

E-Supplement 1: Selection and specification of bivariate group-based trajectory models for maximum pain of the last 7 days assessed by the Numerical Rating Scale and disability assessed by the Oswestry Disability Index.

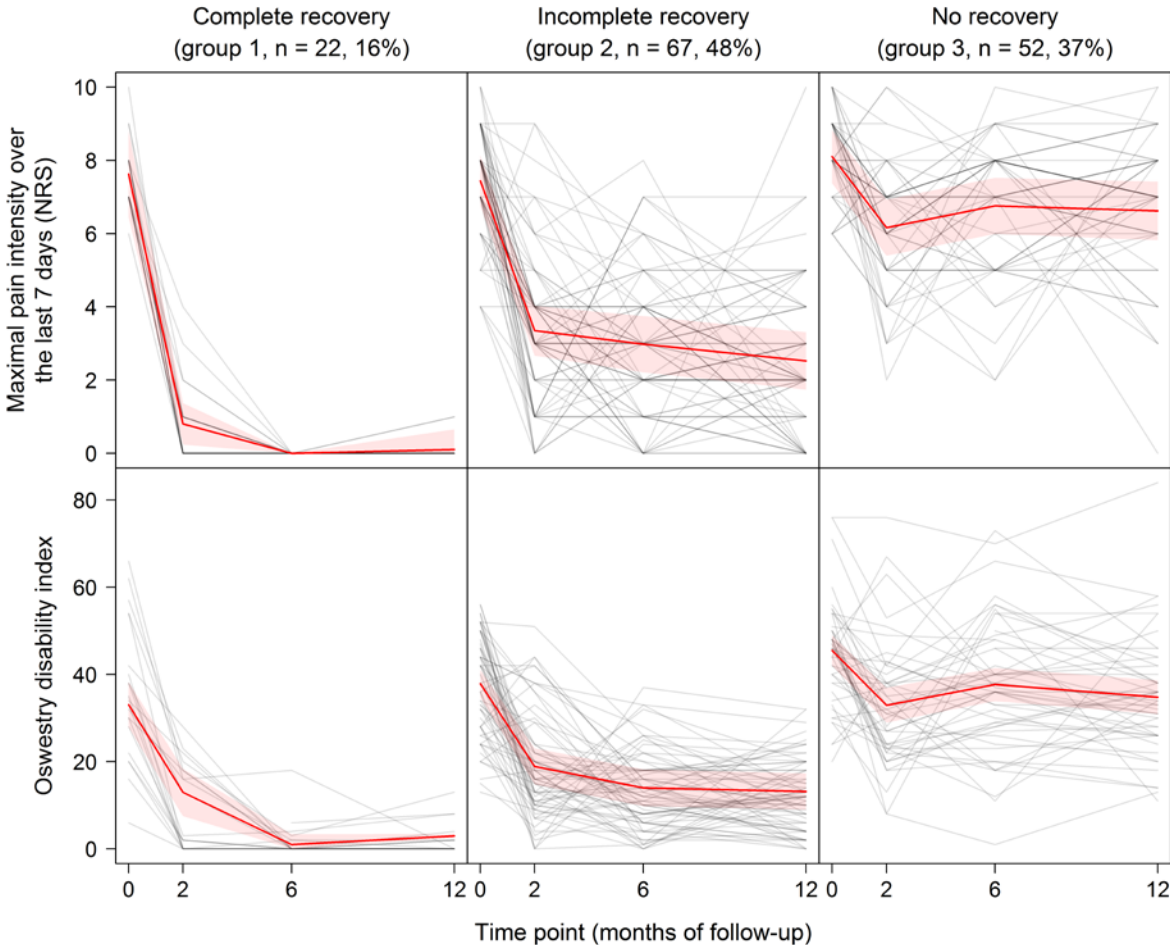
(A) Model statistics for the five best models (in terms of the AIC) for one, two, or three trajectory groups. AIC: Akaike information criteria, BIC: Bayesian information criteria.

No. of groups	Patients per group	Polynomial grades for maximum pain over the last 7 days	Polynomial grades for Oswestry disability index	Degrees of freedom	Log-likelihood	AIC	BIC (n=141)	BIC (n=564)
3	22, 67, 52	2, 3, 3	2, 3, 3	26	-3169	6389	6466	6502
3	22, 67, 52	3, 3, 3	2, 3, 3	27	-3169	6391	6471	6508
3	20, 69, 52	1, 3, 3	3, 3, 3	26	-3170	6393	6469	6505
3	20, 69, 52	2, 3, 3	3, 3, 3	27	-3170	6395	6474	6512
3	22, 67, 52	2, 3, 3	3, 3, 2	26	-3173	6397	6474	6510
2	82, 59	3, 3	3, 3	19	-3241	6519	6575	6602
2	83, 58	3, 2	3, 3	18	-3248	6533	6586	6611
2	82, 59	3, 3	3, 2	18	-3249	6534	6587	6612
2	82, 59	3, 3	3, 1	17	-3252	6538	6588	6612
2	84, 57	3, 1	3, 3	17	-3252	6539	6589	6612
1	141	3	3	10	-3448	6916	6946	6960
1	141	3	2	9	-3461	6941	6967	6980
1	141	2	3	9	-3469	6955	6982	6994
1	141	2	2	8	-3482	6980	7003	7014
1	141	3	1	8	-3483	6981	7005	7016

(B) Coefficients of the selected bivariate group-based multi-trajectory model with three groups and polynomial grades of 2, 3, 3 for both pain and disability.

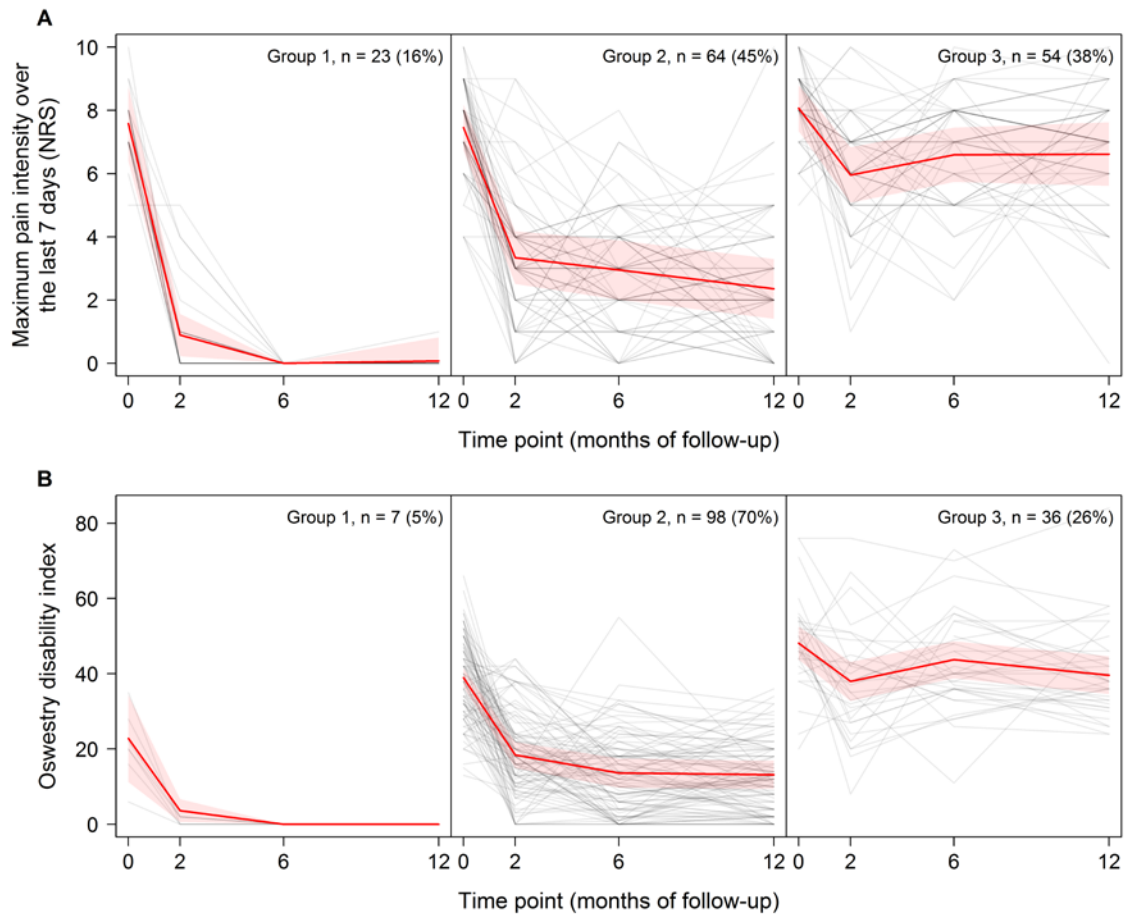
	Maximum pain over the last 7 days	Oswestry disability index
Complete recovery (group 1, n = 22, 16%)		
intercept	7.76 (6.89 to 8.64)	33.1 (28.2 to 38.0)
linear	-4.49 (-5.36 to -3.62)	-12.1 (-15.0 to -9.21)
quadratic	0.30 (0.23 to 0.37)	0.75 (0.52 to 0.98)
Incomplete recovery (group 2, n = 67, 48%)		
intercept	7.56 (7.05 to 8.06)	37.9 (34.8 to 41.0)
linear	-3.14 (-3.75 to -2.53)	-13.7 (-17.4 to -10.0)
quadratic	0.56 (0.42 to 0.71)	2.23 (1.35 to 3.10)
cubic	-0.03 (-0.04 to -0.02)	-0.11 (-0.16 to -0.06)
No recovery (group 3, n = 52, 37%)		
intercept	8.34 (7.76 to 8.91)	45.5 (42.0 to 49.0)
linear	-1.71 (-2.41 to -1.01)	-10.2 (-14.4 to -5.97)
quadratic	0.35 (0.19 to 0.52)	2.19 (1.18 to 3.20)
cubic	-0.02 (-0.03 to -0.01)	-0.12 (-0.17 to -0.06)
Sigma	2.03 (1.88 to 2.18)	12.4 (11.6 to 13.2)
Theta1		1.09 (0.57 to 1.60)
Theta2		0.84 (0.31 to 1.37)

E-Supplement 2: Bivariate trajectories of maximum pain of last 7 days and disability, defining three groups of recovery after spine surgery. Trajectory of each patient with average effect per group and corresponding 95% confidence bands. N=141.



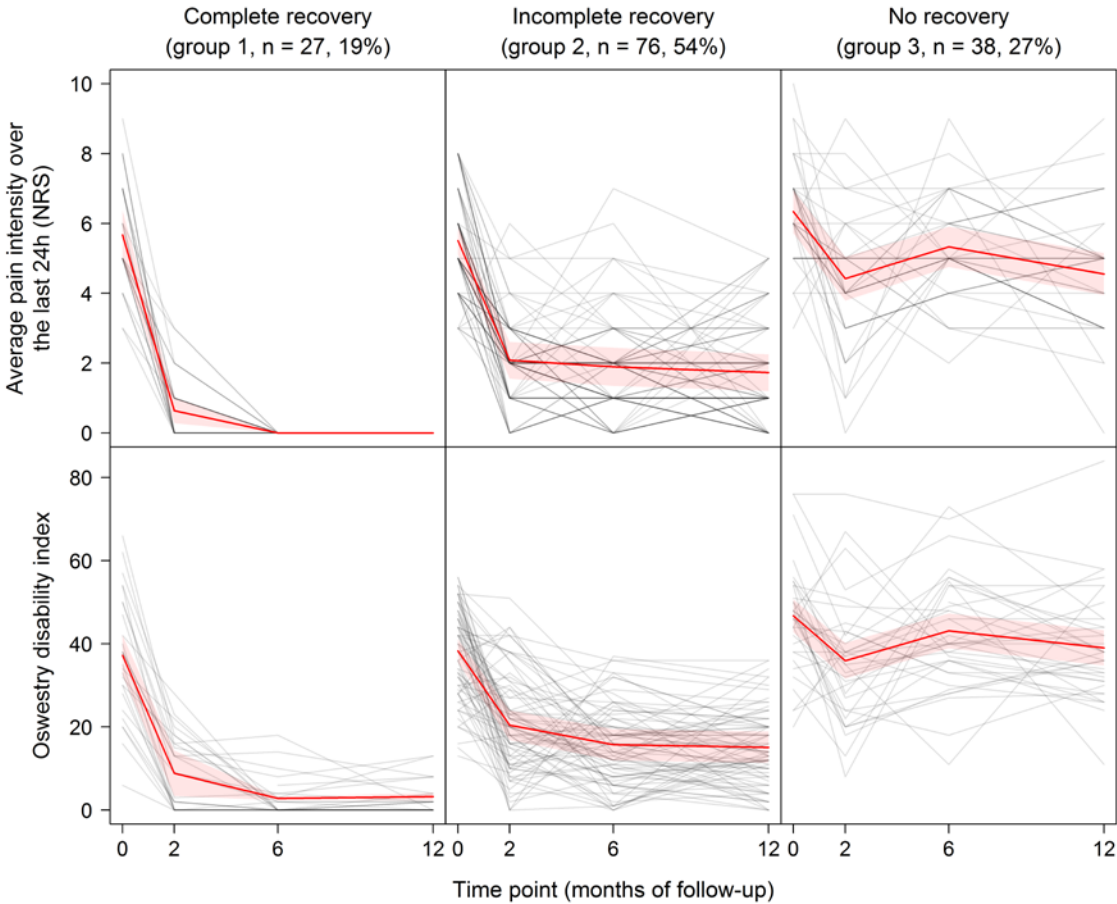
Group-based multi-trajectory model with polynomial grades 2, 3, 3, for both pain and disability.

E-Supplement 3: Univariate trajectories of (A) maximum pain of last 7 days and (B) disability defining three groups of recovery after spine surgery. Trajectory of each patient with average effect per group and corresponding 95% confidence bands. N=141.



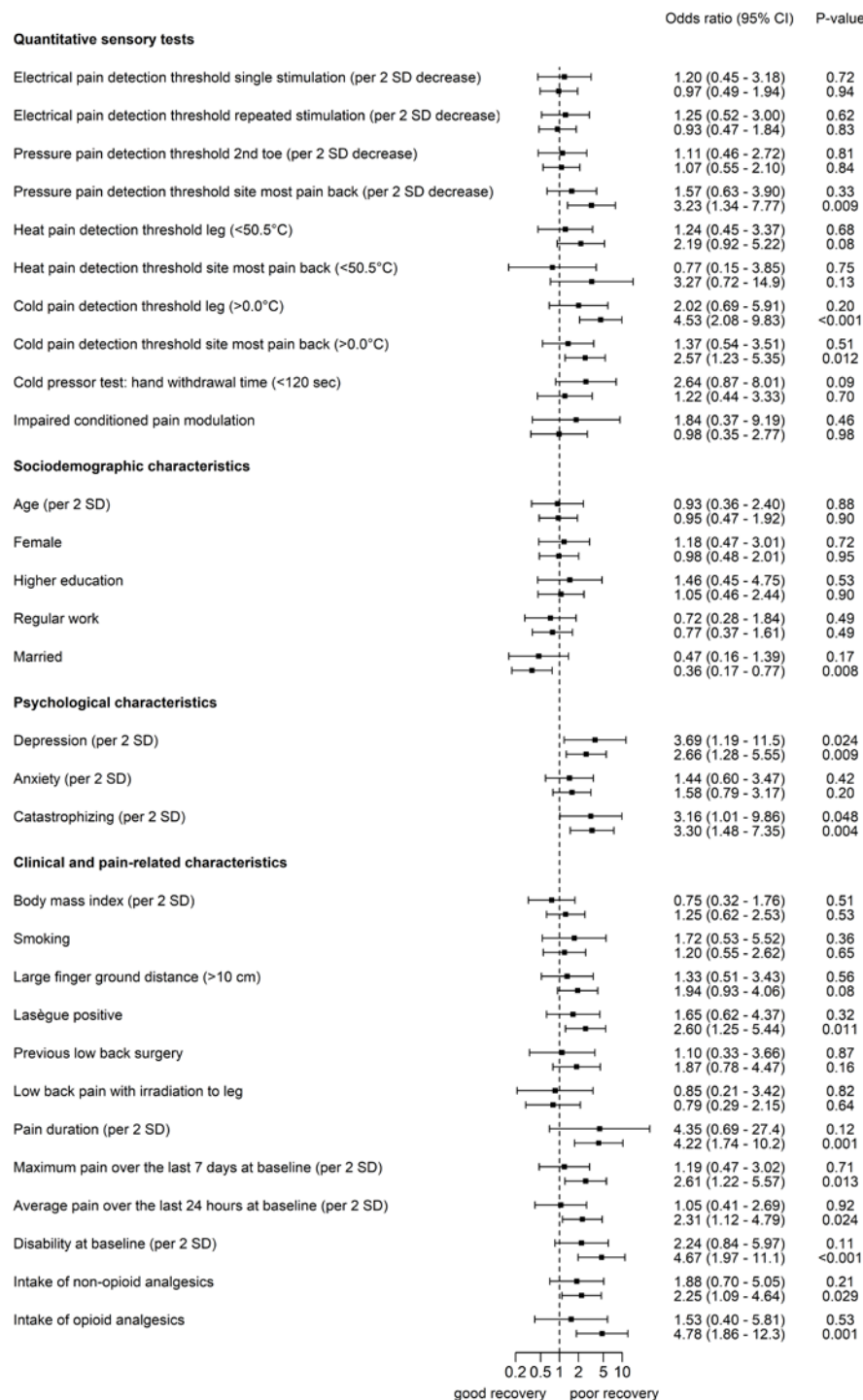
Group-based multi-trajectory model with polynomial grades 2, 3, 3 for pain and 1, 3, 3 for disability.

E-Supplement 4: Bivariate trajectories of average pain intensity of last 24 hours and disability defining three groups of recovery after spine surgery. Trajectory of each patient with average effect per group and corresponding 95% confidence bands. N=141.



Group-based multi-trajectory model with polynomial grades 2, 3, 3 for pain and 3, 3, 3 for disability.

E-Supplement 5: Forest plot of baseline characteristics and quantitative sensory tests as predictors of bivariate trajectories of maximum pain of last 7 days and disability after surgery. Results are odds ratios (ORs) with corresponding 95% confidence intervals (95 % CI) and p-values of univariable generalized ordered logit models*. N=141.



* ORs not assuming proportional odds when comparing “incomplete recovery” with “complete recovery” and “no recovery” with “incomplete recovery” with effects of continuous predictors expressed per two standard deviation change (2 SD)

Top rows represent OR for “incomplete recovery vs complete recovery” and the bottom row OR for “no recovery vs incomplete recovery”.

OR>1.0 means dysfunction in pain processing as measured by quantitative sensory tests are associated with increased risk for poor recovery (i.e. lower thresholds after pressure, electrical and heat stimulation, higher thresholds after cold stimulation, shorter hand withdrawal time and impaired conditioned pain modulation).

E-Supplement 6: Predictive effect of baseline characteristics and quantitative sensory tests on bivariate trajectories of maximum pain of last 7 days and disability after surgery if acute post-surgical pain is considered as covariate. Results are odds ratios (ORs) with corresponding 95% confidence intervals (95 % CI) and p-values of a multivariable ordinal logistic regression*. N=141.

	Odds ratio (95% CI)	P-value
Cold pain at leg (>0.0°C)	2.39 (1.00 - 5.72)	0.05
Pressure pain detection threshold site most pain back (per 2 SD decrease)	1.59 (0.73 - 3.47)	0.24
Married	0.34 (0.14 - 0.80)	0.014
Depression (per 2 SD increase)	0.75 (0.28 - 2.03)	0.57
Catastrophizing (per 2 SD increase)	2.37 (0.87 - 6.48)	0.09
Lasègue positive	1.31 (0.56 - 3.10)	0.54
Pain duration (per 2 SD increase)	2.97 (1.11 - 7.96)	0.030
Maximum pain over the last 7 days at baseline (per 2 SD increase)	0.61 (0.26 - 1.44)	0.26
Disability at baseline (per 2 SD increase)	1.95 (0.74 - 5.10)	0.18
Intake of non-opioid analgesics	1.65 (0.69 - 3.90)	0.26
Intake of opioid analgesics	1.73 (0.56 - 5.35)	0.34
Acute post-surgical pain (per 2 SD increase)	5.88 (2.34 - 14.8)	<0.001

* The model assumes proportional odds when comparing “incomplete recovery” with “complete recovery” and “no recovery” with “incomplete recovery” with effect of continuous predictors expressed per two standard deviation change (per 2SD). The model includes all predictors with $p < 0.10$ in univariable regressions except average pain over the last 24 hours (highly correlated with maximum pain over the last 7 days) and cold pain detection threshold at site of most back pain (highly correlated with cold pain detection threshold at the leg).

OR > 1.0 suggests association with poor recovery