

Supplemental Material

MS PAIN-D-20-000114: Finnern et al. (2020) Differential sensory and clinical phenotypes of patients with chronic widespread and regional musculoskeletal pain

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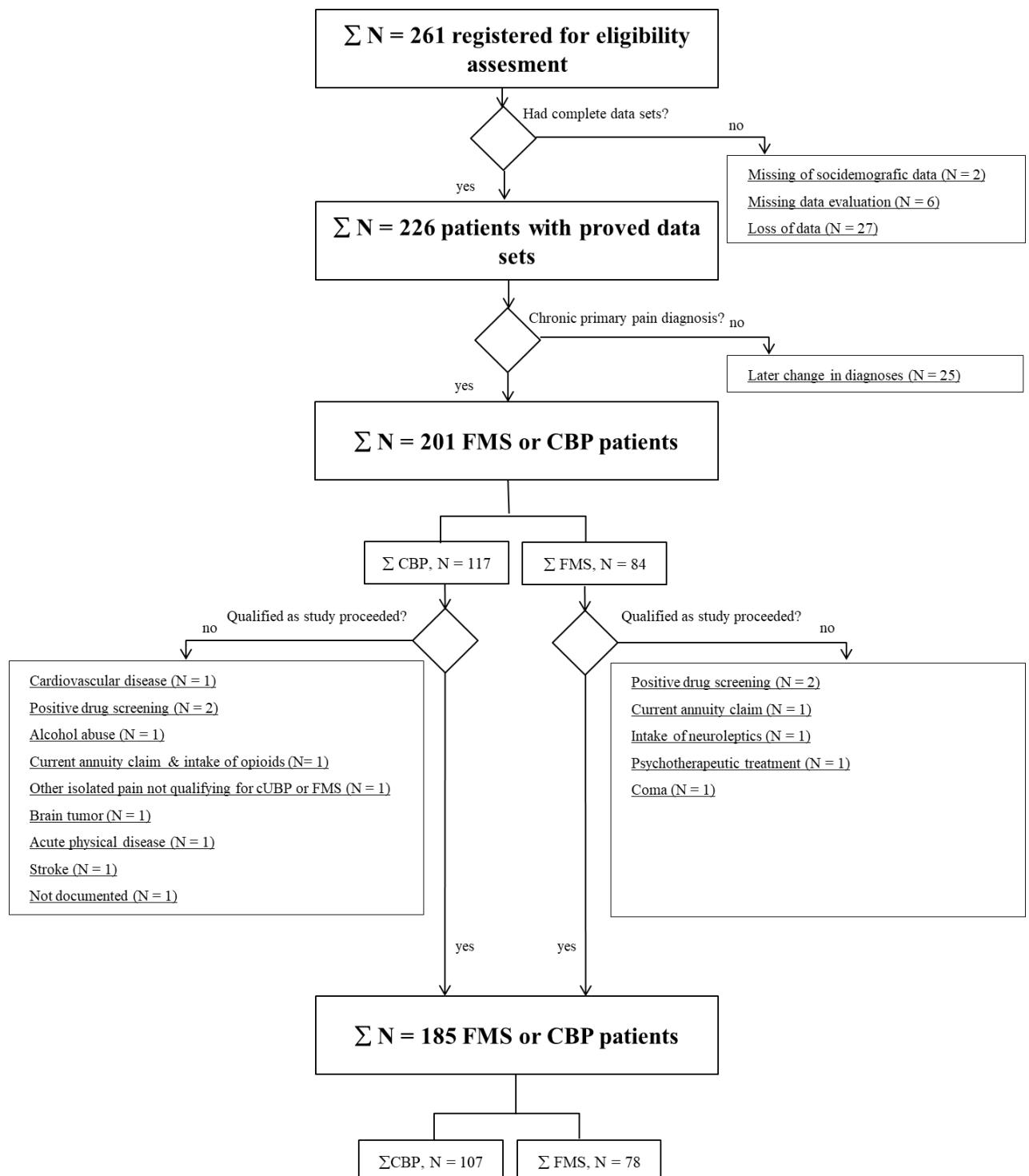
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Figure S1.**Recruitment flow chart**

Recruitment, exclusion and dropouts of participants in the collaborative projects of the Clinical Research Group “Neuroplasticity and Learning in Chronic Pain” (DFG KFO 107); catchment area: Rhein-Neckar-Region, Baden-Württemberg, Germany.

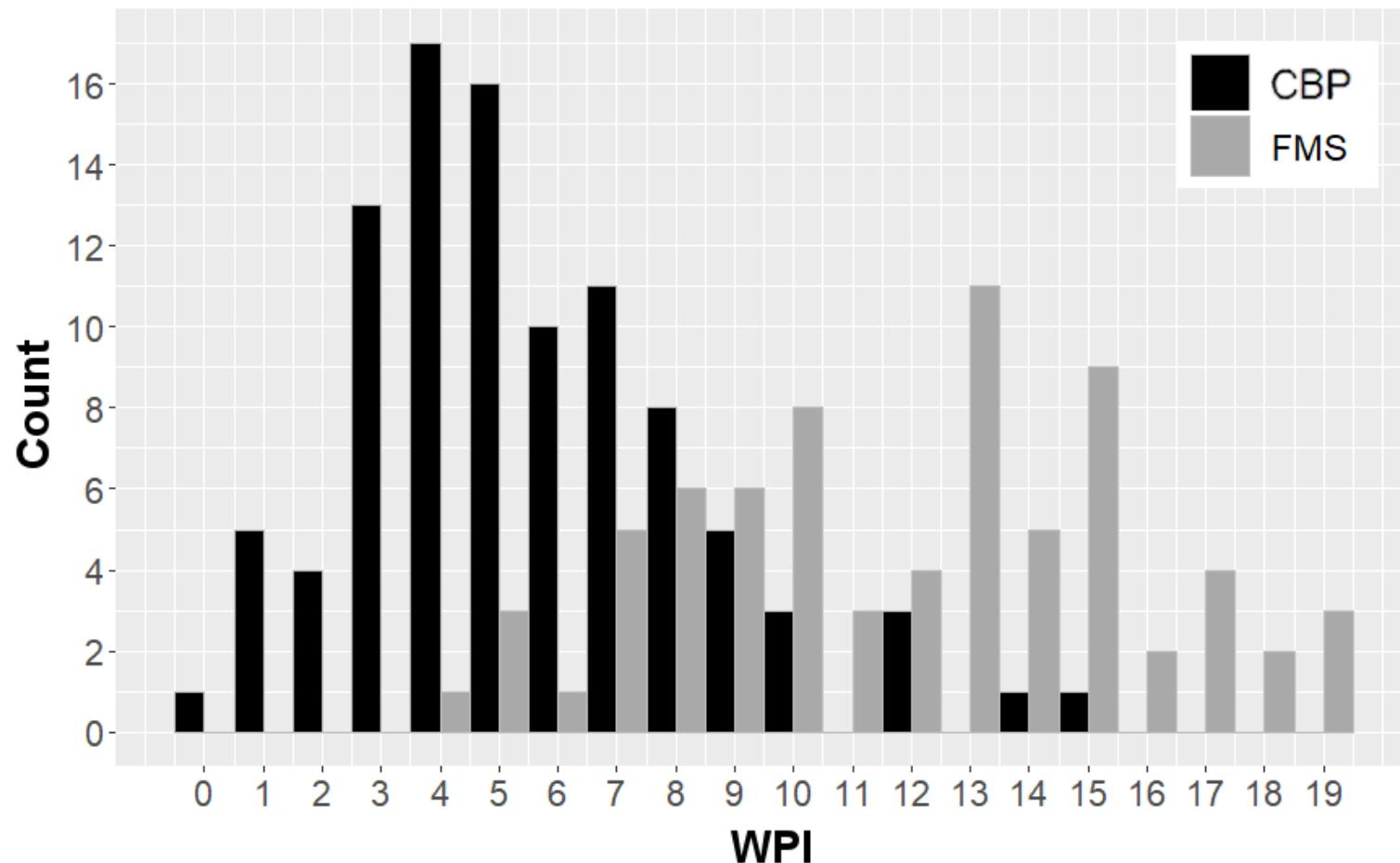
Table S2. Medical chart

Inclusion Criteria	Yes	No
Age ≥ 18, < 70		
Pain for more than 3 months		
Back pain (C1 until bottom) is major pain		
Fibromyalgia syndrome is present		
or person for control group without chronic pain		
Exclusion Criteria	not present	present
Other primary diseases are cause for pain:		
Tumor, fractures, osteoporosis if osteoporosis already caused a fracture (anamn.)		
Secondary back pain with funct. relevant cox-gonarthrosis or degenerative scoliosis (clin.)		
Postherpetic neuralgia (anamn.)		
Claudicatio spinalis (anamn.)		
Radicular back pain is primary condition (clin.)		
Peripheral neurology. Motoric dysfunction including myopathy (muscular weakness, atrophy) (clin.)		
Acute and chronic inflammable diseases with involvement of joint/ autoimmune diseases (anamn.)		
Polyneuropathy (clin.)		
Different severe pain is major pain		
Spinal surgery, especially spinal fusion (excluding disc) (anamn.)		
Opiate medication > 60mg morphine per day		
Relevant change in opiate medication < 3 months prior to the study's start		
Pain-related psychotherapy		
Psychotic disorder (e.g. schizophrenia, delusional, schizoaffective disorder), bipolar disorders, acute or anamn. (incl. SCID-I & II)		
Current intake of neuroleptics		
Current regular intake of benzodiazepines		
Current intake of mood stabilizers		
current intake of Marcumar / heparin		
addictions (drugs, cannabis, alcohol, medication) (anamn. or drug screening)		
Cardiac insufficiency > NYHA II (anamn.)		
Exertional dyspnea, angina pectoris (anamn.)		
Cardiac arrhythmia requiring treatment (anamn.)		
Arterial hypertension not adjustable with medication (anamn.)		

Thyroid disease (not treated with medication) (anamn.)		
Disorders of the central nervous system (epilepsy, intracranial injury, stroke, Parkinson's disease, multiple sclerosis) (anamn.)		
Renal insufficiency requiring dialysis (anamn.)		
Infectious diseases (z.B. borreliosis, AIDS, hepatitis except for hepatitis A)		
Hypersensitivity for tetrahydrocannabinol (anamn.)		
Pregnant or nursing women or acute wish to have children		
Insufficient proficiency in German language (written and spoken language)		
Current annuity claim or compensation pending		
Participation in other clinical trial		

Inclusion and exclusion criteria. *Note:* Check in any grey box led to exclusion from the study.

Figure S2. Widespread Pain Index in patients with prior FMS and CBP diagnoses

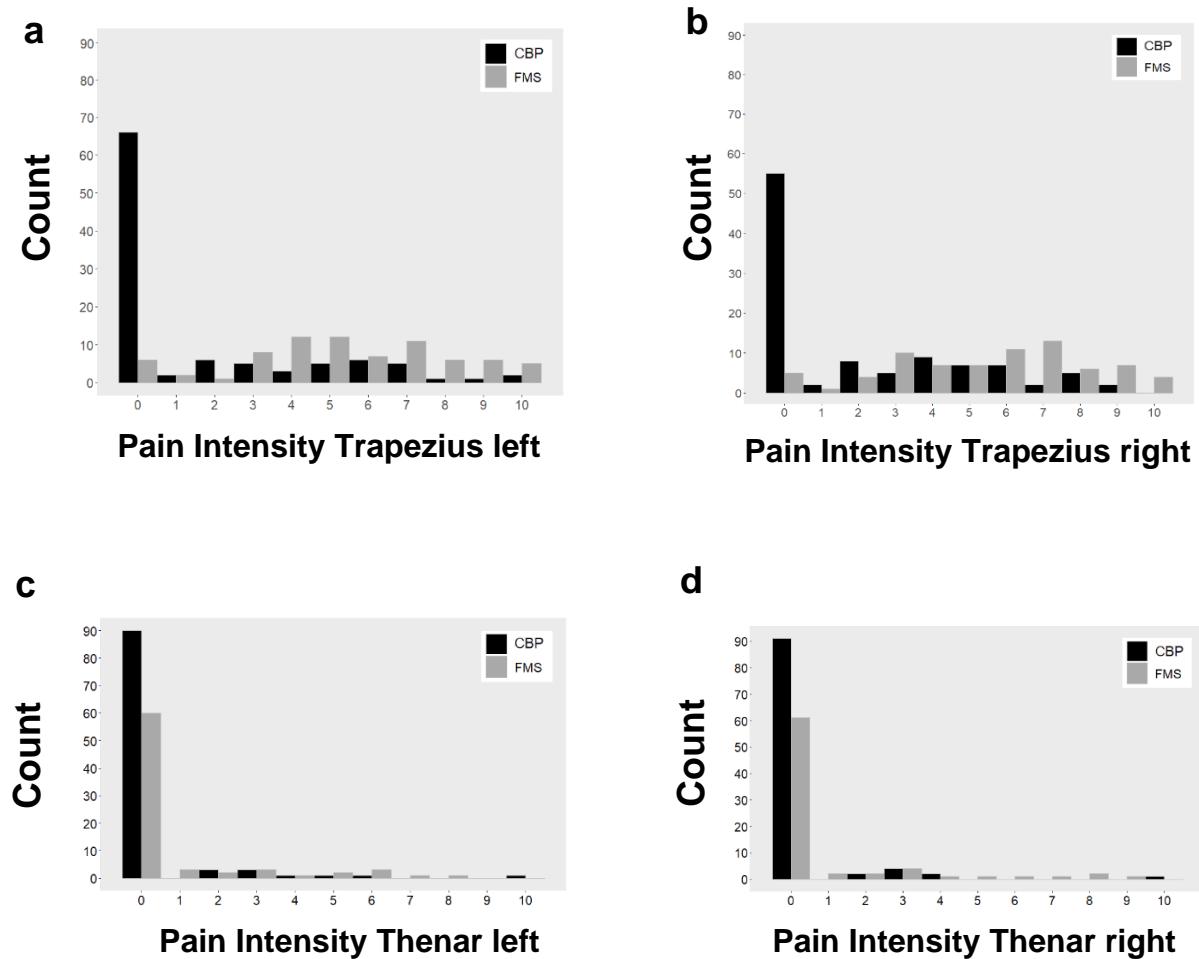


Absolute frequencies of self-reported pain loci according to the Widespread Pain Index, WPI.[71] Note the overlap of WPI distributions of FMS and cBP patients between 4 and 15 and the apparent bimodal distribution in FMS.

Table S2. Correspondence of pain sites to regions of the Heidelberg Pain Drawing Mask

Region in adapted Heidelberg Pain Drawing Mask	Pressure pain site in manual probe
<i>Head-cervical region</i>	forehead left, right; occiput left, right; low cervical left, right
<i>Thoracic region</i>	clavicle left, right; trapezius left, right; supraspinatus left, right; second rib left, right
<i>Lumbar region</i>	gluteal left and right, greater trochanter left, right
<i>Upper limbs</i>	lateral epicondyle left, right; dorsal forearm left, right; thenar left, right; thumbnail left, right
<i>Lower limbs</i>	medial knee left, right; biceps femoris left, right; calcaneal tuberosity left, right

Notes. The 32 single ratings of pressure pain intensity (NRS, 0-10) of the manual probe were averaged for 5 body regions adapted from the Heidelberg pain drawing mask (head-cervical, thoracic, lumbar, upper and lower limb region).[23]

Figure S3.**Frequencies of pain ratings in manual pressure probe**

Notes: Frequency distributions of pain intensity ratings at the selected ACR tender and control points on left and right body sides. **a, b:** trapezius tender points, left and right; **c, d:** thenar control points, left and right. More than half of CPB patients indicated no pain at the trapezius (left: N = 55, 51.4 %; right: N = 66, 61.7 %) and over three-fourth had no pain at the thenar (left: N=90, 84.1 %; right: N=91, 85.0%). Less than 10 % of FMS patients indicated no pain at the trapezius (left: N = 6, 7.7 %; right: N = 5, 6.4 %), but more than three-fourth reported no pain at the thenar (left: N = 60, 76.9 % ; right: N = 61, 78.2 %).

Table S3. Correlation between mechano-nociceptive characteristics ^a

	<i>PPT qst then (Newton)</i>	<i>PPT qst trap (Newton)</i>	<i>PPI qst then (NRS)</i>	<i>PPI qst trap (NRS)</i>
FMS	<i>PPT qst then</i>	-	0.477*** (78)	-0.714*** (77)
	<i>PPT qst trap</i>	0.477*** (78)	-	-0.194(77)
	<i>PPI qst then</i>	-0.714*** (77)	-0.194(77)	-
	<i>PPI qst trap</i>	0.185(77)	-0.194(77)	0.079(76)
	<i>No. Sens TPs</i>	-0.008(76)	-0.198+(76)	0.053(75)
	<i>Intensity Sens TPs</i>	0.222+(76)	-0.046(76)	0.0704*** (75)
	<i>No. Sens CPs</i>	0.210+(77)	0.118(77)	0.169(76)
	<i>Intensity Sens CPs</i>	-0.123(63)	-0.141(63)	0.363** (63)
	<i>No. Sens TPs & CPs</i>	0.146(77)	0.009(77)	0.272* (76)
	<i>Intensity Sens TPs & CPs</i>	0.135+(76)	-0.101(76)	0.674*** (75)
CBP	<i>PPT qst then</i>	-	0.572*** (103)	-0.119(102)
	<i>PPT qst trap</i>	0.572*** (103)	-	0.166+(102)
	<i>PPI qst then</i>	-0.119(102)	0.166+(102)	-
	<i>PPI qst trap</i>	-0.160(101)	-0.059(101)	0.566*** (101)
	<i>No. Sens TPs</i>	0.173+(100)	0.084(100)	-0.220*(99)
	<i>Intensity Sens TPs</i>	-0.332** (81)	-0.170(81)	0.572*** (81)
	<i>No. Sens CPs</i>	0.064+(99)	0.106(99)	0.096(97)
	<i>Intensity Sens CPs</i>	0.096+(33)	-0.115(33)	0.487** (33)
	<i>No. Sens TPs & CPs</i>	0.169+(100)	0.100(100)	-0.232*(99)
	<i>Intensity Sens TPs & CPs</i>	-0.307** (81)	-0.180(81)	0.554*** (81)

^a Spearman's ρ ; variable N due to missings after pairwise exclusion in brackets. + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; 2-tailed, uncorrected.

Notes. PPT qst then = mean pressure pain threshold right and left thenar; PPT qst trap = mean pressure pain threshold right and left trapezius; PPI qst then = mean pressure pain intensity right and left thenar; PPI qst trap = mean pressure pain intensity right and left trapezius; No. Sens. TP = number of sensitive tender points, No Sens. CP = number of sensitive control points

Table S4. Principal components of pain intensities of manual pressure test at “tender” and control points

(a) FMS^a: Loadings of 9 component solution – 79.5 % of total variance

Indicator: Test point ^c pain intensity	Principal Component – Body Region ^b								
	PC 1 <i>TP hnsc</i> 28.4%	PC 2 <i>CP hsa</i> 13.0%	PC 3 <i>TP al</i> 8.8%	PC 4 <i>CP a</i> 7.6%	PC 5 <i>TP thc</i> 6.3%	PC 6 <i>CP l</i> 4.4%	PC 7 <i>TP l</i> 4.1%	PC 8 <i>CP l-f</i> 3.8%	PC 9 <i>TP a</i> 3.1%
<i>TP trap-r</i>	0.859	0.103	0.183	0.118	0.068	-0.073	0.028	0.069	0.068
<i>TP trap-l</i>	0.692	0.193	0.280	0.147	0.133	-0.127	0.146	0.122	-0.103
<i>TP SSpin-r</i>	0.662	0.048	0.001	-0.076	0.062	0.481	0.005	0.074	0.306
<i>TP occ-r</i>	0.657	0.388	0.088	0.086	0.144	-0.030	-0.083	0.049	-0.049
<i>TP lo cerv-l</i>	0.639	0.223	0.048	0.059	0.583	-0.094	0.139	-0.036	0.058
<i>TP lo cerv-r</i>	0.622	0.198	0.050	0.148	0.583	-0.004	0.100	-0.004	0.049
<i>TP occ-l</i>	0.591	0.494	0.232	-0.059	0.323	-0.072	-0.090	0.134	0.100
<i>TP SSpin-l</i>	0.583	-0.023	0.026	-0.078	0.000	0.468	-0.085	0.215	0.337
<i>TP latepic-r</i>	0.327	-0.033	0.561	0.036	0.251	0.069	0.269	-0.013	0.482
<i>TP grtro-l</i>	0.310	0.022	0.564	0.003	0.308	0.137	0.313	0.099	0.269
<i>CP calctub-r</i>	0.296	0.025	0.005	0.066	0.028	0.087	-0.035	0.885	0.043
<i>CP fa-l</i>	0.284	0.211	0.248	0.479	0.273	-0.099	-0.227	-0.293	0.168
<i>TP grtro-r</i>	0.239	0.189	0.578	-0.211	0.211	0.202	0.294	0.116	0.252
<i>CP fh-r</i>	0.229	0.930	-0.019	0.025	0.128	0.043	0.015	0.010	-0.043
<i>CP fh-l</i>	0.203	0.925	-0.024	0.061	0.094	0.049	0.038	0.066	-0.030
<i>TP 2rib-r</i>	0.170	0.202	0.351	-0.021	0.785	0.086	-0.003	-0.066	0.088
<i>CP thnail-l</i>	0.165	0.044	0.095	0.827	0.166	-0.008	-0.220	0.148	-0.137
<i>TP 2rib-l</i>	0.154	0.125	0.186	0.102	0.867	0.069	0.117	0.050	0.076
<i>CP clav-r</i>	0.149	0.568	0.569	0.235	-0.025	-0.023	-0.232	0.058	0.157
<i>CP fa-r</i>	0.143	0.673	-0.018	0.208	0.210	0.289	-0.167	-0.135	0.164
<i>CP bicfem-l</i>	-0.142	-0.019	0.194	0.037	0.085	0.871	0.011	0.045	0.107
<i>TP glut-r</i>	0.131	0.035	0.670	-0.023	0.077	0.488	0.161	-0.038	-0.116
<i>CP thnail-r</i>	0.101	0.129	-0.271	0.742	-0.010	0.165	-0.140	0.213	0.131
<i>TP glut-l</i>	0.101	-0.062	0.770	-0.098	0.271	0.218	0.204	0.061	-0.032
<i>TP latepic-l</i>	0.101	0.035	0.121	-0.081	0.158	0.081	0.124	0.040	0.830
<i>CP clav-l</i>	0.077	0.625	0.503	0.278	0.144	-0.024	-0.248	-0.165	0.119

[Table S4 a continued:]

CP then-r	-0.049	0.243	-0.039	0.514	-0.170	0.245	-0.070	0.105	0.478
TP knee-l	0.035	-0.178	0.261	-0.027	0.064	0.042	0.851	-0.115	0.223
TP knee-r	0.032	-0.038	0.127	-0.067	0.096	0.091	0.895	0.052	-0.025
CP then-l	-0.024	0.083	0.001	0.764	0.013	-0.082	0.284	0.106	-0.138
CP bicfem-r	-0.002	0.214	0.210	0.070	-0.016	0.864	0.149	0.048	0.024
CP calctub-l	0.000	-0.036	0.099	0.384	-0.029	0.033	0.008	0.867	0.059

(b) CBP ^a: Loadings of 9-component solution, 80.4 % of total variance

Indicator: Test point ^c pain intensity	Principal Component – Body Region ^b								
	PC 1 <i>TP hnsl</i> 28.1%	PC 2 <i>TP-CP la</i> 10.7%	PC 3 <i>TP-CP a</i> 8.3%	PC 4 <i>CP hs</i> 7.2%	PC 5 <i>TP c</i> 6.4%	PC 6 <i>TP-CP al</i> 5.7%	PC 7 <i>CP al</i> 5.3%	PC 8 <i>TP l</i> 5.2%	PC 9 <i>TP al-f</i> 3.4%
TP occ-l	0.816	0.050	0.233	0.005	0.073	0.072	0.070	-0.138	-0.147
TP occ-r	0.782	-0.007	0.293	-0.054	0.032	0.189	0.050	-0.088	-0.099
TP lo cerv-r	0.771	0.022	0.287	0.173	-0.050	-0.123	-0.100	0.041	0.191
TP lo cerv-l	0.742	0.120	0.266	0.180	0.034	0.051	-0.069	0.046	0.197
TP trap-l	0.706	0.138	-0.222	0.296	0.270	-0.004	0.115	0.258	-0.083
TP trap-r	0.704	0.084	-0.121	0.348	0.032	0.111	-0.004	0.106	0.193
TP SSpin-r	0.588	0.337	-0.268	-0.064	0.292	0.189	-0.130	0.061	-0.061
TP glut-r	0.535	0.642	-0.143	0.068	0.107	0.200	0.039	0.019	0.035
TP SSpin-l	0.497	0.252	-0.123	0.104	0.381	0.453	-0.108	-0.155	-0.080
TP glut-l	0.415	0.480	-0.148	-0.284	0.207	0.236	0.389	0.241	0.058
CP clav-l	0.405	0.372	0.030	0.540	0.402	-0.149	0.108	0.041	-0.026
TP latepic-r	0.387	0.177	0.496	0.044	0.357	-0.092	-0.095	0.154	0.391
TP latepic-l	0.368	0.510	0.545	0.197	0.206	0.095	-0.103	0.147	-0.032
CP clav-r	0.358	0.361	0.058	0.522	0.486	-0.091	0.170	0.023	0.063
TP grtro-r	0.260	0.603	0.044	0.393	0.130	0.512	-0.034	0.004	0.234
CP fa-l	0.194	0.031	0.110	0.336	0.046	0.820	-0.028	0.072	0.006
CP fh-r	0.156	0.018	-0.099	0.813	0.225	0.292	-0.041	-0.045	-0.041
CP fh-l	0.156	0.018	-0.099	0.813	0.225	0.292	-0.041	-0.045	-0.041
CP thnail-r	-0.138	0.421	-0.020	0.136	-0.332	-0.012	0.454	0.029	-0.147
CP then-r	0.137	-0.003	0.931	-0.093	-0.046	0.099	-0.014	0.089	-0.014

[Table S4 b continued:]

TP 2rib-l	0.125	0.161	0.032	0.219	0.854	0.033	0.128	0.064	-0.061
CP then-l	0.104	0.021	0.923	-0.110	-0.016	0.172	-0.009	0.140	-0.029
TP grtro-l	0.100	0.826	-0.002	0.155	0.077	0.031	-0.009	-0.087	0.052
CP thnail-l	0.044	-0.076	0.013	0.054	0.046	-0.061	0.898	-0.039	-0.071
TP 2rib-r	0.041	0.170	-0.005	0.323	0.825	0.160	-0.066	0.062	-0.016
CP bicfem-l	-0.039	-0.011	-0.057	-0.091	0.055	0.014	0.887	-0.013	0.183
CP calctub-l	0.033	0.272	-0.075	-0.165	0.073	0.033	0.169	-0.037	0.849
CP fa-r	0.024	-0.099	0.043	0.082	-0.123	-0.002	-0.053	-0.032	0.877
TP knee-r	0.023	0.030	0.173	0.064	-0.004	0.173	-0.059	0.928	-0.081
TP knee-l	0.019	-0.104	0.104	-0.106	0.102	0.063	0.020	0.950	0.028
CP calctub-r	-0.009	0.708	0.229	-0.133	0.267	-0.093	-0.075	-0.059	0.072
CP bicfem-r	0.006	0.021	0.218	0.081	0.026	0.861	0.008	0.236	0.000

^a Nine significant components in FMS (N = 46) and CBP (N = 66) according to Kaiser criterion (eigenvalues > 1), for separate within-group PCAs (VARIMAX rotation, listwise exclusion of missings); sequence of indicators/body sites according to loading ranks in the first component. Shaded cells: loadings ≥ 0.50, grouped according to seamless Scree-Plot arrays; four in FMS (PC1, 2-4, 5-6, 7-9), three in CBP (PC1, 2-8, 9); bold numbers: highest loading on single component.

^b Body region modified after IASP taxonomy: *TP hnsc* = ACR tender points on head, neck or shoulder; *CP has* = control point on head and shoulder plus forearm; *TP al* = tender points on arms and legs plus hip; *CP a* = control points on forearm/hands; *TP thc* = tender points on neck and frontal thorax; *CP l* = control points on biceps femori; *TP l* = tender points on knees; *CP l-f* = control points on the foot; *TP a* = tender point on arm/elbow.

^c Rating of pain intensity of tender point (TP) or control point (CP) at selected body site (-r = right, -l = left body side): trap = trapezius, SSpin = supraspinatus, occ = occiput, lo cerv = low cervical; fh = forehead, clav = clavicle; fa = forearm; grtro = greater trochanter, glut = gluteal; latepic = lateral epicondyle; thnail = thumbnail, then = thenar; 2rib = 2nd rib; calctub = calcaneal tuberosity.

Note. Five dominant components (loading ≥ 0.50) collected most of the variance (64.1 % and 60.7 %) representing systematic relations to the functional body regions head-neck, thorax, lumbar region, upper and lower limbs. Notably, tender and control points loaded on separate components only in FMS while the CBP intensity ratings showed 3 composite TP-CP components. Loading patterns reflected the functional difference between TP and CP in FMS patients apparent in the sensory differences described in the main text. CP loadings were distributed all over the body without left-right asymmetries. The first dominant component (28 %) consisted only of TPs from the head, neck, shoulder and upper back in both FMS and CBP. The second, third and fourth components differed in composition between FMS and CBP with tender and control points separated in the former and TP-CP combined in the latter. The fifth dominant component was mainly thoracic in both groups extending to the cervix in FMS. The other components 6 to 9 explained negligible 3 – 4 % amount of variance from extremity sites.

Table S5. Principal component analysis of pain intensities and thresholds at thenar and trapezius in manual and algometer pressure test

(a) FMS: 4-component solution, 88.92% of total variance ^a

Variable	PC 1: 34.4%	PC 2: 27.4%	PC 3: 17.8%	PC 4: 9.4%
	<i>Manual & Algometer: NRS trapezius</i>	<i>Algometer: NRS and thresholds at thenar</i>	<i>Algometer: Thresholds</i>	<i>Manual: Control Points</i>
<i>PPI qst trap-r</i>	0.917	0.085	-0.025	-0.107
<i>PPI man trap-l</i>	0.892	-0.131	-0.091	0.191
<i>PPI qst trap-l</i>	0.875	0.095	0.010	-0.123
<i>PPI man trap-r</i>	0.874	-0.182	0.023	0.176
<i>PPT qst then-r</i>	0.240	-0.646	0.610	-0.161
<i>PPT qst then-l</i>	0.231	-0.704	0.538	-0.158
<i>PPT qst trap-r</i>	-0.095	-0.135	0.950	0.095
<i>PPT qst trap-l</i>	-0.094	-0.143	0.936	0.046
<i>PPI qst then-r</i>	0.077	0.941	-0.067	0.187
<i>PPI man then-l</i>	0.051	0.173	-0.010	0.952
<i>PPI man then-r</i>	0.029	0.196	0.079	0.951
<i>PPI qst then-l</i>	0.015	0.949	-0.130	0.118

(b) CBP: 4-components – 85.95% variance ^a

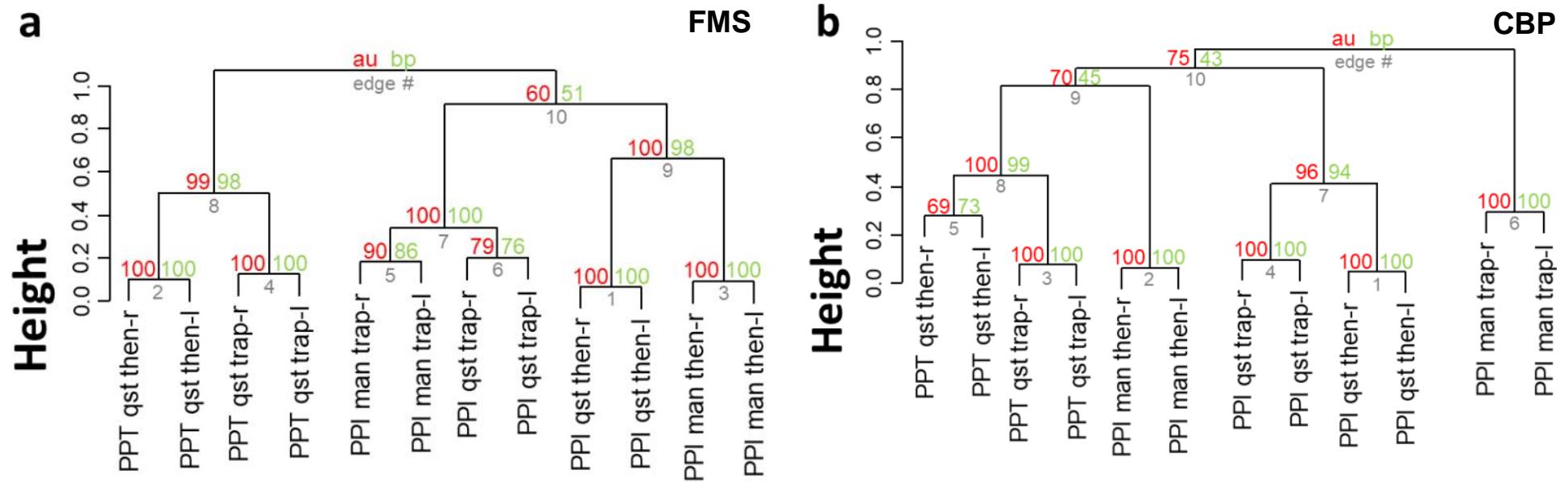
Variable	PC 1: 28.6%	PC 2: 25.9%	PC 3: 18.5%	PC 4: 13.0%
	Algometer: NRS	Algometer: Thresholds	Manual: Tender Points	Manual: Control Points
PPI qst then-l	0.927	0.027	-0.257	0.154
PPI qst then-r	0.920	0.052	-0.254	0.157
PPI qst trap-r	0.781	-0.089	0.510	0.045
PPI qst trap-l	0.776	-0.103	0.510	0.016
PPT qst then-l	-0.296	0.726	0.067	0.106
PPT qst then-r	-0.270	0.831	0.117	0.143
PPT qst trap-r	0.236	0.895	-0.107	0.020
PPT qst trap-l	0.226	0.889	-0.115	0.071
PPI man then-l	0.157	0.087	-0.011	0.963
PPI man then-r	0.084	0.154	-0.011	0.965
PPI man trap-l	-0.062	-0.046	0.899	-0.050
PPI man trap-r	-0.014	0.048	0.880	0.019

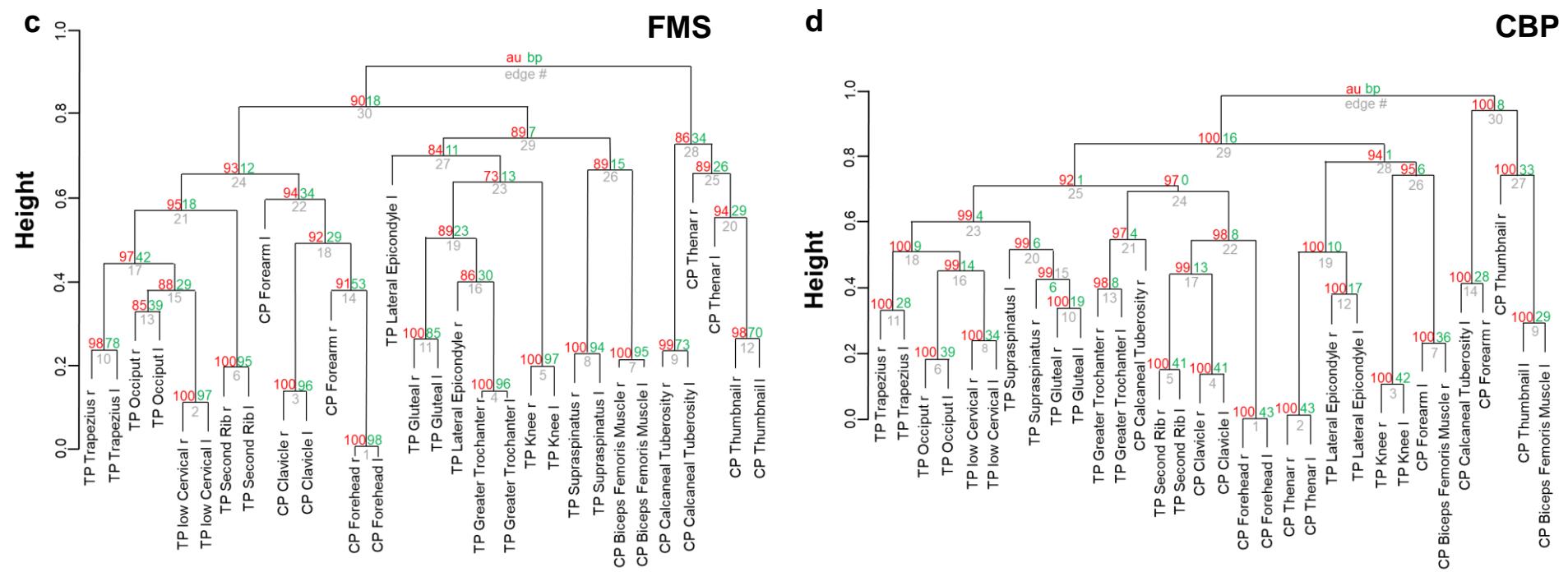
Number of components identified according to Scree Plot criterion. Sequence of sites in the tables according to loadings on the first principal component; VARIMAX rotation; analyses bases on complete datasets (listwise exclusion of missings); N = 72 FMS, N = 96 CBP. Shaded cells: highest loading sites ≥ 0.5 ; cell clusters in the scree plot indicated by different shading (two clusters: PC1; PCs2-4); bold numbers: highest loading for the particular component; interpreted variables with eigenvalues ≥ 1.0 and critical loadings ≥ 0.50 .

PPI qst trap-r = Pressure pain intensity at right trapezius (algometer); PPI man trap-l = Pressure pain intensity at left trapezius (manual); PPI qst trap-l = Pressure pain intensity at left trapezius (algometer); PPI man trap-r = Pressure pain intensity at right trapezius (manual); PPT qst then-r = Pressure pain threshold at right thenar (algometer); PPT qst then-l = Pressure pain threshold at left thenar (algometer); PPT qst trap-r = Pressure pain threshold at right trapezius (algometer); PPT qst trap-l = Pressure pain threshold at left trapezius (algometer); PPI qst then-r = Pressure pain intensity at right thenar (algometer); PPI man then-l = Pressure pain intensity at left thenar (manual); PPI man then-r = Pressure pain intensity at right thenar (manual); PPI qst then-l = Pressure pain intensity at left thenar (algometer); PCA = principal component analysis.

Note: The group-specific dimensional structure of pressure pain sensitivity in the manual probe (Table S4) is reproduced in the additional PCA on the pressure pain thresholds and intensity ratings of the quantitative algometer test at the exemplary ACR tender and control points. In FMS, in particular, the algometer pain intensities at the trapezius TP and the thenar CP loaded on the corresponding tender and control point components of the manual test and TP and CP were separated on different components. This was different in the CBP group where algometer and manual measures created method-specific components irrespective of their functional relation to “tender” vs. “control points”.

Figure S4. Dendrograms of hierarchical cluster analysis of ACR tender and control points





Cluster dendrograms of manual and algometer pressure sensitivity indicators at the trapezius tender and the thenar control points on left and right sides of FMS and CBP patients. Latent class analyses with multiscale bootstrap resampling technique.[60] Red and green numbers: significant clusters with arbitrary unbiased/bootstrap probabilities (AU/BP; AU \geq 95% significant); “height” scale on the left: distance from the center of gravity of the particular cluster, i.e., the dissimilarity relative to the other members of the cluster. Body site abbreviations as in Table S5.

Note. Pain thresholds and pain intensities in the algometer were clearly separated in both FMS and CBP groups. **a:** In FMS, both manual probe and algometer test indicators were grouped into separate clusters for tender and control points. **b:** In CBP patients, indicators grouped according to test method rather than tender vs. control point status (algometer vs. manual probe).

c, d: Cluster dendrograms of pain intensities of the manual pressure test at ACR tender points and control points. Nodes correspond to regional clusters of body sites. TP = ACR tender point, CP = control point.

Table S6. Heat pain thresholds, suprathreshold sensitivity and temporal summation

	Patients: 185		Pain-free Controls: 41
	FMS: 78	CBP: 107	
TPT lim trap-r	44.870 ± 4.353 [35.200 – 50.000 / 26]	45.897 ± 3.513 [36.520 – 50.000 / 30]	44.808 ± 3.467 [37.900 – 50.000 / 25] Kruskal Wallis: p = 0.377, n.s.
			FMS vs. CBP, t-test: p = 0.150, n.s.; FMS vs. CON, t-test: p = 0.955, n.s.; CBP vs. CON, t-test: p = 0.255, n.s.
TPT adj trap-r	44.782 ± 1.571 [42.000 – 46.830 / 16]	46.161 ± 1.670 [42.700 – 49.200 / 21]	45.168 ± 1.629 [42.100 – 48.600 / 23] Kruskal Wallis: p = 0.067+
			FMS vs. CBP, t-test: p = 0.896, n.s.; FMS vs. CON, t-test: p = 0.465, n.s.; CBP vs. CON, t-test: p = 0.052+
TPT ton trap-r	44.560 ± 1.532 [41.400 – 46.470 / 16]	46.266 ± 1.590 [42.700 – 48.780 / 21]	45.111 ± 1.553 [42.100 – 48.400 / 23] Kruskal Wallis: p = 0.005**
			FMS vs. CBP, t-test: p = 0.723, n.s.; FMS vs. CON, t-test: p = 0.280, n.s.; CBP vs. CON, t-test: p = 0.019*
TPT lim then-l	43.421 ± 2.871 [36.500 – 49.700 / 57]	45.203 ± 2.972 [36.800 – 50.000 / 72]	46.247 ± 2.275 [40.700 – 49.900 / 28] Kruskal Wallis: p = 0.001**
			FMS vs. CBP, t-test: p = 0.111, n.s.; FMS vs. CON, t-test: p < 0.0001***; CBP vs. CON, t-test: p = 0.097+
TPT adj then-l	43.471 ± 1.877 [40.260 – 47.820 / 53]	44.596 ± 1.687 [40.600 – 48.700 / 63]	45.048 ± 1.253 [42.160 – 46.900 / 28] Kruskal Wallis: p < 0.001***
			FMS vs. CBP, t-test: p = 0.201, n.s.; FMS vs. CON, t-test: p < 0.001***; CBP vs. CON, t-test: p = 0.208, n.s.
TPT ton then-l	43.276 ± 1.672 [40.300 – 47.440 / 53]	44.639 ± 1.584 [40.400 – 48.470 / 63]	44.836 ± 1.383 [42.100 – 46.700 / 28] Kruskal Wallis: p < 0.001***
			FMS vs. CBP, t-test: p = 0.026*; FMS vs. CON, t-test: p < 0.001***; CBP vs. CON, t-test: p = 0.572, n.s.
TPI lev then-l	49.227 ± 14.013 [26.111 – 83.333 / 44]	47.970 ± 16.332 [6.111 – 83.333 / 42]	50.334 ± 14.052 [17.500 – 82.778 / 27] Kruskal Wallis: p = 0.728, n.s.
			FMS vs. CBP, t-test: p = 0.652, n.s.; FMS vs. CON, t-test: p = 0.748, n.s.; CBP vs. CON, t-test: p = 0.538, n.s.

[Table S6 continued:]

TPI grad then-l	16.587 ± 11.689 [-1.754 – 42.822 / 45]	15.991 ± 11.539 [-1.754 – 41.052 / 42]	17.128 ± 10.478 [-1.005 – 42.822 / 27]
Kruskal Wallis: p = 0.857, n.s.			
			FMS vs. CBP, t-test: p = 0.817, n.s.; FMS vs. CON, t-test: p = 0.844, n.s.; CBP vs. CON, t-test: p = 0.680, n.s.
TSB lev then-l	-0.072 ± 0.288 [-1.059 – 0.511 / 46]	0.025 ± 0.278 [-0.790 – 0.634 / 42]	0.078 ± 0.458 [-1.572 – 0.938 / 27]
Kruskal Wallis: p = 0.042*			
			FMS vs. CBP, t-test: p = 0.195, n.s.; FMS vs. CON, t-test: p = 0.090+; CBP vs. CON, t-test: p = 0.552, n.s.
TSB grad then-l	-0.159 ± 0.309 [-1.397 – 0.630 / 46]	-0.219 ± 0.252 [-0.803 – 0.175 / 42]	-0.233 ± 0.302 [-1.204 – 0.175 / 27]
Kruskal Wallis: p = 0.380, n.s.			
			FMS vs. CBP, t-test: p = 0.263, n.s.; FMS vs. CON, t-test: p = 0.318, n.s.; CBP vs. CON, t-test: p = 0.830, n.s.
TSS lev then-l	0.168 ± 0.206 [-0.403 – 0.722 / 45]	0.148 ± 0.214 [-0.168 – 0.792 / 42]	0.172 ± 0.295 [-0.321 – 0.848 / 27]
Kruskal Wallis: p = 0.680, n.s.			
			FMS vs. CBP, t-test: p = 0.270, n.s.; FMS vs. CON, t-test: p = 0.949, n.s.; CBP vs. CON, t-test: p = 0.713, n.s.
TSS grad then-l	0.202 ± 0.211 [-0.055 – 0.844 / 45]	0.220 ± 0.207 [-0.042 – 0.844 / 42]	0.261 ± 0.186 [-0.042 – 0.533 / 27]
Kruskal Wallis: p = 0.318, n.s.			
			FMS vs. CBP, t-test: p = 0.820, n.s.; FMS vs. CON, t-test: p = 0.235, n.s.; CBP vs. CON, t-test: p = 0.408, n.s.

Cell entries mean \pm SD or median \pm ½ IQD for respective scale levels; [Range /N] in brackets.

+ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; 2-tailed.

Abbreviations: TPT lim trap-r = heat pain threshold phasic, limits at right trapezius; TPT adj trap-r = heat pain threshold phasic, adjusted at right trapezius; TPT ton trap-r = heat pain threshold tonic, re-adjusted at right trapezius; TPT lim then-l = heat pain threshold phasic, limits at left thenar; TPT adj then-l = heat pain threshold phasic, adjusted at left thenar; TPT ton then-l = heat pain threshold tonic, re-adjusted at left thenar; TPI lev then-l = level of suprathreshold sensitivity at left thenar; TPI grad then-l = gradient of suprathreshold sensitivity at left thenar; TSB lev then-l = level of temperature change (temporal summation) at left thenar; TSB grad then-l = gradient of temperature change at left thenar; TSS lev then-l = level of perceptual (VAS rating) response at left thenar; TSS grad then-l = gradient of perceptual (VAS rating) response at left thenar.

Table S7. Intercorrelation of heat pain indicators^a

(a) FMS

	TPT lim trap-r	TPT adj trap-r	TPT ton trap-r	TPT lim then-l	TPT adj then-l	TPT ton then-l	TPI lev then-l	TPI grad then-l	TSB lev then-l	TSB grad then-l	TSS lev then-l	TSS grad then-l
TPT lim trap-r	1.000	0.834*** (26)	0.837*** (16)	0.416* (25)	0.224 (22)	0.298 (22)	-0.030 (15)	-0.086 (15)	0.338 (15)	0.140 (15)	-0.304 (15)	-0.107 (15)
TPT adj trap-r	0.834*** (16)	1.000	0.956*** (16)	0.527* (15)	0.346 (16)	0.413 (16)	0.653+ (9)	-0.167 (9)	0.100 (9)	-0.300 (9)	0.100 (9)	0.217 (9)
TPT ton trap-r	0.837*** (16)	0.956*** (16)	1.000 (16)	0.660** (15)	0.393 (16)	0.445+ (16)	0.603+ (9)	0.117 (9)	0.117 (9)	-0.033 (9)	0.017 (9)	0.017 (9)
TPT lim then-l	0.416* (25)	0.527* (15)	0.660** (15)	1.000 (57)	0.555*** (52)	0.595*** (52)	0.087 (44)	0.003 (45)	0.219 (46)	0.186 (46)	-0.060 (45)	-0.064 (45)
TPT adj then-l	0.224 (22)	0.346 (16)	0.393 (16)	0.555*** (52)	1.000 (53)	0.923*** (53)	0.376* (44)	0.123 (45)	0.062 (46)	0.163 (46)	0.070 (45)	-0.122 (45)
TPT ton then-l	0.298 (22)	0.413 (16)	0.445+ (16)	0.595*** (52)	0.923*** (53)	1.000 (53)	0.217 (44)	0.073 (45)	0.148 (46)	0.187 (46)	0.026 (45)	-0.139 (45)
TPI lev then-l	-0.030 (15)	0.653+ (9)	0.603+ (9)	0.087 (44)	0.376* (44)	0.217 (44)	1.000 (44)	0.441** (44)	-0.349* (44)	-0.046 (44)	0.316* (44)	0.110 (44)
TPI grad then-l	-0.086 (15)	-0.167 (9)	0.117 (9)	0.003 (45)	0.123 (45)	0.073 (45)	0.441** (45)	1.000 (45)	-0.333* (45)	-0.083 (45)	0.404** (45)	0.208 (45)
TSB lev then-l	0.338 (15)	0.100 (9)	0.117 (9)	0.219 (46)	0.062 (46)	0.148 (46)	-0.349* (46)	-0.333* (46)	1.000 (46)	0.188 (46)	-0.725*** (46)	-0.260+ (46)
TSB grad then-l	0.140 (15)	-0.300 (9)	-0.033 (9)	0.186 (46)	0.163 (46)	0.187 (46)	-0.046 (46)	-0.083 (46)	0.188 (46)	1.000 (46)	-0.425** (46)	-0.838*** (46)
TSS lev then-l	-0.304 (15)	0.100 (9)	-0.017 (9)	-0.060 (45)	0.070 (45)	0.026 (45)	0.316* (44)	0.404** (45)	-0.725*** (45)	-0.425** (45)	1.000 (45)	0.527*** (45)
TSS grad then-l	-0.107 (15)	0.217 (9)	-0.017 (9)	0.064 (45)	-0.122 (45)	-0.139 (45)	0.110 (44)	0.208 (45)	-0.260+ (45)	-0.838*** (45)	0.527*** (45)	1.000 (45)

(b) CBP

	TPT lim trap-r	TPT adj trap-r	TPT ton trap-r	TPT lim then-l	TPT adj then-l	TPT ton then-l	TPI lev then-l	TPI grad then-l	TSB lev then-l	TSB grad then-l	TSS lev then-l	TSS grad then-l
TPT lim	1.000	0.415+	0.333	0.510**	0.315	0.234	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>trap-r</i>	(30)	(21)	(21)	(29)	(21)	(21)	(1)	(1)	(1)	(1)	(1)	(1)
TPT adj	0.415+	1.000	0.863***	0.334	0.735***	0.731***	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>trap-r</i>	(21)	(21)	(21)	(21)	(21)	(21)	(1)	(1)	(1)	(1)	(1)	(1)
TPT ton	0.333	0.863***	1.000	0.124	0.521*	0.799***	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<i>trap-r</i>	(21)	(21)	(21)	(21)	(21)	(21)	(1)	(1)	(1)	(1)	(1)	(1)
TPT lim	0.510**	0.334	0.124	1.000	0.521***	0.462***	0.095	0.070	-0.018	0.114	-0.143	-0.060
<i>then-l</i>	(29)	(21)	(21)	(72)	(62)	(62)	(41)	(41)	(41)	(41)	(41)	(41)
TPT adj	0.315	0.735***	0.521*	0.521***	1.000	0.915***	0.448**	0.517***	-0.176	-0.022	0.105	0.046
<i>then-l</i>	(21)	(21)	(21)	(62)	(63)	(63)	(42)	(42)	(42)	(42)	(42)	(42)
TPT ton	0.234	0.731***	0.799***	0.462***	0.915***	1.000	0.467**	0.414**	-0.003	-0.104	0.001	0.019
<i>then-l</i>	(21)	(21)	(21)	(62)	(63)	(63)	(42)	(42)	(42)	(42)	(42)	(42)
TPI lev	n.a.	n.a.	n.a.	0.095	0.448**	0.467**	1.000	.523***	-0.271+	-0.178	0.407**	0.241
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
TPI grad	n.a.	n.a.	n.a.	0.070	0.517***	0.414**	0.523***	1.000	-0.486**	-0.055	0.539***	0.373*
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
TSB lev	n.a.	n.a.	n.a.	-0.018	-0.176	-0.003	-0.271+	-0.486**	1.000	0.237	-0.690***	-0.285+
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
TSB grad	n.a.	n.a.	n.a.	0.040	-0.022	-0.104	-0.178/	-0.055	0.237	1.000	-0.248	-.616***
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
TSS lev	n.a.	n.a.	n.a.	-0.143	0.105	0.001	0.407**	0.539***	-.690***	-0.248	1.000	0.589***
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)
TSS grad	n.a.	n.a.	n.a.	-0.060	0.046	0.019	0.241	0.373*	-0.285+	-.616***	0.589***	1.000
<i>then-l</i>	(1)	(1)	(1)	(41)	(42)	(42)	(42)	(42)	(42)	(42)	(42)	(42)

^a Spearman's ρ ; variable N due to missings after pairwise exclusion in brackets. + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; 2-tailed, uncorrected. Abbreviations as in Table S6.

Table S8. Principal components of thermal pain sensitivity and sensitization^a**(a) Thresholds: patients and pain-free controls**

	FMS: 2-components 88.49% variance		CBP: 2-components 81.26% variance		PFC: 2-components 86.12% variance		
	Component	PC1: 66.6% Trapezius	PC2: 21.9% Thenar	PC1: 61.5% Trapezius & Thenar #1	PC2: 19.4% Trapezius & Thenar #2	PC1: 57.0% Trapezius	PC2: 29.1% Thenar
Variable	<i>TPT adj trap-r</i>	0.962	0.224	0.860	0.267	0.867	-0.008
	<i>TPT ton trap-r</i>	0.933	0.305	0.900	0.133	0.912	0.204
	<i>TPT lim trap-r</i>	0.917	0.177	0.035	0.900	0.924	0.237
	<i>TPT lim then-l</i>	0.475	0.643	0.317	0.749	0.425	0.734
	<i>TPT adj then-l</i>	0.182	0.942	0.892	0.185	0.058	0.978
	<i>TPT ton then-l</i>	0.181	0.951	0.961	0.110	0.069	0.973

(b) Thresholds plus suprathreshold sensitivity: patients

	FMS: 2-components 76.16% variance		CBP: 2-components 79.28% variance		
	Component	PC1: 52.2% Thresholds thenar	PC2: 23.9% Suprathreshold	PC1: 54.9% Thresholds thenar	PC2: 24.3% Suprathreshold
Variable	<i>TPT lim then-l</i>	0.783	-0.004	0.878	-0.212
	<i>TPT adj then-l</i>	0.921	0.227	0.819	0.492
	<i>TPT ton then-l</i>	0.945	0.077	0.775	0.495
	<i>TPI lev then-l</i>	0.319	0.736	0.155	0.807
	<i>TPI grad then-l</i>	-0.095	0.863	0.042	0.845

(c) Thresholds plus suprathreshold sensitivity and temporal summation: patients

Variable	FMS: 3-components 72.34% variance			CBP: 3-components 62.79% variance		
	Component	PC1: 32.5% Thresholds thenar	PC2: 27.0% Summation gradient	PC3: 12.8% Suprathreshold and summation	PC1: 36.1% Suprathreshold & summation	PC 2: 26.7 % Thresholds & suprathreshold
<i>TPT lim then-l</i>	<i>TPT lim then-l</i>	0.778	0.066	-0.003	-0.335	0.632
	<i>TPT adj then-l</i>	0.925	0.042	0.205	0.079	0.951
	<i>TPT ton then-l</i>	0.951	-0.028	0.048	0.032	0.920
	<i>TPI lev then-l</i>	0.327	0.040	0.697	0.447	0.547
	<i>TPI grad then-l</i>	-0.070	0.040	0.716	0.643	0.448
	<i>TSB lev then-l</i>	-0.099	0.445	-0.653	-0.671	-0.038
	<i>TSB grad then-l</i>	0.045	0.895	-0.088	-0.644	0.080
	<i>TSS lev then-l</i>	0.038	-0.503	0.693	0.888	0.009
	<i>TSS grad then-l</i>	-0.065	-0.892	0.059	0.777	-0.022

^a Principal components of correlation matrix with pairwise exclusion of missings; VARIMAX rotation; variables with eigenvalues ≥ 1.0 and critical loadings ≥ 0.50 . Abbreviations as in Table S6.

(a) Thresholds alone: N = 16 FMS patients; N = 21 CBP patients; PFC: N = 27 pain-free controls (Median N's of valid pairs). Note. In FMS, the first principal component explaining 66.6 % of the total variance consists of phasic and tonic heat pain threshold at the trapezius tender point (PT-lim, PT-adj, PT-ton), the second principal component explaining 21.9 % of the variance consists of phasic and tonic thresholds at the thenar control point. In CBP and PFC the same general structure prevails (PC1: 62.1/57 %; PC2: 19.2/29.1 % variance).

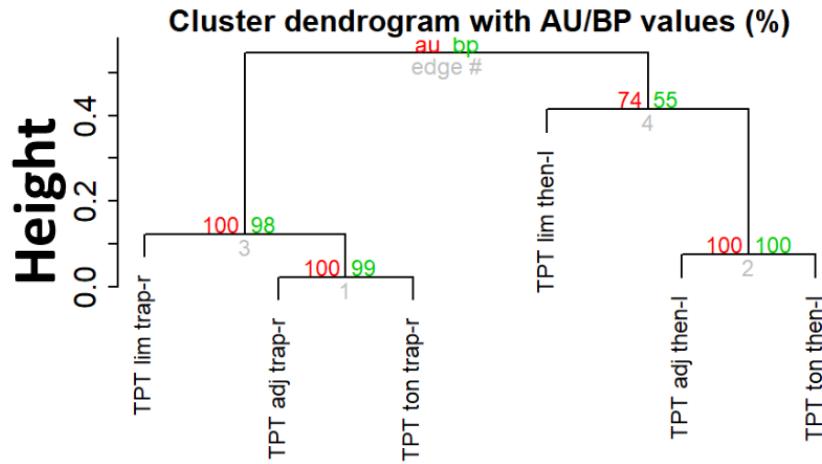
(b) Thresholds plus suprathreshold sensitivity: N = 45 FMS, N = 42 CBP patients. Note. In both FMS and CBP patients, the first principal component (52.2/54.9 % variance) consists of heat pain thresholds at the thenar, the second principal component (23.9/24.3 % variance) consists of the suprathreshold sensitivity (level and gradient of the psychometric function = pain intensity over stimulus temperature).

(c) Thresholds plus suprathreshold sensitivity plus temporal summation: N = 45 FMS, N = 42 CBP patients. Note. In FMS three principal components were extracted: PC1 (32.5 % variance) consists of heat pain thresholds at the thenar; PC2 (27.0 % variance) consists of the gradients of temporal summation; PC3 (12.8 % variance) consists of the suprathreshold sensitivity (level and gradient of the psychometric function) plus the level of temporal summation. In CBP only two components met the criteria in CBP: PC1 (36.1 % variance) consists of temporal summation (dynamic measures of behavioral and perceived temperature change) plus the suprathreshold heat pain sensitivity (gradient of the psychometric function); PC2 (26.7 % variance) consists of the pain thresholds at the thenar and the suprathreshold sensitivity rating (level of the psychometric function = average pain intensity).

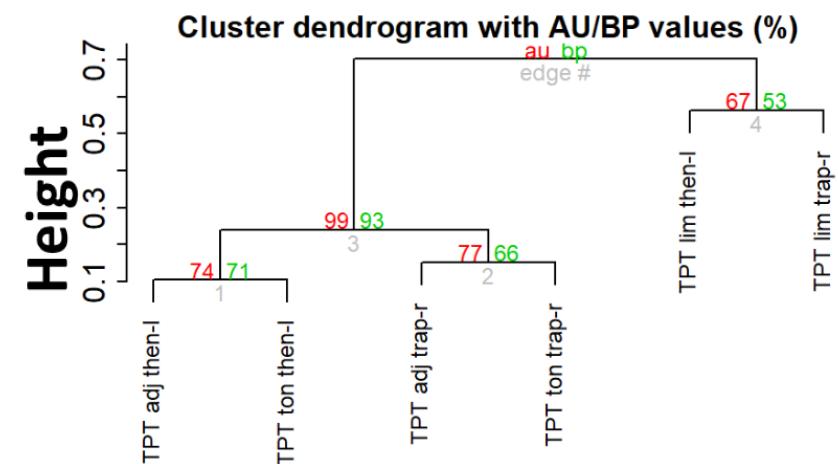
Figure S5. Cluster dendograms of heat pain thresholds, suprathreshold sensitivity and temporal summation at selected tender and control points

(a) Thresholds at thenar and trapezius

FMS

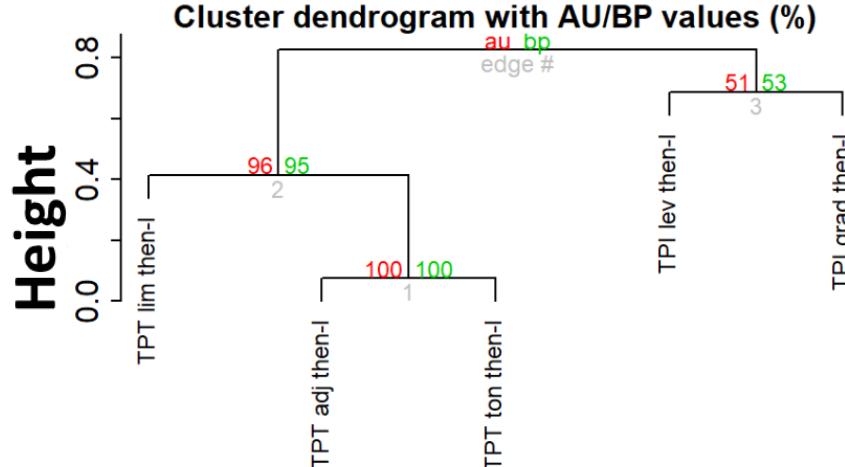


CBP

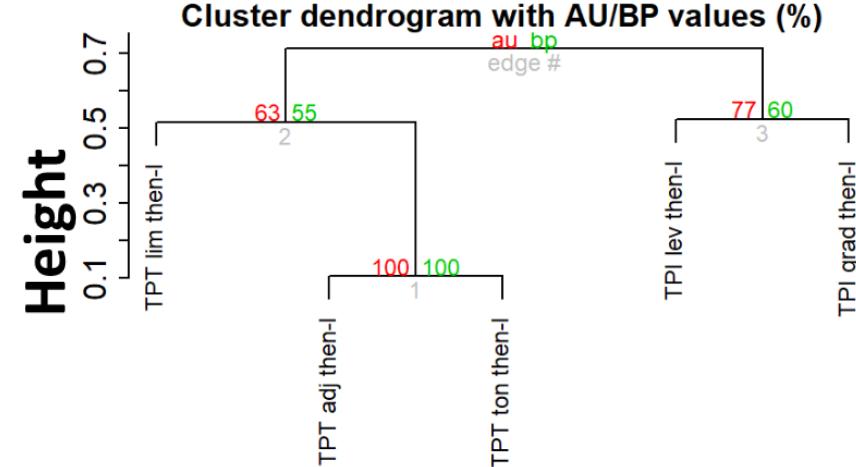


(b) Thresholds plus suprathreshold sensitivity

FMS

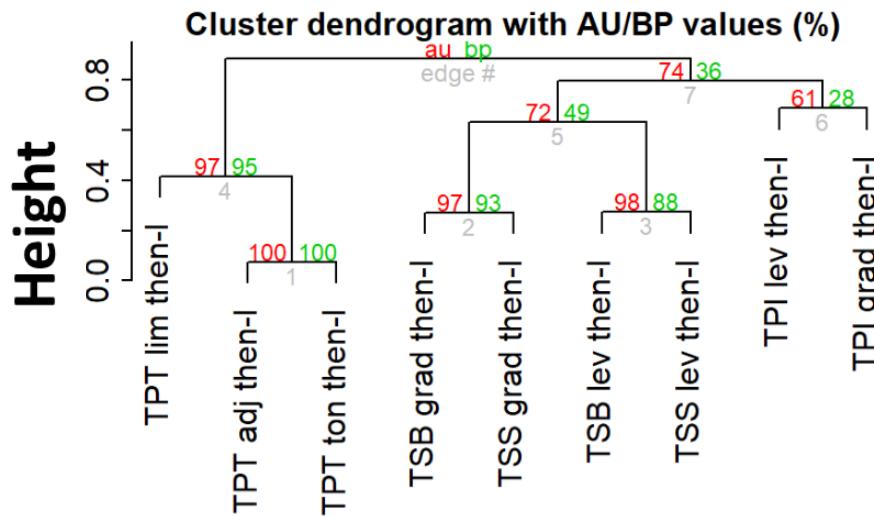


CBP

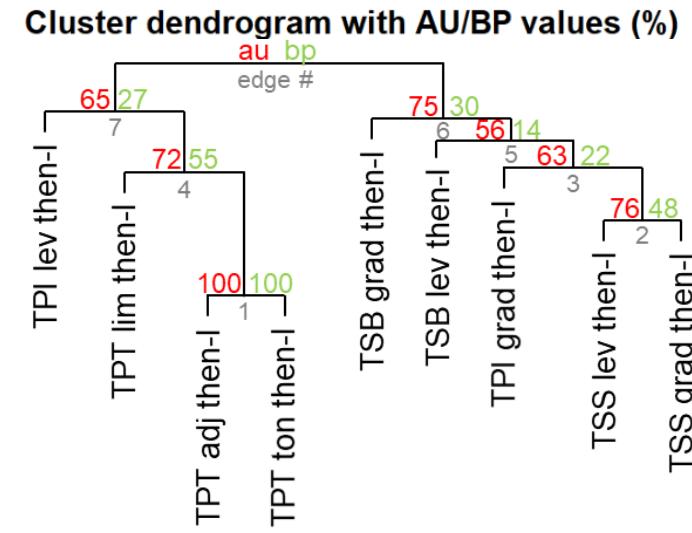


(c) Thresholds plus suprathreshold sensitivity and temporal summation

FMS



CBP



Cluster dendograms of heat pain indicators; latent class analyses with multiscale bootstrap resampling technique. Red and green numbers: AU/BP values of significant clusters ($AU \geq 95\%$). Abbreviations as in Table S7.

Notes:

- Heat pain thresholds at thenar and trapezius: Two super-clusters were separated in MS and CBP. The cluster structure within the FMS data is determined by a separation of test sites according to their functional status of tender (trapezius) or control point (thenar); in CBP indicators clustered according to measurement method (PT_{adj} and PT_{ton} on both sites separated from PT_{lim}).
- Heat pain thresholds plus suprathreshold sensitivity: In both FMS and CBP, PT_{lim} was reliably separated from PT_{adj} and PT_{ton} in the first supercluster. Suprathreshold sensitivity (level: TPI lev then-l, and gradient, TPI grad then-l) formed the independent second cluster.
- Heat pain thresholds plus suprathreshold sensitivity and temporal summation measures: In both FMS and CBP, heat pain thresholds were reliably separated from temporal summation in behavioral as well as perceptual (VAS rating) response (TSB lev, TSB grad then-l; TSS lev and TSS grad then-l). In FMS, suprathreshold sensitivity (TPI lev, TPI grad then-l) clustered on the second arm of the same supercluster of temporal summation. In CBP, the measures of average suprathreshold sensitivity (level) clustered with heat pain thresholds while the slope of the psychophysical function (stimulus gradient) of suprathreshold sensitivity related to the temporal summation.

Table S9. Cross-modal correlation between pressure and heat^a**a) FMS**

	<i>TPT lim trap-r</i>	<i>TPT adj trap-r</i>	<i>TPT ton trap-r</i>	<i>TPT lim then-l</i>	<i>TPT adj then-l</i>	<i>TPT ton then-l</i>	<i>TPI lev then-l</i>	<i>TPI grad then-l</i>	<i>TSB lev then-l</i>	<i>TSB grad then-l</i>	<i>TSS lev then-l</i>	<i>TSS grad then-l</i>
Sens TPs	-0.112 (25)	-0.315 (16)	-0.294 (16)	-0.430** (36)	-0.403* (33)	-0.439* (33)	-0.153 (25)	-0.211 (26)	-0.161 (26)	0.032 (26)	0.027 (26)	-0.152 (26)
Sens CPs	-0.124 (25)	-0.324 (16)	-0.275 (16)	-0.099 (36)	-0.259 (33)	-0.292+ (33)	0.058 (25)	0.236 (26)	0.005 (26)	0.115 (26)	-0.105 (26)	-0.061 (26)
PPI man trap-r	-0.073 (23)	-0.209 (15)	-0.152 (15)	0.130 (33)	-0.165 (30)	-0.222 (30)	0.215 (23)	0.106 (24)	-0.116 (24)	0.063 (24)	0.100 (24)	-0.012 (24)
PPI man trap-l	0.015 (25)	-0.125 (16)	-0.090 (16)	0.054 (36)	-0.124 (33)	-0.151 (33)	0.026 (25)	0.009 (26)	-0.099 (26)	0.166 (26)	-0.075 (26)	-0.102 (26)
PPI man then-r	-0.008 (25)	-0.009 (16)	-0.099 (16)	-0.138 (35)	-0.091 (32)	-0.060 (32)	-0.040 (24)	-0.185 (25)	0.371+ (25)	-0.110 (25)	-0.320 (25)	0.005 (25)
PPI man then-l	-1.000 (3)	-1.000 (3)	-1.000 (3)	-0.853* (7)	-0.232 (6)	-0.145 (6)	-0.316 (4)	-0.316 (4)	0.316 (4)	0.211 (4)	-0.316 (4)	-0.211 (4)
PPI man average cervical	0.052 (25)	-0.213 (16)	-0.171 (16)	-0.024 (35)	-0.109 (32)	-0.182 (32)	0.206 (24)	0.364+ (25)	-0.107 (25)	-0.104 (25)	0.130 (25)	0.175 (25)
PPI man average thoracic	-0.119 (25)	-0.309 (16)	-0.280 (16)	-0.072 (36)	-0.260 (33)	-0.356* (33)	0.168 (25)	0.262 (26)	-0.139 (26)	-0.011 (26)	0.105 (26)	0.020 (26)
PPI man average lumbar	-0.076 (25)	-0.195 (16)	-0.188 (16)	-0.134 (36)	-0.244 (33)	-0.281 (33)	0.220 (25)	0.145 (26)	-0.009 (26)	0.048 (26)	0.107 (26)	-0.061 (26)
PPI man average up-limb	-0.098 (25)	-0.019 (16)	0.043 (16)	0.040 (36)	-0.029 (33)	-0.006 (33)	0.281 (25)	0.145 (26)	-0.133 (26)	-0.001 (26)	0.232 (26)	0.032 (26)
PPI man average low-limb	-0.105 (22)	0.131 (15)	0.149 (15)	0.024 (33)	-0.002 (31)	0.096 (31)	0.161 (23)	-0.077 (24)	-0.222 (24)	-0.169 (24)	0.201 (24)	0.132 (24)
PPI qst trap-r	0.186 (26)	0.156 (16)	0.216 (16)	-0.074 (37)	-0.098 (33)	-0.067 (33)	0.167 (25)	0.163 (26)	-0.282 (26)	-0.170 (26)	0.369+ (26)	0.193 (26)
PPI qst trap-l	0.144 (26)	0.119 (16)	0.173 (16)	-0.001 (37)	-0.053 (33)	-0.043 (33)	0.365+ (25)	0.045 (26)	-0.123 (26)	-0.175 (26)	0.190 (26)	0.118 (26)
PPT qst trap-r	0.452* (26)	0.366 (16)	0.320 (16)	0.039 (37)	0.110 (33)	0.049 (33)	-0.005 (25)	-0.109 (26)	0.195 (26)	-0.006 (26)	-0.264 (26)	-0.035 (26)
PPT qst trap-l	0.433* (26)	0.203 (16)	0.223 (16)	0.042 (37)	0.096 (33)	0.043 (33)	-0.087 (25)	-0.020 (26)	0.177 (26)	0.079 (26)	-0.263 (26)	-0.093 (26)

[Table S9 a continued:]

PPI qst then-r	-0.495*	-0.020	-0.002	-0.294+	-0.100	-0.074	-0.043	-0.365+	0.086	-0.432*	0.111	0.385+
	(25)	(15)	(15)	(36)	(32)	(32)	(24)	(25)	(25)	(25)	(25)	(25)
PPI qst then-l	-0.478*	-0.081	-0.049	-0.288+	-0.145	-0.142	-0.056	-0.448*	0.134	-0.382+	0.031	0.298
	(25)	(15)	(15)	(36)	(32)	(32)	(24)	(25)	(25)	(25)	(25)	(25)
PPT qst then-r	0.272	0.306	0.356	0.140	0.304+	0.215	0.190	0.450*	-0.119	0.153	0.028	-0.092
	(26)	(16)	(16)	(37)	(33)	(33)	(25)	(26)	(26)	(26)	(26)	(26)
PPT qst then-l	0.299	0.346	0.295	0.037	0.067	0.036	-0.023	0.274	-0.183	0.058	0.036	-0.017
	(26)	(16)	(16)	(37)	(33)	(33)	(25)	(26)	(26)	(26)	(26)	(26)

b) CBP

	TPT lim trap-r	TPT adj trap-r	TPT ton trap-r	TPT lim then-l	TPT adj then-l	TPT ton then-l	TPI lev then-l	TPI grad then-l	TSB lev then-l	TSB grad then-l	TSS lev then-l	TSS grad then-l
Manual: No. Sens	-0.118	-0.291	-0.159	-0.359+	-0.295	-0.313	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TPS	(27)	(20)	(20)	(28)	(21)	(21)	(I)	(I)	(I)	(I)	(I)	(I)
Manual: No. Sens	-0.029	-0.236	-0.067	-0.160	-0.256	-0.028	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
CPs	(27)	(20)	(20)	(28)	(21)	(21)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man trap-r	0.093	-0.564	-0.308	-0.257	-0.441	-0.530	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(10)	(5)	(5)	(11)	(6)	(6)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man trap-l	-0.281	-0.278	-0.125	-0.341+	-0.341	-0.224	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(27)	(20)	(20)	(28)	(21)	(21)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man then-r	0.025	-0.361	-0.212	-0.143	-0.414+	-0.230	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(26)	(19)	(19)	(27)	(20)	(20)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man then-l	0.447	-0.866	-0.866	0.447	-0.866	-0.866	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(5)	(3)	(3)	(5)	(3)	(3)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man average cervical	0.211	0.487	-0.126	-0.155	0.120	-0.144	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(11)	(7)	(7)	(12)	(8)	(8)	(I)	(I)	(I)	(I)	(I)	(I)
PPI man average thoracic	-0.318	-0.361	-0.398	-0.339	-0.553	-0.562	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	(14)	(8)	(8)	(15)	(9)	(9)	(I)	(I)	(I)	(I)	(I)	(I)

[Table S9 b continued:]

PPI man average lumbar	0.410 (8)	0.500 (5)	-0.100 (5)	0.067 (9)	0.638 (6)	0.319 (6)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI man average up-limb	0.155 (11)	0.143 (7)	-0.214 (7)	0.068 (11)	0.321 (7)	0.321 (7)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI man average low-limb	-0.120 (11)	-0.101 (9)	-0.017 (9)	-0.378 (12)	-0.354 (9)	-0.017 (9)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI qst trap-r	-0.296 (29)	-0.186 (20)	-0.250 (20)	-0.101 (30)	0.032 (21)	0.085 (21)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI qst trap-l	-0.297 (29)	-0.196 (20)	-0.288 (20)	-0.160 (30)	-0.084 (21)	-0.070 (21)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPT qst trap-r	0.154 (30)	0.180 (21)	0.259 (21)	-0.034 (31)	0.119 (22)	0.223 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPT qst trap-l	0.184 (30)	0.213 (21)	0.319 (21)	-0.032 (31)	0.092 (22)	0.237 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI qst then-r	-0.065 (30)	0.065 (21)	0.046 (21)	0.154 (31)	0.290 (22)	0.302 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPI qst then-l	-0.071 (30)	0.029 (21)	-0.048 (21)	0.186 (31)	0.223 (22)	0.224 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPT qst then-r	0.124 (30)	0.189 (21)	0.169 (21)	-0.039 (31)	-0.051 (22)	-0.051 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)
PPT qst then-l	0.074 (30)	0.353 (21)	0.343 (21)	-0.145 (31)	-0.016 (22)	0.086 (22)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)	n.a. (I)

^a Spearman's ρ ; variable N due to missings after pairwise exclusion in brackets. + p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; 2-tailed. Abbreviations: pressure pain sensitivity as in Table S5; heat pain indicators as in Table S7.

Notes. Pressure and heat pain sensitivity indicators (thresholds, supra-threshold intensity, temporal summation) correlated weakly to moderately with each other in FMS, but insignificantly in CBP patients (algometer \times phasic heat pain threshold, $\rho = 0.452$, $p < 0.05$). Remarkably, the number of sensitive "tender" and control points of FMS patients correlated also with the heat pain thresholds at both the trapezius tender and thenar control points ($\rho = -0.430$ and -0.567 , $p < 0.05$). Temporal summation to heat correlated also moderately with the algometer pressure pain threshold and intensity of FMS patients suggesting that temporal heat summation reflected a generalized tendency to sensitize in this group with widespread pain.

Table S10. Fit-Indices of Latent GOLD cluster solution

Fit Index	LL	BIC(LL)	AIC(LL)	AIC3(LL)	CAIC(LL)	SABIC(LL)	Npar	Class.Err.
1-Cluster	-2116.3949	4572.4064	4366.7899	4433.7899	4639.4064	4360.3144	67	0.0000
2-Cluster	-1983.5182	4347.2043	4117.0364	4192.0364	4422.2043	4109.7877	75	0.0311
3-Cluster	-1949.0729	4318.8649	4064.1459	4147.1459	4401.8649	4056.1240	83	0.0700
4-Cluster	-1927.0865	4315.4432	4036.1730	4127.1730	4406.4432	4027.3779	91	0.0751
5-Cluster	-1913.7755	4329.3725	4025.5510	4124.5510	4428.3725	4015.9827	99	0.0570
6-Cluster	-1883.0058	4308.3844	3980.0116	4087.0116	4415.3844	3969.6701	107	0.0805

Cluster solutions for indicators for pressure pain sensitivity and clinical pain combined. Indicators for pressure pain sensitivity: Number of sensitive tender and control points; test pain intensity with manual probe at the tender point at the right trapezius and the algometer pressure pain threshold at the right trapezius. Clinical pain indicators: WPI and present pain intensity. Results were replicated when WPI was exchanged with number of self-reported current pain regions or the number of major pain regions (item #20 and item #21 in DSF[48]). All parameters were entered as ordinal variable except the algometer pain threshold continuous (interval) variable. N = 159 complete cases (listwise exclusion of missings; 69 FMS, 90 chronic primary back pain (CBP) patients. Descriptive fit indices based on the log-likelihood (LL): Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), Akaike Information Criterion 3 (AIC3), Consistent Akaike Information Criterion (CAIC), sample size adjusted BIC (SABIC).[65] Npar = Number of estimated parameters; Class.Err. = classification errors.

Table S11. Cluster discrimination by indicator: standardized absolute profile differences

Cluster pair difference ^a	Sens TPs	PPI man TP trap-r	WPI	Sens CPs	PPT qst TP trap-r	MPI Intensity	Σ [clusters] ^c
Cluster 1–2	16.67 (1,12.5)	0 (1,4.5)	10.53 (2,10)	21.43 (3,17)	22.45 (5,20)	16.67 (5,12.5)	87.75
Cluster 1–3	52.78 (4,32)	40 (3.5,26.5)	42.1 (5,28)	21.43 (3,17)	22.45 (5,20)	0 (2,4.5)	178.76
Cluster 1–4	88.89 (6,36)	60 (5.5,33.5)	47.37 (6,31)	21.43 (3,17)	22.45 (5,20)	0 (2,4.5)	1240.14
Cluster 2–3	36.11 (2.5,23.5)	40 (3.5,26.5)	31.57 (3,22)	42.86 (5.5,29.5)	0 (2,4.5)	16.67 (5,12.5)	167.21
Cluster 2–4	72.22 (5,35)	60 (5.5,33.5)	36.84 (4,25)	42.86 (5.5,29.5)	0 (2,4.5)	16.67 (5,12.5)	228.59
Cluster 3–4	36.11 (2.5,23.5)	20 (2,15)	0 (1,4.5)	0 (1,4.5)	0 (2,4.5)	0 (2,4.5)	156.11
Σ [indicat] ^b	302.78	220.00	168.41	150.01	67.35	50.01	958.56

^a Absolute differences $|d(i,j)|$ of standardized LCA profile values between clusters i and j as in Figure 3: $|d(i,j)| = \text{relative scale value } (i) - \text{relative scale value } (j)$ for indicator k (1, ..., 6); i, j = 1, ..., 4. Standardized percent profile scaling: $(\text{median}/\text{mean} - \text{min observed value})/\text{range}$.

^b Discrimination Sum Score DS(k) = $\sum |d(i,j)|$ for indicator k (1, ..., 6); numbers in brackets: indicator discrimination sum score ranks (within column, overall); highest ranks = highest values, 1, ..., 36.

^c Discrimination Sum Score DS(i-j) for cluster pair (i,j) over all indicators.

Indicators: Sens TPs = number of sensitive tender points, PPI man trap-r = pressure pain intensity at right trapezius in semi-quantitative manual test, WPI = Widespread Pain Index, Sens CPs = number of sensitive control points, PPT qst trap-r = pressure pain threshold at right trapezius in algometer quantitative sensory test, MPI Intensity = MPI-D present pain intensity (item #1).

Table S12. Sensory characteristics of the four clusters

Cluster	#1	#2	#3	#4
<i>Sens TPs</i>	16.0 ± 1.5 [11.0 – 18.0 / 47]	13.00 ± 3.0 [9.0 – 18.0 / 21]	6.5 ± 3 [1.0 – 13.0 / 58]	$0.0 + 1.0$ [0.0 – 4.0 / 33]
	Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, U-test: p < 0.001***; 1 vs. 3&4; 2 vs. 3&4; 3 vs. 4, multiple U-test: p < 0.001***; 1 vs. 2, U-test: p = 0.012, n.s.			
<i>Sens CPs</i>	3.0 ± 2.5 [0.0 – 14.0 / 47]	6.0 ± 2.75 [0.0 – 14.0 / 21]	0.0 ± 1.0 [0.0 – 6.0 / 58]	$0.0 + 0.0$ [0.0 – 0.0 / 33]
	Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, U-test: p < 0.001***; 1 vs. 3&4; 2 vs. 3&4; 3 vs. 4, multiple U-test: p < 0.001***; 1 vs. 2, U-test: p < 0.01**			
<i>No. all sensitive tender and control points</i>	19.0 ± 3.0 [12.0 – 32.0 / 47]	22.0 ± 5.5 [9.0 – 32.0 / 21]	8.0 ± 4.0 [1.0 – 17.0 / 58]	$0.0 + 1.0$ [0.0 - 4.0 / 33]
	Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, U-test: p < 0.001***			
<i>PPI man trap-l (TP)</i>	5.0 ± 2.0 [3.0 – 10.0 / 47]	6.0 ± 1.75 [0.0 – 1.0 / 21]	$0.0 + 1.5$ [0 – 10.0 / 58]	0.0 ± 0.0 [0.0 – 5.0 / 33]
	Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, U-test: p < 0.001***			
<i>PPI man trap-r (TP)</i>	6.0 ± 2.0 [0.0 – 10.0 / 47]	6.0 ± 1.5 [1.0 – 10.0 / 21]	2.0 ± 2.0 [0.0 – 8.0 / 58]	0.0 ± 0.0 [0.0 – 4.0 / 33]
	Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, U-test: p < 0.001***; 1 vs. 3&4; 2 vs. 3&4; 3 vs. 4, multiple U-test: p < 0.001***			

[Table S12 continued:]

PPI man then-l (CP)	0.0 ± 0.0 [0.0 – 8.0 / 46]	0.0 + 0.75 [0.0 – 7.0 / 21]	0.0 ± 0.0 [0.0 – 10.0 / 58]	0.0 ± 0.0 [0.0 – 00.0 / 32]
Kruskal Wallis: p = 0.029*; 1&2 vs. 3&4, U-test: n.s.				
PPI man then-r (CP)	0.0 ± 0.0 [0.0 – 9.0 / 46]	0.0 ± 1.5 [0.0 – 8.0 / 21]	0.0 ± 0.0 [0.0 – 10.0 / 58]	0.0 ± 0.0 [0.0 – 0.0 / 32]
Kruskal Wallis: p = 0.01**; 1&2 vs. 3&4, U-test: n.s.				
PPI qst trap-l	6.28 ± 2.02 [3.0 – 10.0 / 47]	5.95 ± 2,5 [1.0 – 10.0 / 21]	3.91 ± 2.71 [0.0 – 10.0 / 57]	3.68 ± 3.11 [0.0 – 8.0 / 31]
Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, t-test: p < 0.001***				
PPI qst trap-r	6.11 ± 2.14 [2.0 – 10.0 / 47]	6.00 ± 2.57 [0.0 – 10.0 / 21]	3.68 ± 2.41 [0.0 – 8.0 / 57]	3.87 ± 3.07 [0.0 – 9.0 / 31]
Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, t-test: p < 0.001***				
PPI qst then-l	3.24 ± 3.09 [0.0 – 9.0 / 46]	1.67 + 2.63 [0.0 – 7.0 / 21]	3.26 + 2.64 [0.0 – 8.0 / 58]	3.50 ± 3.22 [0.0 – 9.0 / 32]
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: n.s.				
PPI qst then-r	3.39 ± 3.17 [0.0 – 10.0 / 46]	1.71 ± 2.87 [0.0 – 8.0 / 21]	3.55 ± 2.74 [0.0 – 9.0 / 58]	3.50 ± 3.21 [0.0 – 9.0 / 33]
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: n.s.				

[Table S12 continued:]

PPT qst trap-l	16.799 ± 8.061 [0.981 – 34.323 / 47]	39.737 ± 5.874 [12.258 – 60.801 / 21]	44.199 ± 21.065 [0. 981 – 97.086 / 58]	35.127 ± 9.071 [10.787 – 53.937 / 33]
Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, t-test: p < 0.001***				
PPT qst trap-r	16.612 ± 7.865 [0. 981 – 29.420 / 47]	39.056 ± 1.334 [39.227 – 44.130 / 21]	44.777 ± 20.908 [3.923 – 97.086 / 58]	35.127 ± 8.542 [15.691 – 53.937 / 33]
Kruskal Wallis: p < 0.001***; 1&2 vs. 3&4, t-test: p < 0.001***				
PPT qst then-l	26.203 ± 13.023 [0. 981 – 49.033 / 47]	36.000 ± 7.757 [9.807 – 41.188 / 21]	34.323 ± 12.670 [0. 981 – 68.647 / 58]	33.637 ± 9.248 [10.787 – 50.995 / 33]
Kruskal Wallis: p = 0.003**; 1&2 vs. 3&4, t-test: p = 0.012*				
PPT qst then-r	26.517 ± 12.660 [0. 981 – 49.033 / 47]	37.000 ± 5.168 [19.613 – 39.227 / 21]	35.637 ± 14.955 [0. 981 – 73.550 / 58]	33.460 ± 9.140 [11.768 – 49.033 / 33]
Kruskal Wallis: p = 0.001**; 1&2 vs. 3&4, t-test: p = 0.011*				
TPT lim trap-r	43.954 ± 4.540 [35.20 – 50.0 / 17]	44.553 ± 5.082 [36.52 – 49.30 / 6]	46.313 ± 2.912 [40.50 – 50.0 / 19]	46.256 ± 3.872 [37.70 – 49.80 / 10]
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: p = 0.049				
TPT ton trap-r	44.448 ± 1.729 [42.60 – 46.47 / 13]	$41.400 \pm \text{n.a.}$ [41.00 – 41.00 / 1]	46.313 ± 1.597 [42.70 – 48.78 / 13]	46.262 ± 1.369 [43.80 – 48.40 / 9]
Kruskal Wallis: p = 0.004**; 1&2 vs. 3&4, t-test: p < 0.001***				

[Table S12 continued:]

TPT lim then-l	42.715 ± 2.937 [37.30 – 48.60 / 25]	42.799 ± 3.537 [36.50 – 46.86 / 7]	44.738 ± 4.019 [36.80 – 50.00 / 20]	47.250 ± 2.547 [42.20 – 50.00 / 10]
Kruskal Wallis: p = 0.004**; 1&2 vs. 3&4, t-test: p = 0.002**				
TPT ton then-l	43.090 ± 1.190 [40.30 – 45.80 / 22]	42.676 ± 0.611 [41.81 – 43.34 / 5]	44.623 ± 2.087 [40.40 – 47.60 / 16]	45.192 ± 1.653 [42.70 – 47.00 / 9]
Kruskal Wallis: p = 0.003**; 1&2 vs. 3&4, t-test: p < 0.001***				
TPI lev then-l	51.405 ± 16.032 [26.11 – 83.33 / 30]	49.583 ± 9.333 [36.67 – 58.89 / 4]	45.833 ± 15.426 [31.67 – 67.78 / 4]	-
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: n.s.				
TPI grad then-l	18.499 ± 11.690 [-1,75 – 41.05 / 17]	20.594 ± 17.800 [1.0 – 40.57 / 4]	13.011 ± 7.995 [2.51 – 20.28 / 4]	-
Kruskal Wallis: n.s., 1&2 vs. 3&4, t-test: n.s.				
TSB lev then-l	$-0.024 + 0.183$ [-0.20 – 0.50 / 17]	$0.079 + 0.089$ [0.01 – 0.21 / 4]	$-0.207 + 0.389$ [-0.79 – 0.0 / 4]	-
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: n.s.				
TSB grad then-l	$-0.143 + 0.182$ [-0.46 – 0.25 / 17]	$-0.086 + 0.095$ [-0.22 – 0.01 / 4]	-0.375 ± 0.375 [-0.72 – 0.1 / 4]	-
Kruskal Wallis: n.s.; 1&2 vs. 3&4, t-test: n.s.				

Table S13. Results of the discriminant function analysis

Indicator	Normalized discriminant function		
	1	2	3
<i>Sens TPs</i>	0.900*	0.059	-0.163
<i>PPI man trap-r</i>	0.467*	0.230	0.277
<i>WPI</i>	0.174*	-0.114	0.022
<i>MPI Intensity</i>	0.116*	-0.067	-0.042
<i>PPT qst trap-r</i>	-0.240	.0903*	-0.357
<i>Sens CPs</i>	0.309	0.359	.0764*

*Largest absolute correlation of the indicator with a discriminant function. Abbreviations as in previous tables.

Standardized canonical discriminant function coefficients:

Function 1: 0.868 Sens TPs + 0.415 PPI man trap-r - 0.035 Sens CPs - 0.149 PPT qst trap-r;

Function 2: 0.024 Sens TPs + 0.179 PPI man trap-r + 0.367 Sens CPs + 0.915 PPT qst trap-r;

Function 3: -0.547 Sens TPs + 0.244 PPI man trap-r + 0.921 Sens CPs - 0.393 PPT qst trap-r.

Table S14. Physical strain at work

Subscale ^a	Entrance Diagnosis			Cluster			
	FMS	CBP	PFC	#1	#2	#3	#4
General spinal load	1.6 ± 1.0 [0.2 - 3.8 / 39]	1.5 ± 1.0 [0.2 - 4.4 / 44]	1.5 ± 0.8 [0.5 - 3.4 / 31]	1.3 ± 0.8 [0.2 – 3.6 / 23]	2.0 ± 1.0 [0.8 – 3.8 / 11]	1.6 ± 1.2 [0.8 – 4.4 / 27]	1.6 ± 0.7 [0.5 – 3.5 / 16]
	FMS vs. CBP, t-test: n.s; FMS & CBP vs. PFC, t-test: n.s.			Kruskal Wallis: p = 0.089, n.s.; 1&2 vs. 3&4, t-test: n.s.			
Musculoskeletal load upper back	1.4 ± 0.8 [0.2 - 3.2 / 40]	1.3 ± 0.8 [0.3 - 3.3 / 44]	1.5 ± 0.8 [0.5 - 3.4 / 31]	1.1 ± 0.6 [0.2 – 2.8 / 23]	1.8 ± 0.8 [0.9 – 3.2 / 11]	1.3 ± 0.8 [0.2 – 3.3 / 28]	1.4 ± 0.5 [0.6 – 2.8 / 16]
	FMS vs. CBP, t-test: n.s; FMS & CBP vs. PFC, t-test: n.s.			Kruskal Wallis: p = 0.093, n.s.; 1&2 vs. 3&4, t-test: n.s.			
Musculoskeletal load shoulder^h	1.3 ± 0.8 [0.2 - 3.1 / 42]	1.2 ± 0.8 [0.1 - 3.3 / 46]	1.2 ± 0.7 [0.1 - 2.8 / 32]	1.0 ± 0.7 [0.2 – 3.1 / 24]	1.7 ± 0.8 [0.8 – 3.0 / 12]	1.3 ± 0.9 [0.2 – 3.3 / 30]	1.3 ± 0.6 [0.3 – 2.7 / 16]
	FMS vs. CBP, t-test: n.s; FMS & CBP vs. PFC, t-test: n.s.			Kruskal Wallis: p = 0.039*; 1&2 vs. 3&4, t-test: n.s.			
Musculoskeletal load arms^h	0.9 ± 0.9 [0.0 - 3.4 / 44]	1.0 ± 1.0 [0.0 - 4.0 / 47]	1.0 ± 0.8 [0.0 - 3.2 / 32]	0.7 ± 0.9 [0.0 – 3.4 / 26]	1.3 ± 0.8 [0.2 – 2.8 / 12]	1.0 ± 1.1 [0.0 – 4.0 / 31]	1.0 ± 0.8 [0.0 – 3.0 / 16]
	FMS vs. CBP, t-test: n.s; FMS & CBP vs. PFC, t-test: n.s.			Kruskal Wallis: p = 0.066, n.s.; 1&2 vs. 3&4, t-test: n.s.			
Musculoskeletal load legs^h	2.8 ± 1.0 [1.0 - 4.0 / 43]	2.7 ± 1.0 [0.0 - 4.0 / 47]	3.0 ± 0.6 [1.5 – 4.0 / 32]	2.8 ± 1.0 [1.0 – 4.0 / 26]	2.9 ± 0.9 [1.5 – 4.0 / 12]	2.6 ± 1.0 [0.0 – 4.0 / 32]	3.0 ± 1.0 [1.0 – 4.0 / 16]
	FMS vs. CBP, t-test: n.s; FMS & CBP vs. PFC, t-test: n.s.			Kruskal Wallis: p = 0.552, n.s.; 1&2 vs. 3&4, t-test: n.s.			

^a Dortmund questionnaire on workload (German: “Dortmunder Fragebogen zur Arbeitsbelastung”, DFA).[41] Cell entries: Medians ± 0.5 interquartile distance with range / N in [brackets].

Table S15 Number of medical diagnoses not related to major pain

Clusters of pain patients: N = 159				
	1 N = 47	2 N = 21	3 N = 33	4 N = 58
Diagnosis ^a	N (%)			
<i>Cardiovascular disorder</i> ^b	6 (12.8)	5 (23.8)	4 (12.1)	4 (6.9)
<i>Gastrointestinal, liver or pancreas diseases</i> ^c	12 (25.5)	5 (23.8)	5 (15.2)	8 (13.8)
<i>Endocrinological & metabolic disorders</i> ^d	7 (14.9)	3 (14.3)	4 (12.1)	3 (5.2)
<i>Urogenital and kidney disorder</i>	8 (17.0)	2 (9.5)	5 (15.2)	7 (12.1)
<i>No comorbid somatic diagnosis</i>	17 (36.2)	5 (23.8)	17 (51.5)	27 (46.6)

^a Self-reported diagnoses assigned to medical disciplines, responses to item #40 in DSF; [48] multiple mentions allowed. Comorbid musculoskeletal disorders were considered as a priori pain-related, not included.

^b Including phlebological syndromes, e.g., varicose veins.

^c Including functional disorders, e.g., irritable bowel syndrome.

^d Including diabetes type I and II

Table S16. Prevalence of functional gastrointestinal disorders in prior FMS and CBP diagnosis and sensory clinical phenotypes

a) All patients

G. I. Disorder ^a	Prior Pain Diagnosis: N = 185		Four Clusters: N = 159			
	FMS: N = 78	CBP: N = 107	#1: N = 47	#2: N = 21	#3: N = 58	#4: N = 33
<i>Dyspepsia (NUD)</i>	10 (12.8)	6 (5.6)	3 (6.4)	6 (28.6)	6 (10.3)	1 (3.0)
<i>Irritable bowel (IBS)</i>	9 (11.5)	1 (0.9)	7 (14.9)	0 (0.0)	2 (3.4)	0 (0.0)
<i>NUD and IBS</i>	13 (16.7)	2 (1.9)	8 (17.0)	3 (14.3)	4 (6.9)	0 (0.0)
Any FGID	32 (41.0)	9 (8.4)	18 (38.3)	9 (42.9)	12 (20.7)	1 (3.0)
No FGID	16 (20.5)	41 (38.3)	11 (23.4)	4 (19.0)	22 (37.9)	16 (48.5)

b) Female patients

G. I. Disorder ^a	Prior Pain Diagnosis: N = 142		Four Clusters: N = 123			
	FMS: N = 73	CBP: N = 69	#1: N = 45	#2: N = 19	#3: N = 39	#4: N = 20
<i>Dyspepsia (NUD)</i>	9 (12.3)	6 (8.7)	2 (4.4)	6 (31.6)	6 (15.4)	1 (5.0)
<i>Irritable bowel (IBS)</i>	9 (12.3)	1 (1.4)	7 (15.6)	0 (0.0)	2 (5.1)	0 (0.0)
<i>NUD and IBS</i>	11 (15.1)	1 (1.4)	8 (17.8)	3 (15.8)	1 (2.6)	0 (0.0)
Any FGID	29 (39.7)	8 (11.6)	17 (37.8)	9 (47.4)	9 (23.1)	1 (5.0)
No FGID	15 (20.5)	26 (37.7)	11 (24.4)	2 (10.5)	15 (38.5)	11 (55.5)

^a Diagnoses according to anamnestic questionnaire for functional gastrointestinal disorders.[30] Absolute numbers, % in parentheses; no pain-free control reported a functional gastrointestinal disorder. Contingencies, C_{corr}: Prior diagnosis x NUD/IBS/NUD&IBS/non FGID = 0.652, p < 0.001; cluster x NUD/IBS/NUD&IBS/non FGID = 0.583, p < 0.001.