

**Table 1. Distribution of KL grades in the training and testing sets.**

KL grades	0	1	2	3	4	Total
Training set	10893	4582	6114	3320	799	25,978
	41.9%	18.7%	23.5%	12.8%	3.1%	
Testing set	2472	1353	1696	775	194	6,490
	38.1%	20.8%	26.1%	11.9%	3.0%	

**Table 2. Performance matrices of the Deep-Ten and ResNet18 models to detect osteoarthritis**

	Deep-TEN	ResNet18
Sensitivity	62.29% (95% CI, 60.42%–64.13%)	59.14% (95% CI, 57.24%–61.01%)
Specificity	90.07% (95% CI, 89.07%–91.00%)	94.09% (95% CI, 93.30%–94.82%)
Positive predictive value	81.37% (95% CI, 79.81%–82.84%)	87.46% (95% CI, 85.96%–88.82%)
Negative predictive value	77.42% (95% CI, 77.64%–79.65%)	76.77% (95% CI, 75.93%–77.59%)

**Conclusion:** This study demonstrates that the bone texture model performs reasonably well to detect radiographic osteoarthritis with a similar performance to the bone contour model.

**References:**

- [1] Bertalan Z, Ljuhar R, Norman B, et al. Combining fractal- and entropy-based bone texture analysis for the prediction of osteoarthritis: data from the multicenter osteoarthritis study (MOST). *Osteoarthritis Cartilage* 2018;26:S49.
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- [3] Zhang H, Xue J, Dana K. Deep TEN: Texture Encoding Network. The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2017:708-17.

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OP0063

### QUANTITATIVE COMPUTED TOMOGRAPHY PREDICTS 10-YEAR MORTALITY IN INTERSTITIAL LUNG DISEASE RELATED TO SYSTEMIC SCLEROSIS

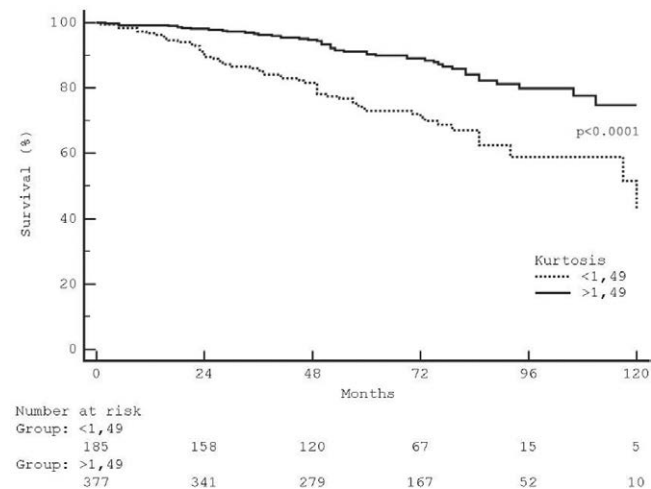
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**Background:** Interstitial lung disease (ILD) is the main cause of death in Systemic Sclerosis (SSc). Chest CT is the gold standard in detecting ILD although it is not easy to understand its prognostic value. ILD qualitative assessment is almost worthless. Goh et al. semi quantitative score of ILD extent is related to mortality risk but it is burdened by relevant inter/intra-readers variability. An operator independent algorithm based on voxel-wise analysis proved to identify SSc patients with an increased risk of mortality according to prediction models.

**Objectives:** To verify if quantitative analysis of chest CT (QCT) predict 10 years-mortality in SSc patients.

**Methods:** SSc patients with availability of a chest CT were enrolled in 13 different centers. The CT voxel-wise analysis with a free software (www.horosproject.com) provided QCT indexes: kurtosis, skewness, mean lung attenuation and standard deviation. Patients characteristics, autoimmune profile and pulmonary function test were collected. The follow-up interval lasted from the date of chest CT to the one of the last visit or death. Each QCT index cutoff, established in a previous study (1), clustered patients in two groups. Kaplan-Meier analysis estimated and compared survival in the above mentioned groups.  $p < 0.05$  was considered statistically significant.

**Results:** Five hundred sixty three SSc patients were enrolled (35938 patient-months); 52.4% had ILD detectable at CT scan. For each QCT index cutoff the cohort was split in two subgroups without differences in terms of sex, age, disease duration, autoimmune profile. All QCT indexes' cutoff selected subgroups with statistically different survival rate (e.g in Figure 1).

**Figure 1**

**Conclusion:** QCT can arise as the new gold standard in identifying SSc patients with poor prognosis. The real possibility to stratify SSc subjects according mortality risk will have a pivotal role in ILD treatment decisional process with the incoming anti-fibrotic drugs.

**References:**

- [1] Ariani A et al. *Rheumatology* 2017

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OP0064

### AUTOMATIC SCORING OF ARTHRITIS DISEASE ACTIVITY ON ULTRASOUND IMAGES FROM RHEUMATOID ARTHRITIS PATIENTS WITH CASCADED CONVOLUTIONAL NEURAL NETWORKS

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**Background:** Systematic Power or Color Doppler (CD) ultrasound (US) of joints can be used for early detection of Rheumatoid Arthritis (RA), predicting radiographic progression and early detection of disease flare in established