

# Basic concepts in preserving holistic well-being in interstitial lung diseases: A MIHRA and G-FoRSS collaborative summary

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## ABSTRACT

**Background:** Interstitial lung diseases (ILD) are a heterogeneous group of diseases that involve inflammation and/or fibrosis of the lung parenchyma. ILD can exert significant stress on a person's extrapulmonary systems, eroding organ and physical function. Thus, ILD can accelerate age-related vulnerabilities that lead to early onset frailty, which makes frailty prevalent in ILD at any age. Frailty confers a three-fold increase of, and predicts, mortality in ILD.

**Objective:** To present a feasible approach to understanding and addressing holistic health in ILD to fortify physical and psychological capacity markedly enhances a person's tolerance of ILD and aging.

**Methods:** From our previous published work that consisted of serial Medline and PubMed scoping reviews (with search terms such as frailty, interstitial lung disease, ILD, idiopathic pulmonary fibrosis, IPF, systemic sclerosis, sarcoidosis, well-being), patient focus groups, ILD outcome measures deconstruction and linking to the World Health Organization's International Classification of Disability, and nominal group processes, we iteratively isolated factors that seem to accelerate and, importantly, protect against and reverse frailty. These factors were presented at The Eastern Pulmonary Conference in September 2024 and summarized herein.

**Results:** The result is a collective statement that (a) summarizes health-care system responsibilities in providing sustainable, humane environments for patients and clinicians; (b) advocates for early intervention and shared decision-making from the time of diagnosis to fortify well-being when living with ILD; and (c) offers guidance to fortify physical, mental, and social well-being as well as health literacy and strength of patient voice.

**Conclusion:** Proactive measures to protect against frailty begins at the time of diagnosis. Interventions that are incremental and based on patient priorities and preferences introduce a feasible approach to holistic well-being.

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We present our groups' comprehensive approach to holistic well-being when living with interstitial lung diseases (ILD), delineating four interconnected domains: (a) determinants beyond patient and/or clinician control, (b) cognitive-psychological well-being, (c) patient-clinician dyad engagement, and (d) physical well-being.<sup>1,2</sup> When emphasizing risk recognition, health education, personalization, and patient-centered well-being, the framework advocates (Fig. 1) for a compassionate continuum for clinicians and patients by facilitating incremental adoption of concepts that align with patient preferences and priorities.<sup>1,2</sup> Key concepts highlight vigilance, communication, and neuro-myo-vascular adaptive health aspects that impact physical function, health-related quality of life (HRQoL), and survival. Foundational principles such as aspects of ILD phenotyping, homeostenosis, and loneliness and/or social connections are discussed, underscoring their roles in preserving holistic health and resilience while mitigating frailty in ILD. Despite the complexity and rarity of ILDs, leveraging primary care and healthy aging principles often proves beneficial.

Resilience and frailty management cannot solely be relegated to the clinician-patient dyad because systemic and environmental support are critical underpinnings for health success.<sup>3-11</sup> Social syndemic constructs, *e.g.*, the social vulnerability index, correlate with increased mortality in pulmonary conditions, which highlights the importance of

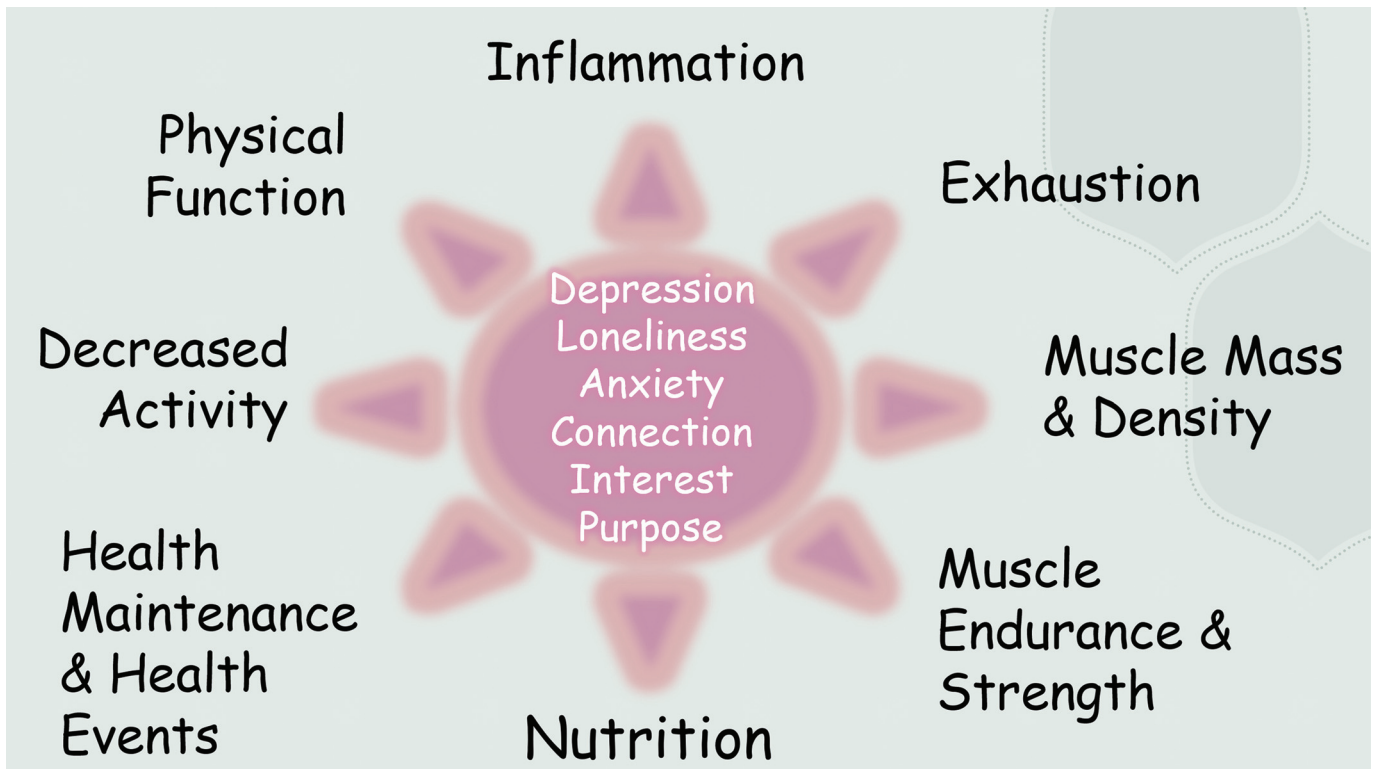
community resilience and caregiver burden assessment.<sup>1-4,10,12-15</sup> This collective statement emphasizes health-care system responsibilities in providing sustainable, humane environments for patients and clinicians. In advocating for early intervention, the article stresses shared decision-making from the time of diagnosis onward to fortify well-being. It offers guidance for clinicians to facilitate a natural, incremental patient engagement physically, mentally, and socially, fostering health literacy and patient agency in decision-making.

### METHODS

Our previous published work<sup>1,2,13</sup> over the past decade of serial and unrestricted Medline and PubMed scoping reviews (with search terms such as frailty, interstitial lung diseases, ILD, idiopathic pulmonary fibrosis, IPF, systemic sclerosis, sarcoidosis, well-being), serial patient focus groups, along with the deconstruction and linking of ILD outcome measures to the World Health Organization's International Classification of Disability,<sup>16</sup> and nominal group processes, collectively created a platform that investigated frailty in ILD. Our works iteratively isolated factors that seem to accelerate and, importantly, also protect against and reverse frailty.<sup>1,2,13,16-18</sup> These



Figure 1. Previously published framework on holistic well-being in interstitial lung diseases (ILD) (Adapted from Ref. 2).



**Figure 2.** Psychologic factors: the inter-connective inter-influential driver–accelerator on the classic biophysical concepts of frailty. Courtesy of L.A. Saketkoo on behalf of Global Fellowship on Rehabilitation and Exercise Science in Systemic Sclerosis, rights reserved.

were presented at The Eastern Pulmonary Conference in September 2024 and are summarized herein.

## RESULTS

### Frailty

Frailty and prefrailty are clinical syndromes associated with diminished biophysical reserve that predisposes one toward vulnerability to rapid deterioration and death.<sup>15,19</sup> Frailty is the precipice to physical demise commonly associated with aging. However, frailty is age indiscriminate that occurs in health conditions such as cancer and autoimmune diseases, and is associated with an accelerated metabolic process in lung disease, known as pulmonary cachexia.<sup>20–24</sup>

Homeostenosis refers to the body-wide accrual of damage from small injuries, which leads to weathering of multiorgan system function<sup>25–28</sup> and relates to recent models of multiorgan vulnerability to cardiovascular and metabolic disease.<sup>29</sup> As histologic rigidity sets in, the body’s physiologic mechanisms are less responsive to routine complex interplays among glandular, hormonal, electrolyte, hemodynamic, hematologic, nutritional, immune, myogenic, angiogenic, vascular, and neuronal responses required for healthy functional tissue. Over time, increasing vulnerabilities lead to an inflection point

in which small challenges overwhelm a person’s biophysical reserve. This inflection point is frailty.

Physical frailty was initially conceptualized by sarcopenia (combined loss of muscle mass and function), nutritional status (cachexia and weight loss), low levels of physical activity, and slow gait.<sup>29</sup> Later, frailty definitions featured inflammation indicators and fatigue or exhaustion. Now, combined biophysical, cognitive, and psychosocial factors are considered critical in frailty assessment (Table 1).

In prefrailty, a single large life stressor or series of smaller stressors can tip an outwardly appearing well-functioning person into a high-risk status for adverse outcomes, such as long-term care admissions, falls, and mortality. Frailty and pre-frailty are an insidious progression of weathering of one’s biophysical and psychosocial reserves (Fig. 1 and 2) and can accumulate without a person’s or his or her loved ones’ cognizance. In the more optimally fit person, these changes occur more slowly, with an increased ability to cope with symptoms and impairments, and to recover from surgical, medical, and/or treatment complications; psychological or biophysical setbacks; and aging.

### ILD Concepts

ILDs are a widely heterogenous group of diseases that involve inflammation and/or fibrosis of the





**Figure 3.** Global multistream impact of exercise on holistic health. Courtesy of L.A. Saketkoo on behalf of Global Fellowship on Rehabilitation and Exercise Science in Systemic Sclerosis, rights reserved.

connective tissue (parenchyma) located between (interstitial, positioned between) lung structures, *e.g.*, airways, vasculature, alveoli. ILDs are a common feature in systemic inflammatory multiorgan conditions such as sarcoidosis, COPA or SAVI syndromes and connective tissue diseases, including systemic sclerosis, idiopathic inflammatory myopathies/myositis (IIM), Sjogren syndrome, and rheumatoid arthritis (RA) in which ILD occurs in the setting of diverse, often severe, extrapulmonary impairments. ILDs also occur in relation to fewer inflammatory processes, such as idiopathic pulmonary fibrosis (IPF), lymphangioleiomyomatosis, and other predominantly “solitary” lung diseases. However, even solitary lung disease exerts stress on extrapulmonary systems, incrementally eroding organ and physical function regardless of age.

Hypoxic oxidative stress and injury, subclinical ischemia, and other downstream effects of lung disease on myo-neuro-vascular networks result in histologic changes that wear on cardiac, glandular, vascular, muscle, osseous, bone, cognitive, psychological, constitutional function (*e.g.*, energy and nutrition), and even sensory function (*e.g.*, hearing).

The presentation, rate of progression, severity, and prognosis vary widely in a single ILD type. RA-ILD is a prototypical of this, whereby ILD may be the most prominent or initial feature, with other disease features, *e.g.*, inflammatory arthritis, being muted or developing

later. Optimal ILD care relies on early diagnosis and timely initiation of appropriate treatment, along with ongoing access to quality health-care interactions and measures to preserve and fortify current physical and psychological capacity. Symptom severity and therapeutic responsiveness determine short-term and long-term disability in ILD. This is especially true in ILDs driven by the intensity of inflammatory or autoimmune activity as with connective tissue diseases–ILDs or sarcoidosis.<sup>16</sup>

Race, ethnicity, and socioeconomic status are significant determinants to timely diagnosis of treatable ILDs and ILD-related outcomes.<sup>10,11,30–34</sup> Fear, anxiety, uncertainty of disease trajectory, and efforts in navigating ILD-related life changes can erode HRQoL in adults living with ILDs.<sup>13,17,18,35–37</sup> Early continued access to quality holistic clinical care potentially mitigate the psychological burden of ILD, which, of course, may vary in pediatric and juvenile experiences of ILD with regard to impact and navigation of psychosocial and biophysical stressors.<sup>35</sup>

ILD and aging are bi-directionally influential, and a person’s level of fitness impacts his or her tolerance of ILD and aging.<sup>38,39</sup> Whereas ILD extent may proportionally accelerate age-related vulnerabilities, ILD subtype and overall functional status more strongly prognosticate outcomes than age. Further, age-related vulnerabilities are likely accelerated and more complex in inflammatory systemic ILDs (*e.g.*, connective tissue diseases, sarcoidosis).

Table 1 **Sampling of influential, but possibly remediable, factors on functional instability and development of frailty**

• Co-Morbidities	• Caregiving Responsibilities
• Routine Health Maintenance	• Depression, Loneliness
• Medication Burden	• Isolation/Lack of Connection
• Equipment Burden	• Lack of Green Space/Nature Exposure
• Red Flag Frailty Risks: osteoporosis, malignancy, malnutrition, diabetes, etc.	• Access to Personal Interests
• Poor Sleep Quality	• On-Going Opportunities for Learning
• Physical Activity Throughout Day	• Living Situation and Circumstances
• Exercise	• Community Support and Interaction
• Pain	• Transportation Strain
• Dental Problems	• Educational Background
• Nutrition	• Financial Insecurity/Strain
• Hearing or Visual Impediments	• Ability to Navigate Complex Systems or Self-Efficacy to Obtain Assistance

Frailty is highly prevalent at any age in a person with ILD.<sup>23,40–48</sup> Frailty poses a three-fold increase in mortality in lung diseases and predicts mortality, lung transplantation success, and the likelihood of recovery from acute medical and psychosocial events.<sup>42,44,48–53</sup> Pulmonary cachexia, a distinctly accelerated syndrome in advanced or severe lung conditions, is characterized by muscle wasting and dysfunction attributed to energy imbalance likely from ongoing oxidative and ischemic stress.<sup>21,22,54,55</sup> Although there is no criterion standard definition for frailty, prefrailty, or frailty risk, extrapolation of evidence across many diseases, including ILDs, suggests that even a loosely defined frailty risk reduction in ILD results in recognition, intervention, and improved outcomes.<sup>1,2,23,41–47,49,51,52</sup>

Patient-clinician conversations for preservation of physical and psychological function in ILD begins on ILD diagnosis regardless of age or strata of ILD severity (Table 2),<sup>1,2,38,39,41–49,56,57</sup> which critically includes early initiation, maintenance, and intensification of comprehensive physical activity.<sup>56–69</sup> Early detection and intervention of frailty risk factors can avert a person's descent into frailty. Interventions such as pulmonary rehabilitation, sustained physical activity and exercise, proactive avoidance of sedentarism, and early initiation of appropriate pharmacologic treatment and/or lung

transplantation evaluation seem to alter physical function and HRQoL outcome trajectories.<sup>42,46,49,50,52,53,70</sup>

**Common Diseases Are Prevalent Among Rare Diseases**

A person living with ILDs faces multiple health vulnerabilities that increase the risk of common diseases compared with that of the general population. Oftentimes, the presence of rare diseases, *e.g.*, ILD, can overwhelm a clinician's attention, that commonplace comorbidities and complications are not recognized. These vulnerabilities to common comorbidities include the following:

- Propensity toward the downward spiral of sedentarism, increasing the risks of cardiovascular, metabolic diseases, muscle atrophy, bone density loss, increasingly diminished physical function, and gait imbalance
- Possible immunosuppression or inherent immune dysfunction, increasing chances of malignancy and infection
- Architectural distortion of the lungs, predisposing to infectious susceptibility and cardiac strain and obstructive sleep apnea (OSA)

Thus, screening for, prevention against, and recognition of common morbidities are critical components to

Table 2 Considerations for initiating and sustaining discussions on holistic health preservation

Considerations for Solution-Provoking Discussions
Presenting concepts as questions may be more apt to promote discussion, curiosity, interest and motivation for considering feasible resources and supplying solutions.
Universalizing concepts with the clinician including self-references can make a patient and their families feel less objectified in discussions and the topics feel part of a shared humanity.
Simple act of listening and expression of understanding in response to challenging patient/family concerns can have high impact on patient/family sense of being valued and also provoking confidence for self-generated solutions.
'Medication treatment and tests are very important parts of the equation, but also successful living with ILD requires attention to self-care that is easily at hand for many of us. I am wondering if you thought of any that might be helpful to you ?'
'It is never too late to experience fitness and to gain muscle mass.'
'Our lungs and heart need the body to support overall health. The same set of lungs in a person who moves around versus a person who doesn't move so much, will have very different experiences of breathing, fatigue and ability to accomplish tasks.'
'Changes that are incremental (little by little) can have lasting impact; awareness of possible resources and preferences is a productive first step.'
'Feeling unmotivated happens to us all especially if we happen to be feeling down or disappointed with our selves or our bodies. Sometimes it helps me to remember that even small episodes of moving and self-care helps with feeling better physical ly and mentally. Is that something you find also?'
'Living with an ILD, I am told, can be psychologically intense. People sometimes feel that life has become medicalized and over-identified with ILD in daily living.'
'Were you aware that mindful movement practices can re-educate muscles, nerves and skeletal alignment, and can have a lasting impact on reducing body pain and fatigue?'
'Many of us experience loss of fitness, which makes any of us feel a sense of deflation and hopelessness which interferes with motivation. Did you know that muscle and fitness can be fairly rapidly restored with small changes but strong commitment?'
'Did you know that the weekly exercise goal is 150 minutes and can occur ten minute segments? And start gentle, just enough intensity that slightly challenges conversation?'
'Did you know there are online pulmonary rehabilitation options and videos? Do you think that might be a comfortable option for you?'
'Breathlessness in ILD is often related to lack of fitness. Breathlessness can be scary, but it is required to increase one's fitness.'
'There are several options for exercise that is pleasurable and non-distressing. Anything in particular come to mind for you?'

well-being when living with ILD. This includes holistic approaches to smoking cessation, sleep quality,<sup>40,71–73</sup> helping patients navigate fear with regard to vaccinations, and counseling on gastroesophageal reflux disorder and postnasal drip to prevent ILD exacerbations and worsening.

Symptoms not consistent with a patient's baseline fatigue, dyspnea, cough, or exercise tolerance should prompt consideration of other treatable causes in addition to worsening ILD. Other treatable causes of decline that require earlier intervention include anemia, coronary heart disease, OSA, pulmonary hypertension (either

from hypoxic ILD, embolus, autoimmunity, OSA, heart disease, *etc.*), uncontrolled diabetes or hypothyroidism, infection, or underlying malignancy, in addition to worsening ILD. Further, undiagnosed treatable conditions, such as depression, OSA, neurologic disease, malignancy, hematologic, cardiovascular, renal, or endocrine disorders, can confound frailty assessments and also contribute toward frailty.

Disease and Humanity

A positive health philosophy adopts psychological health, HRQoL, and well-being as the most central aspects

of living regardless of one's biophysical health circumstances.<sup>74</sup> Compassion-based, person-centered interactions are fundamental to medical care. The individual's subjective holistic life experience supplants the traditional medical paradigms, which practices an objectifying lens on a person as a collection of fixable deficits.<sup>7,75,76</sup> A person retaining a holistic and valued sense of self, versus a segmented medicalized version, inclines toward a sense of empowerment, purpose, and engagement, and the chance of improved mental and biophysical health when navigating a health condition.<sup>76-79</sup>

A positive health philosophy incorporates holistic communication methods that embrace disability, impairment, and vulnerability as being global and collective experiences that most humans will experience.<sup>7,74,75</sup> Communication relies on clinicians' incisive queries driven by curiosity in patients' perceptions and preferences, which ultimately fortifies patients' self-trust in decision-making and solution-sourcing.<sup>76,78,80,81</sup> The philosophy's proactive acceptance of disability and illness as cultural norms, augments ability through collective accessibility efforts, communication, personal choice, and agency, thus fostering a sense of well-being and belonging for both patient and clinician.<sup>4,13,76-78,80,81</sup>

### Loneliness and/or Connection

Loneliness and social isolation reflect emotional states whereby one is separated from a desired social connection and is demonstrated to exceed other mortality risk factors such as smoking and obesity.<sup>9-12,70,82-91</sup> An IL-related symptom burden gives rise to profound identity, financial, relationship, and other life changes that lead to frustration, loneliness, and/or social isolation.<sup>10,35,82,84,85,88,91-93</sup> Moreover, patients consistently report that breathlessness and cough symptoms, including complications of cough, *e.g.*, bladder continence, give rise to conspicuousness, social embarrassment, impaired travel and socializing, distancing from family and/or friends, and affecting intimacy and sexual health.<sup>13,34-36</sup> Similarly, supplemental oxygen use can be logistically burdensome and stigmatizing, fostering feelings of isolation.<sup>13,16-18, 36,70,94,95</sup>

Further, contrary to misconceptions of "being cared for," people with ILD seem more likely to be caregivers for others, especially for elderly parents or neighbors, or grandchildren.<sup>10,12,17,82,84</sup> Tomes of literature depict caregiving as a major association of social isolation, loneliness, feeling overwhelmed, depression, anxiety, cardiovascular events, and mortality.<sup>10,12,17,82,84</sup>

Screening for loneliness, social isolation, and risk factors (*e.g.*, care-giving situations) can spark patient-driven interventions that improve well-being and the risk of premature mortality. Pulmonary rehabilitation, online exercise, health education, singing for lung

health and community classes, nature and green spaces, and remote connectivity to family have demonstrated decreased social isolation and increased parameters associated with well-being.<sup>59,66,85,88,96-107</sup>

### Self-Regulation

Living with ILDs presents diverse impairments, continually disrupted routines, shifting perceptions of self and one's world, and goading uncertainty of mortality and disability. Such high-pressured circumstances can lead to frustration and other disruptions of psychological well-being, usurping mental focus and somatic attention from safely navigating the many disease challenges. With age and chronic illness, social networks diminish, which increases isolation, loneliness, and depression, which further interfere with one's capacity to enlist self-regulatory behaviors.

Self-regulation<sup>8,13,35,106,108-110</sup> is a pivotal health-management coping skill that cultivates parasympathetic disposition through alignment of the following: breath, body sensation and/or movement, and spaciousness of mind when facing life challenges.<sup>85,109,111-115</sup> Self-regulation fosters multilevel emotional and somatic awareness that results in higher performance, especially while under mental or physical duress.<sup>8,81,111-116</sup> Thus, self-regulation confers stronger tolerance for feelings of distress and fortifies confidence to strengthen social connections, which enhances well-being and physical function as well as cognitive function and independent living.

Over the years, urgencies and stresses give rise to repetitively practiced physical and mental habits, while seeming helpful in the short-term, carry tolls on longer-term physical and mental health with tendencies toward mental and physical contraction. Contraction habituates inefficient muscularization, neuroadaptive pathways, and emotional processing. However, self-regulatory mechanisms can be re-assimilated over time. Self-regulatory practices sound introspective but fortify expansive mental and physical awareness that supports curiosity, interest, wonder, and purpose in relation to self, others, and environment. These include physical practices (*e.g.*, mindful movement such as tai chi, Feldenkrais, some types of yoga, dance; or breathwork such as singing, chanting, musical instrumentation) and purposeful awareness as everyday life challenges arise.<sup>64,68 81,99,101,102,106,108,112,116-119</sup>

Self-regulation benefits self-management in diverse contexts, including dietary choices, medication adherence, and motivation for home exercise. Self-regulation is increasingly implemented and documented during pulmonary rehabilitation, Physical Therapy, Occupational Therapy, Speech Therapy sessions for incrementally increasing physical activity, realistic goal



setting, and self-monitoring progress can improve self-efficacy, and motivation, and reduce fear.<sup>120</sup> Self-regulatory strategies mitigate physical and emotional distractions, which allow fuller engagement in learning and optimal execution of therapy. Furthermore, self-regulation modifies disordered breath patterns, often super-imposed on ILDs, that intensify symptoms such as anxiety, breathlessness, and exercise intolerance.<sup>121,122</sup>

### Muscle and Circulation Unifying Paths for Holistic Resilience

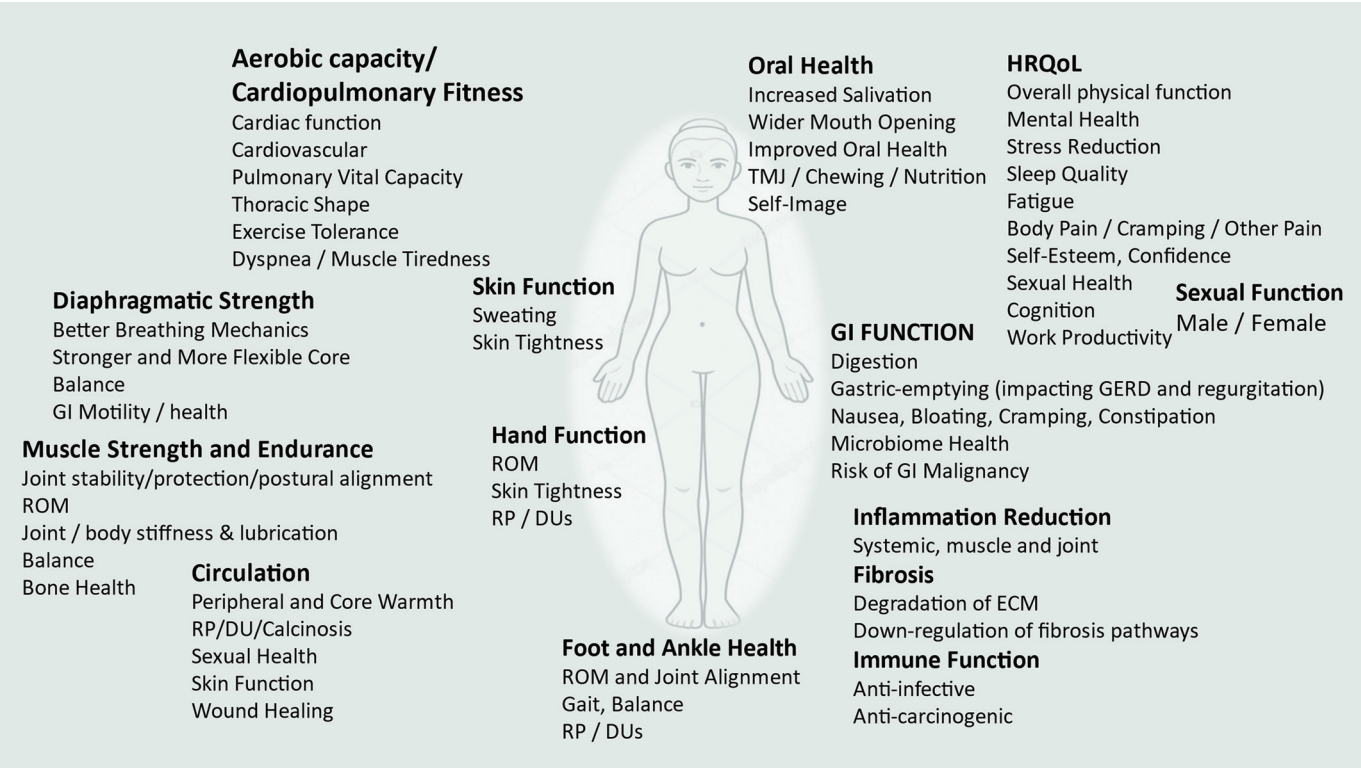
Physical activity, exercise, and other self-regulatory activities are preventive and reparative tonics against homeostenosis for virtually every organ tissue. Evidence that supports exercise’s role as a potent self-regulatory practice and mechanism of muscle engagement with pivotal and pervasive effects on vital pan-systemic function (Fig. 3) is now well established. Beyond motility and/or mobility, muscle is central to biophysical, cognitive, and psychological well-being.<sup>111,114,115</sup> Muscle, a secretory endocrine organ, releases “myokines” with disease-modifying effects that regulate interdependent signaling pathways between vital organs. Myokines sustain organ-to-organ crosstalk with paracrine, endocrine, and cytokine regulation across multiple systems (brain,

skin, cardiovascular, vascular, gastrointestinal, hepatic, osseous, immunologic, endocrine, and pulmonary).<sup>26,58,62,123–134</sup>

Higher fitness and physical activity levels are strongly associated with the absence of disease.<sup>60,101,135–137</sup> Muscle strength, endurance, and aerobic capacity correspond to global health in conditions such as diabetes, hypertension, cardiovascular disease, cancer.<sup>58,67,112,116,129,134,135,138–141</sup> Exercise’s holistic benefits include preservation of gray matter and cognitive function, resistance to age-related memory loss, and reduction in depression, anxiety, and social isolation.

Exercise benefits extend to muscle, bone, nerve and joint health, HRQoL, sleep quality, and mental health, areas highly impacted in connective tissue diseases and ILDs (Fig. 4). Exercise comprehensively enhances self-regulatory mechanisms, reduces loneliness, and improves overall well-being. Physical inactivity rapidly erodes these benefits.

ILD predisposes increased sedentarism, whereas exercise tolerance spirals downward, accelerating frailty risk. Exercise in sarcoidosis, IIMs, RA, SLE, ILD, and pulmonary hypertension evidence positive effects on symptoms such as fatigue, quality of life, depression, and other parameters. Despite age-related challenges in restoring muscle mass, targeted exercise programs significantly augment muscle



**Figure 4.** The potential beneficial impact of exercise on males and females with a multiorgan disease by using systemic sclerosis as an example (Adapted from Ref. 64).



mass, strength, and function, even in nonagenarians.<sup>139,142–145</sup> In IIMs, exercise incites reparative pathways highly relevant to frailty, to systemic inflammatory conditions, and to inflammatory and/or fibrosing ILD. These include the following: (a) up-regulation of genes displaying anti-inflammatory, myogenic, and angiogenic behaviors; (b) downregulation of proinflammatory genes and fibrosis; (c) increased capillary density in muscle tissue coincident with improved mitochondrial enzymic function; and (d) prevention of mitochondrial damage and myofiber apoptosis.<sup>58,124,127,146,147</sup>

Diaphragmatic involvement in diseases such as SLE, systemic sclerosis, and IIMs, although underrecognized, are associated with sleep apnea and hypercapnia. Further, the diaphragm being central to breathing, exercise and other self-regulatory practices (*e.g.*, singing, breathwork) strengthen the diaphragm. The diaphragm also being a core muscle, diaphragmatic strengthening improves mobility, balance, and back pain.<sup>67,148–153</sup>

People living with ILD<sup>16,17,63–65,70,95,154–158</sup> understandably have fear about exercise and exertion during exercise. Patients want guidance and confirmation from their clinicians that exercise is safe.<sup>63–65,154</sup> People with moderate-to-severe disease, heart failure, or arrhythmias can learn how to safely exercise and develop confidence in themselves as exercisers through cardiopulmonary rehabilitation. Gentle, self-paced home exercise that strengthens the diaphragm (singing, chanting), or engages the entire skeletal system (*e.g.*, meditative walking, tai chi, chair and/or bed exercise) may be safely implemented.

A common fear that deters people with ILD from exercising is worrying that breathlessness always signifies a drop in oxygen saturation. Helping people with ILD understand that

- lack of physical fitness is a common cause of breathlessness
- becoming fit necessitates exercise that induces breathlessness
- regularly performing physical activities such as walking and adapted exercises increasingly builds tolerance to perceived breathlessness.

Familiarization with breathlessness concepts tied to increasing fitness can revolutionize a person's perspective as well as learning that many options exist for nondistressing and pleasurable exercises.

Despite the decreasing rate of muscle mass restoration 'after 35 years of age, 8 weeks of targeted exercise in nonagenarians augments muscle mass and strength > 10% and 174%, respectively,<sup>145</sup> along with significant changes in core and appendicular muscle. Physical

activity and/or exercise can be modified to any impairment, physical position, or health condition, including during temporary incapacitation (*e.g.*, flares, postsurgery). In fact, "micro" movement and neuromuscular adaptive approaches (*e.g.*, Feldenkrais) are optimal re-education strategies that strengthen primitive movement functions to optimize trunk-to-limb chain integration and performance mechanics for athletes and nonathletes alike.

### ILD Success and Extrapulmonary Care

Clinician statements can strongly impress patients and their loved ones, and signpost areas of import. This is also true of simple attention or expression of understanding and sympathy<sup>76,78,80,81</sup> can significantly motivate patients' and their families' capacity to source solutions and emotional strength. Clinician repetition of sympathetic behaviors and inquiries can fortify important areas of self-attention, such as feet, oral health, and sensory health.

*Feet.* Healthy feet can be transformative to the HRQoL of a person with breathlessness. General exercise helps keep feet strong; flexible; and responsive to positional, balance, and mobility challenges. Enquiring about general exercise, foot exercise, and footcare can highlight the importance of and interventions for healthy feet in ILD.

*Oral Health.* Important for nutrition and also for communication, of which both can be impaired by breathlessness and metabolic hyperactivity in advanced pulmonary conditions. General exercise as well as singing, humming, chanting increases circulation and salivation thus likely improves mouth health. Querying about oral health may help sensitize patients' attention to this important area of health.

*Sensory Health.* Optimizing vision and hearing is essential for safety and for feeling connected and included. Sensory impairments can lead to isolation, anxiety, depression, and a diminished sense of safety both in- and outside the house. General exercise is associated as protective against hearing loss, peripheral neuropathy, and some forms of vision loss.

### CONCLUSION

Frailty is prevalent and ageless, and predicts mortality in ILD. The antidote to frailty is holistic well-being with an emphasis on physical activity, exercise and other self-regulatory practices, education, and community. Frailty prevention begins at diagnosis and throughout the ILD journey. ILD care informed by connectedness and equity may be pivotal in cultivating transformation of the global health profile and outcomes.

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