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Emerging Therapies for Interstitial Lung Disease

Interstitial lung disease (ILD) encompasses a wide range of conditions and has significant direct and indirect costs for patients, insurance payers, and society. Although new drugs that reduce the progression of fibrosis have been developed for ILD with a progressive fibrotic phenotype, more work is needed to find therapies that abrogate the fibrotic process and treat patients with autoimmune-related ILD that does not respond to immunosuppressant drugs. This article discusses the risk factors, comorbidities, diagnosis, economic burden, and treatments for ILD, with a focus on progressive fibrosing and systemic sclerosis-related subtypes, based on recent Insights video interviews with Alicia M. Hinze, MD; Lisa H. Lancaster, MD; and Gary L. Johnson, MD, MBA. To watch the full interviews, visit ajmc.com/insights.

OVERVIEW OF INTERSTITIAL LUNG DISEASE

Interstitial lung disease (ILD) encompasses over 200 conditions and involves scarring or inflammation in a space (or potential space) between alveoli and capillaries or blood vessels, a unique area important for gas exchange and oxygenation, according to Lisa H. Lancaster, MD. She noted that ILD appears to have become more prevalent with time, although this increase may be in part related to improved diagnostic methods, such as imaging, that identify more subtle interstitial changes.

Lancaster also noted that because ILD includes a wide range of conditions, diagnosis of the particular type of ILD focuses on evaluation of the patient's personal and family history, physical examination, laboratory testing, and imaging. Most cases of ILD are characterized by respiratory symptoms (eg, cough and dyspnea), specific abnormalities on chest radiography, typical changes on pulmonary function tests that would indicate decrease in lung volume, and microscopic patterns characteristic of inflammation and fibrosis.¹ Lancaster noted that causes of ILD vary and include occupational and environmental factors, medications, medical conditions (particularly autoimmune conditions), and genetic propensity.

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Alicia M. Hinze, MD, noted that rheumatologists may see patients with ILD to determine if an autoimmune disease is the underlying cause. “Sometimes they will [see a rheumatologist] in the setting of having some positive autoantibodies, and the rheumatologist is, again, asked to determine whether there may be an underlying autoimmune disease that may be driving some of the ILD process,” Hinze said. “This is particularly important as there are some patients [who] may have a pattern of disease that we call ‘nonspecific interstitial pneumonitis.’ And these patients, if it’s in the context of an autoimmune disease, may respond to immunosuppressant therapies.”

Lancaster added that pulmonologists are key and central figures in the management and diagnosis of ILD but pointed out that primary care physicians may be the first healthcare providers to diagnose ILD and coordinate care with local pulmonologists or an ILD center.

TYPES AND RISKS OF ILD

The different diagnoses and diseases categorized as ILD can make diagnosis challenging. Lancaster noted, “Some [patients] may have a mixture of inflammation coupled with fibrosis, and so teasing out that diagnosis is important.”

According to Lancaster, experts have begun to identify a progressive fibrotic phenotype, called progressive fibrosing–interstitial lung disease (PF-ILD; also called fibrosing–interstitial lung disease with progressive phenotype). Although idiopathic pulmonary fibrosis (IPF) is the classic example of PF-ILD, it characterizes multiple types of ILD with fibrosis, said Lancaster and Hinze.

“We are beginning to think [about PF-ILD] more categorically as a group rather than in specifics,” Lancaster explained. “[For example,] how do we treat that progressive fibrotic disease? Are the pathways that get to that progressive fibrotic disease similar enough that we can use similar antifibrotic therapies for their management?”

Hinze added that some patients with ILD related to systemic sclerosis have a progressive fibrotic phenotype, and this subset of patients will show progressive fibrosis on high-resolution computed tomography (CT) and pulmonary function testing that indicates increasing restrictive lung disease.

“Systemic sclerosis with ILD can change by definition,” Hinze said. “If [we] look strictly at whether there is ILD by high-resolution CT, we can see that there may be some bibasilar interstitial changes on high-res [resolution] CT in about 65% to 90% of patients, depending on the subset of patients that

we’re looking at. However, not all ILD is going to progress to [cause] physiologic changes. There are patients in whom we can see a little bit of bibasilar interstitial fibrosis, but we may not see any changes on pulmonary function testing. Pulmonary function testing is really helping us understand what physiologic lung changes are being caused by the actual fibrosis itself.”

Risk factors associated with ILD include older age, exposure to environmental toxins (eg, asbestos, silica, or dust from metal and wood), farmer’s lung, gastroesophageal reflux disease (GERD), smoking history, radiation, and chemotherapy.¹ Hinze noted that several autoimmune diseases are also associated with ILD, including scleroderma, rheumatoid arthritis, dermatomyositis, antisynthetase syndrome, Sjögren’s syndrome, and occasionally lupus. “There are some patients who have overlapping phenotypes where they do not fit into a specific category, but they may have overlapping features that can also develop [into] ILD,” Hinze explained.

Lancaster noted that many comorbidities are associated with ILD, typically pulmonary hypertension, coronary artery disease, GERD, and obstructive sleep apnea. Although obstructive sleep apnea has long been identified as a comorbidity in chronic obstructive pulmonary disease (COPD), Lancaster said that its high frequency in patients with lung disease, particularly IPF, has become increasingly recognized.

“Assessing sleep in patients with IPF is important because we’re assessing their breathing during one-third of their day,” Lancaster said.

She estimated that 50% to 88% of patients with IPF have obstructive sleep apnea and suggested that the associated oxygen desaturations may be proinflammatory and profibrotic, although she stated that further study is needed to elucidate the relationship between obstructive sleep apnea and the development of IPF or other progressive fibrotic phenotypes of ILD.

DIAGNOSIS OF ILD

Because ILD encompasses over 200 diseases, the differential diagnosis similarly varies broadly and relies on a good history of environmental exposures and any signs or symptoms that may corroborate autoimmune disease, said Hinze. “When talking to patients who may be found to have ILD on high-res [resolution] CT or who were presenting with symptoms of shortness of breath and found to have ILD, we will go through a detailed history all the way back to whether they may have [had] any exposure, such as coal, or whether they have a pet bird at home,” Hinze said.

To evaluate for autoimmune diseases that may be driving ILD, Hinze often asks patients whether they have color changes in their fingers in response to cold (a possible sign of Raynaud's syndrome), stiffness in their joints in the morning (which may indicate inflammatory arthritis), or skin changes such as rashes or skin thickening (which may indicate systemic sclerosis).

Regarding diagnostic tools, Hinze identified high-resolution CT as the optimal modality for visual evaluation and pulmonary function testing for identifying reductions in forced vital capacity (FVC) and diffusing capacity for carbon dioxide and evaluating for clinically relevant reductions in lung function with ILD. "The high-resolution CT and pulmonary function testing [are] the key features that we use in terms of examination and imaging parameters and procedures to define the level of ILD and how it's affecting the patient," Hinze explained.

However, she noted that these findings must be looked at in context with other symptoms the patient may be experiencing as underlying pulmonary hypertension can also lead to a reduction in diffusing capacity for carbon dioxide. "It's a complex evaluation. We use first, a clinical examination, [and] second, patient history of dyspnea," Hinze added.

Gary L. Johnson, MD, MBA, shared that the focus of insurance payers in cost management for ILD is on management of pharmaceuticals, and they generally do not have specified algorithms for diagnostic criteria or preferences for a workup. "We leave that pretty much entirely up to the practicing physician," he said.

According to Hinze, the point at which patients seek care varies greatly. Some patients seek care when they experience shortness of breath, and subsequent lung function tests or imaging show abnormalities suggestive of ILD. "If they're presenting with dyspnea, these patients will often then go see a pulmonologist who will further evaluate the ILD and potential drivers," she said.

Alternatively, she said that some patients present with signs of autoimmune disease which then prompts a workup for ILD based on their risk factors. "With scleroderma, for example, there are certain subsets [of patients] who are more at risk for ILD," she said. "In subsets in which I know clinically, or by laboratory, that they are at higher risk for ILD, I may go looking more intently for it in order to detect it so that we may better monitor it over time to determine [the] need for treatment."

Hinze added that a multidisciplinary approach is essential for diagnosis and treatment of ILD, particularly for patients with ILD related to autoimmune disease. "The pulmonologist and the rheumatologist work together closely because the rheumatologist also assesses other features of autoimmune disease that may also require treatment, such as immunosuppression therapies," she said. "We want to ensure that not only is the patient's lung disease being treated and managed, but also that we are addressing other features of the autoimmune disease that may require immunosuppression."

She also stated that the severity of ILD varies widely. Some patients with scleroderma have radiographic evidence of ILD with normal pulmonary function tests and minimal symptoms, while others have mild dyspnea and slight changes in lung function that can be monitored before implementing immunosuppressive therapies. For patients who have scleroderma-associated ILD that progresses quickly, however, Hinze said that prompt therapeutic intervention is warranted. "[We] try to assess where the patient is at, the level of

symptoms that they are having, and the timing of when it is best to implement therapies," she said.

ECONOMIC BURDEN OF ILD

The panelists discussed the direct and indirect costs of ILD for the patient, payer, and society. Hinze noted that direct patient costs associated with ILD include frequent clinic appointments for patients who need regular monitoring, multiple hospital visits due to exacerbations in patients with progressive ILD, multiple high-resolution CTs and pulmonary function tests used for regular monitoring of patients, and medications, such as immunosuppressant and antifibrotic therapies. Johnson added that the insurers also bear the brunt of many of these

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– Gary L. Johnson, MD, MBA

costs, particularly for the pharmaceuticals, hospitalizations, and ancillary care required for management of ILD and associated comorbidities. Hinze and Johnson both shared that indirect costs for the patient and society include loss of work due to hospitalization or a reduction in workload if their dyspnea prevents them from working a full-time job.

Treatment of comorbidities associated with ILD is important, but also add costs to the equation, said Hinze. GERD is particularly prevalent in patients with scleroderma, who are often prescribed additional therapies to manage acid secretion in the stomach on top of drugs to treat their ILD. Evaluation and treatment of obstructive sleep apnea, which is also especially prevalent in patients with ILD and can contribute to pulmonary hypertension, is important as well, according to Hinze. She added that referring patients who are smokers to programs to help them quit can also help reduce comorbid conditions that could worsen ILD.

Johnson agreed that the increased utilization of healthcare resources due to treating comorbid conditions increases direct and indirect costs, but insurance payers are not looking to change the management strategy for ILD and its comorbid conditions. "It's a relatively rare disease," he said. "Although the costs per patient can be fairly high, the numbers are relatively small. It is not something that we focus on, though, primarily because there's not any particular intervention that we can do to alter those costs." He added that, "there really isn't any intervention that we can do in terms of prevention to avoid individuals from having the disease."

Greater severity of disease also increases the economic burden due to increased frequency of monitoring and need for therapies, said Hinze; however, a patient who is not experiencing progression of disease may not require medication therapy. "We may be able to monitor them less, depending on the stage of disease and the characteristics of the ILD."

Johnson added that much like lung cancer, ILD has become a chronic disease that requires frequent monitoring, which further increases costs. "With any chronic disease, as the individual becomes more ill, costs clearly increase [and] their healthcare utilization increases, both from the disease itself and from the comorbid conditions."

Although Johnson said it is difficult to determine the number of misdiagnoses (either patients mistakenly identified to have ILD or patients diagnosed with another disease who actually have ILD), insurance payers have attempted to minimize unnecessary spending by implementing prior authorizations for the expensive drugs used to treat ILD. “It is our obligation to try to ensure that the patient actually has the disease [before] we put them on the drugs that are approved and used for ILD,” Johnson said.

GUIDELINES AND TREATMENT OPTIONS FOR ILD

Treatment strategies vary widely based on the type of ILD, according to Hinze. Although the American Thoracic Society (ATS) has guidelines for certain conditions such as IPF, no formal guidelines exist for ILD associated with scleroderma or other rheumatic diseases. “We do have some major studies that we reference with regards to medication management and success of those therapies,” she said.

Johnson added that although guidelines may be used in clinical practice, they do not play a major role in determining treatment from a managed care standpoint. “[The ATS guidelines] talk about drugs and treatment approaches that we, from a managed care standpoint, really do not get involved with,” he said. “We do not prescribe to the providers that a certain stepwise-fashion treatment should occur.”

Hinze discussed several lifestyle modifications that should be included when treating patients, with smoking cessation being of primary importance. She also noted that GERD should be managed with a combination of medications and lifestyle changes, such as reducing caffeine and carbonated beverage intake; eating smaller, more frequent meals;

“Patients won’t necessarily feel better with the therapies, but they do slow disease progression, and there are some evolving data about improved survival, too.”

– Lisa H. Lancaster, MD

and increasing the time between the evening meal and bedtime. Pulmonary rehabilitation is another intervention, and this can improve distance on the 6-minute walk test and health-related quality of life, Hinze said.

Regarding treatment for ILD associated with sclero-

derma, Hinze explained that the immunosuppressant drug mycophenolate mofetil is the first-line option for treatment based on results from the Scleroderma Lung Study I,² which showed that cyclophosphamide reduced the progression of ILD better than placebo, and the Scleroderma Lung Study II, which showed that mycophenolate mofetil had similar efficacy as cyclophosphamide, but with a better toxicity profile.³

For patients with IPF, Lancaster said that therapeutic goals should involve multiple modalities of therapy and consider the patient’s personal goals for well-being. “This is a discussion that is ongoing, not just from the point of diagnosis, but at every single visit down the road,” she said. “We want to make sure we discuss the 2 FDA-approved therapies, [adverse] effects, and expectations. Patients won’t necessarily feel better with the therapies, but they do slow disease progression, and there are some evolving data about improved survival, too.”

She added that managing comorbidities; ensuring the patient receives vaccines for influenza and pneumococcus; pulmonary rehabilitation; and discussing early palliative care and hospice for patients who are or may become eligible are also important. “We want patients to be empowered with as much education about not just the disease state, but its course and ultimate plans for the goals of care at the end of life,” Lancaster said.

She concluded that the disease severity, degree of pulmonary impairment, and need for oxygen ultimately guide evaluations, assessments, and discussions of management. “There will be times where we may consider transplantation candidacy sooner rather than later for patients, and the same thing goes for palliative care and hospice discussions,” she said.

Although 2 FDA-approved options, nintedanib and pirfenidone, are available for treatment of IPF, Lancaster stated that more research is needed to find medications that can cure the disease or repair fibrous tissue. “[Nintedanib and pirfenidone] slow disease progression by about 50%, but patients may not necessarily feel better,” she said. “I think that’s a critical point to get across to patients. [Managing] expectations is key to helping them maintain compliance and be able to take these medications for the long term.” In her experience with patients in clinical trials and prescription therapy at Vanderbilt University Medical Center, some patients tolerate one agent better than another, which may guide selection of the optimal agent.

Hinze added that use of antifibrotic therapy in patients with ILD associated with autoimmune disease is an exciting area of research, as ongoing studies are investigating the efficacy of pirfenidone and nintedanib in this population. Data on nintedanib in systemic sclerosis are particularly promising. In March 2018, the drug received a fast track designation by the FDA for treatment of systemic sclerosis with associated ILD based on the anticipated efficacy and safety data from the SENSCIS (Safety and Efficacy of Nintedanib in Systemic Sclerosis), double-blind, randomized, placebo-controlled global phase 3 trial.⁴ Recent results from the trial that were published in the *New England Journal of Medicine* and presented at the ATS International Conference in Dallas, Texas, in 2019, showed that nintedanib reduced the annual rate of decline in FVC compared with placebo in patients with ILD associated with systemic sclerosis.⁵

For ILD associated with rheumatic disease, Hinze stated that the choice of medication is generally guided by the particular autoimmune disease contributing to ILD. For example, azathioprine, rituximab, or corticosteroids may be beneficial for inflammatory myopathies. However, Lancaster referred to the IPF Network Panther Study, which showed that a combination of prednisone, azathioprine, and N-acetyl cysteine was associated with an increased incidence of hospitalization and mortality in patients with IPF,⁶ and Hinze stated that corticosteroids can increase risk of scleroderma renal crisis in patients with systemic sclerosis. “From a rheumatology standpoint, the use of steroids really depends on what autoimmune condition is underlying the interstitial lung disease,” she said.

Johnson added that prior authorization for the approved antifibrotic medications requires a high-resolution CT or lung biopsy to confirm diagnosis and that the patient does not have a disease or symptoms indicating an alternate identifiable case, such as sarcoidosis or radiation-induced fibrosis.

PROGRESSIVE FIBROSING-INTERSTITIAL LUNG DISEASE

PF-ILD is broadly defined as a phenotype of ILD that progressively worsens. According to Hinze, the “progressive” in PF-ILD describes the progression of pulmonary abnormalities and/or worsening of function assessed by pulmonary function testing. “Progressive fibrosing lung disease is a broad overview term that’s used to describe progressive fibrosing lung disease, as the name would suggest,” Hinze said. Definitions may include a 10% or more decrease in FVC on pulmonary function testing, a 15% or more reduction in diffusing capacity for carbon dioxide on pulmonary function testing, or a 5% to 10% decrease in FVC accompanied by CT-confirmed progression of ILD or patient-reported worsening of dyspnea.

The prevalence and incidence of PF-ILD are difficult to determine because of discrepancies in case ascertainment and systems of classification among studies. One global estimate suggested an incidence range of 3 to 9 cases per 100,000 individuals per year for IPF (the classic example of PF-ILD) in Europe and North America, with a lower incidence rate in East Asia and South America.⁷ However, Hinze noted that PF-ILD encompasses a larger group of patients with ILD, such as those with ILD related to autoimmune disease who eventually develop a progressive fibrosing phenotype.

The economic burden of PF-ILD is similar to other types of ILD, according to Johnson. “The economic burden to the patient involves loss of work productivity and also any other ancillary care that might be required that is not covered by their health plan,” he said. “We actually do not make a distinction between PF-ILD and ILD. It’s splitting hairs, and the bottom line is that it really doesn’t matter from the health plan perspective.”

Treatment of PF-ILD depends on whether the ILD is driven by an autoimmune process or a potentially idiopathic process, according to Hinze. “It’s very important to make this distinction because right now, if progressive fibrosing lung disease is caused by or underlies an autoimmune disease, we will use therapies directed at suppressing the immune system,” she said. “However, in idiopathic pulmonary fibrosis, [we] use approved antifibrotic agents.”

Idiopathic Pulmonary Fibrosis–Interstitial Lung Disease

A collaborative effort by the ATS, the European Respiratory Society, the Japanese Respiratory Society, and the Latin American Thoracic Association defined IPF as “a specific form of chronic, progressive fibrosing interstitial pneumonia of unknown cause, occurring primarily in older adults, limited to the lungs, and associated with the histopathologic and/or radiologic pattern of usual interstitial pneumonia [UIP].”⁸

“Most patients will have some element of progression and be asymptomatic for an undefined period, such as a few years, and then come to clinical awareness of [the disease] with the development of a cough or shortness of breath,” Lancaster explained. “Patients will usually see their primary care provider first to have that evaluated. Many times, [patients are] labeled as having bronchitis, pneumonia, COPD, or asthma at first. Then ultimately, when those diagnoses and treatment paradigms do not help the patient’s problems, further imaging with CT scans usually occurs, and the diagnosis is ultimately noted.”

Although there are no large-scale studies on the incidence and prevalence of ILD, a study using healthcare claims data from a large health plan in the United States estimated a prevalence of 14.0 to 42.7 per 100,000 individuals; the large range is likely due to differences in case definitions used.⁹ Confirming a diagnosis of IPF requires excluding other known causes of ILD, presence of a UIP pattern on high-resolution CT in patients who do not undergo surgical lung biopsy, and certain combinations of high-resolution CT and surgical lung biopsy patterns in patients who do receive a surgical lung biopsy.⁸

Much like with ILD in general, Johnson stated that healthcare plans do not provide specific step-wise algorithms for treatment of IPF, but Lancaster added that better oxygen delivery systems, as well as better payment systems for oxygen, are needed to provide patients with

the equipment they need. “We need further development of smaller systems that deliver higher flow rates because patients with ILD, with time and with disease progression, require higher flow rates of oxygen than somebody with emphysema or certain other lung diseases,” she said.

However, she added that multiple clinical trials of fibrotic therapies that target the various pathways of the fibrotic process make it an exciting time to treat IPF. “We have a lot of opportunity to learn from these clinical trials,” she said. “Even if [the results] are negative, we will learn a lot about the disease process and the different pathways that get us ultimately to those fibrotic pathways, typically UIP, and [nonspecific interstitial pneumonia].”

Lancaster added that a multimodality care team is also important for treatment of IPF. This often includes a primary care physician, pulmonologist, rheumatologist (when autoimmune disease is involved), physical therapist at the pulmonary rehabilitation program, and the leader of a local or online support group for pulmonary fibrosis (if the patient is a member). She also emphasized the importance of considering treatment at a Pulmonary Fibrosis Foundation Center of Excellence, which has the expertise and resources to provide standard-of-care therapy along with access to the latest clinical trials.

“Many of these can be found by just looking on the Pulmonary Fibrosis Foundation website,” Lancaster said. “We want patients to come early because we want to start the education process and we want to be a support with them along their journey through the multiple different phases of the disease.”

SYSTEMIC SCLEROSIS AND ILD

Hinze described systemic sclerosis as a complex autoimmune disease with features of vasculopathy and fibrosis that affect multiple organs. “Systemic sclerosis is a very heterogeneous disease,” she said. “In making a diagnosis of systemic sclerosis, [the physician] relies heavily on physical examination and clinical history.”

“Treatment of PF-ILD depends on whether the ILD is driven by an autoimmune process or a potentially idiopathic process. It’s very important to make this distinction.”

– Alicia M. Hinze, MD

She also noted that clinical features may include Raynaud's syndrome (which can lead to ulcerations in the digits if untreated), ILD, pulmonary arterial hypertension, and thickening of the skin that can be widespread. "It is a chronic disease, and so once a patient has it, unfortunately, we don't have the cure," Hinze explained. "We focus on being able to treat the different manifestations of disease to improve overall morbidity and mortalities of the disease process itself."

The results of a recent systematic review indicated that the prevalence of systemic sclerosis in the United States ranged from 13.5 to 30.0 per 100,000 individuals, and the study estimated that 30% to 52% of patients with systemic sclerosis in North America went on to develop ILD.¹⁰ However, Hinze estimated that the percentages of patients who develop ILD may be as high as 90%, based on imaging, although not all these patients will go on to develop progressive lung disease. "Actual percentages can be a little difficult because it depends on the characteristics of the cohort that we're looking at," she said, adding that risk factors associated with the development of progressive lung disease related to systemic sclerosis include diffuse skin thickening, presence of certain autoantibodies in the blood, and African American race.

No FDA-approved treatment options are available for ILD related to systemic sclerosis, and Hinze stated that the goal of treatment is stabilization of disease. "When we are seeing progressive fibrosis, as defined by either progression on high-res [resolution] CT, most of the time we are really looking at pulmonary function testing to evaluate whether patients are developing physiological changes in their lung functions themselves to track progression," she said. "Our focus is on trying to stabilize lung disease that is progressing."

Hinze said that she uses mycophenolate mofetil as a first-line treatment, but stressed the importance of additional supportive care, such as optimizing nutritional status and prescribing pulmonary rehabilitation, the latter of which can be beneficial for improving distance on the 6-minute walk test and health-related quality of life. "Pulmonary rehabilitation can be a big aspect," she said. "Our patients are getting weaker, [and] their health-related quality of life is not improving. They can get deconditioned, which is not good for overall health as well as lung function."

Lancaster added that although patients with systemic sclerosis can have intrinsic lung disease, it can be aggravated by esophageal dysmotility and severe reflux with recurrent events of aspiration. Pulmonary hypertension that may or may not be related to chronic hypoxia is also a concern, Lancaster said. "ILD in the setting of systemic sclerosis can be particularly morbid, and there is a high risk for mortality in these patients," she said.

Much like treatment of IPF-ILD, treatment of ILD associated with systemic sclerosis requires a multidisciplinary approach, according to Lancaster. "Treatment for patients with autoimmune diseases such as systemic sclerosis takes a village," she said. "It's a combination of the rheumatologist assisting with prescription or prescribing of the immunosuppressive therapy that's appropriate for that particular autoimmune disease, coupled with the pulmonologist's assessment of lung physiology, treating the oxygenation problem, and helping to organize the assessment for reflux and dysmotility with the help of gastroenterologists skilled in that area."

However, Hinze noted that therapies for patients who continue to progress on immunosuppression agents remains an unmet need, particularly as ILD transitions from being immune- or inflammatory-driven in the early stages to a profibrotic phenotype in the later stages.

EMERGING TREATMENT OPTIONS

The panelists concluded with a discussion of emerging treatment options for IPF- and systemic sclerosis-related ILD. Lancaster said that although the future appears promising for treatment of IPF with targeted antifibrotic therapies, much remains to be learned about aspects of the disease, such as methods of ending the pattern of interstitial pneumonitis injury and determining if genetics are associated with response to therapy. She added that ongoing studies are investigating spirometry strategies to monitor patients with ILD in the home setting between clinic visits, and telehealth to investigate how nursing support and education affects the patient journey in IPF and ILD.

"There are multiple compounds that are being studied in clinical trials that could be the next best therapy that is given independently or perhaps even layered on the therapies that we have presently," Lancaster said. "We're very optimistic about what we've learned in the past but realize that we have a lot more to learn about the disease."

Hinze agreed that antifibrotic therapy such as nintedanib, shown to be effective in progressive fibrotic phenotypes, could be a game changer for patients with systemic sclerosis-related ILD with a progressing fibrosing phenotype that does not respond to immunosuppression therapies.

Johnson concluded that from the payer perspective, the advent of the 2 antifibrotic drugs and potential new drugs coming down the pipeline will likely increase the costs associated with treatment, "but if we can get benefit from those drugs, it's something that we, as an insurer, have an obligation to pay for." ■

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