

# Bone & Joint Research



## Supplementary Material

10.1302/2046-3758.129.BJR-2023-0070.R2

**Appendix 1: Overview of the complete set of variables as well as the variables selected by the random forest.**

**Table i.** All features initially available to models for feature selection for the hip arthroplasty sample.

N	Variable name	Description	Type
1	gender	Gender	Dummy
2	I_trauma_HR	Joint-related pre-existing conditions - trauma or ligament injury - hip r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
3	I_trauma_HL	Joint-related pre-existing conditions - trauma or ligament injury - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
4	I_trauma_KR	Joint-related pre-existing conditions - trauma or ligament injury - knee r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
5	I_trauma_KL	Joint-related pre-existing conditions - trauma or ligament injury - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
6	I_dev_HR	Joint-related pre-existing conditions - Congenital or developmental - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
7	I_dev_HL	Joint-related pre-existing conditions - Congenital or developmental disease - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
8	I_dev_KR	Joint-related pre-existing conditions - Congenital or developmental disease - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
9	I_dev_KL	Joint-related pre-existing conditions - Congenital or developmental disease - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy

10	I_joint_HR	Joint-related pre-existing conditions - Other joint disease - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
11	I_joint_HL	Joint-related pre-existing conditions - Other joint diseases - Left hip - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
12	I_joint_KR	Joint-related pre-existing conditions - Other joint diseases - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
13	I_joint_KL	Joint-related pre-existing conditions - Other joint diseases - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
14	I_no_HR	Joint-related pre-existing conditions - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
15	I_no_HL	Joint-related pre-existing conditions - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
16	I_no_KR	Joint-related pre-existing conditions - None - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
17	I_no_KL	Joint-related past medical history - None - Knee left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
18	I_repl_HR	Joint-related surgical history - Joint replacement - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
19	I_repl_HL	Joint Surgical History - Joint Replacement - Left Hip - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
20	I_repl_KR	Joint surgical history - joint replacement - knee right - baseline hip/knee osteoarthritis (ICHOM)	Dummy
21	I_repl_KL	Joint surgical history - joint replacement - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
22	I_osteotom_HR	Joint specific surgical history regarding osteotomy - hip right	Dummy
23	I_osteotom_HL	Joint surgical history - osteotomy - left hip - baseline hip/knee osteoarthritis (ICHOM)	Dummy
24	I_osteotom_KR	Joint surgical history - osteotomy - knee r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
25	I_osteotom_KL	Joint surgical history - osteotomy - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
26	I_osteosyn_HR	Joint specific surgical history regarding osteosynthesis - hip right	Dummy
27	I_osteosyn_HL	Joint surgical history - osteosynthesis/surgical fracture repair - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy

28	I_osteosyn_KR	Joint surgical history - osteosynthesis/surgical fracture repair - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
29	I_osteosyn_KL	Joint surgical history - osteosynthesis/surgical fracture repair - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
30	I_recon_HR	Joint surgical history - knee ligament reconstruction - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
31	I_recon_HL	Joint Surgical History - Knee Ligament Reconstruction - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
32	I_recon_KR	Joint surgical history - knee ligament reconstruction - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
33	I_recon_KL	Joint Surgical History - Knee Ligament Reconstruction - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
34	I_arth_HR	Joint Surgical History - Other Arthroscopic Procedures - Hip Right - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
35	I_arth_HL	Joint Surgical History - Other Arthroscopic Procedures - Left Hip - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
36	I_arth_KR	Joint Surgical History - Other Arthroscopic Procedures - Knee Right - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
37	I_arth_KL	Joint Surgical History - Other Arthroscopic Procedures - Left Knee - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
38	I_chirno_HR	Joint-related surgical history - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
39	I_chirno_HL	Joint surgical history - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
40	I_chirno_KR	Joint surgical history - None - Knee right - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
41	I_chirno_KL	Joint Surgical History - None - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
42	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
43	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
44	PQ_arth_HR	Pre-diagnosis of arthrosis - Right hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
45	PQ_arth_HL	Pre-diagnosis of arthrosis - Left hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy

46	PQ_arth_KR	Pre-diagnosis of arthrosis - Right knee - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
47	PQ_arth_KL	Pre-diagnosis of arthrosis - Left knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
48	PQ_arthno	Pre-diagnosis of arthrosis - No - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
49	PQ_OParth_HR	Operations for therapy of an arthrosis in the past year - Right hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
50	PQ_OParth_HL	Operations for the therapy of an arthrosis in the past year - Left hip - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
51	PQ_OParth_KR	Operations for the therapy of an arthrosis in the past year - Right knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
52	PQ_OParth_KL	Operations for the therapy of an arthrosis in the past year - Left knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
53	PQ_OParthno	Operations for therapy of an arthrosis in the past year - None - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
54	PQ_therarth1	Therapies for osteoarthritis-related hip/knee problems in the past year - Information/advice - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
55	PQ_therarth2	Therapies for osteoarthritis-related hip/knee problems in the past year - Self-administered care - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
56	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
57	PQ_therarth4	Therapies for osteoarthritis-related hip/knee problems in the past year - Operations - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
58	PQ_therarthno	Therapies for osteoarthritis-related hip/knee problems in the past year - None - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
59	PQ_care_selfhelp	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Health educator/support group - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
60	PQ_care_gpnutphy	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Nutritionist/physiotherapist/family	Dummy

		physician - History of knee- hip osteoarthritis (PROMoting Quality)	
61	PQ_care_rheu	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Rheumatologist - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
62	PQ_care_ortho	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic surgeon - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
63	PQ_care_healer	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic practitioner - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
64	PQ_careno	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - None - Medical history of knee/hip osteoarthritis (PROMoting Quality)	Dummy
65	smoker	Smoker - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
66	como_heart	Self-reported heart disease (anamnese)	Dummy
67	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
68	como_stroke	Self-reported history of stroke (anamnese)	Dummy
69	como_circulation	Self-reported pain while walking due to circulation disease (anamnese)	Dummy
70	como_lung	Self-reported lung comorbidity (anamnese)	Dummy
71	como_diabetes	Self-reported diabetes (anamnese)	Dummy
72	como_kidney	Self-reported kidney disease (anamnese)	Dummy
73	como_neuro	Self-reported neurological disease (anamnese)	Dummy
74	como_liver	Self-reported liver disease (anamnese)	Dummy
75	como_cancer	Self-reported cancer disease within the last 5 years (anamnese)	Dummy
76	como_depression	Self-reported depression (anamnese)	Dummy
77	como_back	Self-reported back arthritis / disease of back (anamnese)	Dummy
78	como_arthritis	Self-reported arthritis (anamnese)	Dummy
79	comono	Self-reported absence of diseases (anamnese)	Dummy
80	EQ_health	EQ-VAS	Numeric
81	EQ_total	EQ-5D-5L	Numeric
82	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
83	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric

84	HOOS_KOOS	HOOS-PS or KOOS-PS (depending on hip or knee patient)	Numeric
85	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
86	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
87	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
88	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
89	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
90	bmi	Body Mass index	Numeric
91	age_at_surgery	Age at the day of surgery	Numeric
92	HOOS_1_2	HOOS-PS, subdimension 1, second answer	Dummy
93	HOOS_1_3	HOOS-PS, subdimension 1, third answer	Dummy
94	HOOS_1_4	HOOS-PS, subdimension 1, fourth answer	Dummy
95	HOOS_1_5	HOOS-PS, subdimension 1, fifth answer	Dummy
96	HOOS_2_2	HOOS-PS, subdimension 2, second answer	Dummy
97	HOOS_2_3	HOOS-PS, subdimension 2, third answer	Dummy
98	HOOS_2_4	HOOS-PS, subdimension 2, fourth answer	Dummy
99	HOOS_2_5	HOOS-PS, subdimension 2, fifth answer	Dummy
100	HOOS_3_2	HOOS-PS, subdimension 3, second answer	Dummy
101	HOOS_3_3	HOOS-PS, subdimension 3, third answer	Dummy
102	HOOS_3_4	HOOS-PS, subdimension 3, fourth answer	Dummy
103	HOOS_3_5	HOOS-PS, subdimension 3, fifth answer	Dummy
104	HOOS_4_2	HOOS-PS, subdimension 4, second answer	Dummy
105	HOOS_4_3	HOOS-PS, subdimension 4, third answer	Dummy
106	HOOS_4_4	HOOS-PS, subdimension 4, fourth answer	Dummy
107	HOOS_4_5	HOOS-PS, subdimension 4, fifth answer	Dummy
108	HOOS_5_2	HOOS-PS, subdimension 5, second answer	Dummy
109	HOOS_5_3	HOOS-PS, subdimension 5, third answer	Dummy
110	HOOS_5_4	HOOS-PS, subdimension 5, fourth answer	Dummy
111	HOOS_5_5	HOOS-PS, subdimension 5, fifth answer	Dummy
112	PROMIS_fat1_2	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: A bit	Dummy
113	PROMIS_fat1_3	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Medium	Dummy
114	PROMIS_fat1_4	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Not at all	Dummy
115	PROMIS_fat1_5	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Very	Dummy
116	PROMIS_fat2_2	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
117	PROMIS_fat2_3	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: A bit	Dummy
118	PROMIS_fat2_4	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
119	PROMIS_fat2_5	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy

120	PROMIS_fat3_2	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: Not at all	Dummy
121	PROMIS_fat3_3	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: A bit	Dummy
122	PROMIS_fat3_4	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: A lot	Dummy
123	PROMIS_fat3_5	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: Very	Dummy
124	PROMIS_fat4_2	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Not at all	Dummy
125	PROMIS_fat4_3	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: A bit	Dummy
126	PROMIS_fat4_4	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Very	Dummy
127	PROMIS_fat4_5	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: A lot	Dummy
128	PROMIS_dep1_2	PROMIS Depression, subdimension 1, second answer	Dummy
129	PROMIS_dep1_3	PROMIS Depression, subdimension 1, third answer	Dummy
130	PROMIS_dep1_4	PROMIS Depression, subdimension 1, fourth answer	Dummy
131	PROMIS_dep1_5	PROMIS Depression, subdimension 1, fifth answer	Dummy
132	PROMIS_dep2_2	PROMIS Depression, subdimension 2, second answer	Dummy
133	PROMIS_dep2_3	PROMIS Depression, subdimension 2, third answer	Dummy
134	PROMIS_dep2_4	PROMIS Depression, subdimension 2, fourth answer	Dummy
135	PROMIS_dep2_5	PROMIS Depression, subdimension 2, fifth answer	Dummy
136	PROMIS_dep3_2	PROMIS Depression, subdimension 3, second answer	Dummy
137	PROMIS_dep3_3	PROMIS Depression, subdimension 3, third answer	Dummy
138	PROMIS_dep3_4	PROMIS Depression, subdimension 3, fourth answer	Dummy
139	PROMIS_dep3_5	PROMIS Depression, subdimension 3, fifth answer	Dummy
140	PROMIS_dep4_2	PROMIS Depression, subdimension 4, second answer	Dummy
141	PROMIS_dep4_3	PROMIS Depression, subdimension 4, third answer	Dummy
142	PROMIS_dep4_4	PROMIS Depression, subdimension 4, fourth answer	Dummy

143	PROMIS_dep4_5	PROMIS Depression, subdimension 5, answer 1	Dummy
144	EQ_anxiety_2	EQ anxiety: I'm not scared or depressed	Dummy
145	EQ_anxiety_3	EQ anxiety: I'm a bit scared or depressed	Dummy
146	EQ_anxiety_4	EQ anxiety: I'm heavily scared or depressed	Dummy
147	EQ_anxiety_5	EQ-5D-5L, subdimension anxiety, answer 5	Dummy
148	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
149	EQ_pain_3	EQ pain: I have no pain or complaints	Dummy
150	EQ_pain_4	EQ pain: I have no pain or complaints	Dummy
151	EQ_pain_5	EQ pain: I have small pain or complaints	Dummy
152	EQ_dailyactiv_2	EQ daily activity: I have small problems doing my daily activities	Dummy
153	EQ_dailyactiv_3	EQ daily activity: I have huge problems doing my daily activities	Dummy
154	EQ_dailyactiv_4	EQ daily activity: I have no problems doing my daily activities	Dummy
155	EQ_dailyactiv_5	EQ daily activity: I am not able to do my daily activities	Dummy
156	EQ_selfcare_2	EQ selfcare: I do not have problems with cleaning myself or to put clothes on	Dummy
157	EQ_selfcare_3	EQ selfcare: I am not able to clean myself or to put clothes on	Dummy
158	EQ_selfcare_4	EQ selfcare: I have huge problems with cleaning myself or to put clothes on	Dummy
159	EQ_selfcare_5	EQ selfcare: I have medium-size problems with cleaning myself or to put clothes on	Dummy
160	EQ_mobility_2	EQ mobility: I have small problems with walking	Dummy
161	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
162	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
163	EQ_mobility_5	EQ mobility: I am not able to walk	Dummy
164	caredegree_2	German care degree: Level 2	Dummy
165	caredegree_3	German care degree: Level 1	Dummy
166	caredegree_4	German care degree: Level 3	Dummy
167	caredegree_5	Care-degree 5 according to the German care-degree system (range: 1-5)	Dummy
168	duration_weeklyactiv_2	Duration of weekly physical activity: More than 2 hours	Dummy
169	duration_weeklyactiv_3	Duration of weekly physical activity: About an hour	Dummy
170	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy
171	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
172	jobeffort_2	Physical activity during work: Can not judge	Dummy
173	jobeffort_3	Physical activity during work: Heavy	Dummy
174	jobeffort_4	Physical activity during work: Easy	Dummy
175	jobeffort_5	Physical activity during work: Medium	Dummy
176	job_2	Job: Not working (Student, Housewife/man)	Dummy



177	job_3	Job: Full-time	Dummy
178	job_4	Job: Part-time	Dummy
179	job_5	Job: Not able to work due to a disease other than arthrosis	Dummy
180	job_6	Job: Searching for work (able to work but currently jobless)	Dummy
181	livesituation_2	Living situation: Living alone	Dummy
182	livesituation_3	Living situation: Other	Dummy
183	livesituation_4	Living situation: Nursing home or hospital	Dummy
184	education_2	Highest educational level: Primary school	Dummy
185	education_3	Highest educational level: Graduated from university	Dummy
186	education_4	Highest educational level: No degree	Dummy
187	hospital_2	Hospital_2	Dummy
188	hospital_3	Hospital_3	Dummy
189	hospital_4	Hospital_4	Dummy
190	hospital_5	Hospital_5	Dummy
191	hospital_6	Hospital_6	Dummy
192	hospital_7	Hospital_7	Dummy
193	hospital_8	Hospital_8	Dummy
194	hospital_9	Hospital_9	Dummy
195	duration_weeklyactiv_at_least_1_hour	Duration of weekly physical activity: At least 1 hour	Dummy
196	worker	Working at least part-time	Dummy
197	living_nursinghome	Living in a nursing home	Dummy
198	highschool_or_higher	Highest school degree high school or higher	Dummy

**Table ii.** All features initially available to models for feature selection for the knee arthroplasty sample.

<b>N</b>	<b>Variable name</b>	<b>Description</b>	<b>Type</b>
1	gender	Gender	Dummy
2	I_trauma_HR	Joint-related pre-existing conditions - trauma or ligament injury - hip r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
3	I_trauma_HL	Joint-related pre-existing conditions - trauma or ligament injury - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
4	I_trauma_KR	Joint-related pre-existing conditions - trauma or ligament injury - knee r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
5	I_trauma_KL	Joint-related pre-existing conditions - trauma or ligament injury - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
6	I_dev_HR	Joint-related pre-existing conditions - Congenital or developmental - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
7	I_dev_HL	Joint-related pre-existing conditions - Congenital or developmental disease - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
8	I_dev_KR	Joint-related pre-existing conditions - Congenital or developmental disease - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
9	I_dev_KL	Joint-related pre-existing conditions - Congenital or developmental disease - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
10	I_joint_HR	Joint-related pre-existing conditions - Other joint disease - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
11	I_joint_HL	Joint-related pre-existing conditions - Other joint diseases - Left hip - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
12	I_joint_KR	Joint-related pre-existing conditions - Other joint diseases - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
13	I_joint_KL	Joint-related pre-existing conditions - Other joint diseases - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
14	I_no_HR	Joint-related pre-existing conditions - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
15	I_no_HL	Joint-related pre-existing conditions - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
16	I_no_KR	Joint-related pre-existing conditions - None - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
17	I_no_KL	Joint-related past medical history - None - Knee left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
18	I_repl_HR	Joint-related surgical history - Joint replacement - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
19	I_repl_HL	Joint Surgical History - Joint Replacement - Left Hip - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
20	I_repl_KR	Joint surgical history - joint replacement - knee right - baseline hip/knee osteoarthritis (ICHOM)	Dummy
21	I_repl_KL	Joint surgical history - joint replacement - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy

22	I_osteotom_HR	Joint specific surgical history regarding osteotomy - hip right	Dummy
23	I_osteotom_HL	Joint surgical history - osteotomy - left hip - baseline hip/knee osteoarthritis (ICHOM)	Dummy
24	I_osteotom_KR	Joint surgical history - osteotomy - knee r. - baseline hip/knee osteoarthritis (ICHOM)	Dummy
25	I_osteotom_KL	Joint surgical history - osteotomy - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
26	I_osteosyn_HR	Joint specific surgical history regarding osteosynthesis - hip right	Dummy
27	I_osteosyn_HL	Joint surgical history - osteosynthesis/surgical fracture repair - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
28	I_osteosyn_KR	Joint surgical history - osteosynthesis/surgical fracture repair - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
29	I_osteosyn_KL	Joint surgical history - osteosynthesis/surgical fracture repair - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
30	I_recon_HR	Joint surgical history - knee ligament reconstruction - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
31	I_recon_HL	Joint Surgical History - Knee Ligament Reconstruction - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
32	I_recon_KR	Joint surgical history - knee ligament reconstruction - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
33	I_recon_KL	Joint Surgical History - Knee Ligament Reconstruction - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
34	I_arth_HR	Joint Surgical History - Other Arthroscopic Procedures - Hip Right - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
35	I_arth_HL	Joint Surgical History - Other Arthroscopic Procedures - Left Hip - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
36	I_arth_KR	Joint Surgical History - Other Arthroscopic Procedures - Knee Right - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
37	I_arth_KL	Joint Surgical History - Other Arthroscopic Procedures - Left Knee - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
38	I_chirno_HR	Joint-related surgical history - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
39	I_chirno_HL	Joint surgical history - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
40	I_chirno_KR	Joint surgical history - None - Knee right - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
41	I_chirno_KL	Joint Surgical History - None - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
42	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
43	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
44	PQ_arth_HR	Pre-diagnosis of arthrosis - Right hip - Anamnesis knee-hip arthrosis (PROMoting Quality)	Dummy
45	PQ_arth_HL	Pre-diagnosis of arthrosis - Left hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy

46	PQ_arth_KR	Pre-diagnosis of arthrosis - Right knee - Anamnesis knee-hip arthrosis (PROMoting Quality)	Dummy
47	PQ_arth_KL	Pre-diagnosis of arthrosis - Left knee - anamnesis knee-hip arthrosis (PROMoting Quality)	Dummy
48	PQ_arthno	Pre-diagnosis of arthrosis - No - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
49	PQ_OParth_HR	Operations for therapy of an arthrosis in the past year - Right hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
50	PQ_OParth_HL	Operations for the therapy of an arthrosis in the past year - Left hip - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
51	PQ_OParth_KR	Operations for the therapy of an arthrosis in the past year - Right knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
52	PQ_OParth_KL	Operations for the therapy of an arthrosis in the past year - Left knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
53	PQ_OParthno	Operations for therapy of an arthrosis in the past year - None - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
54	PQ_therarth1	Therapies for osteoarthritis-related hip/knee problems in the past year - Information/advice - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
55	PQ_therarth2	Therapies for osteoarthritis-related hip/knee problems in the past year - Self-administered care - Anamnesis knee-hip osteoarthritis (PROMoting Quality)	Dummy
56	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
57	PQ_therarth4	Therapies for osteoarthritis-related hip/knee problems in the past year - Operations - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
58	PQ_therarthno	Therapies for osteoarthritis-related hip/knee problems in the past year - None - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
59	PQ_care_selfhelp	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Health educator/support group - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
60	PQ_care_gpnutphy	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Nutritionist/physiotherapist/family physician - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
61	PQ_care_rheu	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Rheumatologist - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
62	PQ_care_ortho	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic surgeon - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy

63	PQ_care_healer	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic practitioner - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
64	PQ_careno	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - None - Medical history of knee/hip osteoarthritis (PROMoting Quality)	Dummy
65	smoker	Smoker - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
66	como_heart	Self-reported heart disease (anamnese)	Dummy
67	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
68	como_stroke	Self-reported history of stroke (anamnese)	Dummy
69	como_circulation	Self-reported pain while walking due to circulation disease (anamnese)	Dummy
70	como_lung	Self-reported lung comorbidity (anamnese)	Dummy
71	como_diabetes	Self-reported diabetes (anamnese)	Dummy
72	como_kidney	Self-reported kidney disease (anamnese)	Dummy
73	como_neuro	Self-reported neurological disease (anamnese)	Dummy
74	como_liver	Self-reported liver disease (anamnese)	Dummy
75	como_cancer	Self-reported cancer disease within the last 5 years (anamnese)	Dummy
76	como_depression	Self-reported depression (anamnese)	Dummy
77	como_back	Self-reported back arthritis / disease of back (anamnese)	Dummy
78	como_arthritis	Self-reported arthritis (anamnese)	Dummy
79	comono	Self-reported absence of diseases (anamnese)	Dummy
80	EQ_health	EQ-VAS	Numeric
81	EQ_total	EQ-5D-5L	Numeric
82	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
83	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
84	HOOS_KOOS	HOOS-PS or KOOS-PS (depending on hip or knee patient)	Numeric
85	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
86	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
87	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
88	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
89	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
90	bmi	Body mass index	Numeric
91	age_at_surgery	Age at the day of surgery	Numeric
92	KOOS_1_2	KOOS-PS, subdimension 1, second answer	Dummy
93	KOOS_1_3	KOOS-PS, subdimension 1, third answer	Dummy
94	KOOS_1_4	KOOS-PS, subdimension 1, fourth answer	Dummy
95	KOOS_1_5	KOOS-PS, subdimension 1, fifth answer	Dummy
96	KOOS_2_2	KOOS-PS, subdimension 2, second answer	Dummy
97	KOOS_2_3	KOOS-PS, subdimension 2, third answer	Dummy
98	KOOS_2_4	KOOS-PS, subdimension 2, fourth answer	Dummy
99	KOOS_2_5	KOOS-PS, subdimension 2, fifth answer	Dummy

100	KOOS_3_2	KOOS-PS, subdimension 3, second answer	Dummy
101	KOOS_3_3	KOOS-PS, subdimension 3, third answer	Dummy
102	KOOS_3_4	KOOS-PS, subdimension 3, fourth answer	Dummy
103	KOOS_3_5	KOOS-PS, subdimension 3, fifth answer	Dummy
104	KOOS_4_2	KOOS-PS, subdimension 4, second answer	Dummy
105	KOOS_4_3	KOOS-PS, subdimension 4, third answer	Dummy
106	KOOS_4_4	KOOS-PS, subdimension 4, fourth answer	Dummy
107	KOOS_4_5	KOOS-PS, subdimension 4, fifth answer	Dummy
108	KOOS_5_2	KOOS-PS, subdimension 5, second answer	Dummy
109	KOOS_5_3	KOOS-PS, subdimension 5, third answer	Dummy
110	KOOS_5_4	KOOS-PS, subdimension 5, fourth answer	Dummy
111	KOOS_5_5	KOOS-PS, subdimension 5, fifth answer	Dummy
112	KOOS_6_2	KOOS-PS, subdimension 6, second answer	Dummy
113	KOOS_6_3	KOOS-PS, subdimension 6, third answer	Dummy
114	KOOS_6_4	KOOS-PS, subdimension 6, fourth answer	Dummy
115	KOOS_6_5	KOOS-PS, subdimension 6, fifth answer	Dummy
116	KOOS_7_2	KOOS-PS, subdimension 7, second answer	Dummy
117	KOOS_7_3	KOOS-PS, subdimension 7, third answer	Dummy
118	KOOS_7_4	KOOS-PS, subdimension 7, fourth answer	Dummy
119	KOOS_7_5	KOOS-PS, subdimension 7, fifth answer	Dummy
120	PROMIS_fat1_2	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: A bit	Dummy
121	PROMIS_fat1_3	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Medium	Dummy
122	PROMIS_fat1_4	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Not at all	Dummy
123	PROMIS_fat1_5	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Very	Dummy
124	PROMIS_fat2_2	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
125	PROMIS_fat2_3	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: A bit	Dummy
126	PROMIS_fat2_4	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
127	PROMIS_fat2_5	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
128	PROMIS_fat3_2	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: Not at all	Dummy
129	PROMIS_fat3_3	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: A bit	Dummy
130	PROMIS_fat3_4	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: A lot	Dummy
131	PROMIS_fat3_5	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: Very	Dummy
132	PROMIS_fat4_2	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Not at all	Dummy
133	PROMIS_fat4_3	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: A bit	Dummy
134	PROMIS_fat4_4	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Very	Dummy

135	PROMIS_fat4_5	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: A lot	Dummy
136	PROMIS_dep1_2	PROMIS Depression, subdimension 1, second answer	Dummy
137	PROMIS_dep1_3	PROMIS Depression, subdimension 1, third answer	Dummy
138	PROMIS_dep1_4	PROMIS Depression, subdimension 1, fourth answer	Dummy
139	PROMIS_dep1_5	PROMIS Depression, subdimension 1, fifth answer	Dummy
140	PROMIS_dep2_2	PROMIS Depression, subdimension 2, second answer	Dummy
141	PROMIS_dep2_3	PROMIS Depression, subdimension 2, third answer	Dummy
142	PROMIS_dep2_4	PROMIS Depression, subdimension 2, fourth answer	Dummy
143	PROMIS_dep2_5	PROMIS Depression, subdimension 2, fifth answer	Dummy
144	PROMIS_dep3_2	PROMIS Depression, subdimension 3, second answer	Dummy
145	PROMIS_dep3_3	PROMIS Depression, subdimension 3, third answer	Dummy
146	PROMIS_dep3_4	PROMIS Depression, subdimension 3, fourth answer	Dummy
147	PROMIS_dep3_5	PROMIS Depression, subdimension 3, fifth answer	Dummy
148	PROMIS_dep4_2	PROMIS Depression, subdimension 4, second answer	Dummy
149	PROMIS_dep4_3	PROMIS Depression, subdimension 4, third answer	Dummy
150	PROMIS_dep4_4	PROMIS Depression, subdimension 4, fourth answer	Dummy
151	EQ_anxiety_2	EQ anxiety: I'm not scared or depressed	Dummy
152	EQ_anxiety_3	EQ anxiety: I'm a bit scared or depressed	Dummy
153	EQ_anxiety_4	EQ anxiety: I'm heavily scared or depressed	Dummy
154	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
155	EQ_pain_3	EQ pain: I have no pain or complaints	Dummy
156	EQ_pain_4	EQ pain: I have no pain or complaints	Dummy
157	EQ_pain_5	EQ pain: I have small pain or complaints	Dummy
158	EQ_dailyactiv_2	EQ daily activity: I have small problems doing my daily activities	Dummy
159	EQ_dailyactiv_3	EQ daily activity: I have huge problems doing my daily activities	Dummy
160	EQ_dailyactiv_4	EQ daily activity: I have no problems doing my daily activities	Dummy
161	EQ_dailyactiv_5	EQ daily activity: I am not able to do my daily activities	Dummy
162	EQ_selfcare_2	EQ selfcare: I do not have problems with cleaning myself or to put clothes on	Dummy
163	EQ_selfcare_3	EQ selfcare: I am not able to clean myself or to put clothes on	Dummy
164	EQ_selfcare_4	EQ selfcare: I have huge problems with cleaning myself or to put clothes on	Dummy
165	EQ_selfcare_5	EQ selfcare: I have medium-size problems with cleaning myself or to put clothes on	Dummy
166	EQ_mobility_2	EQ mobility: I have small problems with walking	Dummy
167	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
168	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
169	EQ_mobility_5	EQ mobility: I am not able to walk	Dummy
170	caredegree_2	German care degree: Level 2	Dummy
171	caredegree_3	German care degree: Level 1	Dummy
172	caredegree_4	German care degree: Level 3	Dummy
173	duration_weeklyactiv_2	Duration of weekly physical activity: More than 2 hours	Dummy
174	duration_weeklyactiv_3	Duration of weekly physical activity: About an hour	Dummy

175	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy
176	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
177	jobeffort_2	Physical activity during work: Can not judge	Dummy
178	jobeffort_3	Physical activity during work: Heavy	Dummy
179	jobeffort_4	Physical activity during work: Easy	Dummy
180	jobeffort_5	Physical activity during work: Medium	Dummy
181	job_2	Job: Not working (Student, Housewife/man)	Dummy
182	job_3	Job: Full-time	Dummy
183	job_4	Job: Part-time	Dummy
184	job_5	Job: Not able to work due to a disease other than arthrosis	Dummy
185	job_6	Job: Searching for work (able to work but currently jobless)	Dummy
186	livesituation_2	Living situation: Living alone	Dummy
187	livesituation_3	Living situation: Other	Dummy
188	livesituation_4	Living situation: Nursing home or hospital	Dummy
189	education_2	Highest educational level: Primary school	Dummy
190	education_3	Highest educational level: Graduated from university	Dummy
191	education_4	Highest educational level: No degree	Dummy
192	hospital_2	Hospital_2	Dummy
193	hospital_3	Hospital_3	Dummy
194	hospital_4	Hospital_4	Dummy
195	hospital_5	Hospital_5	Dummy
196	hospital_6	Hospital_6	Dummy
197	hospital_7	Hospital_7	Dummy
198	hospital_8	Hospital_8	Dummy
199	hospital_9	Hospital_9	Dummy
200	duration_weeklyactiv_at_least_1_hour	Self-reported weekly physical activity of at least 1 hour	Dummy
201	worker	Working at least part-time	Dummy
202	living_nursinghome	Living in a nursing home	Dummy
203	highschool_or_higher	Highest school degree high school or higher	Dummy



**Table iii.** Selected features for the hip arthroplasty sample and EuroQol five-dimension five-level questionnaire (EQ-5D-5L).

N	Variable name	Description	Type
1	EQ_5D_5L	EQ-5D-5L score	Numeric
2	EQ_pain_4	EQ pain: I have no pain or complaints	Dummy
3	EQ_pain_3	EQ pain: I have no pain or complaints	Dummy
4	bmi	Body mass index	Numeric
5	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
6	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
7	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
8	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
9	age_at_surgery	Age at the day of surgery	Numeric
10	EQ_VAS	EQ-VAS score	Numeric
11	HOOS	HOOS-PS score	Numeric
12	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
13	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
14	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
15	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
16	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
17	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
18	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
19	EQ_dailyactiv_2	EQ daily activity: I have small problems doing my daily activities	Dummy
20	como_back	Self-reported back arthritis / disease of back (anamnese)	Dummy
21	EQ_selfcare_2	EQ selfcare: I do not have problems with cleaning myself or to put clothes on	Dummy
22	education_3	Highest educational level: Graduated from university	Dummy
23	HOOS_4_5	HOOS-PS, subdimension 4, fifth answer	Dummy
24	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
25	PQ_care_ortho	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic surgeon - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
26	PROMIS_fat1_3	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Medium	Dummy
27	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy
28	EQ_dailyactiv_4	EQ daily activity: I have no problems doing my daily activities	Dummy
29	HOOS_3_3	HOOS-PS, subdimension 3, third answer	Dummy

30	PQ_care_gpnutphy	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Nutritionist/physiotherapist/family physician - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
31	como_blood	Self-reported blood pressure disease (anamnese)	Dummy

**Table iv.** Selected features for the hip arthroplasty sample and EuroQol-visual analogue scale (EQ-VAS).

<b>N</b>	<b>Variable name</b>	<b>Description</b>	<b>Type</b>
1	EQ_VAS	EQ-VAS score	Numeric
2	bmi	Body mass index	Numeric
3	age_at_surgery	Age at the day of surgery	Numeric
4	EQ_5D_5L	EQ-5D-5L score	Numeric
5	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
6	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
7	HOOS	HOOS-PS score	Numeric
8	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
9	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
10	PQ_pain_HL	EQ-VAS score	Numeric
11	PQ_pain_HR	HOOS-PS score	Numeric
12	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
13	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
14	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
15	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
16	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
17	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
18	comono	Self-reported absence of diseases (anamnese)	Dummy
19	como_diabetes	Self-reported diabetes (anamnese)	Dummy

**Table v.** Selected features for the hip arthroplasty sample and Hip disability and Osteoarthritis Outcome Score-Physical Function Short-form (HOOS-PS).

N	Variable name	Description	Type
1	HOOS	HOOS-PS score	Numeric
2	age_at_surgery	Age at the day of surgery	Numeric
3	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
4	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
5	bmi	Body Mass index	Numeric
6	EQ_5D_5L	EQ-5D-5L score	Numeric
7	EQ_VAS	EQ-VAS score	Numeric
8	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
9	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
10	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
11	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
12	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
13	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
14	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
15	HOOS_5_2	HOOS-PS, subdimension 5, second answer	Dummy
16	HOOS_5_5	HOOS-PS, subdimension 5, fifth answer	Dummy
17	HOOS_4_2	HOOS-PS, subdimension 4, second answer	Dummy
18	PROMIS_fat2_2	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
19	HOOS_5_4	HOOS-PS, subdimension 5, fourth answer	Dummy
20	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
21	comono	Self-reported absence of diseases (anamnese)	Dummy
22	HOOS_4_5	HOOS-PS, subdimension 4, fifth answer	Dummy
23	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
24	HOOS_5_3	HOOS-PS, subdimension 5, third answer	Dummy
25	HOOS_4_4	HOOS-PS, subdimension 4, fourth answer	Dummy
26	I_dev_HL	Joint-related pre-existing conditions - Congenital or developmental disease - hip left - baseline hip/knee osteoarthritis (ICHOM)	Dummy
27	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
28	hospital_4	Hospital_4	Dummy
29	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
30	HOOS_2_2	HOOS-PS, subdimension 2, second answer	Dummy
31	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy

**Table vi.** Selected features for the knee arthroplasty sample and EuroQol five-dimension five-level questionnaire (EQ-5D-5L).

N	Variable name	Description	Type
1	EQ_5D_5L	EQ-5D-5L score	Numeric
2	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
3	bmi	Body mass index	Numeric
4	EQ_pain_4	EQ pain: I have no pain or complaints	Dummy
5	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
6	EQ_VAS	EQ-VAS score	Numeric
7	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
8	age_at_surgery	Age at the day of surgery	Numeric
9	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
10	KOOS	KOOS-PS score	Numeric
11	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
12	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
13	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
14	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
15	EQ_pain_3	EQ pain: I have no pain or complaints	Dummy
16	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
17	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
18	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
19	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
20	EQ_mobility_2	EQ mobility: I have small problems with walking	Dummy
21	EQ_dailyactiv_4	EQ daily activity: I have no problems doing my daily activities	Dummy
22	hospital_6	Hospital_6	Dummy
23	EQ_dailyactiv_3	EQ daily activity: I have huge problems doing my daily activities	Dummy
24	hospital_4	Hospital_4	Dummy
25	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
26	KOOS_4_3	KOOS-PS, subdimension 4, third answer	Dummy
27	I_dev_KR	Joint-related pre-existing conditions - Congenital or developmental disease - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
28	PROMIS_dep2_2	PROMIS Depression, subdimension 2, second answer	Dummy
29	PROMIS_fat2_2	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
30	comono	Self-reported absence of diseases (anamnese)	Dummy

31	KOOS_2_2	KOOS-PS, subdimension 2, second answer	Dummy
32	PROMIS_fat4_2	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Not at all	Dummy
33	KOOS_1_2	KOOS-PS, subdimension 1, second answer	Dummy
34	como_heart	Self-reported heart disease (anamnese)	Dummy
35	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
36	KOOS_3_3	KOOS-PS, subdimension 3, third answer	Dummy
37	PQ_therarth2	Therapies for osteoarthritis-related hip/knee problems in the past year - Self-administered care - Anamnesis knee-hip osteoarthritis (PROMoting Quality)	Dummy
38	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy
39	KOOS_5_3	KOOS-PS, subdimension 5, third answer	Dummy
40	I_chirno_KL	Joint Surgical History - None - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
41	EQ_anxiety_2	EQ anxiety: I'm not scared or depressed	Dummy
42	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
43	gender	Gender	Dummy
44	KOOS_5_4	KOOS-PS, subdimension 5, fourth answer	Dummy
45	I_chirno_KR	Joint surgical history - None - Knee right - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
46	PQ_care_gpnutphy	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Nutritionist/physiotherapist/family physician - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
47	jobeffort_4	Physical activity during work: Easy	Dummy
48	PQ_therarthno	Therapies for osteoarthritis-related hip/knee problems in the past year - None - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
49	hospital_8	Hospital_8	Dummy
50	livesituation_2	Living situation: Living alone	Dummy
51	KOOS_3_2	KOOS-PS, subdimension 3, second answer	Dummy
52	PROMIS_dep1_2	PROMIS Depression, subdimension 1, second answer	Dummy
53	EQ_dailyactiv_2	EQ daily activity: I have small problems doing my daily activities	Dummy
54	como_kidney	Self-reported kidney disease (anamnese)	Dummy
55	PQ_care_ortho	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic surgeon - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
56	KOOS_7_4	KOOS-PS, subdimension 7, fourth answer	Dummy
57	jobeffort_3	Physical activity during work: Heavy	Dummy
58	I_dev_KL	Joint-related pre-existing conditions - Congenital or developmental disease - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
59	KOOS_4_2	KOOS-PS, subdimension 4, second answer	Dummy
60	PQ_therarth1	Therapies for osteoarthritis-related hip/knee problems in the past year - Information/advice - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy

61	KOOS_5_2	KOOS-PS, subdimension 5, second answer	Dummy
62	I_arth_KL	Joint Surgical History - Other Arthroscopic Procedures - Left Knee - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
63	KOOS_1_3	KOOS-PS, subdimension 1, third answer	Dummy
64	job_4	Job: Part-time	Dummy
65	KOOS_6_4	KOOS-PS, subdimension 6, fourth answer	Dummy

**Table vii.** Selected features for the knee arthroplasty sample and EuroQol-visual analogue scale (EQ-VAS).

<b>N</b>	<b>Variable name</b>	<b>Description</b>	<b>Type</b>
1	EQ_VAS	EQ-VAS score	Numeric
2	age_at_surgery	Age at the day of surgery	Numeric
3	EQ_5D_5L	EQ-5D-5L score	Numeric
4	bmi	Body Mass index	Numeric
5	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
6	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
7	KOOS	KOOS-PS score	Numeric
8	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
9	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
10	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
11	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
12	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
13	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
14	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
15	comono	Self-reported absence of diseases (anamnese)	Dummy
16	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
17	KOOS_3_2	KOOS-PS, subdimension 3, second answer	Dummy
18	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
19	KOOS_2_2	KOOS-PS, subdimension 2, second answer	Dummy
20	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
21	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
22	I_chirno_KL	Joint Surgical History - None - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
23	como_back	Self-reported back arthritis / disease of back (anamnese)	Dummy
24	KOOS_5_4	KOOS-PS, subdimension 5, fourth answer	Dummy



**Table viii.** Selected features for the knee arthroplasty sample and Knee injury and Osteoarthritis Outcome Score-Physical Function Short-form (KOOS-PS).

<b>N</b>	<b>Variable name</b>	<b>Description</b>	<b>Type</b>
1	KOOS	KOOS-PS score	Numeric
2	bmi	Body mass index	Numeric
3	weight	Body weight (in kg) - anamnesis knee- hip arthrosis (PROMoting Quality)	Numeric
4	EQ_5D_5L	EQ-5D-5L score	Numeric
5	height	Body height (in cm) - History of knee-hip osteoarthritis (PROMoting Quality)	Numeric
6	EQ_VAS	EQ-VAS score	Numeric
7	age_at_surgery	Age at the day of surgery	Numeric
8	PQ_pain_KL	Average pain intensity left knee within the last 7 days (1-10)	Numeric
9	PROMIS_fat	Score: Exhaustion - PROMIS Depressiveness & Exhaustion	Numeric
10	PQ_pain_KR	Average pain intensity right knee within the last 7 days (1-10)	Numeric
11	PQ_back	Average pain intensity back within the last 7 days (1-10)	Numeric
12	PROMIS_dep	Score: Depressiveness - PROMIS Depressiveness & Exhaustion	Numeric
13	PQ_pain_HL	Average pain intensity left hip within the last 7 days (1-10)	Numeric
14	PQ_pain_HR	Average pain intensity right hip within the last 7 days (1-10)	Numeric
15	KOOS_6_5	KOOS-PS, subdimension 6, fifth answer	Dummy
16	KOOS_5_3	KOOS-PS, subdimension 5, third answer	Dummy
17	I_chirno_KR	Joint surgical history - None - Knee right - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
18	KOOS_1_2	KOOS-PS, subdimension 1, second answer	Dummy
19	KOOS_7_2	KOOS-PS, subdimension 7, second answer	Dummy
20	KOOS_5_5	KOOS-PS, subdimension 5, fifth answer	Dummy
21	KOOS_5_4	KOOS-PS, subdimension 5, fourth answer	Dummy
22	hospital_8	Hospital_8	Dummy
23	KOOS_2_2	KOOS-PS, subdimension 2, second answer	Dummy
24	PQ_care_gpnutphy	Visited providers for therapy osteoarthritis-related hip/knee problems in past year - Nutritionist/physiotherapist/family physician - History of knee- hip osteoarthritis (PROMoting Quality)	Dummy
25	PROMIS_fat2_2	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: Not at all	Dummy
26	I_arth_KL	Joint Surgical History - Other Arthroscopic Procedures - Left Knee - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
27	PQ_therarth3	Therapies for osteoarthritis-related hip/knee problems in the past year - Non-surgical clinical care - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
28	KOOS_7_5	KOOS-PS, subdimension 7, fifth answer	Dummy

29	duration_weeklyactiv_5	Duration of weekly physical activity: 30 minutes	Dummy
30	PQ_care_ortho	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Orthopedic surgeon - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
31	PQ_therarth2	Therapies for osteoarthritis-related hip/knee problems in the past year - Self-administered care - Anamnesis knee-hip osteoarthritis (PROMoting Quality)	Dummy
32	KOOS_3_2	KOOS-PS, subdimension 3, second answer	Dummy
33	I_chirno_KL	Joint Surgical History - None - Knee Left - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
34	EQ_mobility_3	EQ mobility: I have medium problems with walking	Dummy
35	EQ_dailyactiv_2	EQ daily activity: I have small problems doing my daily activities	Dummy
36	education_3	Highest educational level: Graduated from university	Dummy
37	KOOS_4_2	KOOS-PS, subdimension 4, second answer	Dummy
38	hospital_6	Hospital_6	Dummy
39	como_blood	Self-reported blood pressure disease (anamnese)	Dummy
40	KOOS_3_3	KOOS-PS, subdimension 3, third answer	Dummy
41	gender	Gender	Dummy
42	KOOS_6_4	KOOS-PS, subdimension 6, fourth answer	Dummy
43	education_4	Highest educational level: No degree	Dummy
44	KOOS_7_4	KOOS-PS, subdimension 7, fourth answer	Dummy
45	KOOS_3_4	KOOS-PS, subdimension 3, fourth answer	Dummy
46	PROMIS_fat1_2	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: A bit	Dummy
47	EQ_mobility_4	EQ mobility: I have no problems with walking	Dummy
48	PROMIS_fat4_2	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: Not at all	Dummy
49	comono	Self-reported absence of diseases (anamnese)	Dummy
50	livsituation_2	Living situation: Living alone	Dummy
51	EQ_pain_3	EQ pain: I have no pain or complaints	Dummy
52	PQ_therarth1	Therapies for osteoarthritis-related hip/knee problems in the past year - Information/advice - History of knee-hip osteoarthritis (PROMoting Quality)	Dummy
53	EQ_dailyactiv_3	EQ daily activity: I have huge problems doing my daily activities	Dummy
54	I_dev_KL	Joint-related pre-existing conditions - Congenital or developmental disease - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
55	PQ_arth_KR	Pre-diagnosis of arthrosis - Right knee - Anamnesis knee-hip arthrosis (PROMoting Quality)	Dummy
56	PROMIS_dep3_2	PROMIS Depression, subdimension 3, second answer	Dummy
57	PROMIS_fat1_3	Promis Fatigue Dimension 1: I felt exhausted within the last 7 days: Medium	Dummy
58	jobeffort_4	Physical activity during work: Easy	Dummy
59	KOOS_5_2	KOOS-PS, subdimension 5, second answer	Dummy

60	PQ_OParthno	Operations for therapy of an arthrosis in the past year - None - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
61	I_arth_KR	Joint Surgical History - Other Arthroscopic Procedures - Knee Right - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
62	jobeffort_2	Physical activity during work: Can not judge	Dummy
63	I_dev_KR	Joint-related pre-existing conditions - Congenital or developmental disease - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
64	KOOS_1_3	KOOS-PS, subdimension 1, third answer	Dummy
65	PROMIS_fat3_2	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: Not at all	Dummy
66	job_6	Job: Searching for work (able to work but currently jobless)	Dummy
67	worker	Working at least part-time	Dummy
68	KOOS_4_3	KOOS-PS, subdimension 4, third answer	Dummy
69	KOOS_1_4	KOOS-PS, subdimension 1, fourth answer	Dummy
70	PQ_arth_KL	Pre-diagnosis of arthrosis - Left knee - anamnesis knee-hip arthrosis (PROMoting Quality)	Dummy
71	hospital_4	Hospital_4	Dummy
72	I_no_KR	Joint-related pre-existing conditions - None - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
73	como_heart	Self-reported heart disease (anamnese)	Dummy
74	I_chirno_HL	Joint surgical history - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
75	jobeffort_3	Physical activity during work: Heavy	Dummy
76	job_4	Job: Part-time	Dummy
77	EQ_selfcare_2	EQ selfcare: I do not have problems with cleaning myself or to put clothes on	Dummy
78	EQ_mobility_2	EQ mobility: I have small problems with walking	Dummy
79	PROMIS_fat4_3	Promis Fatigue Dimension 2: I felt exhausted in general within the last 7 days: A bit	Dummy
80	KOOS_7_3	KOOS-PS, subdimension 7, third answer	Dummy
81	I_recon_KR	Joint surgical history - knee ligament reconstruction - right knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
82	PQ_therarthno	Therapies for osteoarthritis-related hip/knee problems in the past year - None - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
83	PROMIS_dep2_2	PROMIS Depression, subdimension 2, second answer	Dummy
84	como_arthritis	Self-reported arthritis (anamnese)	Dummy
85	como_diabetes	Self-reported diabetes (anamnese)	Dummy
86	I_no_KL	Joint-related past medical history - None - Knee left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
87	KOOS_6_3	KOOS-PS, subdimension 6, third answer	Dummy
88	I_no_HL	Joint-related pre-existing conditions - None - Hip left - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
89	KOOS_2_3	KOOS-PS, subdimension 2, third answer	Dummy
90	I_chirno_HR	Joint-related surgical history - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy

91	PROMIS_fat3_3	Promis Fatigue Dimension 2: I felt drained in general within the last 7 days: A bit	Dummy
92	highschool_or_higher	Highest school degree high school or higher	Dummy
93	EQ_pain_4	EQ pain: I have no pain or complaints	Dummy
94	I_no_HR	Joint-related pre-existing conditions - None - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
95	education_2	Highest educational level: Primary school	Dummy
96	KOOS_6_2	KOOS-PS, subdimension 6, second answer	Dummy
97	PQ_arth_HL	Pre-diagnosis of arthrosis - Left hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
98	duration_weeklyactiv_3	Duration of weekly physical activity: About an hour	Dummy
99	EQ_pain_2	EQ pain: I have medium pain or complaints	Dummy
100	EQ_selfcare_3	EQ selfcare: I am not able to clean myself or to put clothes on	Dummy
101	PROMIS_dep3_3	PROMIS Depression, subdimension 3, third answer	Dummy
102	duration_weeklyactiv_4	Duration of weekly physical activity: Zero	Dummy
103	PROMIS_dep4_3	PROMIS Depression, subdimension 4, third answer	Dummy
104	como_back	Self-reported back arthritis / disease of back (anamnese)	Dummy
105	smoker	Smoker - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
106	I_repl_KR	Joint surgical history - joint replacement - knee right - baseline hip/knee osteoarthritis (ICHOM)	Dummy
107	EQ_anxiety_2	EQ anxiety: I'm not scared or depressed	Dummy
108	I_dev_HR	Joint-related pre-existing conditions - Congenital or developmental - Hip r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
109	PQ_careno	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - None - Medical history of knee/hip osteoarthritis (PROMoting Quality)	Dummy
110	I_joint_KL	Joint-related pre-existing conditions - Other joint diseases - Left knee - Baseline hip/knee osteoarthritis (ICHOM)	Dummy
111	job_3	Job: Full-time	Dummy
112	PQ_arth_HR	Pre-diagnosis of arthrosis - Right hip - Anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
113	PQ_care_rheu	Visited providers for therapy of osteoarthritis-related hip/knee problems in the past year - Rheumatologist - History of knee/hip osteoarthritis (PROMoting Quality)	Dummy
114	PROMIS_dep1_2	PROMIS Depression, subdimension 1, second answer	Dummy
115	PQ_OParth_KL	Operations for the therapy of an arthrosis in the past year - Left knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
116	PQ_OParth_KR	Operations for the therapy of an arthrosis in the past year - Right knee - anamnesis knee- hip arthrosis (PROMoting Quality)	Dummy
117	I_joint_KR	Joint-related pre-existing conditions - Other joint diseases - Knee r. - Baseline hip/knee osteoarthritis (ICHOM)	Dummy

118	PQ_therarth4	Therapies for osteoarthritis-related hip/knee problems in the past year - Operations - Anamnesis knee- hip osteoarthritis (PROMoting Quality)	Dummy
119	PROMIS_fat2_3	Promis Fatigue Dimension 2: I felt exhausted within the last 7 days: A bit	Dummy
120	I_repl_HL	Joint Surgical History - Joint Replacement - Left Hip - Baseline Hip/Knee Osteoarthritis (ICHOM)	Dummy
121	como_kidney	Self-reported kindey disease (anamnese)	Dummy
122	hospital_9	Hospital_9	Dummy
123	PROMIS_dep4_2	PROMIS Depression, subdimension 4, second answer	Dummy
124	I_osteotom_KL	Joint surgical history - osteotomy - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
125	como_circulation	Self-reported pain while walking due to circulation disease (anamnese)	Dummy
126	I_repl_KL	Joint surgical history - joint replacement - left knee - baseline hip/knee osteoarthritis (ICHOM)	Dummy
127	como_lung	Self-reported lung comorbidity (anamnese)	Dummy
128	PROMIS_dep2_3	PROMIS Depression, subdimension 2, third answer	Dummy
129	jobeffort_5	Physical activity during work: Medium	Dummy
130	PROMIS_dep1_3	PROMIS Depression, subdimension 1, third answer	Dummy

## Appendix 2: Missing values.

**Table i.** Missing values in the hip arthroplasty sample before imputation.

Variable	Note	Number of missing values
HOOS_1	HOOS-PS, subdimension 1 (before surgery)	1
HOOS_2	HOOS-PS, subdimension 2 (before surgery)	15
HOOS_3	HOOS-PS, subdimension 3 (before surgery)	2
HOOS_4	HOOS-PS, subdimension 4 (before surgery)	7
HOOS_5	HOOS-PS, subdimension 5 (before surgery)	7
HOOS_KOOS	HOOS-PS baseline score (before surgery)	19
HOOS_KOOS_outcome	HOOS outcome score (12 months after surgery)	278
PROMIS_dep_outcome	PROMIS depression outcome score (12 months after surgery)	278
EQ_total_outcome	EQ-5D-5L outcome score (12 months after surgery)	278
EQ_health_outcome	EQ-VAS outcome score (12 months after surgery)	278

**Table ii.** Missing values in the knee arthroplasty sample before imputation.

Variable	Note	Number of missing values
HOOS_KOOS	KOOS-PS baseline score (before surgery)	6
KOOS_3	KOOS-PS, subdimension 3 (before surgery)	1
KOOS_4	KOOS-PS, subdimension 4 (before surgery)	1
KOOS_5	KOOS-PS, subdimension 5 (before surgery)	3
KOOS_6	KOOS-PS, subdimension 6 (before surgery)	1
KOOS_7	KOOS-PS, subdimension 7 (before surgery)	1
HOOS_KOOS_outcome	KOOS outcome score (12 months after surgery)	267
PROMIS_dep_outcome	PROMIS depression outcome score (12 months after surgery)	267
EQ_total_outcome	EQ-5D-5L outcome score (12 months after surgery)	267
EQ_health_outcome	EQ-VAS outcome score (12 months after surgery)	267

**Appendix 3: Tuning parameters.**

**Table i.** Tuning parameters of all models and all patient-reported outcome measures (PROMs).

Sample	PROM	Method	Tuning parameters (according to the h2o package in R)	Values
<b>Knee arthroplasty</b>	KOOS-PS	Neural network	hidden	100
	KOOS-PS	Neural network	rate	0.01
	KOOS-PS	Neural network	activation	MaxoutWithDropout
	EQ-5D-5L	Neural network	hidden	10
	EQ-5D-5L	Neural network	rate	0.001
	EQ-5D-5L	Neural network	activation	TanhWithDropout
	EQ-VAS	Neural network	hidden	100, 100
	EQ-VAS	Neural network	rate	0.1
	EQ-VAS	Neural network	activation	TanhWithDropout
	KOOS-PS	Gradient boosting machine	max_depth	1
	KOOS-PS	Gradient boosting machine	ntrees	100
	EQ-5D-5L	Gradient boosting machine	max_depth	1
	EQ-5D-5L	Gradient boosting machine	ntrees	100
	EQ-VAS	Gradient boosting machine	max_depth	1
	EQ-VAS	Gradient boosting machine	ntrees	250
	KOOS-PS	Random forest	mtries	5
	KOOS-PS	Random forest	ntrees	100
	KOOS-PS	Random forest	max_depth	10
	KOOS-PS	Random forest	nbins	30

	EQ-5D-5L	Random forest	mtries	2
	EQ-5D-5L	Random forest	ntrees	500
	EQ-5D-5L	Random forest	max_depth	10
	EQ-5D-5L	Random forest	nbins	25
	EQ-VAS	Random forest	mtries	5
	EQ-VAS	Random forest	ntrees	500
	EQ-VAS	Random forest	max_depth	10
	EQ-VAS	Random forest	nbins	25
	KOOS-PS	Elastic net	alpha	0.4
	KOOS-PS	Elastic net	lambda	0.005
	EQ-5D-5L	Elastic net	alpha	0.5
	EQ-5D-5L	Elastic net	lambda	0.03
	EQ-VAS	Elastic net	alpha	0.4
	EQ-VAS	Elastic net	lambda	0.02
	KOOS-PS	Ridge	alpha	0
	KOOS-PS	Ridge	lambda	0.05
	EQ-5D-5L	Ridge	alpha	0
	EQ-5D-5L	Ridge	lambda	0.2
	EQ-VAS	Ridge	alpha	0
	EQ-VAS	Ridge	lambda	0.04
	KOOS-PS	LASSO	alpha	1
	KOOS-PS	LASSO	lambda	0.01
	EQ-5D-5L	LASSO	alpha	1
	EQ-5D-5L	LASSO	lambda	0.01
	EQ-VAS	LASSO	alpha	1
	EQ-VAS	LASSO	lambda	0.01
<b>Hip arthroplasty</b>	HOOS-PS	Neural network	hidden	100, 100
	HOOS-PS	Neural network	rate	0.01
	HOOS-PS	Neural network	activation	RectifierWithDropout
	EQ-5D-5L	Neural network	hidden	100
	EQ-5D-5L	Neural network	rate	0.1
	EQ-5D-5L	Neural network	activation	TanhWithDropout
	EQ-VAS	Neural network	hidden	100



EQ-VAS	Neural network	rate	0.1
EQ-VAS	Neural network	activation	RectifierWithDropout
HOOS-PS	Gradient boosting machine	max_depth	1
HOOS-PS	Gradient boosting machine	ntrees	500
EQ-5D-5L	Gradient boosting machine	max_depth	3
EQ-5D-5L	Gradient boosting machine	ntrees	25
EQ-VAS	Gradient boosting machine	max_depth	3
EQ-VAS	Gradient boosting machine	ntrees	50
HOOS-PS	Random forest	mtries	2
HOOS-PS	Random forest	ntrees	250
HOOS-PS	Random forest	max_depth	10
HOOS-PS	Random forest	nbins	30
EQ-5D-5L	Random forest	mtries	10
EQ-5D-5L	Random forest	ntrees	100
EQ-5D-5L	Random forest	max_depth	10
EQ-5D-5L	Random forest	nbins	20
EQ-VAS	Random forest	mtries	10
EQ-VAS	Random forest	ntrees	250
EQ-VAS	Random forest	max_depth	10
EQ-VAS	Random forest	nbins	25
HOOS-PS	Elastic net	alpha	0.1
HOOS-PS	Elastic net	lambda	0.01
EQ-5D-5L	Elastic net	alpha	0.5
EQ-5D-5L	Elastic net	lambda	0.02

EQ-VAS	Elastic net	alpha	0.2
EQ-VAS	Elastic net	lambda	0.02
HOOS-PS	Ridge	alpha	0
HOOS-PS	Ridge	lambda	0.03
EQ-5D-5L	Ridge	alpha	0
EQ-5D-5L	Ridge	lambda	0.1
EQ-VAS	Ridge	alpha	0
EQ-VAS	Ridge	lambda	0.05
HOOS-PS	LASSO	alpha	1
HOOS-PS	LASSO	lambda	0.001
EQ-5D-5L	LASSO	alpha	1
EQ-5D-5L	LASSO	lambda	0.01
EQ-VAS	LASSO	alpha	1
EQ-VAS	LASSO	lambda	0.001

**Appendix 4. All discrimination and calibration metrics for training and performance assessment.**

**Table i.** Total hip arthroplasty: All discrimination metrics on training data with 5-fold cross-validation.

<b>Performance indicator</b>	<b>Neural network</b>	<b>Gradient boosting</b>	<b>LASSO</b>	<b>Ridge</b>	<b>Elastic Net</b>	<b>Random forest</b>	<b>Logistic regression</b>	<b>Pre-surgery PROM scores</b>
<b>EQ-5D-5L (n = 1,159)</b>								
Accuracy	0.79 (0.77 to 0.82)	0.78 (0.76 to 0.8)	0.79 (0.77 to 0.82)	0.79 (0.76 to 0.81)	0.79 (0.77 to 0.81)	0.8 (0.77 to 0.82)	0.79 (0.76 to 0.81)	0.74 (0.68 to 0.8)
AUC	0.85 (0.83 to 0.87)	0.86 (0.83 to 0.88)	0.85 (0.83 to 0.87)	0.85 (0.83 to 0.87)	0.85 (0.83 to 0.87)	0.86 (0.84 to 0.88)	0.85 (0.83 to 0.87)	0.79 (0.73 to 0.84)
G-mean	0.8 (0.78 to 0.82)	0.78 (0.76 to 0.81)	0.79 (0.77 to 0.81)	0.79 (0.76 to 0.81)	0.79 (0.76 to 0.81)	0.79 (0.77 to 0.82)	0.79 (0.77 to 0.81)	0.72 (0.66 to 0.78)
Sensitivity	0.78 (0.76 to 0.81)	0.78 (0.75 to 0.8)	0.8 (0.77 to 0.82)	0.79 (0.76 to 0.81)	0.79 (0.77 to 0.81)	0.8 (0.78 to 0.82)	0.78 (0.76 to 0.81)	0.75 (0.69 to 0.81)
Specificity	0.82 (0.8 to 0.84)	0.79 (0.77 to 0.81)	0.79 (0.76 to 0.81)	0.79 (0.76 to 0.81)	0.79 (0.76 to 0.81)	0.79 (0.77 to 0.81)	0.8 (0.78 to 0.82)	0.69 (0.63 to 0.76)
Youden Index	0.6 (0.57 to 0.63)	0.57 (0.54 to 0.6)	0.58 (0.55 to 0.61)	0.57 (0.55 to 0.6)	0.58 (0.55 to 0.6)	0.59 (0.56 to 0.62)	0.58 (0.55 to 0.61)	0.45 (0.37 to 0.52)
<b>EQ-VAS (n = 1,455)</b>								
Accuracy	0.74 (0.72 to 0.76)	0.75 (0.73 to 0.77)	0.74 (0.71 to 0.76)	0.75 (0.73 to 0.77)	0.76 (0.73 to 0.78)	0.74 (0.72 to 0.77)	0.76 (0.74 to 0.78)	0.78 (0.74 to 0.83)
AUC	0.79 (0.77 to 0.82)	0.8 (0.78 to 0.82)	0.8 (0.78 to 0.82)	0.8 (0.77 to 0.82)	0.8 (0.77 to 0.82)	0.8 (0.77 to 0.82)	0.8 (0.78 to 0.82)	0.8 (0.75 to 0.84)
G-mean	0.73 (0.7 to 0.75)	0.78 (0.76 to 0.8)	0.73 (0.71 to 0.76)	0.73 (0.71 to 0.76)	0.73 (0.71 to 0.76)	0.74 (0.72 to 0.76)	0.74 (0.71 to 0.76)	0.73 (0.68 to 0.78)
Sensitivity	0.77 (0.74 to 0.79)	0.78 (0.76 to 0.8)	0.74 (0.72 to 0.76)	0.78 (0.75 to 0.8)	0.79 (0.77 to 0.81)	0.75 (0.73 to 0.77)	0.81 (0.79 to 0.83)	0.87 (0.83 to 0.9)
Specificity	0.69 (0.66 to 0.71)	0.79 (0.77 to 0.81)	0.73 (0.71 to 0.75)	0.69 (0.67 to 0.72)	0.68 (0.66 to 0.71)	0.72 (0.7 to 0.75)	0.67 (0.64 to 0.69)	0.61 (0.56 to 0.67)
Youden Index	0.45 (0.43 to 0.48)	0.49 (0.46 to 0.51)	0.47 (0.44 to 0.49)	0.47 (0.44 to 0.49)	0.47 (0.45 to 0.5)	0.48 (0.45 to 0.5)	0.48 (0.45 to 0.5)	0.48 (0.42 to 0.55)
<b>HOOS-PS (n = 1,463)</b>								

Accuracy	0.73 (0.71 to 0.76)	0.69 (0.67 to 0.71)	0.7 (0.67 to 0.72)	0.72 (0.69 to 0.74)	0.7 (0.67 to 0.72)	0.71 (0.69 to 0.74)	0.66 (0.64 to 0.69)	0.87 (0.83 to 0.92)
AUC	0.73 (0.69 to 0.77)	0.75 (0.71 to 0.78)	0.76 (0.72 to 0.79)	0.75 (0.71 to 0.78)	0.75 (0.71 to 0.79)	0.74 (0.71 to 0.78)	0.76 (0.73 to 0.8)	0.58 (0.47 to 0.68)
G-mean	0.66 (0.64 to 0.69)	0.69 (0.67 to 0.71)	0.7 (0.67 to 0.72)	0.7 (0.67 to 0.72)	0.69 (0.67 to 0.72)	0.68 (0.66 to 0.71)	0.7 (0.68 to 0.73)	0.5 (0.38 to 0.61)
Sensitivity	0.75 (0.73 to 0.77)	0.69 (0.66 to 0.71)	0.7 (0.67 to 0.72)	0.72 (0.7 to 0.74)	0.7 (0.67 to 0.72)	0.72 (0.7 to 0.74)	0.65 (0.63 to 0.68)	0.92 (0.89 to 0.96)
Specificity	0.59 (0.56 to 0.61)	0.69 (0.67 to 0.72)	0.69 (0.67 to 0.72)	0.67 (0.65 to 0.7)	0.69 (0.67 to 0.72)	0.65 (0.62 to 0.67)	0.76 (0.74 to 0.78)	0.27 (0.16 to 0.38)
Youden Index	0.34 (0.31 to 0.36)	0.38 (0.36 to 0.41)	0.39 (0.37 to 0.42)	0.39 (0.37 to 0.42)	0.39 (0.36 to 0.41)	0.37 (0.35 to 0.39)	0.41 (0.39 to 0.44)	0.19 (0.09 to 0.29)

**Table ii.** Total knee arthroplasty: all discrimination metrics on training data with fivefold cross-validation.

Performance indicator	Neural network	Gradient boosting	LASSO	Ridge	Elastic net	Random forest	Logistic regression	Pre-surgery PROM scores
<b>EQ-5D-5L (n = 1,150)</b>								
Accuracy	0.74 (0.71 to 0.77)	0.76 (0.74 to 0.78)	0.77 (0.74 to 0.79)	0.72 (0.69 to 0.75)	0.74 (0.71 to 0.76)	0.76 (0.73 to 0.78)	0.73 (0.71 to 0.76)	0.76 (0.71 to 0.82)
AUC	0.79 (0.76 to 0.81)	0.82 (0.8 to 0.85)	0.81 (0.78 to 0.83)	0.8 (0.77 to 0.82)	0.8 (0.78 to 0.83)	0.8 (0.78 to 0.83)	0.8 (0.78 to 0.83)	0.76 (0.7 to 0.81)
G-mean	0.73 (0.71 to 0.76)	0.76 (0.74 to 0.79)	0.75 (0.72 to 0.77)	0.73 (0.71 to 0.76)	0.74 (0.72 to 0.77)	0.75 (0.73 to 0.78)	0.74 (0.71 to 0.76)	0.73 (0.67 to 0.79)
Sensitivity	0.75 (0.73 to 0.78)	0.75 (0.73 to 0.78)	0.8 (0.77 to 0.82)	0.7 (0.67 to 0.72)	0.73 (0.7 to 0.75)	0.76 (0.74 to 0.79)	0.73 (0.7 to 0.75)	0.81 (0.76 to 0.86)
Specificity	0.72 (0.69 to 0.74)	0.77 (0.75 to 0.8)	0.7 (0.67 to 0.73)	0.77 (0.75 to 0.79)	0.76 (0.74 to 0.79)	0.74 (0.72 to 0.77)	0.75 (0.72 to 0.77)	0.67 (0.6 to 0.73)
Youden Index	0.47 (0.44 to 0.49)	0.53 (0.5 to 0.56)	0.5 (0.47 to 0.53)	0.47 (0.44 to 0.5)	0.49 (0.46 to 0.52)	0.5 (0.47 to 0.53)	0.47 (0.44 to 0.5)	0.47 (0.4 to 0.55)
<b>EQ-VAS (n = 1,224)</b>								
Accuracy	0.71 (0.68 to 0.74)	0.71 (0.68 to 0.73)	0.71 (0.68 to 0.73)	0.69 (0.66 to 0.72)	0.71 (0.69 to 0.74)	0.74 (0.71 to 0.76)	0.69 (0.66 to 0.71)	0.7 (0.65 to 0.76)
AUC	0.74 (0.72 to 0.77)	0.77 (0.75 to 0.8)	0.77 (0.74 to 0.8)	0.77 (0.74 to 0.79)	0.77 (0.74 to 0.8)	0.76 (0.73 to 0.78)	0.77 (0.74 to 0.79)	0.75 (0.7 to 0.81)
G-mean	0.69 (0.67 to 0.72)	0.76 (0.74 to 0.79)	0.71 (0.68 to 0.73)	0.71 (0.68 to 0.73)	0.71 (0.69 to 0.74)	0.71 (0.68 to 0.73)	0.71 (0.68 to 0.73)	0.69 (0.63 to 0.75)
Sensitivity	0.74 (0.72 to 0.77)	0.75 (0.73 to 0.78)	0.7 (0.68 to 0.73)	0.65 (0.62 to 0.68)	0.71 (0.68 to 0.73)	0.79 (0.77 to 0.81)	0.64 (0.62 to 0.67)	0.74 (0.68 to 0.79)
Specificity	0.65 (0.62 to 0.67)	0.77 (0.75 to 0.8)	0.72 (0.69 to 0.74)	0.77 (0.74 to 0.79)	0.72 (0.69 to 0.74)	0.63 (0.6 to 0.66)	0.78 (0.75 to 0.8)	0.64 (0.58 to 0.7)
Youden Index	0.39 (0.36 to 0.42)	0.42 (0.39 to 0.44)	0.42 (0.39 to 0.45)	0.42 (0.39 to 0.45)	0.43 (0.4 to 0.45)	0.42 (0.39 to 0.45)	0.42 (0.39 to 0.45)	0.38 (0.32 to 0.45)
<b>KOOS-PS (n = 1,235)</b>								
Accuracy	0.61 (0.58 to 0.64)	0.59 (0.56 to 0.61)	0.59 (0.56 to 0.62)	0.58 (0.55 to 0.61)	0.61 (0.58 to 0.64)	0.66 (0.64 to 0.69)	0.61 (0.58 to 0.64)	0.76 (0.71 to 0.82)

AUC	0.61 (0.57 to 0.65)	0.64 (0.61 to 0.68)	0.67 (0.64 to 0.71)	0.65 (0.62 to 0.69)	0.67 (0.63 to 0.7)	0.68 (0.64 to 0.71)	0.67 (0.64 to 0.71)	0.74 (0.68 to 0.8)
G-mean	0.59 (0.56 to 0.62)	0.6 (0.57 to 0.63)	0.62 (0.6 to 0.65)	0.62 (0.59 to 0.65)	0.62 (0.59 to 0.64)	0.63 (0.6 to 0.66)	0.62 (0.59 to 0.65)	0.67 (0.6 to 0.73)
Sensitivity	0.62 (0.59 to 0.64)	0.58 (0.55 to 0.61)	0.57 (0.54 to 0.6)	0.56 (0.53 to 0.59)	0.6 (0.58 to 0.63)	0.68 (0.65 to 0.71)	0.6 (0.57 to 0.63)	0.83 (0.78 to 0.87)
Specificity	0.57 (0.54 to 0.6)	0.62 (0.6 to 0.65)	0.68 (0.65 to 0.71)	0.69 (0.66 to 0.72)	0.63 (0.6 to 0.66)	0.58 (0.55 to 0.61)	0.64 (0.61 to 0.67)	0.54 (0.46 to 0.61)
Youden Index	0.19 (0.16 to 0.21)	0.2 (0.18 to 0.23)	0.25 (0.23 to 0.28)	0.25 (0.23 to 0.27)	0.23 (0.21 to 0.26)	0.26 (0.24 to 0.29)	0.24 (0.22 to 0.26)	0.36 (0.29 to 0.44)

**Table iii.** Total hip arthroplasty: all discrimination metrics on unforeseen test data.

Performance indicator	Neural network	Gradient boosting	LASSO	Ridge	Elastic net	Random forest	Logistic regression	Pre-surgery PROM scores
<b>EQ-5D-5L (n = 290)</b>								
Accuracy	0.76 (0.71 to 0.8)	0.72 (0.67 to 0.77)	0.73 (0.68 to 0.79)	0.73 (0.68 to 0.79)	0.72 (0.67 to 0.78)	0.72 (0.67 to 0.78)	0.73 (0.68 to 0.79)	0.74 (0.68 to 0.8)
AUC	0.8 (0.75 to 0.86)	0.81 (0.76 to 0.86)	0.81 (0.76 to 0.86)	0.8 (0.75 to 0.85)	0.81 (0.76 to 0.86)	0.81 (0.75 to 0.86)	0.81 (0.76 to 0.86)	0.79 (0.73 to 0.84)
Brier Score	0.15 (0.11 to 0.19)	0.14 (0.11 to 0.18)	0.15 (0.11 to 0.18)	0.15 (0.11 to 0.18)	0.14 (0.11 to 0.18)	0.14 (0.11 to 0.18)	0.15 (0.11 to 0.18)	0.26 (0.22 to 0.31)
Calibration intercept	0.15 (-0.2 to 0.51)	0.13 (-0.23 to 0.49)	0.2 (-0.14 to 0.55)	0.18 (-0.17 to 0.53)	0.13 (-0.22 to 0.48)	0.21 (-0.14 to 0.56)	0.22 (-0.13 to 0.56)	0.52 (0.44 to 0.6)
Calibration slope	0.63 (0.45 to 0.82)	0.8 (0.59 to 1.03)	0.72 (0.52 to 0.95)	0.8 (0.58 to 1.05)	0.85 (0.62 to 1.12)	0.8 (0.57 to 1.05)	0.7 (0.51 to 0.93)	0.36 (0.27 to 0.46)
G-mean	0.74 (0.69 to 0.79)	0.75 (0.7 to 0.8)	0.74 (0.69 to 0.79)	0.73 (0.67 to 0.78)	0.73 (0.68 to 0.78)	0.74 (0.69 to 0.79)	0.74 (0.69 to 0.79)	0.72 (0.66 to 0.78)
Sensitivity	0.77 (0.72 to 0.81)	0.68 (0.63 to 0.74)	0.73 (0.68 to 0.78)	0.74 (0.69 to 0.79)	0.72 (0.67 to 0.77)	0.71 (0.66 to 0.76)	0.73 (0.68 to 0.78)	0.75 (0.69 to 0.81)
Specificity	0.72 (0.67 to 0.77)	0.82 (0.78 to 0.86)	0.75 (0.7 to 0.8)	0.71 (0.66 to 0.76)	0.74 (0.69 to 0.79)	0.76 (0.72 to 0.81)	0.75 (0.7 to 0.8)	0.69 (0.63 to 0.76)
Youden Index	0.49 (0.43 to 0.55)	0.5 (0.45 to 0.56)	0.48 (0.42 to 0.54)	0.45 (0.39 to 0.51)	0.46 (0.4 to 0.51)	0.47 (0.42 to 0.53)	0.48 (0.42 to 0.54)	0.45 (0.37 to 0.52)
<b>EQ-VAS (n = 364)</b>								
Accuracy	0.76 (0.72 to 0.81)	0.76 (0.71 to 0.8)	0.79 (0.75 to 0.83)	0.77 (0.73 to 0.82)	0.79 (0.74 to 0.83)	0.8 (0.76 to 0.84)	0.77 (0.73 to 0.82)	0.78 (0.74 to 0.83)
AUC	0.82 (0.78 to 0.86)	0.83 (0.79 to 0.87)	0.84 (0.8 to 0.88)	0.84 (0.8 to 0.88)	0.84 (0.8 to 0.88)	0.84 (0.8 to 0.88)	0.84 (0.8 to 0.88)	0.8 (0.75 to 0.84)
Brier Score	0.16 (0.12 to 0.2)	0.15 (0.12 to 0.19)	0.15 (0.11 to 0.19)	0.15 (0.12 to 0.19)	0.15 (0.12 to 0.19)	0.15 (0.11 to 0.19)	0.15 (0.11 to 0.19)	0.22 (0.17 to 0.26)
Calibration intercept	0.21 (-0.05 to 0.47)	0.07 (-0.22 to 0.35)	0.08 (-0.2 to 0.35)	0.01 (-0.27 to 0.29)	-0.09 (-0.38 to 0.19)	0.03 (-0.26 to 0.31)	0.09 (-0.19 to 0.36)	0.3 (0.22 to 0.38)

Calibration slope	0.86 (0.67 to 1.08)	0.98 (0.78 to 1.21)	1.15 (0.9 to 1.42)	1.27 (0.99 to 1.57)	1.45 (1.14 to 1.79)	1.19 (0.95 to 1.47)	1.13 (0.88 to 1.4)	0.52 (0.43 to 0.61)
G-mean	0.76 (0.72 to 0.81)	0.77 (0.72 to 0.81)	0.77 (0.73 to 0.82)	0.77 (0.73 to 0.81)	0.77 (0.73 to 0.82)	0.79 (0.74 to 0.83)	0.77 (0.73 to 0.82)	0.73 (0.68 to 0.78)
Sensitivity	0.77 (0.73 to 0.81)	0.73 (0.69 to 0.78)	0.82 (0.78 to 0.86)	0.78 (0.74 to 0.82)	0.81 (0.77 to 0.85)	0.83 (0.79 to 0.87)	0.77 (0.73 to 0.81)	0.87 (0.83 to 0.9)
Specificity	0.75 (0.71 to 0.8)	0.8 (0.76 to 0.84)	0.73 (0.68 to 0.78)	0.76 (0.72 to 0.81)	0.74 (0.69 to 0.78)	0.75 (0.7 to 0.79)	0.78 (0.74 to 0.82)	0.61 (0.56 to 0.67)
Youden Index	0.52 (0.47 to 0.57)	0.53 (0.48 to 0.59)	0.55 (0.5 to 0.6)	0.54 (0.49 to 0.59)	0.55 (0.5 to 0.6)	0.57 (0.52 to 0.62)	0.55 (0.5 to 0.6)	0.48 (0.42 to 0.55)
<b>HOOS-PS (n = 366)</b>								
Accuracy	0.72 (0.68 to 0.77)	0.66 (0.61 to 0.71)	0.58 (0.53 to 0.63)	0.63 (0.58 to 0.68)	0.6 (0.55 to 0.65)	0.62 (0.57 to 0.67)	0.58 (0.53 to 0.63)	0.87 (0.83 to 0.92)
AUC	0.71 (0.65 to 0.76)	0.67 (0.62 to 0.72)	0.66 (0.61 to 0.72)	0.71 (0.66 to 0.76)	0.71 (0.65 to 0.76)	0.64 (0.58 to 0.69)	0.67 (0.61 to 0.72)	0.58 (0.47 to 0.68)
Brier Score	0.07 (0.04 to 0.09)	0.07 (0.04 to 0.09)	0.07 (0.05 to 0.1)	0.07 (0.04 to 0.09)	0.07 (0.04 to 0.09)	0.07 (0.04 to 0.09)	0.07 (0.05 to 0.1)	0.87 (0.84 to 0.91)
Calibration intercept	0.23 (-1.07 to 1.55)	1.02 (0.07 to 2.06)	1.49 (0.69 to 2.37)	0.67 (-0.37 to 1.77)	0.84 (-0.13 to 1.86)	1.16 (0.07 to 2.33)	1.46 (0.66 to 2.35)	0.94 (0.92 to 0.97)
Calibration slope	0.67 (0.29 to 1.08)	0.66 (0.24 to 1.1)	0.41 (0.1 to 0.73)	0.83 (0.36 to 1.32)	0.74 (0.32 to 1.19)	0.61 (0.13 to 1.12)	0.42 (0.11 to 0.75)	-0.15 (-0.24 to -0.06)
G-mean	0.67 (0.62 to 0.72)	0.64 (0.59 to 0.69)	0.66 (0.61 to 0.71)	0.69 (0.64 to 0.74)	0.69 (0.64 to 0.74)	0.63 (0.58 to 0.68)	0.66 (0.61 to 0.71)	0.5 (0.38 to 0.61)
Sensitivity	0.73 (0.68 to 0.77)	0.66 (0.61 to 0.71)	0.56 (0.51 to 0.61)	0.61 (0.56 to 0.66)	0.59 (0.53 to 0.64)	0.61 (0.56 to 0.66)	0.57 (0.52 to 0.62)	0.92 (0.89 to 0.96)
Specificity	0.62 (0.57 to 0.67)	0.62 (0.57 to 0.67)	0.77 (0.73 to 0.81)	0.77 (0.73 to 0.81)	0.81 (0.77 to 0.85)	0.65 (0.61 to 0.7)	0.77 (0.73 to 0.81)	0.27 (0.16 to 0.38)
Youden Index	0.34 (0.3 to 0.39)	0.28 (0.23 to 0.32)	0.33 (0.28 to 0.38)	0.38 (0.33 to 0.43)	0.39 (0.34 to 0.44)	0.27 (0.22 to 0.31)	0.34 (0.29 to 0.39)	0.19 (0.09 to 0.29)



**Table iv.** Total knee arthroplasty: all discrimination metrics on unforeseen test data.

Performance indicator	Neural network	Gradient boosting	LASSO	Ridge	Elastic net	Random forest	Logistic regression	Pre-surgery PROM scores
<b>EQ-5D-5L (n = 288)</b>								
Accuracy	0.73 (0.67 to 0.78)	0.79 (0.74 to 0.84)	0.75 (0.7 to 0.8)	0.72 (0.66 to 0.77)	0.77 (0.72 to 0.82)	0.8 (0.76 to 0.85)	0.72 (0.67 to 0.77)	0.76 (0.71 to 0.82)
AUC	0.76 (0.7 to 0.81)	0.79 (0.74 to 0.84)	0.75 (0.69 to 0.8)	0.75 (0.69 to 0.81)	0.76 (0.7 to 0.81)	0.8 (0.74 to 0.85)	0.74 (0.68 to 0.8)	0.76 (0.7 to 0.81)
Brier Score	0.18 (0.14 to 0.22)	0.13 (0.09 to 0.17)	0.17 (0.13 to 0.22)	0.18 (0.13 to 0.22)	0.17 (0.13 to 0.22)	0.16 (0.12 to 0.2)	0.18 (0.14 to 0.22)	0.24 (0.19 to 0.28)
Calibration intercept	-0.14 (-0.51 to 0.23)	-0.43 (-0.8 to -0.07)	0.22 (-0.1 to 0.53)	0.2 (-0.11 to 0.52)	0.07 (-0.26 to 0.41)	-0.17 (-0.53 to 0.18)	0.29 (-0.01 to 0.6)	0.4 (0.32 to 0.48)
Calibration slope	0.63 (0.45 to 0.83)	1.49 (1.18 to 1.84)	0.64 (0.43 to 0.87)	0.67 (0.47 to 0.9)	0.86 (0.58 to 1.16)	1.2 (0.9 to 1.54)	0.52 (0.34 to 0.71)	0.45 (0.35 to 0.55)
G-mean	0.72 (0.66 to 0.77)	0.74 (0.69 to 0.79)	0.73 (0.68 to 0.78)	0.72 (0.67 to 0.78)	0.74 (0.69 to 0.79)	0.75 (0.7 to 0.8)	0.72 (0.67 to 0.78)	0.73 (0.67 to 0.79)
Sensitivity	0.74 (0.69 to 0.79)	0.85 (0.81 to 0.89)	0.78 (0.73 to 0.83)	0.7 (0.65 to 0.75)	0.81 (0.76 to 0.85)	0.87 (0.83 to 0.91)	0.71 (0.66 to 0.76)	0.81 (0.76 to 0.86)
Specificity	0.69 (0.64 to 0.74)	0.64 (0.59 to 0.7)	0.68 (0.62 to 0.73)	0.75 (0.7 to 0.8)	0.68 (0.62 to 0.73)	0.64 (0.59 to 0.7)	0.74 (0.68 to 0.79)	0.67 (0.6 to 0.73)
Youden Index	0.43 (0.37 to 0.49)	0.49 (0.44 to 0.55)	0.46 (0.4 to 0.52)	0.45 (0.39 to 0.51)	0.48 (0.43 to 0.54)	0.51 (0.46 to 0.57)	0.45 (0.39 to 0.5)	0.47 (0.4 to 0.55)
<b>EQ-VAS (n = 307)</b>								
Accuracy	0.71 (0.66 to 0.76)	0.7 (0.65 to 0.75)	0.73 (0.68 to 0.78)	0.71 (0.66 to 0.76)	0.72 (0.67 to 0.77)	0.73 (0.68 to 0.78)	0.72 (0.67 to 0.77)	0.7 (0.65 to 0.76)
AUC	0.73 (0.67 to 0.78)	0.74 (0.69 to 0.8)	0.76 (0.71 to 0.82)	0.76 (0.7 to 0.81)	0.76 (0.71 to 0.82)	0.73 (0.68 to 0.79)	0.76 (0.7 to 0.81)	0.75 (0.7 to 0.81)
Brier Score	0.2 (0.15 to 0.24)	0.19 (0.15 to 0.23)	0.19 (0.14 to 0.23)	0.19 (0.14 to 0.23)	0.19 (0.14 to 0.23)	0.19 (0.15 to 0.24)	0.19 (0.14 to 0.23)	0.3 (0.25 to 0.35)
Calibration intercept	0.08 (-0.2 to 0.35)	-0.08 (-0.39 to 0.22)	-0.18 (-0.49 to 0.13)	-0.11 (-0.41 to 0.19)	-0.22 (-0.55 to 0.09)	-0.05 (-0.36 to 0.24)	-0.05 (-0.35 to 0.24)	0.41 (0.34 to 0.49)

Calibration slope	0.73 (0.51 to 0.96)	0.96 (0.69 to 1.26)	1.11 (0.81 to 1.43)	0.99 (0.71 to 1.29)	1.2 (0.87 to 1.55)	0.93 (0.66 to 1.21)	0.88 (0.64 to 1.15)	0.37 (0.27 to 0.47)
G-mean	0.69 (0.64 to 0.75)	0.74 (0.69 to 0.79)	0.73 (0.68 to 0.78)	0.71 (0.66 to 0.77)	0.72 (0.67 to 0.77)	0.7 (0.65 to 0.75)	0.72 (0.67 to 0.77)	0.69 (0.63 to 0.75)
Sensitivity	0.74 (0.69 to 0.79)	0.85 (0.81 to 0.89)	0.74 (0.69 to 0.79)	0.7 (0.65 to 0.75)	0.71 (0.66 to 0.76)	0.78 (0.74 to 0.83)	0.71 (0.66 to 0.76)	0.74 (0.68 to 0.79)
Specificity	0.65 (0.6 to 0.71)	0.64 (0.59 to 0.7)	0.71 (0.66 to 0.76)	0.73 (0.68 to 0.78)	0.72 (0.67 to 0.77)	0.62 (0.57 to 0.68)	0.72 (0.67 to 0.77)	0.64 (0.58 to 0.7)
Youden Index	0.39 (0.34 to 0.44)	0.4 (0.34 to 0.45)	0.46 (0.4 to 0.51)	0.43 (0.37 to 0.48)	0.44 (0.38 to 0.49)	0.41 (0.35 to 0.46)	0.44 (0.38 to 0.49)	0.38 (0.32 to 0.45)
<b>KOOS-PS (n = 309)</b>								
Accuracy	0.63 (0.58 to 0.69)	0.59 (0.53 to 0.64)	0.75 (0.71 to 0.8)	0.72 (0.68 to 0.77)	0.74 (0.69 to 0.79)	0.65 (0.6 to 0.7)	0.73 (0.68 to 0.78)	0.76 (0.71 to 0.82)
AUC	0.68 (0.62 to 0.75)	0.71 (0.64 to 0.77)	0.75 (0.69 to 0.81)	0.73 (0.67 to 0.79)	0.76 (0.7 to 0.82)	0.69 (0.63 to 0.76)	0.76 (0.7 to 0.81)	0.74 (0.68 to 0.8)
Brier Score	0.2 (0.15 to 0.24)	0.13 (0.09 to 0.17)	0.15 (0.11 to 0.19)	0.16 (0.12 to 0.2)	0.15 (0.11 to 0.19)	0.16 (0.12 to 0.2)	0.15 (0.11 to 0.19)	0.76 (0.72 to 0.81)
Calibration intercept	0.22 (-0.3 to 0.74)	-1.31 (-2.26 to -0.45)	-0.8 (-1.53 to -0.11)	-0.34 (-0.98 to 0.28)	-1.12 (-1.93 to -0.35)	-0.82 (-1.72 to 0.04)	-0.94 (-1.7 to -0.22)	0.87 (0.82 to 0.92)
Calibration slope	0.23 (0.13 to 0.33)	1.76 (1.22 to 2.38)	1.33 (0.9 to 1.81)	0.98 (0.62 to 1.37)	1.55 (1.06 to 2.1)	1.42 (0.85 to 2.04)	1.43 (0.97 to 1.93)	-0.33 (-0.43 to -0.23)
G-mean	0.66 (0.61 to 0.71)	0.64 (0.59 to 0.7)	0.7 (0.65 to 0.75)	0.69 (0.64 to 0.74)	0.71 (0.66 to 0.76)	0.68 (0.63 to 0.73)	0.71 (0.66 to 0.76)	0.67 (0.6 to 0.73)
Sensitivity	0.61 (0.56 to 0.67)	0.53 (0.48 to 0.59)	0.79 (0.74 to 0.83)	0.75 (0.7 to 0.8)	0.76 (0.71 to 0.8)	0.63 (0.57 to 0.68)	0.74 (0.69 to 0.79)	0.83 (0.78 to 0.87)
Specificity	0.72 (0.67 to 0.77)	0.78 (0.73 to 0.82)	0.63 (0.57 to 0.68)	0.64 (0.59 to 0.7)	0.67 (0.62 to 0.72)	0.73 (0.68 to 0.78)	0.69 (0.63 to 0.74)	0.54 (0.46 to 0.61)
Youden Index	0.33 (0.28 to 0.38)	0.31 (0.26 to 0.36)	0.42 (0.36 to 0.47)	0.39 (0.34 to 0.44)	0.43 (0.37 to 0.48)	0.36 (0.31 to 0.41)	0.43 (0.37 to 0.48)	0.36 (0.29 to 0.44)