If at all, how might OT treatment for COPD differ from treatment for other chronic conditions?

Section 3 Key Words

Hypoxemia - Low levels of blood oxygen

Respiratory acidosis - Low/acidic blood pH levels that stem from weak lungs that have difficulty removing carbon dioxide from the body

Sympathetic overactivity - A prolonged state of nervous system stress or overload

Section 4: Occupation-Based OT Interventions for Patients with COPD

References: 52, 53, 54, 55, 56, 57, 58, 59, 60

In order to understand the most suitable OT interventions for patients diagnosed with COPD, therapists must be aware of what adverse outcomes may result from lack of treatment. This will serve several purposes. Firstly, this allows OTs to offer proper education to patients about the potential course of the condition. Knowledge of adverse outcomes also gives therapists a greater understanding of the risks their patients face. By properly assessing risk, OTs can tailor interventions to the specific patient.

The chief long-term effects or complications of COPD include depression, anxiety disorders, impaired cognition, lower quality-of-life, lower capacity for physical activity and exercise, and a greater risk of mortality. There are various categories of interventions that are shown to be beneficial for individuals with COPD.

Lifestyle Redesign

Health maintenance is a major aspect of lifestyle redesign for those with COPD. This includes taking steps to medically manage one's COPD as well as any comorbidities. Therapists can encourage patients to regularly see a pulmonologist and any other specialists that help manage their care. This also applies to following up with any referrals these providers make. Another aspect of health maintenance is getting regular vaccinations to avoid seasonal illnesses that may cause exacerbations.

Lifestyle redesign also consists of planning and scheduling activities in a way that does not interfere with or worsen existing symptoms. Some ways to do this include checking the weather ahead of any outdoor plans (whether it be

community outings for appointments or social events). If possible, it's advised to move plans to avoid poor weather conditions, especially at times when the pollen count or pollution is high or there is a lot of wind. Extreme temperatures – either hot or cold and humid or dry – can also exacerbate respiratory symptoms. There are certain times of day that are known to have peak poor air quality, which is traditionally between 1:00 pm and 4:00 pm. People with COPD should also plan daily activities (indoors or outdoors) in a way that accommodates their energy levels and allows for breaks, availability of assistive devices if needed, and close proximity to home or other lodging.

Other lifestyle modifications include smoking cessation (if the patient smokes or vapes), avoiding lung irritants of any kind, regularly taking prescribed medications, remaining active, and adhering to oxygen therapy (if recommended by their provider). Changing one's diet is another lifestyle change that has been proven to slow COPD progression. To assist with boosting the immune system and managing symptoms, individuals with COPD are advised to seek out foods with Vitamins A, C, D, and E along with iron, magnesium, and zinc. Omega-3 fatty acids and antioxidants are also considered key immune boosters.

Each component of lifestyle redesign allows individuals with COPD to preventively and proactively manage symptoms, which is an important skill for one's health.

Education

The cycle of muscle deconditioning is one of the most important pieces of education for individuals with COPD. Therapists must inform patients of the negative effects associated with drastically reducing their physical activity levels. While some modifications are realistic and necessary to help avoid exacerbations, it is important to continue being physically active in certain ways to improve

disease prognosis, reduce the likelihood of hospitalization, and decrease risk of early mortality.

Breathing techniques are another strategy therapists should educate patients about. While pursed lip breathing exercises are some of the most commonly regarded, they are not the only ones patients with COPD should know. These include:

- Pursed lip breathing exercises:
    - Breathe in through the nose only while using the abdominal muscles to slowly fill the lungs with air.
    - Slowly breathe out through the mouth with lips gently resting on one another. If you hear a quiet hiss as you breathe out, this step is being done correctly. Do this step even more slowly (ideally, for twice as long) than the first one to expel as much air from the lungs as possible. This helps make room for cleaner, fresher air.
    - Repeat these steps several times as needed to manage dyspnea and other symptoms.
- Deep breathing and coughing
    - Take a deep breath in through your nose and hold it for as long as you comfortably can. This helps open the airways to allow for a greater breath capacity. You can use an incentive spirometer for this step if you wish.
    - Open your mouth and forcefully let the air out as you strongly cough.
    - Repeat these steps several times each hour, as this helps expel accumulation from the lungs and decreases risk of infection.

- Diaphragmatic breathing with resistance
    - Sit or lay in a comfortable position.
    - Place one hand flat on your stomach just below your ribs and your other hand flat on your chest.
    - Slowly and deeply breathe in through your nose. Pay attention to the hand resting on your stomach. The hand should rise as the diaphragm expands to allow air to enter the chest cavity.
    - Once you cannot breathe in anymore, purse your lips and slowly breathe out. As you do this, engage the muscles in your abdomen while gently pushing your hand down. This helps engage the diaphragm to push as much air out as possible.
    - Practice this multiple times each day starting with 1 minute and gradually increasing the amount of time in each breathing session.

This education should be paired with other interventions, namely activity modifications and energy conservation techniques, so that patients can achieve the proper balance between overexertion and a sedentary lifestyle while participating in functional activities. This allows COPD education to be occupation-based. Therapists can also educate patients on spoon theory, which is a visual concept that allows individuals a greater understanding of rationing their energy. Since spoon theory can apply to nearly any chronic condition, it may be useful to help individuals with COPD manage physical and emotional energy. The basis of spoon theory involves the difference between healthy individuals (who may start their day with 10 ‘spoons’ of energy, say) and chronically ill individuals (who may start their day with 7 ‘spoons’ of energy, for instance). Individuals with COPD should understand how many spoons they have at any given time and estimate

how many spoons each of their frequently performed activities requires. This allows them to plan their days accordingly.

If an individual with COPD utilizes supplemental oxygen, they should be educated as to maintenance for this equipment. Occupational therapists can inform patients with COPD of how to properly care for their medical equipment and, in many cases, therapists can even help patients carry out these tasks in the event they'd like to be more independent in such maintenance:

- Tank storage
    - For those being currently used, ensure proper placement in a cart or stand
    - For extra tanks, ensure they are flat on the floor
    - Avoid storing any tanks in cabinets, closets, or other unventilated areas
    - Do not place items (especially clothing or other flammable items) over tanks
- Safe use of oxygen
    - Keep oxygen away from any open flames (heaters, stoves), electric appliances (hair dryers, curling irons, heating pads, electric razors, etc.), and aerosol products (hairspray, spray deodorant, cleaners, etc.) to avoid fire
    - Post 'no smoking' signs within the home, especially in every room where oxygen is currently used
    - Keep oil- or petroleum-based products (lotions, creams) away from oxygen supplies

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    - Patients should be prompted to ask their DME provider or pulmonologist if they'd like more specifics about fire safety with oxygen use

- Device cleaning
    - Nasal cannula should be cleaned weekly using soapy water and a 10:1 water and white vinegar solution
    - Other parts of oxygen tubing should be wiped down on the outside
    - Oxygen concentrator filters should be cleaned weekly with warm soapy water
    - If used, oxygen face masks should be cleaned twice weekly using the same solution
    - Never submerge oxygen tubing in water or other solutions
    - All equipment should be hung until fully dried
- Device replacement
    - Nasal cannula should be replaced every two weeks or immediately in the event of an illness
    - Long oxygen tubing (which attaches to stationary equipment) should be replaced every 3 months

If appropriate, OTs can create goals that help patients learn to safely use oxygen while functionally ambulating and completing ADLs, IADLs, leisure, and community activities.

Home Safety/Modifications

A range of environmental modifications are beneficial to managing COPD. Some of these take the form of household maintenance while others involve adjusting the layout of the home to allow for improved occupational participation. These include but are not limited to:

- Clearing walkways and reducing visible clutter to allow for safe ambulation with or without an assistive device
- Removing throw rugs and carpeting to decrease allergens and make walking safer
- Securing the home's windows and doors to keep allergens out, especially during spring and summer
- Frequently cleaning and changing the filters on air purifiers, furnaces, dehumidifiers, fans, air conditioners, and other electronic devices
- Testing your home for carbon monoxide, radon, and other harmful gases
- Packing a travel bag and placing it in an easy-to-access spot with portable medical equipment and medications for community outings
- Avoiding sources of household smoke or excess fragrance include wood stoves, candles, indoor or outdoor fireplaces, air fresheners, and perfumes
- Dedicating separate sleeping spaces for any pets in the home to keep bed linens clean
- Recognizing and eliminating thirdhand smoke, if any, from the home
- Safely using supplemental oxygen during ambulation, cooking, dressing, bathing, and other occupations

- Using help from friends, family, or paid professionals for strenuous activities such as cleaning, yard work, and grocery shopping; depending on symptoms and finances, people may opt to get this help for heavy or seasonal indoor cleaning and yard maintenance (for instance) or to complete these tasks on a regular basis
- Cleaning the home thoroughly enough to avoid exacerbations while using as few chemicals as possible and also managing energy levels
- Regularly checking the home for water leaks, broken heating ventilation and air conditioner (HVAC) systems, and other potential sources of mold that can lead to exacerbations
- Modifying the bathroom
    - Adding DME such as a raised toilet seat and tub bench or shower chair to allow for resting during toileting and bathing
    - Installing a bathroom fan to manage humidity and ensuring it is properly working as time goes on
    - Installing grab bars in appropriate locations to assist with toilet and shower transfers

Energy Conservation Techniques

There are several components of energy conservation, which are often referred to as the 4 Ps: prioritization, planning, pacing, and positioning. While some may take the forefront on certain days and when completing certain activities, they are meant to be used together to help someone expend less energy and function more efficiently. Therapists and patients wishing to practice energy conservation

techniques to better manage COPD should remember the following tenets as part of each P:

Prioritization

- Chiefly, prioritization means focusing on the most important tasks of the day and ensuring those get done before other activities
    - In order to properly do this, individuals will need to utilize pacing, planning, and positioning, as sometimes the most important tasks are big and difficult.

Planning

- Alternating between light and heavy tasks to manage energy levels throughout the day and prevent exhaustion from any one task
- Organizing one's schedule in a way that allows distribution of heavy tasks throughout the week and pairing with lighter tasks, if any
- Collecting any supplies or ingredients needed before starting a task; this is especially helpful for tasks such as cooking, grooming, and dressing
- Planning is important even when delegating tasks, as patients must ensure support is available when they need it (especially for time-sensitive tasks)
- Structuring activities and travel in a way that allows for enough sleep each night
- Establishing routines to allow a sense of predictability on the days when energy is especially low and the act of planning may even be too taxing
- Researching oxygen requirements and needs for traveling

    - Packing all of the oxygen supplies (in the right quantities) for the length of the trip
    - Knowing tank safety guidelines associated with each mode of transportation
    - If flying, knowing what rules surround in-flight oxygen use and oxygen use after arrival

Pacing

- Taking frequent breaks, though the key is to do this before getting tired and not when already tired
- Adopting a slower pace to all activities
- Using pursed lip breathing during all activities to ensure proper oxygen delivery and maintenance of energy
- Getting a doctor's note to assist with modifying work duties if certain tasks are too strenuous or extra time is needed to complete them

Positioning

- Focusing on a good posture (head straight up so eyes can look forward, shoulders rolled back, chest flat and facing forward) when seated and standing is important since it allows more internal space for the lungs to expand and contract
    - When seated, good posture also involves keeping joints in a neutral position to allow for proper alignment
- Postures such as bending, squatting, and over-extended reaching can worsen symptoms, especially when done repetitively

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    - If there is no way to avoid these positions for task and delegating them is not an option, change positions often to allow for recovery time, though be careful not to do so too quickly as this can bring about dizziness and shortness of breath

- Completing activities in seated whenever possible since this eases strain on the body and makes the activity less difficult

Delegation of tasks is an embedded component of energy conservation that tends to be overlooked. Therapists should encourage patients, especially those with severe symptoms and frequent exacerbations, to utilize external support for tasks that may be too difficult or taxing for them. Support may take the form of grocery or meal delivery services, lawn care or landscaping companies, handyman services, or the help of friends and family to do these and other tasks. Patients should be educated on how this practice can help their long-term functioning and quality-of-life.

Activity Modifications to Assist with Occupational Participation

Many times, this involves the steps of energy conservation, particularly the planning component. Other times, activity modification means taking different steps than usual to get something done. This looks different depending on the task.

For dressing:

- Laying tomorrow's clothing out the night before
- Sitting in a chair or on the edge of the bed (ideally with a bed rail for support) to get dressed

- Dressing the lower body (which is more taxing due to the need to bend and reach) followed by the upper body
- In the event you have musculoskeletal or neurological concerns, dressing the weaker limb first
- Using adaptive equipment – such as a button hook, dressing stick, long-handled shoehorn, reacher, elastic shoelaces, and sock aid – during the dressing process
- Opting for easier clothing options; this may look different for different people; if you struggle with buttons, try clothing with zippers or no fasteners at all; pullover shirts may require too much energy to don, so try cardigans instead; elastic waist bands and slip-on shoes are other good options
- Wearing loose fitting clothing
- Layering clothing to assist with temperature management regardless of what season it is
- Resting between each article of clothing

For bathing:

- Using warm water
- Using adaptive equipment – such as tub bench, shower chair, handheld shower head, long-handled sponge, grab bar(s)
- Using a robe to help towel off
- If you use oxygen, prioritize using it during bathing since this can be especially taxing on the body

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- Managing incontinence using products (adult depends, pantyliners, etc.) to prevent the need for excessive clean-ups that can spike symptoms

For shopping:

- Making a list
- If you frequent the same store, mapping out which of the items you need are located in what aisle (this can often be done with the help of the grocery store's app)
- Gathering items aisle by aisle starting at the front of the store
- Using a large cart or a motorized scooter, in the event the store has them
- Avoiding shopping during peak days and hours (most ideal times are Tuesdays, Wednesdays, and Thursdays during the early morning hours)

For cleaning:

- Breaking down heavy tasks into smaller tasks and spreading them out through the week while balancing them with lighter tasks
- Focusing on one room at a time rather than doing whole-house tasks (such as dusting or vacuuming everything)
- Sitting for tasks such as cleaning the bathtub, making the bed, and folding laundry
- Allowing cleaning products to do the heavy work for you, if possible (for instance, soaking items that need to be cleaned more thoroughly rather than scrubbing them)
- Sliding heavy objects that need to be moved rather than picking them up or using a cart to carry items throughout the home

- If not using a dishwasher, letting dishes air dry rather than hand drying them
- Using adaptive equipment such as a long-handled dust pan and broom or easier-to-handle equipment such as a lightweight stick vacuum
- If possible, using lightweight vacuums, ideally those with HEPA filters that effectively trap dust and allergens
- Placing dedicated cleaning items in each room to avoid multiple trips to gather supplies

For cooking:

- Breaking large cooking tasks (such as making lasagnas) into smaller steps; for instance, make the meat sauce one day, then store it and assemble, cook the lasagna another day
- Gathering ingredients, utensils, and cookware before starting to cook
- Completing meal prepping at the start of the week
- Placing leftovers in the freezer for simple, 'no cook' meals on days when symptoms are more severe
- Batch cooking preferred or simple meals and freezing for later use
- Using lightweight and low-work equipment such as air fryers, food processors, rice cookers, electric can openers, and slow cookers
- Placing frequently used items on countertops or low shelves for easy access
- Relying on disposable flatware such as paper plates and plastic cups, when needed

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- Resting after eating before cleaning up, as digestion takes up excess energy and can impact fatigue levels
- When it comes to eating, try to eat 5-6 small meals during the day to better manage energy levels

For intimate activities:

- Expressing your preferences and needs with your partner
- Resting well before and after
- Opting for slow, thoughtful movements with an emphasis on rest breaks spent kissing, hugging, cuddling, and touching
- Experimenting with new positions for short periods of time to see if they are comfortable or helpful
- Incorporating sexual activities into morning routines or another time when energy levels are higher
- Using medications or mechanically clearing lungs to improve breathing before sex; short-acting medication right before or even during intimate time can be especially helpful; if you only have long-acting medication, plan your intimate time around when it takes effect
- Asking your partner to do most of the moving

For functional mobility:

- Pacing your breaths with each step you take
- When ascending or descending stairs, breathing out as you take a step

- Taking rest breaks, even when doing stairs; this may entail stopping and holding onto the railing or leaning against the wall, anything to safely allow you to catch your breath before moving again

For medication management:

- Keeping a record of all medication taken
- Taking medication at the same time each day to encourage consistency and better compliance
- Keeping nebulizers in easy to access places so they can be used when needed the most
- Using manual or digital methods to keep track of medication that is taken or needs to be taken

For morning routines:

- Planning enough time to allow for gradually increasing energy levels and symptom management upon waking
- Keeping water on the nightstand to help with lung clearing in the morning
- Bathing in the morning, if possible, since this is often when energy levels are higher

Exercising

As we mentioned earlier, exercising is a crucial but often difficult activity for a person with COPD. Physical activity is essential to avoid muscle deconditioning, but it must be approached in a way that avoids worsening symptoms and causing safety concerns.

Endurance Training

While there are no specific physical activity guidelines for individuals with chronic respiratory conditions, the American Thoracic Society has endorsed general guidelines from the World Health Organization (WHO) that apply to individuals with chronic condition(s). The WHO advises people with chronic conditions to engage in between 150 and 300 minutes of moderate-intensity aerobic physical activity per week whenever possible. The American Lung Association has slightly lower recommendations, stating that people with COPD should participate in 20 to 30 minutes of moderate-intensity exercise three to four days per week.

The most recent, though dated, guidelines developed by the American Thoracic Society in conjunction with the European Respiratory Society note that 20 to 60 minute endurance training sessions completed 3 to 5 times each week are most effective. In order for therapists to measure the intensity of sessions, it is common to use the Borg RPE Scale or the modified RPE Scale. The original Borg RPE Scale has subjective ranges from 6 (no exertion at all) to 20 (maximum exertion), which reflect a person's heart rate. The modified RPE scale also has a subjective range, but this measures breathlessness and spans from 0 (no exertion at all) to 10 (maximum exertion). When performing any exercises (including endurance training) with individuals who have COPD, therapists can use these tools to determine the level of difficulty the patient feels. Ideally, modified RPE scores between 4 and 6 and original Borg scores between 12 and 14 are considered a desirable range to safely build exercise capacity.

To appropriately adhere to guidance from these organizations, therapists must first factor in each patient's physical capacity, COPD severity, and the presence of other health conditions. This allows therapists to make client-centered recommendations that gradually help patients build their tolerance for exercise.

In accordance with remaining client-centered and placing patient safety fit, therapists should also educate patients to avoid exercise when these concerns are present:

- Severe chest pain, severe shortness of breath, or increased severity of other COPD symptoms
- They have run out of or don't have access to their doctor-prescribed supplemental oxygen
- Loss of balance, incoordination, or dizziness
- Nausea
- Fever or an active infection

In the event it isn't possible to follow the above guidelines for whatever reason, people with COPD should aim to be as active as they can and avoid long periods of lying down or sitting upright while they are awake during the day. They can do this by getting up a little more each day, such as to walk to another room in their home, take a shower, or go outside to get the mail in decent weather conditions. Therapists can assist patients in making these into habits that are integrated into daily routines.

Strength Training

Patients can be instructed in the use of free weights or machines to strengthen their arms and legs, which will help with transfers, functional ambulation, and various daily activities. For patients with higher exercise tolerance and a more stable condition, therapists may consider (or build up to) resistance training that focuses on multiple joints. As long as the patient can tolerate it, this type of exercise provides the most benefit in terms of efficiently building strength during sessions. In addition, multi-joint exercises prepare patients to improve their

functional performance since the majority of ADLs, IADLs, and other activities require stability and strength in multiple parts of the body.

General Recommendations

Therapists can also guide patients through some of the following exercise recommendations:

- Practice light stretching regularly. This not only helps with mobility and flexibility but can assist with relaxation and prevents overexertion during other physical activities. The best way to stretch is to hold each position for 10 to 30 seconds at a time while slowly breathing in and out. You can repeat each sequence several times as long as you remember not to push through pain.
- Try participating in activities you enjoyed before your diagnosis, either with or without modifications.
- Utilize exercise programs through apps, the internet, or television. You can also explore local libraries, recreation centers, or community centers for group exercise classes.
- Set small but achievable goals to build confidence and improve tolerance for exercise. You can start small such as walking through each room in your home briefly once per day. As you build strength, adjust your goals such as possibly including a walk around the perimeter of your home or up and down your driveway once.

When guiding patients with COPD through endurance exercises, therapists should aim to improve heart rate recovery while preventing muscle decline. They should also manage exertional dyspnea during exercise rather than COPD-associated dyspnea. Some activities that allow patients to address endurance include use of

an ergometer, graded treadmill walking, and real-world walking. Understandably, functional mobility training on the ground is proven to increase endurance for walking better than when using equipment, though therapists may need to start patients on equipment as they build strength and tolerance. When addressing upper limb strength, therapists should focus on the biceps, triceps, pectoralis, latissimus dorsi, and deltoid muscles, as these assist the most with functional transfers as well as movement of the chest cavity during breathing.

Pain Management

Stretching and gentle movement are considered some of the chief ways to manage pain for COPD and other chronic conditions. Therapists can also instruct patients in some self-massage techniques as well as the use of heat and water therapy to manage pain. If their doctor is amenable to it, providers may recommend acupuncture or massage therapy from licensed providers to further assist with pain.

Complementary Modalities

There is some evidence to support the benefits of tai chi as a way to improve tolerance for moderate-intensity exercise. Similarly, certain yoga practices (with modifications such as the use of a chair or assistive device for stability, if needed) can serve as a complementary modality in addition to standard exercise plans.

Other Interventions

Education on sleep hygiene can assist with managing symptoms such as chronic fatigue. Individuals with COPD may benefit from the use of fitness trackers and similar tools to improve their interoception and awareness of various COPD

symptoms. This can help with modifying activities, managing energy levels, and reducing exacerbations.

Therapists may need to provide compensatory strategies or cognitive remediation in the event a patient's COPD is severe and/or has impacted skills such as memory, information retention, and safety awareness. Individuals with these COPD-related problems may benefit from digital reminders, visual schedules, and notes to assist with medication management, scheduling, grocery shopping, and more.

While major mental health concerns may warrant a referral to a licensed mental health professional, OTs can offer some forms of mental health support as part of their intervention. For instance, therapists may want to incorporate aspects of Acceptance and Commitment Therapy (ACT) into treatment in order to assist patients in coming to terms with having a chronic illness and being unable to function in the same way they once did.

Section 4 Personal Reflection

In what setting(s) might an OT be able to best address the mental health of a person with COPD? Why?

Section 4 Key Words

Incentive spirometer - A simple piece of medical equipment used to offer a visual that assists with deep breathing inspiratory muscle training; incentive spirometers are often part of pulmonary rehabilitation but may also be provided post-operatively after procedures such as heart surgery to reduce the likelihood of infections

Thirdhand smoke - Smoke residue that has settled on indoor and bodily surfaces over time; depending on how heavy thirdhand smoke is, residue may be on and in

carpets, curtains, walls, floors, counters, appliances, linens, and cars as well as skin, clothing, and hair

Section 5: Case Study #1

A 62-year-old man presents to outpatient OT for an evaluation. Upon taking the patient's history, the OT learns that he has been smoking a pack a day for the past 22 years. He was recently diagnosed with COPD, but reports a poor experience with his doctor, who "didn't tell him anything about the condition other than that he had it." The patient presents with limited insight or knowledge of the condition as well as moderate dyspnea at rest and a productive cough, which he said have been a problem for 2 or 3 months.

During his evaluation, the therapist notices he has difficulty walking in a straight line from the waiting room to the treatment space and he stumbled a few times within a matter of 75 feet. Upon sitting down in the treatment space, he is dyspenic and yells at the therapist when she attempts to guide him through pursed lip breathing. When the OT took his vitals, his blood pressure was slightly above average at 130/80 and his oxygen saturation dipped down to 84% spO2. His heart rate was 140 bpm and respiratory rate was 40 breaths per minute. A brief physical examination shows the patient has edematous bilateral lower extremities.

1. What is the next step this therapist should take as part of this patient's evaluation?
2. Once it is safe to proceed, would the patient benefit more from continued instruction on pursed lip breathing or education on his condition?
3. Does this patient demonstrate a medical need for OT services to address his COPD?

4. What functional areas should the OT assess first?
5. Once they are identified, what approaches should the OT use to assess these areas?

Section 6: Case Study #1 Review

This section will review the case studies that were previously presented. Responses will guide the clinician through a discussion of potential answers as well as encourage reflection.

1. What is the next step this therapist should take as part of this patient's evaluation?

   Based on the patient's vital signs, he is experiencing a medical emergency. Regardless of other aspects of the patient's presentation, it is important to get him the medical intervention he needs.

2. Once it is safe to proceed, would the patient benefit more from continued instruction on pursed lip breathing or education on his condition?

   After the patient receives medical intervention and is considered stable enough to resume (or reschedule) OT services, the therapist can proceed with the rest of the evaluation. The therapist should firstly focus on educating the patient about their condition. It's best to avoid pursed lip breathing for the immediate time being, since the patient became agitated when instructed on this technique during his medical emergency. While he will benefit from this technique and his response may have been due to the medical circumstances, it is likely that the patient doesn't know why he needs to do this or how it can benefit him. Since he mentioned the doctor told him nothing about his condition, he may need the chance to learn

about it, ask questions, and understand why he is at OT in the first place. This should come first, as it will also help establish rapport.

3. Does this patient demonstrate a medical need for OT services to address his COPD?

   Based on the patient's symptoms and recent diagnosis, he could medically benefit from OT services.

4. What functional areas should the OT assess first?

   The therapist was already able to observe the patient's functional ambulation, so it would be good to supplement this information with a standardized mobility or transfer test. This will also shed some light on the patient's ability to get around during ADLs and IADLs.

5. Once they are identified, what approaches should the OT use to assess these areas?

   Research emphasizes the importance of not relying only on self-report for patients with COPD. While it's good practice to incorporate multiple assessment types in any OT evaluation, it is important to account for insight and self-awareness impairments early on in this condition. This is especially the case since the patient didn't appear to know much about his condition prior to meeting with OT.

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References

1. National Heart, Lung, and Blood Institute. (2024). COPD - Causes and Risk Factors. Retrieved from https://www.nhlbi.nih.gov/health/copd/causes

2. American Lung Association. (2026). COPD Causes and Risk Factors. Retrieved from https://www.lung.org/lung-health-diseases/lung-disease-lookup/copd/what-causes-copd

3. American Lung Association. (n.d.). Learn About COPD. Retrieved from https://www.lung.org/lung-health-diseases/lung-disease-lookup/copd/learn-about-copd

4. National Heart, Lung, and Blood Institute. (n.d.). COPD. Retrieved from https://www.nhlbi.nih.gov/health-topics/copd

5. Weeks, J.D., & Elgaddal, N. (2025). Chronic obstructive pulmonary disease in adults age 18 and older: United States, 2023. NCHS Data Brief, 529, 1–9. DOI: https://dx.doi.org/10.15620/cdc/174596.

6. American Lung Association. (2026). Stages of COPD. Retrieved from https://www.lung.org/lung-health-diseases/lung-disease-lookup/copd/symptoms-diagnosis/diagnosing/stages

7. Li, X., Xue, M., Xu, D., Fan, C., & Zhang, J. (2024). Prevalence, mortality and risk factors for self-reported COPD among smokers and never smokers, NHANES 1999-2018. *Tobacco induced diseases*, *22*, 10.18332/tid/192745. https://doi.org/10.18332/tid/192745

8. Boers, E., Barrett, M., Su, J. G., Benjafield, A. V., Sinha, S., Kaye, L., Zar, H. J., Vuong, V., Tellez, D., Gondalia, R., Rice, M. B., Nunez, C. M., Wedzicha, J. A., & Malhotra, A. (2023). Global burden of chronic obstructive pulmonary

disease through 2050. *JAMA Network Open*, *6*(12), e2346598. https://doi.org/10.1001/jamanetworkopen.2023.46598

9. Cronin, E., & Cushen, B. (2025). Diagnosis and management of comorbid disease in COPD. *Breathe*, *21*(1), 240099. DOI: https://doi.org/10.1183/20734735.0099-2024

10. Skajaa, N., Laugesen, K., Horvath-Puho, E., & Sorensen, H.T. (2023). Comorbidities and mortality among patients with chronic obstructive pulmonary disease. *BMJ Journals*, *10*, e001798. https://doi.org/10.1136/bmjresp-2023-001798

11. Santos, N. C. D., Miravitlles, M., Camelier, A. A., Almeida, V. D. C., Maciel, R. R. B. T., & Camelier, F. W. R. (2022). Prevalence and impact of comorbidities in individuals with chronic obstructive pulmonary disease: A systematic review. *Tuberculosis and Respiratory Diseases*, *85*(3), 205–220. https://doi.org/10.4046/trd.2021.0179

12. Liu, Y., Carlson, S.A., Watson, K.B., Xu, F., & Greenlund, K.J. (2023). Trends in the Prevalence of Chronic Obstructive Pulmonary Disease Among Adults Aged ≥18 Years — United States, 2011–2021. MMWR Morb Mortal Wkly Rep, *72*, 1250–1256. DOI: http://dx.doi.org/10.15585/mmwr.mm7246a1.

13. Shenoy, M.A., & Paul, V. (2023). *Pulmonary Rehabilitation* (PMID 30085607). National Library of Medicine, National Center for Biotechnology. https://www.ncbi.nlm.nih.gov/books/NBK563166/

14. Santos-de-Araújo, A.D., da Luz Goulart, C., Marinho, R.S. et al. (2024). The six-minute step test can predict COPD exacerbations: A 36-month follow-up study. *Sci Rep*, *14*, 3649. https://doi.org/10.1038/s41598-024-54338-9

15. Prins, H. J., Duijkers, R., Daniels, J. M. A., van der Molen, T., van der Werf, T. S., & Boersma, W. (2021). COPD-Lower Respiratory Tract Infection Visual

Analogue Score (c-LRTI-VAS) validation in stable and exacerbated patients with COPD. *BMJ Open Respiratory Research*, *8*(1), e000761. https://doi.org/10.1136/bmjresp-2020-000761

16. Obi, O. N., Judson, M. A., Birring, S. S., Maier, L. A., Wells, A. U., Lower, E. E., & Baughman, R. P. (2022). Assessment of dyspnea in sarcoidosis using the Baseline Dyspnea Index (BDI) and the Transition Dyspnea Index (TDI). *Respiratory Medicine*, *191*, 106436. https://doi.org/10.1016/j.rmed.2021.106436

17. Amber, S., Mujaddadi, A., & Moiz, J. A. (2023). Reliability and responsiveness of Endurance Shuttle Walk Test to estimate functional exercise capacity in patients with Chronic Obstructive Pulmonary Disease: A systematic review and meta-analysis. *Oman Medical Journal*, *38*(1), e455. https://doi.org/10.5001/omj.2023.21

18. Spence, J. G., Brincks, J., Løkke, A., Neustrup, L., & Østergaard, E. B. (2023). One-minute sit-to-stand test as a quick functional test for people with COPD in general practice. *NPJ Primary Care Respiratory Medicine*, *33*(1), 11. https://doi.org/10.1038/s41533-023-00335-w

19. Fernandes, A. L., Neves, I., Luís, G., Camilo, Z., Cabrita, B., Dias, S., Ferreira, J., & Simão, P. (2021). Is the 1-Minute Sit-To-Stand Test a good tool to evaluate exertional oxygen desaturation in Chronic Obstructive Pulmonary Disease?. *Diagnostics (Basel, Switzerland)*, *11*(2), 159. https://doi.org/10.3390/diagnostics11020159

20. Gaeckle, N., Corazalla, E., Kelloway, J. S., Liberman, J. N., Darer, J. D., Kahle-Wrobleski, K., Paczkowski, R., Parab, P., & Ruetsch, C. (2025). Real-world evaluation of an EHR-enabled Chronic Obstructive Pulmonary Disease

Assessment Test. *International Journal of Chronic Obstructive Pulmonary Disease*, *20*, 325–334. https://doi.org/10.2147/COPD.S479853

21. de Freitas, A. P. V. M., Belo, L. F., Martinez, L., Hernandes, N. A., & Pitta, F. (2023). Use of the Borg dyspnea scale to identify dynamic hyperinflation during the 6-minute walking test in individuals with moderate-severe COPD: A pilot study. *Pulmonology*, *29*(4), 335–337. https://doi.org/10.1016/j.pulmoe.2023.02.003

22. Elvekjaer, M., Rasmussen, S. M., Grønbæk, K. K., Porsbjerg, C. M., Jensen, J. U., Haahr-Raunkjær, C., Mølgaard, J., Søgaard, M., Sørensen, H. B. D., Aasvang, E. K., & Meyhoff, C. S. (2022). Clinical impact of vital sign abnormalities in patients admitted with acute exacerbation of chronic obstructive pulmonary disease: an observational study using continuous wireless monitoring. *Internal and Emergency Medicine*, *17*(6), 1689–1698. https://doi.org/10.1007/s11739-022-02988-w

23. Chae, G., Ko, E. J., Lee, S. W., Kim, H. J., Kwak, S. G., Park, D., & Ra, S. W. (2022). Stronger correlation of peak oxygen uptake with distance of incremental shuttle walk test than 6-min walk test in patients with COPD: A systematic review and meta-analysis. *BMC Pulmonary Medicine*, *22*(1), 102. https://doi.org/10.1186/s12890-022-01897-0

24. Péran, L., Berriet, A. C., Le Ber, C., Consigny, M., & Beaumont, M. (2025). Reliability and validity of upper limb muscle strength measurements by handheld dynamometer in patients with Chronic Obstructive Pulmonary Disease. *Physiotherapy research international : the journal for researchers and clinicians in physical therapy*, *30*(4), e70111. https://doi.org/10.1002/pri.70111

25. Mumtaz, M., Venkatachalapathi, S., Mohammed, T., Sudeshna, P., Kota, T., Gandhi, S. S., Melkumian, M., Mohammed, Z. U. R., Kaur, K., & Khalid, R. (2025). The BODE (Body Mass Index, Airflow Obstruction, Dyspnea, and Exercise Capacity) Index in Chronic Obstructive Pulmonary Disease: A comprehensive clinical assessment tool. *Cureus*, *17*(10), e95206. https://doi.org/10.7759/cureus.95206

26. Ichikawa, T., Tajiri, S., Yokoba, M., Horimizu, Y., Yamaguchi, S., Kawakami, A., Kimura, M., Kondo, T., Katagiri, M., & Toyokura, M. (2023). Sniff and reverse-sniff nasal respiratory pressures after exacerbation of chronic obstructive pulmonary disease: A single-center prospective study. *Respiratory Medicine*, *219*, 107438. https://doi.org/10.1016/j.rmed.2023.107438

27. Checkley, W., Yang, M., Robertson, N. M., Sharma, A. K., Chandyo, R. K., Shrestha, L., Das, S. K., Kirenga, B., Alupo, P., Gianella, G., Siddharthan, T., Pollard, S. L., Quaderi, S., Rykiel, N., Flores-Flores, O., Hurst, J. R., Wise, R. A., & Global Excellence in COPD outcomes (GECo) Study Investigators. (2025). Population-based screening for Chronic Obstructive Pulmonary Disease using the St. George's Respiratory Questionnaire in resource-limited settings. *American Journal of Respiratory and Critical Care Medicine*, *211*(5), 779–788. https://doi.org/10.1164/rccm.202409-1862OC

28. Tiel Groenestege, E., Sloothaak, B., van Geer-Postmus, I., van de Maat, A., van Heijst, E., van Reenen, N. H., Kan, K., Kerkhof, M., Lentjes, C., van der Molen, T., Zonneveld, M., In 't Veen, J., & Kocks, J. (2026). Health status in patients with limited health literacy; development and validity of the Clinical COPD Questionnaire graphic (CCQg). *NPJ Primary Care Respiratory Medicine*, *36*(1), 1. https://doi.org/10.1038/s41533-025-00454-6

29. Al Wachami, N., Boumendil, K., Arraji, M., Iderdar, Y., Mourajid, Y., Ghosne, N., Benmoussa, A., Khalis, M., Korrida, A., Laamiri, F. Z., Lajane, H., Louerdi, M. L., El Madani, S., & Chahboune, M. (2024). Evaluating the effectiveness of the COPD Assessment Test (CAT) in screening for Chronic Obstructive Pulmonary Disease. *International Journal of Chronic Obstructive Pulmonary Disease*, *19*, 1623–1633. https://doi.org/10.2147/COPD.S460649

30. Beech, A., & Singh, D. (2023). The COPD Assessment Test (CAT) and depression: A longitudinal analysis during the COVID-19 pandemic. *International Journal of Chronic Obstructive Pulmonary Disease*, *18*, 1187–1195. https://doi.org/10.2147/COPD.S405050

31. Kashif, M., Hassan, D., Khalid, S., Shakil Ur Rehman, S., & Noor, N. (2023). Development of Urdu version of Chronic Respiratory Disease Questionnaire Self-Administered Standardized (CRQ-SAS): Validity and reliability analysis in COPD patients. *PloS One*, *18*(12), e0293981. https://doi.org/10.1371/journal.pone.0293981

32. Abu-Odah, H., Xian-Liang Liu, Wang, T., Zhao, I. Y., Yorke, J., Tan, J. B., & Molassiotis, A. (2025). Modified Borg Scale (mBorg), the Numerical Rating Scale (NRS), and the Dyspnea- 12 Scale (D- 12): Cross-scale comparison assessing the development of dyspnea in early-stage lung cancer patients. *Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer*, *33*(5), 442. https://doi.org/10.1007/s00520-025-09474-x

33. Azhimamatova, R., Salieva, R. S., Zalova, T. B., Karimova, K., Karimova, D. S., Dyikanova, S. A., Kalmatov, R., & Tynaliev, U. M. (2025). Frailty in COPD: Clinical impact, diagnosis, biomarkers, and management strategies. *International Journal of Chronic Obstructive Pulmonary Disease*, *20*, 2445–2458. https://doi.org/10.2147/COPD.S522862

34. Nishimura, K., Kusunose, M., Sanda, R., Shibayama, A., & Nakayasu, K. (2024). Frailty and exacerbation of Chronic Obstructive Pulmonary Disease: Is there any association?. *International Journal of Chronic Obstructive Pulmonary Disease*, *19*, 1131–1139. https://doi.org/10.2147/COPD.S455316

35. Yorke, J., Khan, N., Garrow, A., Tyson, S., Singh, D., Vestbo, J., & Jones, P. W. (2022). Evaluation of the individual activity descriptors of the mMRC Breathlessness Scale: A mixed method study. *International Journal of Chronic Obstructive Pulmonary Disease*, *17*, 2289–2299. https://doi.org/10.2147/COPD.S372318

36. Sharma, M., Joshi, S., Banjade, P., Ghamande, S. A., & Surani, S. (2024). Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2023 Guidelines Reviewed. *The Open Respiratory Medicine Journal*, *18*, e18743064279064. https://doi.org/10.2174/0118743064279064231227070344

37. Suha, F., Modi, P., & Sharma, S. Dyspnea. [Updated 2025 Dec 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499965/

38. Goubeau, G., Mandigout, S., Sombardier, T., & Borel, B. (2023). Occupational therapy for improving occupational performance in COPD patients: A scoping review. *Canadian Journal of Occupational Therapy*, *90*(4), 353-362. doi:10.1177/00084174221148037

39. McCowan, A., Gustafsson, L., Bissett, M., & Sriram, B. K. (2023). Occupational therapy in adults with chronic respiratory conditions: A scoping review. *Australian Occupational Therapy Journal*, *70*(3), 392–415. https://doi.org/10.1111/1440-1630.12861

40. Koolen, E. H., Spruit, M. A., de Man, M., Antons, J. C., Nijhuis, E., Nakken, N., Janssen, D. J. A., & van 't Hul, A. J. (2021). Effectiveness of home-based occupational therapy on COPM performance and satisfaction scores in patients with COPD. *Canadian Journal of Occupational Therapy. Revue Canadienne D'ergotherapie*, *88*(1), 26–37. https://doi.org/10.1177/0008417420971124

41. Kaptain, R. J., Helle, T., Patomella, A. H., Weinreich, U. M., & Kottorp, A. (2021). New insights into activities of daily living performance in Chronic Obstructive Pulmonary Disease. *International Journal of Chronic Obstructive Pulmonary Disease*, *16*, 1–12. https://doi.org/10.2147/COPD.S264365

42. Chi Hong Siu, D., & Gafni-Lachter, L. (2024). Best practices of care for patients with Chronic Obstructive Pulmonary Disease (COPD) in primary care. *Am J Occup Ther*, *78*(Supplement_2), 7811500102p1. doi: https://doi.org/10.5014/ajot.2024.78S2-PO102

43. Holland, A.E., Cox, N.S., Houchen-Wolloff, L., Rochester, C.L., Garvey, C., ZuWallack, R., Nici, L., Limberg, T., Lareau, S.C., Yawn, B.P., & Galwicki, M. (2021). Defining modern pulmonary rehabilitation. An official American Thoracic Society workshop report. *Annals of the American Thoracic Society*, *18*(5), e12-29.

44. Finch, L., Frankel, D., Gallant, B., Landa, C., Snyder, N., Wilson, R., Packham, T., Brooks, D., & Oliveira, A. (2022). Occupational therapy in pulmonary rehabilitation programs: A scoping review. *Respiratory Medicine*, *199*, 106881. https://doi.org/10.1016/j.rmed.2022.106881.

45. Siu, D. C. H., & Gafni-Lachter, L. (2024). Addressing barriers to Chronic Obstructive Pulmonary Disease (COPD) care: Three innovative evidence-

based approaches: A review. *International Journal of Chronic Obstructive Pulmonary Disease*, *19*, 331–341. https://doi.org/10.2147/COPD.S426050

46. Wingårdh, A. S. L., Göransson, C., Larsson, S., Slinde, F., & Vanfleteren, L. E. G. W. (2020). Effectiveness of energy conservation techniques in patients with COPD. *Respiration; International Review of Thoracic Diseases*, *99*(5), 409–416. https://doi.org/10.1159/000506816

47. Snyder, N., Wilson, R., Finch, L., Gallant, B., Landa, C., Frankel, D., Brooks, D., Packham, T., & Oliveira, A. (2021). The role of occupational therapy in pulmonary rehabilitation programs: Protocol for a scoping review. *JMIR Research Protocols*, *10*(7), e30244. https://doi.org/10.2196/30244

48. Kaptain, R. J., Helle, T., & Larsen, S. M. (2025). Everyday technology and assistive technology supporting everyday life activities in adults living with COPD – A narrative literature review. *Disability and Rehabilitation: Assistive Technology*, *20*(4), 742–756. https://doi.org/10.1080/17483107.2024.2431627

49. Cazorla, S., Busegnies, Y., D'Ans, P., Héritier, M., & Poncin, W. (2023). Breathing control exercises delivered in a group setting for patients with Chronic Obstructive Pulmonary Disease: A randomized controlled trial. *Healthcare*, *11*(6), 877. https://doi.org/10.3390/healthcare11060877

50. Wilde, L.J., Percy, C., Clark, C., Ward, G., Wark, P.A., & Sewell, L. (2023). Views and experiences of healthcare practitioners supporting people with COPD who have used activity monitors: "More than just steps". *Respiratory Medicine*, *218*, 107395. https://doi.org/10.1016/j.rmed.2023.107395.

51. Fields, B., & Smallfield, S. (2022). Occupational therapy practice guidelines for adults with chronic conditions. *Am J Occup Ther*, *76*(2), 7602397010. doi: https://doi.org/10.5014/ajot.2022/762001

52. Mathur, S., & Singh, P. (2024). Chronic Obstructive Pulmonary Disease: Lifestyle impact. *International Journal of Preventive Medicine*, *15*, 67. https://doi.org/10.4103/ijpvm.ijpvm_297_23

53. Born, C. D. C., Bhadra, R., D'Souza, G., Kremers, S. P. J., Sambashivaiah, S., Schols, A. M. W. J., Crutzen, R., Beijers, R. J. H. C. G., & P4O2 Consortium (2024). Combined lifestyle interventions in the prevention and management of asthma and COPD: A systematic review. *Nutrients*, *16*(10), 1515. https://doi.org/10.3390/nu16101515

54. National Heart, Lung, & Blood Association & Respiratory Health Association. (n.d.). The COPD Caregiver's Toolkit. Retrieved from https://www.nhlbi.nih.gov/sites/default/files/publications/COPD-CaregiversToolkit-Managing-the-Home.pdf

55. St. Joseph's Healthcare. (n.d.). Energy Conservation. Retrieved from https://www.stjoes.ca/patients-visitors/patient-education/a-e/PD%208278%20Energy%20Conservation.pdf

56. American Lung Association. (2026). Conserving Energy and Managing Daily Activities. Retrieved from https://www.lung.org/lung-health-diseases/lung-disease-lookup/copd/living-with-copd/daily-activities

57. New York-Presbyterian. (2025). Conserving Energy When You Have COPD or Other Chronic Conditions. Retrieved from https://www.nyp.org/healthlibrary/articles/conserving-energy-when-you-have-copd-or-other-chronic-conditions

58. American Lung Association. (2026). Physical Activity and COPD. Retrieved from https://www.lung.org/lung-health-diseases/lung-disease-lookup/copd/living-with-copd/physical-activity

59. American Thoracic Society Assembly. (n.d.). Physical activity recommendations for patients with Chronic Obstructive Pulmonary Disease. Retrieved from https://site.thoracic.org/assemblies/pr/quarterly-bite/physical-activity-recommendations-for-patients-with-chronic-obstructive-pulmonary-disease

60. Liu, S., Yang, A., Yu, Y., Xu, B., Yu, G., & Wang, H. (2025). Exercise prescription training in Chronic Obstructive Pulmonary Disease: Benefits and mechanisms. *International Journal of Chronic Obstructive Pulmonary Disease*, *20*, 1071–1082. https://doi.org/10.2147/COPD.S512275

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