Objectives: To assess the body composition (BC) and to identify the frequency of sarcopenia (SP) in SSc patients.

Methods: A total of 44 women who met the ACR/EULAR 2013 classification criteria were included. Mean age was 53.2±8.8 years. The median disease duration was 7.0 [4.0;12.0] years. 26 (59.1%) patients had limited and 18 (40.9%) - diffuse cutaneous subtype. Body composition was measured using Dual-energy X-ray absorptiometry (DXA) of whole body. The appendicular lean mass index (ALMI) was calculated as the ratio of appendicular lean mass (ALM) to height (kg/m²). Handgrip measurement and chair stand test were performed. Physical function was measured with the Short Physical Performance Battery (SPPB). SP was diagnosed in agreement with the 2019 revised consensus on definition and diagnosis of SP of the European Working Group on Sarcopenia in Older People 2 (EWGSOP2): handgrip <16kg, chair stand test > 15 seconds for 5 rises, ALM <15 kg or ALMI <5.5 kg/m². Severe SP was detected if the patient additionally had gait speed ≤0.8 m/s or SPPB ≤ 8-point score. Overfat was defined as body fat percentage >35%.

Results: The median bone mineral content was 2.0 [1.8; 2.2] kg, total lean mass - 39.5 [35.7; 45.5] kg, ALM - 16.3 [14.5; 19.4] kg, ALMI - 6.5 [5.7; 7.2] kg/m², trunk fat mass - 13.5 [9.1; 16.7] kg and total fat mass - 26.6 [20.1; 34.5] kg. Body fat percentage was 38.8% [34.2; 42.7].

9 (20.5%) women had low ALM and low ALMI, 6 (13.6%) - only low ALM. Healthy BC was found in 5 (11.3%), low ALM or low ALMI - in 7 (15.9%), overfat - in 24 (54.5%), low ALM + overfat - in 8 (18.2%) patients. We found no differences in BC between SSc patients with limited and diffuse cutaneous subtype.

Low muscle strength (SP probable) was found in 21 (47.7%) women, meanwhile confirmed SP (low muscle strength and muscle mass) was diagnosed in 10 (22.7%) patients, among them 5 (11.4%) persons had severe SP. No significant difference in SP frequency among patients with limited and diffuse cutaneous SSc 4 (15.4%) and 6 (33.3%), respectively, (p=0.27). Osteoporosis was found in 6 (60%) patients with SP without differences in SSc subtypes.

Conclusion: Healthy BC was found only in 11.3% cases, while overfat - in 72.7% and low ALM - in 34.1% SSc patients. SP was detected in 22.7% of women, among them in half of cases - severe SP, without any differences between the limited and diffuse subtypes of the disease.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.970

POS0840

RISK OF MALNUTRITION IN PATIENTS WITH SYSTEMIC SCLEROSIS-ASSOCIATED INTERSTITIAL LUNG DISEASE (SSc-ILD): FURTHER ANALYSES OF THE SENSICIS TRIAL

E. Volkman¹, Z. McMahan², S. Johnson³, V. Smith⁴, S. Jouneau⁵, C. Miede⁶, M. Alves⁷, A. Herrick⁸ on behalf of the SENSICIS trial investigators. ¹University of California, David Geffen School of Medicine, Department of Medicine, Division of Rheumatology, Los Angeles, United States of America; ²Johns Hopkins University School of Medicine, Division of Rheumatology, Baltimore, United States of America; ³Toronto Western and Mount Sinai Hospitals, University of Toronto, Toronto Scleroderma Program, Department of Medicine, Toronto, Canada; ⁴Ghent University Hospital, Department of Rheumatology and Internal Medicine, Ghent, Belgium; ⁵Competences Centre for Rare Pulmonary Diseases, University of Rennes, CHU Rennes, Inserm, EHESP, Irset (Institut de recherche en santé, environnement et travail) - UMR_S 1085, Department of Respiratory Medicine, F-35000 Rennes, France; ⁶mainanalytics GmbH, Statistics, Sulzbach (Taunus), Germany; ⁷Boehringer Ingelheim International GmbH, TA Inflammation Med, Ingelheim am Rhein, Germany; ⁸The University of Manchester, Salford Royal NHS Foundation Trust, Centre for Musculoskeletal Research, Manchester, United Kingdom

Background: Gastrointestinal (GI) involvement is common in patients with SSc and may lead to weight loss and malnutrition. In the SENSICIS trial in patients with SSc-ILD, nintedanib reduced the rate of decline in forced vital capacity (FVC) (mL/year) over 52 weeks, with mainly GI adverse events. The Malnutrition Universal Screening Tool (MUST) was developed to identify adults who are at risk of malnutrition and has been used in studies of patients with SSc.

Objectives: To evaluate nutritional status over 52 weeks in the SENSICIS trial based on a modified MUST score.

Methods: The SENSICIS trial enrolled patients with SSc-ILD with first non-Raynaud symptom ≤7 years before screening, extent of fibrotic ILD ≥10% on HRCT and FVC ≥40% predicted. Patients who had taken a stable dose of mycophenolate for ≥6 months were eligible to participate. Patients were randomised to receive nintedanib 150mg bid or placebo. Dose reductions to 100mg bid and treatment interruptions were allowed to manage adverse events and specific recommendations were provided for the management of diarrhoea. We calculated a modified MUST score at baseline and weeks 12, 24, 36 and 52 based on (A) BMI, (B) weight loss (week 12 vs baseline; week 24 vs week 12; week 36 vs week 24; week 52 vs week 36), and (C) a surrogate for acute disease effect (if

the patient had any serious adverse event that led to hospitalisation between weight assessments and received ≥1 medication from the WHO classification code for "solutions for parenteral nutrition" for ≥5 days). MUST score at baseline was based solely on BMI. With scores ranging from 0 to 6, the risk of malnutrition is defined as low (score = 0), medium (score = 1) or high (score ≥2).

Results: Among 576 patients who received nintedanib (n=288) or placebo (n=288), mean (SD) age at baseline was 54.0 (12.2) years, weight was 69.7 (15.9) kg and BMI was 25.9 (5.0) kg/m²; median time since onset of first non-Raynaud symptom was 3.4 years; and 75.2% of patients were female. In the nintedanib and placebo groups, respectively, MUST scores suggested that 74.0% and 78.1% of patients were at low risk of malnutrition at baseline and remained at low risk at their last measurement (Table 1). At weeks 12 and 52, respectively, mean (SD) MUST scores were 0.3 (0.6) and 0.4 (0.7) in the nintedanib group and 0.2 (0.5) and 0.2 (0.6) in the placebo group. At weeks 12, 24, 36 and 52, respectively, the proportions of patients at low risk of malnutrition were 81.8%, 80.9%, 72.9% and 76.5% in the nintedanib group and 86.6%, 86.4%, 88.3% and 80.8% in the placebo group; the proportions at medium risk were 12.1%, 13.1%, 18.0% and 13.5% in the nintedanib group and 8.5%, 8.6%, 5.8% and 13.1% in the placebo group; and the proportions of patients at high risk were 6.1%, 5.6%, 8.3% and 9.6% in the nintedanib group and 4.9%, 4.3%, 4.7% and 5.4% in the placebo group.

Table 1. Risk of malnutrition at baseline and at last assessment over 52 weeks in the SENSICIS trial.

Last assessment of risk	Nintedanib (n=288)				Placebo (n=288)			
	Baseline risk				Baseline risk			
	Low	Medium	High	Total	Low	Medium	High	Total
Low	213 (74.0)	1 (0.3)	0	214 (74.3)	225 (78.1)	7 (2.4)	0	232 (80.6)
Medium	31 (10.8)	8 (2.8)	0	39 (13.5)	20 (6.9)	14 (4.9)	4 (1.4)	38 (13.2)
High	13 (4.5)	8 (2.8)	7 (2.4)	28 (9.7)	3 (1.0)	2 (0.7)	10 (3.5)	15 (5.2)
Missing	7 (2.4)	0	0	7 (2.4)	3 (1.0)	0	0	3 (1.0)
Total	264 (91.7)	17 (5.9)	7 (2.4)	288 (100)	251 (87.2)	23 (8.0)	14 (4.9)	288 (100)

MUST score ranges from 0 to 6. Score of 0 = low risk; score of 1 = medium risk; score of ≥2 = high risk. Baseline MUST score was based solely on BMI.

Conclusion: In the SENSICIS trial, scores based on a modified MUST indicated that most patients treated with nintedanib were at low risk of malnutrition at baseline and remained at low risk over 52 weeks. The proportions of patients at high risk of malnutrition were low but were numerically greater in patients who received nintedanib than placebo. Management of disease manifestations and gastrointestinal adverse events that may be associated with weight loss is important to reduce the risk of malnutrition in patients with SSc-ILD treated with nintedanib.

Acknowledgements: The SENSICIS trial was funded by Boehringer Ingelheim. Medical writing support was provided by FleishmanHillard Fishburn, London, UK. The authors meet criteria for authorship as recommended by the International Committee of Medical Journal Editors (ICMJE).

Disclosure of Interests: Elizabeth Volkman Consultant of: Boehringer Ingelheim, Grant/research support from: Corbus and Forbuis, Zsuzsanna McMahan: None declared, Sindhu Johnson Consultant of: Boehringer Ingelheim, CSL Behring and Ikaria, Grant/research support from: Bayer, Boehringer Ingelheim, Corbus, GlaxoSmithKline, Merck and Roche, Vanessa Smith Speakers bureau: Boehringer Ingelheim and Janssen, Consultant of: Boehringer Ingelheim, Grant/research support from: Belgian Fund for Scientific Research in Rheumatic diseases (FWRO), Boehringer Ingelheim, Research Foundation - Flanders (FWO) and Janssen, Stéphane Jouneau Speakers bureau: Actelion, AIRB, AstraZeneca, Bristol-Myers Squibb, Boehringer Ingelheim, Chiesi, Genzyme, GlaxoSmithKline, LVL Mediphar, Mundipharma, Novartis, Pfizer, Roche and Sanofi, Consultant of: AIRB, Boehringer Ingelheim, Novartis and Roche, Grant/research support from: AIRB, Boehringer Ingelheim, LVL Mediphar, Novartis and Roche, Corinna Miede Employee of: Currently an employee of mainanalytics GmbH, contracted by Boehringer Ingelheim, Margarida Alves Employee of: Currently an employee of Boehringer Ingelheim, Ariane Herrick Speakers bureau: Janssen, Consultant of: Boehringer Ingelheim, Camurus, CSL Behring and Gesynta Pharma, Grant/research support from: Actelion and Gesynta Pharma

DOI: 10.1136/annrheumdis-2021-eular.1083

POS0841

RISK FACTORS OF LOW BONE MINERAL DENSITY IN WOMEN WITH SYSTEMIC SCLEROSIS

A. Efremova¹, N. Toroptsova², N. Demin², O. Dobrovolskaya², O. Nikitinskaya². ¹V.A. Nasonova Research Institute of Rheumatology, Department of Osteoporosis, Moscow, Russian Federation; ²V.A. Nasonova Research Institute of Rheumatology, Department of Osteoporosis, Moscow, Russian Federation

Background: Chronic inflammatory rheumatic diseases are risk factors of bone loss and fractures. Systemic sclerosis (SSc) has been recognized to be another potential inflammatory joint disease that may affect bone tissue.

Objectives: to evaluate bone mineral density (BMD) and risk factors of low BMD in women with SSc.

Methods: 173 women, among them 110 postmenopausal (median age 60[55,63] years) and 63 premenopausal (median age 35[31,44] years). BMD was measured at lumbar spine (LS), femoral neck (FN) and total hip (TH) by dual energy X-ray absorptiometry (DXA, Hologic 4500A). Low BMD was diagnosed if the T-score was < -1.0 standard deviation (SD) in postmenopausal women and if the Z-score was < -2.0 SD in premenopausal women. The relationship between BMD and SSc patients' characteristics was evaluated using univariate linear regression analysis.

Results: Low BMD was found in 66% patients: 79% - in postmenopausal and 18% - in premenopausal women. Among postmenopausal persons osteoporosis was discovered in 47% and osteopenia - in 32% cases. In postmenopausal woman BMD of LS, FN and TH were associated with body mass index (BMI) ($\beta=0.27$, $p=0.010$; $\beta=0.47$, $p<0.001$ and $\beta=0.45$, $p<0.001$, respectively), duration of glucocorticoids (GCs) using ($\beta=-0.31$, $p=0.008$; $\beta=-0.34$, $p=0.003$ and $\beta=-0.27$, $p=0.022$, respectively); BMD of FN and TH with C-reactive protein ($\beta=-0.32$, $p=0.016$ and $\beta=-0.29$, $p=0.029$, respectively) and LS BMD with current and cumulative GCs dose ($\beta=-0.24$, $p=0.039$ and $\beta=-0.29$, $p=0.014$, respectively). In premenopausal women BMD of LS, FN and TH were associated with BMI ($\beta=0.51$, $p<0.001$; $\beta=0.45$, $p=0.003$ and $\beta=0.47$, $p=0.002$, respectively), duration of GCs using ($\beta=-0.45$, $p=0.004$; $\beta=-0.47$, $p=0.003$ and $\beta=-0.48$, $p=0.002$, respectively) and GCs cumulative dose ($\beta=-0.48$, $p=0.002$; $\beta=-0.51$, $p=0.001$ and $\beta=-0.46$, $p=0.004$, respectively); BMD of FN and TH with 25(OH)D level ($\beta=0.52$, $p=0.008$ and $\beta=0.54$, $p=0.005$, respectively), and LS BMD with SSc duration ($\beta=-0.44$, $p=0.004$).

Conclusion: Low BMD was diagnosed in 66% of women with SSc. Low BMI, GCs cumulative dose and duration of GCs using were independent risk factors for low BMD in both premenopausal and postmenopausal persons. Additional factors as SSc duration and low vitamin D level were found out for premenopausal and current GCs dose and C-reactive protein level for postmenopausal women.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.1339

POS0842 LUNG ULTRASOUND TO ASSESS THE SEVERITY OF INTERSTITIAL LUNG DISEASE IN SYSTEMIC SCLEROSIS

C. Bruni¹, L. Mattolini¹, L. Tofani¹, L. Gargani², N. Landini^{3,4}, G. Lepri¹, M. Orlandi¹, S. Guiducci¹, S. Bellando Randone¹, M. Matucci-Cerinic¹.

¹Careggi University Hospital, Experimental and Clinical Medicine, Division of Rheumatology, Firenze, Italy; ²National Research Council (CNR) PISA, Institute of Clinical Physiology, Pisa, Italy; ³Cà Foncello General Hospital, Radiology, Treviso, Italy; ⁴University of Florence, Experimental and Clinical Biomedical Sciences, Division of Radiology, Firenze, Italy

Background: Interstitial lung disease (ILD) is one of the most common complications and one of the main causes of morbidity and mortality in Systemic Sclerosis (SSc). High-resolution computed tomography (HRCT) is the gold standard for the diagnosis of ILD and it allows its quantification. Among semi-quantitative methods, Goh et al proposed a semi-quantitative scoring system to visually quantify ILD extent, with categorical cut-off of 20% to distinguish limited and extensive parenchymal involvement with prognostic implications. More recently, the use of radiomics has allowed the objective quantification of ILD through the use of dedicated software, which calculate different parameters of lung density. Given the exposure to ionizing radiation that the procedure entails, other methods of ILD evaluation are being studied, among which lung ultrasound (LUS) identifies the B-lines as a main feature of ILD. So far, different evidences have proposed the use of LUS for the screening of ILD, even in the early phases of the disease and in subclinical lung involvement.

Objectives: the aim of this study is to test the role of LUS in quantifying the severity of SSc-ILD, evaluated with both semi-quantitative visual radiological and quantitative radiomic scores.

Methods: Adult SSc patients classified according to the ACR/EULAR 2013 criteria patients were assessed with pulmonary function test (PFTs), lung ultrasound and HRCT over 60 days. CT images were analysed qualitatively (by presence/absence of ILD), semi-quantitatively (categorical Goh score $<20\%$ vs $>20\%$ of extent and the continuous extent Goh score made from 5 levels' assessment- 0 to 100%) and quantitatively [with the densitometric radiomic data obtained through the Horos software - Mean lung attenuation (MLA), Standard Deviation (SD), Kurtosis, Skewness and Lung volume (LV)]. LUS was used to quantify the B-lines detected in each patient by scanning a total of 13 intercostal spaces, on both anterior and posterior chest wall.

Results: Among 59 SSc patients (81% women, mean age 48 ± 14 years, 45% anti-Scl70 positive), 23 (39%) presented ILD on HRCT, of which 14 limited and 9 extensive. The mean visual semi-quantitative score was 6%, ranging from 0 to 66%. Our data showed a significantly different number of B-Lines in ILD vs non-ILD patients (median 38 vs 9, $p<0.005$), a result which was further confirmed among non-ILD vs ILD $>20\%$ (median 47 vs 9, $p=.001$) and ILD $<20\%$ (median

36 vs 9, $p=.001$) patients. Conversely, the number of B-lines was not statistically different between patients with ILD $<20\%$ and $>20\%$ (median 47 vs 36, $p=.78$). We observed a significant negative correlation between the number of B-lines and FVC ($r=-.472$, $p<0.05$) TLC ($r=-.436$, $p=.003$), DLco ($r=-.515$, $p<0.001$), DLCO/VA ($r=-.306$, $p=.03$). Finally, the number of B-lines showed a statistically significant correlation with the Goh score on 5 levels ($r=.437$, $p=.001$), MLA ($r=.571$, $p<0.001$), kurtosis ($r=-.285$, $p=.028$), skewness ($r=-.370$, $p=.004$) and LV ($r=-.277$, $p=.033$). All data were confirmed analysing anterior and posterior B-Lines separately.

Conclusion: Our study confirms that LUS represents a useful tool for the identification of SSc-ILD. In addition, we showed that LUS may be useful also for the quantification of the severity of SSc-ILD, by correlating with PFT parameters, radiomics parameters and visual radiological evaluation. Together with the PFTs, LUS could be used to increase the accuracy of the screening and, potentially, of the follow-up of SSc-ILD patients.

Disclosure of Interests: Cosimo Bruni: None declared, Lavinia Mattolini: None declared, Lorenzo Tofani: None declared, Luna Gargani Consultant of: GE Healthcare, Philips Healthcare and Caption Health, Nicholas Landini: None declared, Gemma Lepri: None declared, Martina Orlandi: None declared, Serena Guiducci: None declared, Silvia Bellando Randone: None declared, Marco Matucci-Cerinic: None declared

DOI: 10.1136/annrheumdis-2021-eular.1350

POS0843 A NEW RISK MODEL IS ABLE TO IDENTIFY SYSTEMIC SCLEROSIS PATIENTS WITH A LOW RISK OF DISEASE PROGRESSION

N. Van Leeuwen¹, M. Maurits¹, S. Liem¹, J. Ciaffai¹, N. Ajmone-Marsan², M. Ninaber³, C. Allaart¹, H. Gillet-van Dongen⁴, R. Goekoop⁵, T. Huizinga¹, R. Knevel¹, J. De Vries-Bouwstra¹. ¹Leiden University Medical Center, Rheumatology, Leiden, Netherlands; ²Leiden University Medical Center, Cardiology, Leiden, Netherlands; ³Leiden University Medical Center, Pulmonology, Leiden, Netherlands; ⁴Haaglanden Medisch Centrum, Rheumatology, Den Haag, Netherlands; ⁵HagaZiekenhuis, Rheumatology, Den Haag, Netherlands

Background: Disease course in Systemic Sclerosis (SSc) ranges from mild, to severe with progressive organ involvement within months. Guidelines for follow-up are mainly based on expert consensus, and advocate annual assessment. So far, no data driven guidelines exist that describe tailored systematic assessments for individual patients in line with individual disease course.

Objectives: To develop a prediction model to guide annual assessment of SSc patients tailored in accordance to disease activity.

Methods: A machine learning approach was used to develop a model that can identify patients without disease progression. SSc patients included in the prospective Leiden SSc cohort and fulfilling the ACR/EULAR 2013 criteria were included. The primary endpoint in the prediction model was disease progression which was defined as progression in ≥ 1 organ system, and/or start of immunosuppression or death between the two most recent visits. Using elastic-net-regularization, and including 90 independent clinical variables (100% complete), we trained the model on 75% and validated it on 25% of the patients in order to perform internal validation of the final model. We optimized the model on negative predictive value (NPV) to minimize the likelihood of missing progression. By expert assessment of the test characteristics, including swarm plots of the probability scores, cut-offs were identified for low, intermediate and high risk for disease progression.

Results: Of the 492 SSc patients (range of follow-up: 2-10yrs), disease progression during follow-up was observed in 52% (median time 4.9yrs), including myocardial progression in 29%, lung progression in 23%, skin progression in 16%,

Baseline characteristics	Total n=492	Non-Progressors N=235	Progressors N=257
Demographics			
Female, n (%)	389 (79)	193 (82)	196 (76)
Age, mean (SD)	55 (14)	55 (15)	55 (13)
Disease duration nonRP, median (IQR)	3.2 (0.9-10.3)	3.5 (0.8-10.5)	3.6 (1.1-9.3)
Organ involvement			
DcSSc, n (%)	118 (24)	34 (15)	84 (33)
DLCO% of pred, mean (SD)	66 (18)	69 (18)	64 (17)
FVC% of pred, mean (SD)	98 (23)	96 (24)	97 (21)
ILD on HRCT, n (%)	183 (37)	66 (28)	117 (46)
PAH, n (%)	26 (5)	10 (4)	16 (6)
GAVE, n (%)	9 (2)	4 (2)	5 (2)
Cardiac involvement, n (%)	28 (6)	14 (6)	14 (5)
Myositis, n (%)	8 (2)	6 (3)	2 (1)
Renal crisis, n (%)	14 (3)	6 (3)	8 (3)
Autoantibodies			
Anti-centromere, n (%)	194 (39)	118 (50)	76 (30)
Anti-topoisomerase, n (%)	116 (24)	42 (18)	74 (29)

RP=raynaud phenomenon, dcSSc= diffuse cutaneous systemic sclerosis, mRSS=modified rodnan skin score, DU=digital ulcers, DLCO= single-breath diffusing capacity for carbon monoxide, FVC= forced vital capacity, ILD=interstitial lung disease, HRCT= high resolution computed tomography, PAH= pulmonary arterial hypertension, GAVE= gastric antral vascular ectasia.