Nursing Care Strategies for Patients with Idiopathic Pulmonary Fibrosis

Wesam Faisal Ajaj Alanzi[1], Ibrahim Abdulrahman Awad Al-Burkani Al-Harbi[2], Ali Thuwayni Olawi Alruwaili[3], Aloatibi Turki Abdullah M.[4], Sarah Mobark Almarwani[5], Mohammed Aabdullah H. Albahdal[6], Arrowaili Antsar Alasmr A.[7], Alruwaili Khafi Almshani T.[8], Hamidah Faraj Hamad[9], Sharifah Obaid Saket Alshammari[10]

[1] Specialist Nursing - Maternity and Children's Hospital, Northern Borders Health Cluster, Arar, Northern Borders Region, Saudi Arabia.
[2] Technician-Nursing - Reem Health Center, Madinah, Madinah Region, Saudi Arabia.
[3] Technician-Nursing - Forensic Medicine Center, Arar, Northern Borders Region, Saudi Arabia.
[4] Technician-Nursing - Zulfi General Hospital, Al-Zulfi, Riyadh Region, Saudi Arabia.
[5] Nursing - Yanbu General Hospital, Yanbu, Madinah Region, Saudi Arabia.
[6] Nursing and Midwifery - Al-Zulfi General Hospital, Al-Zulfi, Riyadh Region, Saudi Arabia.
[7] Specialist Nursing - Maternity and Children Hospital, Sakaka, Al-Jouf Region, Saudi Arabia.
[8] Nursing Technician - Suwair General Hospital, Al-Jouf Region, Saudi Arabia.
[9] Nursing Technician - Manar Primary Health Center, Al-Awailqilah, Northern Borders Region, Saudi Arabia.
[10] Nursing Technician - Eradah Hospital and Mental Health, Sakaka, Al-Jouf Region, Saudi Arabia.

Abstract:

Idiopathic Pulmonary Fibrosis (IPF) is a progressive lung disease characterized by the accumulation of fibrous tissue in the lungs, leading to diminished lung function and quality of life. Effective nursing care strategies for patients with IPF are essential in managing symptoms, promoting engagement in care, and ensuring comprehensive support. One critical approach is education about the disease process, encouraging patients to understand their condition, recognize symptoms, and adhere to treatment plans. Nurses can implement structured education sessions that include information about the importance of medication compliance, techniques for energy conservation, and nutritional guidance to help maintain overall health. Furthermore, establishing a strong therapeutic relationship allows nurses to assess patients' physical and emotional needs accurately, providing individualized support and enhancing coping strategies for anxiety and depression often associated with chronic illness. Another vital nursing care strategy involves facilitating respiratory support and therapy initiatives tailored to improve patients' pulmonary function. This may include coordinating pulmonary rehabilitation programs that focus on physical exercise, breathing techniques, and oxygen therapy when necessary. Nurses play a key role in monitoring patients' respiratory status, assessing for exacerbations, and managing medications such as corticosteroids or antifibrotic agents. Providing psychological and emotional support also remains crucial; nurses can offer referrals to mental health professionals or support groups to address the emotional burden of IPF. Furthermore, developing a comprehensive discharge plan that includes resources for home care, follow-up appointments, and community support can significantly help patients manage their condition effectively and enhance their independence.

Keywords: Idiopathic Pulmonary Fibrosis, Nursing Care Strategies, Patient Education, Disease Management, Medication Compliance, Energy Conservation, Nutritional Support, Respiratory Therapy, Pulmonary Rehabilitation, Emotional Support, Home Care Resources, Discharge Planning

Introduction:

Idiopathic Pulmonary Fibrosis (IPF) is a chronic, progressive lung disease characterized by the replacement of normal lung tissue with scar tissue, leading to a gradual decline in lung function. The etiology of IPF remains poorly understood, which is reflected in the term "idiopathic." This condition predominantly affects older adults, typically those aged 50 years and above, with a higher prevalence among men. Patients often present with symptoms such as dyspnea (shortness of breath), a persistent dry cough, and fatigue, significantly impacting their quality of life. Given the progressive nature of the disease, early diagnosis and the implementation of

effective management strategies are crucial to enhancing patient outcomes [1].

As the prevalence of IPF is on the rise, primarily due to an aging population and increased recognition of the disease, there is an urgent need for comprehensive nursing care strategies that address the complexities of IPF management. The nursing profession plays a pivotal role in the multidisciplinary team tasked with providing care to individuals with this debilitating condition. Nurses are often at the forefront of patient interaction and education, and they serve as critical advocates for patients navigating the challenges imposed by IPF [2].

Given the complex pathophysiology of IPF and the variability in patient responses to treatment, nursing strategies must be multifaceted. Effective nursing care involves a comprehensive assessment of the patient's physical, emotional, and social needs. This integrated approach is essential in addressing the multifactorial nature of IPF, which includes the psychosocial aspects of living with a chronic illness. Key nursing interventions may encompass symptom management, patient education regarding disease progression and treatment options, and fostering a supportive environment that encourages adherence to therapeutic regimens [3].

Moreover, the provision of specialized care necessitates a robust understanding of pharmacological treatments, including antifibrotic medications, as well as non-pharmacological interventions such as pulmonary rehabilitation. By engaging in collaborative care planning, nurses can work alongside respiratory therapists, physicians, and other healthcare professionals to devise individualized treatment approaches that consider the physical decline and psychosocial challenges faced by patients with IPF [4].

In addition, current research in nursing care strategies highlights the importance of patient and family education. Educating both patients and their families about IPF, its prognosis, available treatments, and self-management techniques fosters empowerment and equips them with the tools necessary to navigate the healthcare system effectively. This is particularly vital in the context of IPF, where patients may experience uncertainty regarding their health status and future, leading to anxiety and depression. Therefore, incorporating mental health resources into nursing care is an essential component of a holistic approach, ultimately improving health-related quality of life [5].

Recent studies underscore the effectiveness of structured nursing interventions aimed at enhancing symptom management and promoting physical activity among IPF patients. Such interventions may include personalized exercise programs, dietary modifications, and strategies to improve sleep quality. The integration of telehealth technologies has also emerged as a promising avenue to support patient care, allowing for regular monitoring and follow-up, thereby fostering continuous communication between patients and their healthcare providers [6].

As the understanding of IPF evolves, so too must the nursing practices that support this patient population. Future research should explore the efficacy of various nursing interventions, patient education methods, and psychological support systems to refine nursing care strategies further. Additionally, the influence of cultural factors on patient responses to care must be examined to develop culturally competent nursing practices that are sensitive to the diverse backgrounds of individuals diagnosed with IPF [7].

Understanding the Role of Nursing in IPF Management:

Idiopathic Pulmonary Fibrosis (IPF) is a progressive and debilitating lung disease characterized by the scarring of lung tissue, leading to significant morbidity and mortality. The unpredictable course of IPF poses unique challenges for healthcare providers, requiring a multi-disciplinary approach for effective management. Among the various healthcare professionals involved, nurses play a pivotal role in the comprehensive care of patients with IPF [8].

IPF is a type of interstitial lung disease that primarily affects older adults, commonly presenting with symptoms such as shortness of breath and a persistent dry cough. The etiology of IPF remains largely unknown, although several risk factors, including smoking and environmental exposures, have been implicated. Due to the progressive nature of the disease, patients often face significant physical and emotional challenges, necessitating a strategic and empathetic approach to care [8].

Nursing professionals play a critical role in educating patients about IPF, its progression, and management options. This education is crucial as it empowers patients to take control of their health, understand their disease, and make informed decisions regarding their care. Nurses provide information about the importance of medication adherence, recognizing symptoms of exacerbations, and lifestyle modifications, including smoking cessation and pulmonary rehabilitation [9].

For instance, through structured education sessions, nurses can explain how lung function gradually deteriorates due to fibrosis and how treatments—such as antifibrotic therapies—can help slow this progression. Additionally, nurses are vital in teaching patients proper use of inhalers, nebulizers, and oxygen therapy, which can significantly enhance their quality of life. Self-management strategies, such as pacing activities and engaging in regular physical exercise tailored to the patient's capacity, are also essential components of nursing education [10].

Nurses play a key role in monitoring and managing the symptoms of IPF, which can include breathlessness, cough, fatigue, and psychosocial issues stemming from chronic disease management. Through regular assessments, nurses can identify symptoms early and implement appropriate interventions, such as administering bronchodilators or coordinating with respiratory therapists for more advanced treatments [11].

Furthermore, IPF can lead to complex suffering that encompasses not only physical symptoms but also emotional and spiritual distress, often necessitating palliative care principles. Nurses are uniquely positioned to assess and address these multifaceted issues. They can provide pain management and other symptom relief strategies while also offering psychological support through active listening and establishing rapport with patients. This holistic approach ensures that care teams address not only the physical needs but also the emotional and social challenges faced by patients and their families.

The diagnosis of IPF can lead to feelings of anxiety, depression, and helplessness among patients and their families. Nursing professionals are often the first point of contact for patients navigating the complexities of their illness. They can provide critical emotional support by creating a safe environment for patients to express their fears and concerns [11].

Furthermore, nurses are instrumental in guiding patients and families through the emotional landscape associated with chronic illness. By facilitating support groups or connecting patients with mental health services, nurses help to mitigate feelings of isolation and despair that may arise from living with a progressive disease. This support is crucial, as mental well-being can significantly impact patients' adherence to treatment and overall quality of life [12].

IPF management requires a coordinated effort among various healthcare professionals, including pulmonologists, nurses, social workers, dietitians, respiratory therapists, and pharmacists. Nurses act as the hub of this interdisciplinary team, ensuring communication and collaboration among all members.

Effective nursing care involves coordinating referrals to specialists, ensuring timely follow-ups, and managing the logistics of care for patients who may face multiple healthcare appointments. This coordination is vital to streamline patient care, minimize hospital visits, and improve clinical outcomes. By actively engaging in care transitions and discharge planning, nurses can help ensure continuity of care and reduce the risk of hospital readmissions [13].

In addition to direct patient care, nurses advocate for patients with IPF at individual, community, and institutional levels. They are essential in voicing the needs of patients and ensuring that they have access to necessary resources, including funding for medications and therapies. Nurses can also play a role in advancing public policy to improve the quality of care for individuals with IPF and other chronic illnesses. By participating in patient advocacy groups and engaging in research efforts, nurses contribute to the development of guidelines and protocols that enhance care delivery for IPF patients [14].

Comprehensive Patient Education and Health Literacy:

Idiopathic Pulmonary Fibrosis (IPF) is a chronic lung disease characterized by the progressive scarring of lung tissue, which can lead to significant impairments in respiratory function and overall

quality of life. Given the complexity of the disease, patient education and health literacy play pivotal roles in managing IPF effectively. Comprehensive patient education involves providing patients and their caregivers with the necessary information about IPF, its progression, treatment options, and coping strategies [15].

Importance of Comprehensive Patient Education

IPF is a challenging disease, not only due to its unpredictable course but also because there is currently no cure. Consequently, the focus of healthcare providers often shifts toward managing symptoms and improving the quality of life for patients. Comprehensive patient education helps to empower patients and their families, enabling them to make informed decisions about their health, adhere to treatment plans, and adopt healthier lifestyle choices [16].

1. **Understanding the Condition**: Patients with IPF need a clear understanding of what the disease entails, including its symptoms, progression, and potential complications. This understanding can alleviate anxiety, as patients are better prepared for what to expect. Education should cover the pathophysiology of IPF, including the role of inflammation and fibrosis, as well as the factors contributing to disease progression. Furthermore, informing patients about the stages of IPF and those at higher risk for complications can foster proactive engagement in their health care [17].
2. **Treatment Options**: IPF treatment primarily focuses on slowing disease progression and managing symptoms. Comprehensive patient education includes information on available therapies, such as antifibrotic medications, pulmonary rehabilitation, and the potential for lung transplantation. By understanding treatment options and their potential side effects, patients can engage in discussions with their healthcare providers about personalized treatment plans that align with their values and preferences [18].
3. **Managing Symptoms and Comorbidities**: Patients with IPF often experience various symptoms like shortness of breath, chronic cough, and fatigue. They may also have comorbidities, such as pulmonary hypertension, gastroesophageal reflux disease (GERD), or depression, complicating their clinical management. Comprehensive education encompasses effective symptom management strategies, lifestyle modifications, and addressing psychological well-being. Patients must be educated on breathing exercises, physical activity, nutrition, and the importance of maintaining a healthy lifestyle to mitigate symptoms and improve their overall well-being [19].
4. **Seeking Support**: The isolation often experienced by individuals with chronic illnesses can lead to psychological distress. Educating patients on the importance of social support—whether through family, friends, support groups, or therapists—can help mitigate feelings of loneliness. Support networks can provide emotional comfort and practical assistance in navigating the challenges associated with IPF. Resources for mental health support and counseling should also be available, as mental health is closely linked to overall quality of life in chronic illness [20].

Health Literacy: A Key Component of Patient Education

Health literacy—the ability to obtain, process, and understand basic health information—sat at the forefront of fundamental skills that individuals need to manage their health effectively. Low health literacy can lead to poor health outcomes, including misunderstandings about treatment, inappropriate medication use, and decreased adherence to prescribed therapies [21].

1. **Assessing Health Literacy**: Healthcare providers should assess patients' health literacy levels to tailor their educational materials and approach effectively. Simple tools and assessments, such as the Test of Functional Health Literacy in Adults (TOFHLA) or the Rapid Estimate of Adult Literacy in Medicine (REALM), can be utilized in clinical settings. It is essential to recognize that health literacy is not solely

related to reading ability but encompasses cognitive and communication skills, including how patients navigate the healthcare system [22].

2. **Utilizing Plain Language**: When imparting information, healthcare providers must use clear, concise, and jargon-free language. This practice aids in improving comprehension and retention. Visual aids, such as diagrams or infographics, can also enhance understanding, especially when dealing with complex medical concepts. Additionally, the use of teach-back techniques, where patients repeat the information back to the healthcare provider, can verify patient understanding and reinforce learning [23].
3. **Tailoring Information to the Audience**: Recognizing that patients have varying levels of health literacy necessitates the use of diverse educational materials that can accommodate different learning preferences. This may include written materials, videos, and interactive online resources. Importance should also be placed on culturally sensitive practices to ensure that patient education is respectful and responsive to diverse backgrounds. Engaging family members or caregivers in educational sessions can further enhance understanding and retention of crucial information [24].

Implementation Strategies for Comprehensive Education

1. **Multidisciplinary Approach**: A collaborative care model involving various healthcare professionals—physicians, nurses, respiratory therapists, social workers, and nutritionists—can provide comprehensive support for patients with IPF. Each professional can contribute knowledge tailored to their area of expertise, which creates a holistic educational environment for patients and families [25].
2. **Regular Educational Sessions**: Healthcare facilities should establish regular educational sessions or workshops for patients with IPF. These sessions can cover topics such as disease management, coping strategies, nutrition, and available resources for support. Such gatherings provide a platform for patients to interact with one another, share experiences, and foster a sense of community [26].
3. **Utilizing Technology**: The internet and mobile applications can serve as valuable tools for promoting health literacy. Online platforms can provide reliable information and resources about IPF, treatment options, and lifestyle changes. Telehealth services also present an innovative approach to providing information to patients who may have mobility challenges or those living in remote areas, allowing for the dissemination of critical health information.
4. **Evaluation and Feedback**: To ensure that educational efforts are meeting patients' needs, healthcare providers should actively seek feedback about educational content and formats. Regular evaluation of patient engagement and understanding can guide improvements in patient education practices and ensure that they remain relevant and effective [27].

Symptom Assessment and Monitoring Techniques:

Pulmonary fibrosis (PF) is a progressive lung disease characterized by the accumulation of scar tissue in the lungs, leading to a decline in lung function and compromised quality of life. Diagnosing and managing pulmonary fibrosis involves a multidisciplinary approach that incorporates a variety of assessment and monitoring techniques. Given the complexity of the disease and its variable course, it is essential that clinicians utilize a combination of clinical assessments, imaging studies, laboratory tests, pulmonary function tests, and patient-reported outcomes to guide treatment decisions and monitor disease progression [28].

A thorough clinical assessment serves as the foundational step in diagnosing and managing pulmonary fibrosis. The initial visit may include a detailed medical history and physical examination, particularly focusing on respiratory symptoms such

as cough, dyspnea (shortness of breath), and fatigue. A clinician must carefully assess duration, severity, and characteristics of symptoms, as well as any factors that may exacerbate them. This contextual information is vital for determining the potential causes of lung function decline, ruling out other interstitial lung diseases, and guiding further diagnostic testing.

Pulmonary function tests (PFTs) are essential for quantifying lung function and assessing the severity of pulmonary fibrosis. One of the primary parameters evaluated is the forced vital capacity (FVC), which measures the volume of air that can be forcibly exhaled after taking a deep breath. A decline in FVC% predicted is indicative of worsening lung function. Additionally, diffusing capacity for carbon monoxide (DLCO) is crucial in evaluating the ability of the lungs to transfer gas, which can be reduced in patients with pulmonary fibrosis due to impaired gas exchange caused by scarring. Regular monitoring of PFTs is necessary to track progression or stabilization of the disease and to make informed decisions regarding therapeutic interventions [29].

Imaging studies play an instrumental role in the assessment of pulmonary fibrosis. High-resolution computed tomography (HRCT) is the gold standard for evaluating the presence and extent of interstitial lung disease. HRCT can visualize the characteristic reticular pattern and ground-glass opacities associated with pulmonary fibrosis, revealing the distribution of fibrosis, which may inform the diagnostic process. Regular follow-up imaging can also provide key insights into the course of the disease, as radiological changes often precede clinical deterioration. Radiologists' interpretations, combined with clinical findings, can guide decision-making regarding more advanced therapeutic options such as antifibrotic therapies or lung transplantation [29].

While no definitive laboratory tests exist for diagnosing pulmonary fibrosis, certain blood tests can help rule out secondary causes and assess comorbid conditions. Inflammatory markers, autoantibodies, and pulmonary function-related biomarkers such as surfactant proteins (SP-A and SP-D) may be evaluated. Although these tests are often more useful for research than for routine clinical practice, emerging studies are investigating the potential role of biomarkers as predictors of disease progression. Advanced research into genomic and proteomic biomarkers may yield new insights into individual patient risk profiles and treatment responses [29].

Regarding symptom monitoring, patient-reported outcomes (PROs) play an increasingly vital role. Tools such as the St. George's Respiratory Questionnaire (SGRQ) and the University of California, San Diego, Shortness of Breath Questionnaire (UCSD SOBQ) assess the impact of pulmonary fibrosis on quality of life. These questionnaires evaluate domains such as symptom severity, activity limitations, and overall health status. Regular use of PROs allows clinicians to gauge the patient's perception of their condition, enabling more tailored therapeutic strategies [29].

Additionally, digital health technologies and wearable devices are being integrated into the management of pulmonary fibrosis. Remote symptom monitoring through mobile applications and telehealth platforms can improve communication between patients and healthcare providers, enhancing the ability to track symptoms, medication adherence, and respiratory therapy effectiveness. Such innovations help promote patient engagement and empower individuals in self-management, fostering a sense of responsibility in managing their health [30].

The management of pulmonary fibrosis benefits from a multidisciplinary approach, fostering collaboration among pulmonologists, radiologists, pathologists, physical therapists, and nutritionists. This team-based approach enables comprehensive assessment and individualized management plans tailored to each patient's clinical presentation and personal preferences.

Shared decision-making is integral to the treatment process, allowing patients to participate in their care actively. Clinicians should ensure that patients are fully informed about their disease state and treatment options, which may include antifibrotic therapies such as nintedanib and pirfenidone, pulmonary rehabilitation, and palliative care for symptom management. Regular follow-up visits are crucial to evaluating treatment efficacy, managing side effects, and making necessary adjustments [30].

Personalized Care Plans and Interventions:

Pulmonary fibrosis is a chronic lung disease characterized by the progressive scarring of the lung tissue, leading to a decline in lung function. As the tissue becomes thickened and stiff, the ability to transfer oxygen to the bloodstream diminishes, resulting in significant respiratory symptoms and reduced quality of life for affected individuals. This condition can be caused by various factors including environmental exposures, genetic predisposition, certain medications, and underlying medical conditions. Given its complexity, managing pulmonary fibrosis requires a comprehensive approach that integrates medical treatment with personalized care plans designed to meet the unique needs of the patient.

Before diving into personal care plans, it is essential to understand the impact of pulmonary fibrosis on everyday life. Patients often experience symptoms such as shortness of breath, persistent dry cough, fatigue, and unintentional weight loss. As the disease progresses, activities of daily living may become increasingly challenging, leading to a substantial emotional and psychological burden. Additionally, the condition is often accompanied by anxiety and depression, which can further complicate the management of symptoms and overall well-being [31].

Personalized Care Plans: Importance and Overview

Personalized care plans for pulmonary fibrosis are tailored to address individual patient needs, preferences, and goals. These plans are typically developed through collaboration between the patient, healthcare providers, and caregivers, ensuring that all aspects of the patient's health – including physical, emotional, and social well-being – are considered [32].

Elements of a Personal Care Plan

1. **Medical Management:**
    - **Medication Therapy:** The first line of treatment for pulmonary fibrosis may include antifibrotic agents such as pirfenidone and nintedanib, which have been shown to slow the progression of the disease. Close monitoring for side effects and regular follow-up appointments are critical components of medical management.
    - **Oxygen Therapy:** As the disease advances, patients may require supplemental oxygen to alleviate dyspnea and improve oxygen saturation levels. A personalized oxygen therapy plan is essential to ensure that patients receive the appropriate flow rate based on their activity levels and rest.
    - **Pulmonary Rehabilitation:** A structured rehabilitation program that provides education, exercise, and breathing techniques can significantly enhance lung function, endurance, and quality of life. Tailored exercise programs can be designed based on the patient's physical capabilities [32].
2. **Lifestyle Modifications:**
    - **Nutritional Support:** A balanced diet can bolster overall health and immune function. Nutritionists may work with patients to develop meal plans that meet their specific nutritional needs, paying attention to aspects like caloric intake, hydration, and the inclusion of foods that reduce inflammation.
    - **Smoking Cessation:** For individuals who smoke or have a history of smoking, quitting is imperative for halting further lung damage. Smoking cessation programs may include counseling, medication, and support groups.
    - **Physical Activity:** While fatigue can limit physical activity, maintaining a regular, mild exercise routine helps improve lung capacity, enhance endurance, and manage emotional stress [33].

3. **Psychosocial Support:**
    - **Mental Health Services:** Due to the distress and anxiety posed by chronic illness, mental health interventions are crucial. This may involve therapy, counseling, or support groups to help patients process their emotions and cope with the challenges of living with pulmonary fibrosis.
    - **Family Education and Support:** Informing family members about the condition and how to support the patient can create a conducive environment for emotional recovery. Family involvement in care enhances adherence to treatment plans and fosters better communication between patients and healthcare providers [33].
4. **Routine Monitoring and Follow-Up:**
    - Ongoing assessments of lung function, symptom progression, and treatment efficacy are essential. Regular check-ups with pulmonologists and other specialists ensure that the care plan is adaptive and aligned with the patient's evolving health status [34].

Collaboration in Care Delivery

Successful care management for pulmonary fibrosis necessitates a multidisciplinary approach. Primary care providers, pulmonologists, dietitians, respiratory therapists, mental health professionals, and social workers must work in concert to provide holistic care [34].

Patient education is a cornerstone of effective care management. Empowering patients with knowledge about pulmonary fibrosis, its progression, treatment options, and self-management techniques fosters a sense of control over their health. Educational initiatives can include information about the importance of medication adherence, recognizing exacerbation symptoms, and available resources for managing the condition.

As pulmonary fibrosis is a progressive condition, there may be times when the care plan needs to be modified to address new challenges such as an acute exacerbation of symptoms or the occurrence of comorbidities. Patients must remain adaptable, and healthcare providers must remain vigilant in monitoring and adjusting the care plan accordingly [34].

Multidisciplinary Collaboration in Treatment Approaches:

Pulmonary fibrosis (PF) is a severe and progressive lung disease characterized by the accumulation of scar tissue (fibrosis) in the lungs, leading to a decline in lung function. The pathophysiology of PF involves complex biological processes that can result from a multitude of factors including environmental exposures, autoimmune diseases, genetic predisposition, and idiopathic origins. The complexity of the disease necessitates a concerted approach to its treatment, integrating knowledge from various specialties to enhance patient care, improve outcomes, and maximize quality of life for patients afflicted by this challenging condition [35].

Understanding Pulmonary Fibrosis

Pulmonary fibrosis can be classified into two main categories: idiopathic pulmonary fibrosis (IPF), where the cause remains unknown, and secondary pulmonary fibrosis, which arises due to known factors such as exposure to certain drugs, asbestos, radiation, or underlying medical conditions like rheumatoid arthritis or scleroderma. The symptoms of PF often include a persistent dry cough, shortness of breath, and a general sense of fatigue. Over time, the disease can lead to significant morbidity and, ultimately, mortality, making timely intervention paramount.

Current treatment strategies for pulmonary fibrosis involve antifibrotic medications, such as pirfenidone and nintedanib, lung transplantation, pulmonary rehabilitation, and supportive care measures. Each of these strategies requires specialized knowledge and interventions, underscoring the need for a collaborative approach that transcends traditional boundaries in medical practice [36].

The Need for Multidisciplinary Cooperation

The complexities of pulmonary fibrosis—its multifactorial etiology, varied clinical presentations, and differing responses to treatment—demand a

comprehensive and integrated model of care that brings together multiple disciplines. The landscape of PF management can be broadly divided into diagnostics, pharmacologic interventions, non-pharmacologic therapies, and end-of-life care, each requiring distinct yet overlapping expertise [37].

1. **Diagnosis and Initial Assessment**

The diagnostic process of pulmonary fibrosis involves a combination of clinical evaluation, imaging studies, pulmonary function tests, and sometimes lung biopsies. Interdisciplinary teams typically include pulmonologists, radiologists, pathologists, and clinical coordinators. Pulmonologists are essential in evaluating lung function and symptoms, while radiologists provide interpretative imaging expertise, identifying characteristic patterns of fibrosis on high-resolution computed tomography (HRCT) scans. Pathologists, in turn, play a vital role in confirming diagnoses through histological analysis. The collaboration among these specialties ensures a timely and accurate diagnosis, which is crucial for subsequent management decisions [38].

2. **Pharmacological Management**

Once a diagnosis is established, treatment often begins with the initiation of antifibrotic therapy. The decision regarding the appropriate medication and dosage may involve pharmacologists who can provide insights into drug interactions and side effects. Pulmonologists remain at the forefront of prescribing medications, but they benefit from the input of nutritionists who can address the importance of maintaining optimal nutrition during treatment and physical therapists who can advocate for maintaining lung function through appropriate exercise regimes. Moreover, pharmacists assist in medication management, optimizing adherence strategies to ensure patients receive maximum benefit from their treatment plan [39].

3. **Non-Pharmacologic Interventions**

In addition to pharmacologic treatments, pulmonary rehabilitation has emerged as a cornerstone of PF management. These programs, which combine exercise training, education, and behavioral interventions, typically require the skills of physical therapists, respiratory therapists, and occupational therapists. Each discipline contributes unique perspectives to help patients enhance their exercise capacity, manage breathlessness, and adapt to changes in functional abilities. Furthermore, mental health professionals play a critical role in addressing the psychological impact of pulmonary fibrosis, helping patients cope with anxiety and depression associated with their chronic illness [40].

4. **End-of-Life Care and Palliative Options**

As pulmonary fibrosis progresses, the focus of care may shift towards palliative approaches and end-of-life care. This transition requires collaboration among pulmonologists, palliative care specialists, nurses, social workers, and spiritual care providers. Palliative care aims to relieve symptoms and improve the quality of life for patients and their families through comprehensive support and the management of complex needs. Effective communication among all team members ensures the patient's wishes are honored, and appropriate care plans are developed, facilitating smoother transitions between different facets of care [40].

Models of Multidisciplinary Cooperation

Effective multidisciplinary collaboration can be achieved through several models, including regular case conferences, integrated care pathways, and the establishment of multidisciplinary clinics. Case conferences allow various specialists to share insights and develop cohesive treatment plans tailored to individual patients. Integrated care pathways streamline patient management processes and ensure that all practitioners work towards common goals, enhancing efficiencies and reducing delays in interventions.

Multidisciplinary clinics, where specialists come together in a single location to assess patients jointly, have also shown promise in enhancing the patient experience and outcomes. These settings provide the opportunity for patients to receive comprehensive assessments and individualized care plans in a single visit, thereby minimizing the burden of coordinating multiple appointments across different facilities [41].

Psychosocial Support and Mental Health Considerations:

Pulmonary fibrosis is a debilitating condition characterized by progressive scarring of lung tissue, leading to significant respiratory impairment. While the physical aspects of the disease—chronic cough, shortness of breath, and fatigue—are often the

primary focus of clinical management, it is equally important to recognize the significant psychosocial impact of pulmonary fibrosis on patients and their families. The progressive nature of the disease, coupled with its associated symptom burden, may lead to exacerbated feelings of anxiety, depression, and social isolation.

Pulmonary fibrosis can result from various causes, including environmental factors, autoimmune diseases, and certain medications, with idiopathic pulmonary fibrosis (IPF) being the most common form. As the condition progresses, lung tissue becomes stiff and thickened, impeding oxygen transfer into the bloodstream. This not only affects the patient's physical health but also places immense strain on their emotional well-being. The diagnosis of pulmonary fibrosis is often accompanied by a range of emotional responses including shock, fear, anger, and confusion, which can take a significant toll on mental health [43].

The Psychosocial Impact of Pulmonary Fibrosis

The psychosocial implications of pulmonary fibrosis are profound. Patients often encounter a variety of emotional and psychological challenges, which can stem from the diagnosis itself or from the ramifications of living with a chronic illness. The following factors contribute significantly to the psychosocial burden experienced by these patients:

1. **Chronic Illness and Uncertainty**: The progressive nature of pulmonary fibrosis creates uncertainty about the future. Patients may grapple with the inevitability of disease progression, leading to fears about declining health, loss of independence, and potential mortality.
2. **Social Isolation**: Breathing difficulties can restrict patients' ability to engage in social activities, further exacerbating feelings of loneliness and isolation. This isolation can hinder social support networks, which are essential for emotional resilience [44].
3. **Impact on Personal Relationships**: The physical limitations of pulmonary fibrosis can strain relationships with family and friends. Caregivers shoulder significant responsibilities, which can lead to caregiver burnout while patients may feel guilty for being a burden.
4. **Adjustments to Daily Life**: Everyday activities can become monumental challenges. Tasks such as walking up stairs or participating in social gatherings may trigger anxiety, leading to avoidance behaviors that exacerbate feelings of inadequacy and depression.
5. **Financial Strain**: Managing a chronic illness often incurs significant medical expenditures and may limit employment opportunities, leading to financial stress. This adds a layer of anxiety regarding cancer treatment and disease management [45].

Mental Health Considerations

Given the multifaceted challenges that arise from living with pulmonary fibrosis, mental health considerations should be an integral part of the clinical framework. Many patients may not seek help for their emotional struggles, which can lead to underdiagnosed or untreated anxiety and depression. It's essential for healthcare providers to maintain an open dialogue about mental well-being and to consider the following aspects in care:

1. **Screening for Mental Health Issues**: Routine screenings for anxiety and depression should be standard practice in pulmonary fibrosis care settings. Utilizing validated screening tools can facilitate early identification and intervention [46].
2. **Psychological Support**: Encouraging patients to seek psychological support can markedly improve their quality of life. Cognitive-behavioral therapy (CBT), in particular, has shown promise in helping patients cope with chronic illness by addressing negative thought patterns and fostering adaptive coping strategies.
3. **Support Groups**: Participation in support groups can provide patients with a sense of community and belonging. Sharing experiences with others who understand the challenges associated with pulmonary fibrosis can help patients feel less isolated.
4. **Education**: Providing education about the disease, what to expect in terms of progression, and coping strategies can empower patients and caregivers.

Knowledge can reduce uncertainty and improve the capacity to manage symptoms [47].

5. **Mindfulness and Relaxation Techniques**: Encouraging the use of mindfulness, yoga, or relaxation techniques can help patients manage stress and anxiety. These practices can improve emotional regulation and enhance overall well-being.
6. **Family Involvement**: Engaging family members in the care process is vital. Providing them with education and resources can improve their ability to support the patient and navigate the challenges of caregiving.
7. **Holistic Approaches**: Integrating holistic approaches such as nutrition counseling, physical rehabilitation, or alternative therapies can address both physical and mental health needs, fostering an overall sense of well-being [48].

Transitioning to Home Care and Long-Term Management:

Idiopathic pulmonary fibrosis (IPF) is a progressive lung disease characterized by the accumulation of scar tissue in the lungs, resulting in significant respiratory impairment. The etiology of IPF remains elusive, but it is believed to involve a combination of genetic, environmental, and biological factors that incite aberrant wound healing responses. Given the chronic nature of the disease, patients often experience a decline in pulmonary function, leading to debilitating symptoms that negatively impact their quality of life. Transitioning patients with IPF from acute care settings to home care is a crucial step in ensuring effective long-term management [49].

Understanding Idiopathic Pulmonary Fibrosis

IPF primarily affects older adults, and its prevalence has been rising steadily. Symptoms typically manifest as progressive dyspnea (shortness of breath), a persistent dry cough, fatigue, and unexplained weight loss. The average life expectancy post-diagnosis is markedly limited, with many patients experiencing significant morbidity as their lung function worsens. The pathophysiology of IPF involves complex processes like repeated injury to the lung epithelium, activation of fibroblasts, and excessive extracellular matrix deposition, resulting in irreversible lung scarring.

The standard diagnostic approach involves a thorough clinical history, physical examination, imaging studies (most notably high-resolution computed tomography, or HRCT), and lung biopsy in uncertain cases. Treatment strategies often include antifibrotic medications such as pirfenidone and nintedanib, which have shown efficacy in slowing disease progression. However, these treatments do not reverse fibrosis, and supportive care remains essential as lung function declines [49]].

The Need for Home Care Transition

As IPF progresses, patients often find themselves in situations where they require more than outpatient clinic visits but are not yet in a state that necessitates intensive acute medical care. The transition to home care is essential because it provides a comfortable, familiar environment that can significantly enhance the patient's overall well-being. Home care may include nursing support, assistance with daily activities, telehealth follow-ups, and access to palliative care services.

One of the main goals during this transition is to ensure that patients maintain optimal respiratory function and manage symptoms effectively. Home care facilitates continuous monitoring of the patient's condition, allowing for timely interventions in response to exacerbations or complications of the disease. Moreover, maintaining a routine can instill a sense of normalcy and autonomy for patients who may feel overwhelmed by their diagnosis [49].

Developing a Personalized Care Plan

A personalized care plan is essential for patients with IPF transitioning to home care. This plan should incorporate the patient's medical history, current health status, goals of care, and personal preferences. Key components of a comprehensive care plan include:

1. **Medication Management**: Ensuring that patients adhere to prescribed antifibrotic medications and manage other comorbid conditions (such as hypertension or diabetes) is vital. Education on medication side effects and the importance of

adherence can empower patients to take an active role in their care [50].

2. **Symptom Management**: Patients often need assistance in managing symptoms such as dyspnea and cough. Home care providers can teach breathing exercises, provide oxygen therapy when necessary, and recommend pulmonary rehabilitation techniques that emphasize physical conditioning and energy conservation techniques.
3. **Nutritional Support**: Given the potential for weight loss and diminished appetite, addressing nutritional needs is a critical component of care. Home care services can incorporate dietitians who work with patients to create meal plans that enhance nutrient intake and support overall health [50].
4. **Psychosocial Support**: Addressing the psychological impact of IPF is vital to overall care. Home care should include mental health professionals who can support patients and their families in coping with the emotional burden of the disease, as well as the practicalities of caregiving.
5. **Advance Care Planning**: Engaging patients in discussions around goals of care and advance directives is crucial as they progress in their disease. Home care providers can facilitate these discussions to ensure that the patient's wishes are respected throughout their care journey [50].

The Role of Healthcare Professionals

Healthcare professionals play an integral role in the transition to home care for IPF patients. A multidisciplinary team approach is vital, involving pulmonologists, nurses, respiratory therapists, dietitians, and social workers. Each member contributes unique insights and expertise, enabling comprehensive care tailored to the individual [51].

1. **Pulmonologists** often lead the care team, managing pharmacotherapy and overseeing disease progression. They provide regular assessments and adjust treatment plans as necessary, coordinating closely with other providers.
2. **Nurses and Respiratory Therapists** can offer education on disease management and support services, administer treatments, and manage equipment such as oxygen concentrators.
3. **Social Workers** can assist with resources related to home care funding, community support services, and psychological counseling, ensuring patients and families can navigate the complexities of care systems [51].

Challenges in Long-Term Management

Despite the myriad of benefits of transitioning to home care, several challenges must be addressed to optimize patient outcomes. These include:

1. **Education Gaps**: There may be variability in the knowledge and training of caregivers, leading to inconsistencies in care delivery. Comprehensive training programs must be developed for home care providers to ensure standardized care [52].
2. **Patient and Family Resilience**: IPF presents not only a medical challenge but a significant emotional one. Family members often experience caregiver burden, necessitating regular evaluations of their mental health and offering respite care services when needed [52].
3. **Coordination of Care**: Ensuring seamless communication among healthcare providers is vital for consistent care management. Implementing electronic health record systems that enhance real-time sharing of patient information can improve coordination.
4. **Financial Resources**: The cost of home care services can be prohibitive for some patients. Exploring options for financial assistance or insurance coverage that includes home health services is essential to making such care accessible [52].

Conclusion:

In conclusion, the implementation of effective nursing care strategies for patients with Idiopathic

Pulmonary Fibrosis (IPF) is vital in optimizing their quality of life and managing the complexities of this progressive disease. By focusing on comprehensive patient education, individualized care plans, and continuous symptom monitoring, nurses can empower patients to take an active role in their own care. Collaborative approaches involving multidisciplinary teams ensure that all aspects of a patient's health, including physical and emotional needs, are addressed holistically.

Furthermore, ongoing psychosocial support is essential in helping patients cope with the challenges of living with IPF, promoting resilience and mental well-being. As the healthcare landscape continues to evolve, it is crucial for nursing practice to adapt and refine strategies that accommodate the unique requirements of IPF patients. Continued research and professional development in this area will further enhance nursing competencies, leading to improved patient outcomes and a stronger support network for individuals navigating this chronic condition. Ultimately, the dedication of nursing professionals to understanding and implementing tailored care strategies will significantly contribute to the overall management of IPF, fostering hope and improved health for patients and their families.

References:

1. Holtze C, Flaherty K, Kreuter M, Luppi F, Moua T, Vancheri C, et al. Healthcare utilisation and costs in the diagnosis and treatment of progressive-fibrosing interstitial lung diseases. Eur Respir Rev. 2018;27(150):180078. doi: 10.1183/16000617.0078-2018.
2. Akhtar AA, Ali MA, Smith RP. Depression in patients with idiopathic pulmonary fibrosis. Chron Respir Dis. 2013;10(3):127–133. doi: 10.1177/1479972313493098.
3. Strongman H, Kausar I, Maher TM. Incidence, prevalence, and survival of patients with idiopathic pulmonary fibrosis in the UK. Adv Ther. 2018;35(5):724–736. doi: 10.1007/s12325-018-0693-1.
4. Raghu G, Amatto VC, Behr J, Stowasser S. Comorbidities in idiopathic pulmonary fibrosis patients: a systematic literature review. Eur Respir J. 2015;46(4):1113–1130. doi: 10.1183/13993003.02316-2014.
5. Lee JYT, Tikellis G, Corte TJ, Goh NS, Keir GJ, Spencer L, et al. The supportive care needs of people living with pulmonary fibrosis and their caregivers: a systematic review. Eur Respir Rev. 2020; 29(156).
6. Yount SE, Beaumont JL, Chen S-Y, Kaiser K, Wortman K, Van Brunt DL, et al. Health-related quality of life in patients with idiopathic pulmonary fibrosis. Lung. 2016;194(2):227–234. doi: 10.1007/s00408-016-9850-y.
7. Diamentopoulos A, Wright E, Vlahopoulou K, Cornic L, Schoof N, Maher TM. The burden of illness of idiopathic pulmonary fibrosis: a comprehensive evidence review. Pharmacoeconomics. 2018;36:779–807. doi: 10.1007/s40273-018-0631-8.
8. Raghu G, Rochwerg B, Zhang Y, Garcia CAC, Azuma A, Behr J, et al. An official ATS/ERS/JRS/ALAT clinical practice guideline: treatment of idiopathic pulmonary fibrosis: an update of the 2011 clinical practice guideline. Am J Respir Crit Care Med. 2015;192(2):3–19. doi: 10.1164/rccm.201506-1063ST.
9. Flaherty KR, Brown KK, Wells AU, Clerisme-Beaty E, Collard HR, Cottin V, et al. Design of the PF-ILD trial: a double-blind, randomised, placebo-controlled phase III trial of nintedanib in patients with progressive fibrosing interstitial lung disease. BMJ open Respir Res. 2017;4(1):000212. doi: 10.1136/bmjresp-2017-000212.
10. Kreuter M, Swigris J, Pittrow D, Geier S, Klotsche J, Prasse A, et al. Health related quality of life in patients with idiopathic pulmonary fibrosis in clinical practice: insights-IPF registry. Respir Res. 2017;18(1):139. doi: 10.1186/s12931-017-0621-y.
11. Bonella F, Wijsenbeek M, Molina-Molina M, Duck A, Mele R, Geissler K, et al. European IPF Patient Charter: unmet needs and a call to action for healthcare

policymakers. Eur Respir J. 2016;47(2):597–606. doi: 10.1183/13993003.01204-2015.

12. Raghu G, Remy-Jardin M, Myers JL, Richeldi L, Ryerson CJ, Lederer DJ, et al. Diagnosis of idiopathic pulmonary fibrosis. An official ATS/ERS/JRS/ALAT clinical practice guideline. Am J Respir Crit Care Med. 2018;198(5):44–68. doi: 10.1164/rccm.201807-1255ST.
13. Hutchinson J, Fogarty A, Hubbard R, McKeever T. Global incidence and mortality of idiopathic pulmonary fibrosis: a systematic review. Eur Respir J. 2015;46(3):795–806. doi: 10.1183/09031936.00185114.
14. Swigris JJ, Stewart AL, Gould MK, Wilson SR. Patients' perspectives on how idiopathic pulmonary fibrosis affects the quality of their lives. Health Qual Life Outcomes. 2005;3(1):61. doi: 10.1186/1477-7525-3-61.
15. World Health Organization. Innovative care for chronic conditions: building blocks for action. Date last updated: 2002. Date last accessed: November 20 2020.
16. WHO Regional Office for Europe. Strengthening people-centred health systems: a European framework for action on integrated health services delivery Conceptual overview and main elements. Date last updated: 2013. Date last accessed: November 20 2020.
17. Systematic Reviews. CRD's guidance for undertaking reviews in health care. Centre for Reviews and Dissemination University of York. 2009.
18. World Health Organization (WHO). Roadmap Strengthening people-centred health systems in the WHO Europe Region. A framework for Action towards Coordinated/Integrated Health Services Delivery (CIHSD). WHO Reg Off Eur Copenhagen, Denmark 2013.
19. Glaspole IN, Chapman SA, Cooper WA, et al. Health-related quality of life in idiopathic pulmonary fibrosis: data from the Australian IPF Registry. Respirology. 2017;22:950-956. doi: 10.1111/resp.12989
20. Wolters PJ, Collard HR, Jones KD. Pathogenesis of idiopathic pulmonary fibrosis. Ann Rev Pathol. 2014;9:157-179. doi: 10.1146/annurev-pathol-012513-104706
21. Raghu G, Remy-Jardin M, Myers JL, et al. Diagnosis of idiopathic pulmonary fibrosis: an official ATS/ERS/JRS/ALAT clinical practice guideline. Am J Respir Crit Care Med. 2018;198:e44-e68. doi: 10.1164/rccm.201807-1255ST
22. Jo HE, Glaspole I, Grainge C, et al. Baseline characteristics of idiopathic pulmonary fibrosis: analysis from the Australian Idiopathic Pulmonary Fibrosis Registry. Eur Respir J. 2017;49:1601592. doi: 10.1183/13993003.01592-2016
23. Brown AW, Fischer CP, Shlobin OA, et al. Outcomes after hospitalization in idiopathic pulmonary fibrosis: a cohort study. Chest. 2015;147:173-179. doi: 10.1378/chest.13-2424
24. Jo HE, Randhawa S, Corte TJ, Moodley Y. Idiopathic pulmonary fibrosis and the elderly: diagnosis and management considerations. Drugs Aging. 2016;33:321-334. doi: 10.1007/s40266-016-0366-1
25. National Heart, Lung, and Blood Institute. Idiopathic pulmonary fibrosis.
26. Cottin V. The impact of emphysema in pulmonary fibrosis. Eur Respir Rev. 2013;22:153-157. doi: 10.1183/09059180.00000813
27. Driving factors behind idiopathic pulmonary fibrosis: a review of current understanding. Eur Clin Respir J. 2016;3:31090. doi: 10.3402/ecrj.v3.31090
28. Hutchinson JP, Fogarty AW, McKeever TM, Hubbard RB. In-hospital mortality after surgical lung biopsy for interstitial lung disease in the United States. 2000 to 2011. Am J Respir Crit Care Med. 2016;193:1161-1167. doi: 10.1164/rccm.201508-1632OC

29. Martinez FJ, Flaherty K. Pulmonary function testing in idiopathic interstitial pneumonias. Proc Am Thorac Soc. 2006;3:315-321. doi: 10.1513/pats.200602-022TK

30. Kreuter M, Ehlers-Tenenbaum S, Palmowski K, et al. Impact of comorbidities on mortality in patients with idiopathic pulmonary fibrosis. PLoS One. 2016;11:e0151425. doi: 10.1371/journal.pone.0151425

31. Fernandez IE, Eickelberg O. New cellular and molecular mechanisms of lung injury and fibrosis in idiopathic pulmonary fibrosis. Lancet. 2012;380:680-688. doi: 10.1016/S0140-6736(12)61144-1

32. Ley B, Urbania T, Husson G, et al. Code-based diagnostic algorithms for idiopathic pulmonary fibrosis: case validation and improvement. Ann Am Thorac Soc. 2017;14:880-887. doi: 10.1513/AnnalsATS.201610-764OC

33. Doubková M, Švancara J, Svoboda M, et al. EMPIRE Registry, Czech part: impact of demographics, pulmonary function and HRCT on survival and clinical course in idiopathic pulmonary fibrosis. Clin Respir J. 2018;12:1526-1535. doi: 10.1111/crj.12700

34. Hutchinson JP, McKeever TM, Fogarty AW, Navaratnam V, Hubbard RB. Surgical lung biopsy for the diagnosis of interstitial lung disease in England: 1997-2008. Eur Respir J. 2016;48: 1453-1461. doi: 10.1183/13993003.00378-2016

35. King CS, Nathan SD. Idiopathic pulmonary fibrosis: effects and optimal management of comorbidities. Lancet Respir Med. 2017;5:72-84. doi: 10.1016/S2213-2600(16)30222-3

36. Jo HE, Glaspole I, Moodley Y, et al. Disease progression in idiopathic pulmonary fibrosis with mild physiological impairment: analysis from the Australian IPF registry. BMC Pulm Med. 2018;18:19. doi: 10.1186/s12890-018-0575-y

37. Behr J, Kreuter M, Hoeper MM, et al. Management of patients with idiopathic pulmonary fibrosis in clinical practice: the INSIGHTS-IPF registry. Eur Respir J. 2015;46:186-196. doi: 10.1183/09031936.00217614

38. Lynch DA, Sverzellati N, Travis WD, et al. Diagnostic criteria for idiopathic pulmonary fibrosis: a Fleischner Society White Paper. Lancet Respir Med. 2018;6:138-153. doi: 10.1016/S2213-2600(17)30433-2

39. Sharp C, Lamb H, Jordan N, Edwards A, et al. Development of tools to facilitate palliative and supportive care referral for patients with idiopathic pulmonary fibrosis. BMJ Support Palliat Care. 2018;8(3):340–346. doi: 10.1136/bmjspcare-2017-001330

40. Wells AU, Brown KK, Flaherty KR, Kolb M, Thannickal VJ. What's in a name? That which we call IPF, by any other name would act the same. Eur Respir J. 2018;51(5):1800692. doi: 10.1183/13993003.00692-2018

41. Cottin V, Hirani NA, Hotchkin DL, Nambiar AM, et al. Presentation, diagnosis and clinical course of the spectrum of progressive-fibrosing interstitial lung diseases. Eur Respir Rev. 2018;27(150):180076. doi: 10.1183/16000617.0076-2018

42. Duck A, Pigram L, Errhalt P, Ahmed D, Chaudhuri N. IPF care: a support program for patients with idiopathic pulmonary fibrosis treated with pirfenidone in Europe. Adv Ther. 2015;32(2):87–107. doi: 10.1007/s12325-015-0183-7

43. Moor CC, van Manen MJG, Tak NC, van Noort E, Wijsenbeek MS. Development and feasibility of an eHealth-tool for Idiopathic Pulmonary Fibrosis. Eur Respir J. 2018;51:1702508. doi: 10.1183/13993003.02508-2017

44. Chaudhuri N, Duck A, Frank R, Holme J, Leonard C. Real world experiences: pirfenidone is well tolerated in patients with idiopathic pulmonary fibrosis. Respir

Med. 2014;108(1):224–226. doi: 10.1016/j.rmed.2013.11.005

45. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. Syst Rev. 2016;5(1):210. doi: 10.1186/s13643-016-0384-4

46. Ryan R; Cochrane Consumers and Communication Review Group. Cochrane Consumers and Communication Review Group: data synthesis and analysis.

47. Hambly N, Goodwin S, Aziz-Ur-Rehman A, Makhdami N, et al. A cross-sectional evaluation of the idiopathic pulmonary fibrosis patient satisfaction and quality of life with a care coordinator. J Thorac Dis. 2019;11(12):5547–5556. doi: 10.21037/jtd.2019.11.41

48. Bajwah S, Ross JR, Wells AU, Mohammed K, et al. Palliative care for patients with advanced fibrotic lung disease: a randomised controlled phase II and feasibility trial of a community case conference intervention. Thorax. 2015;70(9):830–839. doi: 10.1136/thoraxjnl-2014-206583

49. Tsai AC, Morton SC, Mangione CM, Keeler EB. A meta-analysis of interventions to improve care for chronic illnesses. Am J Manag Care. 2005;11(8):478–488.

50. Kalluri M, Claveria F, Ainsley E, Haggag M, et al. Beyond idiopathic pulmonary fibrosis diagnosis: multidisciplinary care with an early integrated palliative approach is associated with a decrease in acute care utilization and hospital deaths. J Pain Symptom Manage. 2018;55(2):420–426. doi: 10.1016/j.jpainsymman.2017.10.016

51. Bramer WM, Giustini D, de Jonge GB, Holland L, Bekhuis T. De-duplication of database search results for systematic reviews in EndNote. J Med Libr Assoc. 2016;104(3):240–243. doi: 10.3163/1536-5050.104.3.014

52. Hong QN, Pluye P, Fàbregues S, Bartlett G, Boardman F, et al. Improving the content validity of the mixed methods appraisal tool: a modified e-Delphi study. J Clin Epidemiol. 2019;111:49–59.e1. doi: 10.1016/j.jclinepi.2019.03.008