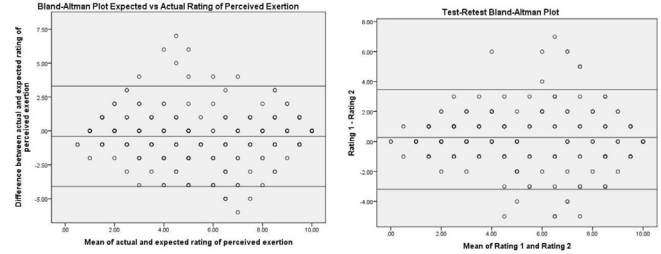Perceived Exertion (RPE) scale to approximate 1RM in healthy young adults, but results have not been confirmed in a general adult population or using a sample of participants who may have a history of OA or other painful joint pathology. In addition, test-retest reliability of RPE for use in resistive exercise has not been determined. The purpose of this correlational study was (1) to examine the association between Rating of Perceived Exertion (RPE) and percentage of 1RM while performing resisted knee extension, and (2) to examine test-retest reliability of RPE in a general population of adults.

Methods: Following determination of 1RM, participants performed 1-3 repetitions of knee extension at ten equal increments of the determined 1RM (10%-100% of 1RM) in random order. Participants stated perceived exertion rating for each level of resistance. This protocol was repeated 5-10 days later to determine test-retest reliability. Spearman rho correlations were calculated to assess correlation between 1RM and RPE, as well as test-retest reliability. Sensitivity, specificity, Youden's index, and likelihood ratios were calculated to determine optimal RPE cutoff values for use in dosage of resistive exercise.

Results: 14 female and 12 male participants completed the study (mean age 45.3, SD 18.4, range 21.0-81.4). 27% of participants self-reported knee OA, and 19% reported a history of unilateral lower extremity surgery. A good-to-excellent correlation was found between 1RM and RPE (Spearman rho, 0.787, $p < .001$; see Figure 1 for Bland-Altman plot). In addition to the overall relationship between the two dosage methods, moderate correlations were determined to exist between percentage of 1RM and RPE at each resistance interval (see Table 1). Test-retest reliability was excellent (Spearman rho, 0.830, $p < .001$, see Figure 2 for Bland-Altman plot). Area under the curve was high at each resistance interval (0.83-0.92), indicating that RPE strongly predicted percentage of 1RM at each interval from 20% through 90% of 1RM. Table 2 represents these data and suggested RPE cutoff values to approximate each percentage of 1RM for use in dosage of strengthening exercises.

Conclusions: RPE for resistive exercise demonstrates excellent test-retest reliability and strong correlation with 1-repetition maximum. Ratings of perceived exertion may be a feasible alternative to 1-repetition maximum to dose strengthening exercises in an adult population, and may be particularly useful for patients whose painful joints limit the ability to elicit maximal muscle contraction.

Bland-Altman Plot Expected vs Actual Rating of Perceived Exertion / Test-Retest Bland-Altman Plot

Correlation of actual vs. expected RPE at each % 1RM interval

% 1RM	Spearman rho	*p*-value
10	.684	<.001
20	.450	.021
30	.495	.010
40	.467	.016
50	.605	.001
60	.531	.005
70	.472	.015
80	.635	<.001
90	.391	.048
100	.107	.602

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DEVELOPMENT OF PATIENT-CENTRED STANDARDS OF CARE FOR OSTEOARTHRITIS IN EUROPE: THE EUMUSC.NET-PROJECT

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Purpose: The eumusc.net project is an initiative founded by the European Community and the European League Against Rheumatism (EULAR). One aim of the project was to facilitate equal standards for musculoskeletal health across Europe. The aim of this work-package was to develop patient-centred and evidence-based standards of care (SOC) for Osteoarthritis (OA), which should be available in a professional and a patient version.

Methods: A systematic review concerning guidelines dealing with OA was conducted. Furthermore, experts in musculoskeletal diseases were contacted to ensure that "grey" literature was not excluded. Documents that fulfilled pre-defined inclusion/ exclusion criteria were included and all interventions for OA were extracted and categorised. Based on this list of interventions, a three round Delphi exercise with an international and multidisciplinary expert panel (26 experts from ten countries), including patient research partners, was performed to achieve expert consensus.

Results: Six documents were included and used for further analysis. Out of them 46 interventions have been extracted and ten evidence based

Determination of recommended RPE cutoff ranges for each % 1RM based on ROC curves

% 1RM	RPE with highest + LR, and - LR <.5	Likelihood ratios	RPE with highest youden index	Area under the curve (AUC)	Suggested RPE
20%	3.5	+LR: 3.37 -LR: .34	2.5	.83	3
30%	4.5	+LR: 5.96 -LR: .44	2.5	.86	3-4
40%	4.5	+LR: 6.34 -LR: .36	3.5	.87	4
50%	5.5	+LR: 8.58 -LR: .44	4.5	.89	5
60%	6.5	+LR: 8.11 -LR: .43	5.5	.89	6
70%	7.5	+LR: 18.34 -LR: .43	5.5	.92	6-7
80%	8.5	+LR: 23.91 -LR: .49	6.5	.91	7-8
≥90%	8.5	+LR: 12.34 -LR: .37	7.5	.90	8

SOC were formulated. In addition, a patient version, written in a lay-understandable wording and in the format of check-list questions was developed. An example is SOC 5: "People with OA should achieve optimal pain control using pharmacological and non-pharmacological means." The matching patient-centred checklist question reads: "Do I know how to control pain associated with OA?"

Conclusion: The SOC for OA will be available in the 23 languages of the European Union to enhance unified information to patients and professionals and to further harmonize the treatment of OA within Europe.

Spine

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DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE FOR THE IDENTIFICATION OF DIFFERENT BEHAVIORAL STRATEGIES IN PATIENTS WITH LOW BACK PAIN

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Purpose: Assessing behavioral strategies implemented by low back pain (LBP) patients is important to optimize their care.

Objective: To create and validate a questionnaire allowing the identification of different behavioral strategies of patients with LBP.

Methods: A preliminary questionnaire was constructed based on patients verbatim (issued from a previous qualitative study). Questions were focused on specific behavior domains (daily life activities, physical activities, leisure activities or work time) and multiple items were submitted for each domain, representing different possible coping strategies. A prospective multicentric study in France and Switzerland included patients if they have LBP at least since 6 weeks, with or without sciatica, without recent back surgery (less than 3 month). Demographic characteristics, preliminary questionnaire and other reference questionnaire were collected. Multiple component analysis and hierarchical clustering were used to validate existence of different coping strategies and to reduce items numbers and identify behavioral profiles. After item reduction, the final questionnaire was submitted to the same sample. Characteristics of coping groups, internal consistency (Cronbach alpha coefficient) and external validity were evaluated.

Results: 162 patients were included: 42% were men, median age was 50 years old (22 to 82) and 70% have radicular pain associated with LBP. Preliminary questionnaire was constituted from 83 items in 8 domains. Multiple component analysis and hierarchical clustering found 3 different behavioral profiles (figure): patients down, patients with good coping strategies, and patients who have difficulties to identify themselves. Final questionnaire was constituted from 7 questions representing the 7 domains with for each 3 response options corresponding to the 3 different behavioral profiles. Cronbach alpha for each domain of the questionnaire (corresponding to patients down, with difficulties to identify themselves or good coping) was 72%, 64% and 74% respectively. External validity with other questionnaires was well correlated with the

Figure: Hierarchical Clustering

final questionnaire: "down" group was correlated with depression, anxiety, negative coping stragegy (dramatization), higher pain visual analogic scale ($p < 0.001$ for each one); "adapted coping" group was correlated with higher positive coping strategies (distraction and ignoring the pain, $p = 0.017$ and 0.019 respectively) and lower depression ($p < 0.001$), anxiety ($p = 0.02$) and pain visual analogic scale ($p = 0.006$).

Conclusions: The questionnaire has a good validity to identify 3 different coping strategies for LBP patients, and should be used to optimize the care of such patients.

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THE IMPACT OF CHRONIC LOW BACK PAIN IS PARTLY RELATED TO LOSS OF SOCIAL ROLE: A QUALITATIVE STUDY OF 25 PATIENTS

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Purpose: Low back pain (LBP) is accepted as a biopsychological phenomenon in which anatomical injury interplays with psychological and social factors, however the social consequences of LBP have been less explored. The objective was to better understand experiences of patients living with chronic LBP, with a focus on impact on relationships with family, friends and work colleagues.

Methods: Monocentric qualitative study in a tertiary-referral center in Paris, France. Participants had sub-acute or chronic mechanical LBP, with or without sciatica, without recent back surgery (less than 3 month). Semi-structured interviews were conducted during 4 focus groups discussions (6 to 9 participants). Participants were asked to describe their behaviour, knowledge and mind-sets regarding low back pain, and to report feelings and moods toward LBP. The focus groups were continued until no new information emerged from them. Verbatim was recorded, categorized and coded using standardized thematic content analysis.

Results: The sample consisted of 25 participants (4 focus groups; 11 men, 14 women); ages ranged 25-81 years and disease duration ranged 1-35 years. As expected based on the literature regarding LBP, participants often reported psychological distress, such as anxiety or depressive mood. Specifically regarding social aspects, participants often reported a negative self-perception in social interactions, with shame and frustration regarding their difficulties to perform activities ("I'm ashamed of being disabled, I'm ashamed to ask my wife to help me"). They often felt misunderstood and unsupported, partly due to the absence of external signs of the condition ("It can't be seen, so it doesn't exist"). Participants suffered from the negative collective image attached to LBP ("benign and / or only psychological disease"). Some men highlighted also a perceived loss of masculinity. Some participants also felt they could not fill their social role in the workplace ("I feel out of my place, I get the impression I'm giving a lot of work to my colleagues and my work gets unloaded on someone else"). LBP resulted in some patients in a significant loss of social identity with perceived impossibility to perform one's social role at home and at work. In contrast, family and friends may be a support and may help in pain management by pushing patients to have more activities or to focus participants' attention on something else ("Social activities allow us to forget the pain, or even if the pain is always there, it doesn't matter").

Conclusions: The multidimensional management of LBP should take into account social interactions.

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FUNCTIONAL RESTORATION PROGRAMS FOR CHRONIC LOW BACK PAIN PATIENTS ARE NOT JUST A FITNESS CLASS – CHANGE IN MUSCLE MASS ASSESSED THROUGH DXA IN 95 PATIENTS: A MONOCENTRIC LONGITUDINAL STUDY

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Purpose: Chronic low back pain leads to high societal costs; interventions to improve chronic low back pain are often disappointing. However, functional restoration (FR) programs improve patients' functional capacity in chronic low back pain. The mechanisms of this improvement is the object of discussions: is it linked to muscle mass (as could be the case with a fitness/sports class), or to other, non-muscle related factors such as coping and patient education?