

625 **Supplemental Table 1:** List of 112 predictors included in data exploration

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<b>Demographics</b>			<b>Type of variable</b>
	p01bmi	BMI	Continuous
	v00age	age	Continuous
	p02sex_01	sex	Categorical
	p02race	Race	Categorical
	p02hispanic	Hispanic	Continuous
	v00abcirc	EV: Abdominal circumference (cm)	Continuous
	v00bpsys	EV:Q6.Blood pressure: systolic (mm Hg)	Continuous
	v00bpdias	EV:Q6.Blood pressure: diastolic (mm Hg)	Continuous
	v00rpavg	EV: Radial pulse: average beats per minute	Continuous
<b>History</b>			
	p02famhkr	IEI:Q15.Mother, father, sister, or brother (blood relative) had knee repl surgery	Categorical
	p01famhr	SV:Q12.Mother, father, sister, or brother (blood relative) had hip replacement	Categorical
	p01famkr	SV:Q13.Mother, father, sister, or brother (blood relative) had knee replacement	Categorical
	p01brohrcv	SV:Q12d.Brother had hip replacement surgery	Categorical
	p01momkrcv	SV:Q13a.Mother had knee replacement surgery	Categorical
	p01dadkrcv	SV:Q13b.Father had knee replacement surgery	Categorical
	p01siskrcv	SV:Q13c.Sister had knee replacement surgery	Categorical

	p01brokrvcv	SV:Q13d.Brother had knee replacement surgery	Categorical
	p01injr	SV:Q24.Right knee, ever injured badly enough to limit ability to walk	Categorical
	p01ksurgr	SV:Q25.Right knee, ever have surgery or arthroscopy	Categorical
	p01hrs	SV:Q40.Ever had hip replacement surgery where all or part of joint was replaced	Categorical
	v00diab	SAQ:Q24.Charlson Comorbidity: have diabetes (high blood sugar)	Categorical
	v00fall	SAQ:Q32.Fallen and landed on floor or ground, past 12 months	Categorical
	p02kinj	Either knee, ever injured so badly difficult to walk for at least one week	Categorical
<b>Pain</b>			
	v00womkpr	EV: Right knee: WOMAC Pain Score	Continuous
	p01kprn12	SV:Q15.Right knee pain, aching or stiffness: any, past 12 months	Categorical
	p01kpr12cv	SV:Q15a.Right knee pain, aching or stiffness: more than half the days of a month	Categorical
	v00wprkn1	EV: Right knee pain: walking, last 7 days	Categorical
	v00wprkn2	EV: Right knee pain: stairs, last 7 days	Categorical
	v00wprkn3	EV: Right knee pain: in bed, last 7 days	Categorical
	v00wprkn4	EV: Right knee pain: sit or lie down, last 7 days	Categorical
	v00wprkn5	EV: Right knee pain: standing, last 7 days	Categorical
	v00kprkn1	EV:Q2a.Right knee pain: twisting/pivoting on knee, last 7 days	Categorical
	v00kprkn2	EV:Q2b.Right knee pain: straightening knee fully, last 7 days	Categorical
	v00kprkn3	EV:Q2c.Right knee pain: bending knee fully, last 7 days	Categorical

v00p7rkfr	EV:Q3.Right knee pain: how often	Continuous
v00ksxrkn1	EV:Q6.Right knee symptoms: swelling, last 7 days	Categorical
v00ksxrkn2	EV:Q7.Right knee symptoms: feel grinding, hear clicking	Categorical
v00ksxrkn4	EV:Q9.Right knee symptoms: straighten knee fully, last 7 days	Categorical
v00ksxrkn5	EV:Q10.Right knee symptoms: bend knee fully, last 7 days	Categorical
p02kpnrcv	IEI:Q9a.Right knee pain, aching or stiffness: more than half the days of a month	Categorical
p01kpr30cv	SV:Q16a.Right knee pain, aching or stiffness: more than half the days, past 30 days	Categorical
v00womtsr	EV: Right knee: WOMAC Total Score	Continuous
p01rksx	SV: Right knee baseline symptom status (combines past 30 days and 12 months)	Categorical
p01rsxkoa	SV: Right knee baseline symptomatic OA status	Categorical
p01ksx	SV: Frequent knee pain status by person	Categorical
p01bl12sxr	SV: Right knee baseline frequent knee pain status	Categorical
p01rkp30cv	SV:Q16.Right knee pain, aching or stiffness: any, past 30 days	Categorical
v00p7rkrcv	EV:Q3a.Right knee pain: severity, past 7 days, rated on scale of 0-10	Categorical
p01pmrkrcv	SV:Q16b.Right knee pain: severity, past 30 days, rated on scale of 0-10	Categorical
p01bp30	SV:Q43.Any back pain, past 30 days	Categorical
v00kooskpr	EV: Right knee: KOOS Pain Score	Continuous
v00womstfr	EV: Right knee: WOMAC Stiffness Score	Continuous
v00koosymr	EV: Right knee: KOOS Symptoms Score	Continuous

	v00womadlr	EV: Right knee: WOMAC Disability Score	Continuous
	p01kpnrev	SV:Q14.Right knee pain, aching or stiffness: ever had more than half the days of the month	Categorical
<b>Muscle</b>			
	v00remaxf	Right Extension MAX Force	Continuous
	v00rfmaxf	Right Flexion MAX Force	Continuous
	v00rlwgt	EV:Q5.Isometric strength: right leg weight	Continuous
	v00rftlpl	Right Flexion MAX Force Low Production Limit	Continuous
	v00rfthpl	Right Flexion MAX Force High Production Limit	Continuous
	v00rftlrl	Right Flexion MAX Force Low Relaxation Limit	Continuous
	v00rfthrl	Right Flexion MAX Force High Relaxation Limit	Continuous
	v00retlpl	Right Extension MAX Force Low Production Limit	Continuous
	v00rethpl	Right Extension MAX Force High Production Limit	Continuous
	v00retlrl	Right Extension MAX Force Low Relaxation Limit	Continuous
	v00rethrl	Right Extension MAX Force High Relaxation Limit	Continuous
<b>T<sub>2</sub></b>			
	Average T <sub>2</sub>		Continuous
	Lateral Femur T <sub>2</sub>		Continuous
	Lateral Tibia T <sub>2</sub>		Continuous
	Medial Femur T <sub>2</sub>		Continuous
	Medial Tibia T <sub>2</sub>		Continuous

	Patella T <sub>2</sub>		Continuous
<b>WORMS</b>			Ordinal
	Cartilage: Patella		Ordinal
	Cartilage: Trochlea		Ordinal
	Cartilage: Medial Femur		Ordinal
	Cartilage: Lateral Femur		Ordinal
	Cartilage: Medial Tibia		Ordinal
	Cartilage: Lateral Tibia		Ordinal
	Meniscus: Medial Anterior		Ordinal
	Meniscus: Medial Body		Ordinal
	Meniscus: Medial Posterior		Ordinal
	Meniscus: Lateral Anterior		Ordinal
	Meniscus: Lateral Body		Ordinal
	Meniscus: Lateral Posterior		Ordinal
	Bone Marrow: Patella		Ordinal
	Bone Marrow: Trochlea		Ordinal
	Bone Marrow: Medial Femur		Ordinal
	Bone Marrow: Lateral Femur		Ordinal
	Bone Marrow: Medial Tibia		Ordinal
	Bone Marrow: Lateral Tibia		Ordinal

	Meniscus Max Score		Ordinal
	Cartilage Max Score		Ordinal
	Bone Marrow Max Score		Ordinal
	Joint Effusion		Ordinal
<b>Physical Activity</b>			
	v00cstime1	EV: Repeated chair stands: trial 1 time (sec.hundredths/sec)	Continuous
	v00cstime2	EV: Repeated chair stands: trial 2 time (sec.hundredths/sec)	Continuous
	v00timet1	EV:Q1.20-meter walk: trial 1 time to complete (sec.hundredths/sec)	Continuous
<b>Clinical Exam</b>			
	v00rkpatpn	EV: Right knee exam: patellar quadriceps tendinitis, pain/tenderness	Categorical
	v00rkeffb	EV: Right knee exam: effusion, bulge sign positive	Categorical
	v00rkeffpt	EV: Right knee exam: effusion, patellar tap positive	Categorical
	v00rkrfxpn	EV: Right knee exam: knee flexion pain/tenderness present on exam	Categorical
	v00rklttptn	EV: Right knee exam: lateral tibiofemoral pain/tenderness present on exam	Categorical
	v00rkmttptn	EV: Right knee exam: medial tibiofemoral pain/tenderness present on exam	Categorical
	v00rkabpn	EV: Right knee exam: anserine bursa, pain/tenderness present on exam	Categorical
	v00rkpfcrc	EV: Right knee exam: patello-femoral crepitus present on exam	Categorical
	v00rkpgdptn	EV: Right knee exam: patellar grind, painful or tender behind knee cap	Categorical
<b>Medication</b>			
	v00nsaids	EV:Q50b.Used nonprescription NSAIDS (e.g., Aspirin, Ibuprofen...) for joint pain	Categorical

	v00nsaidrx	EV:Q50c.Used prescription NSAIDS (e.g., Ibuprofen, Diclofenac...) for joint pain	Categorical
	v00coxibs	EV:Q50d.Used COXIBS (e.g., Bextra, Celebrex...) for joint pain or arthritis	Categorical
	v00narcot	EV:Q50e.Used strong prescription pain medications (e.g., narcotics) for joint	Categorical
<b>Alignment</b>			
	v00rkalnmt	EV: Right knee exam: alignment, degrees (valgus negative)	Continuous
	v00rkdefcv	EV: Right knee exam: alignment varus or valgus	Categorical

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651 **Supplementary Table 2:** The number of and percentage of missing data for each predictor in  
652 the model with 10 predictors (final proposed model).

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Variable	Number Missing (of the 1044 total subjects)	Percent Missing (%)
Repeated chair stands: trial 1 time	35	3.35
Age	0	0
Cartilage T <sub>2</sub> : medial femur	27	2.59
WORMS: meniscus max score	0	0
Isometric strength: knee extension, max force	184	17.62
Blood pressure: systolic	0	0
Cartilage T <sub>2</sub> : average	0	0
WORMS: cartilage max score	0	0
WOMAC pain score	0	0
Body Mass Index (BMI)	0	0

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