Supplementary data

Table 2. Baseline characteristics of our study population versus the baseline characteristics of the excluded patients/non-responders

	Current study population n = 868	Excluded patients/ non-responders n = 134	p-value
Age	56 (5.2)	56 (5.3)	0.6
Sex:			
Male	179 (21)	31 (23)	
Female	689 (79)	103 (77)	0.5
BMI	26 (4.1)	26 (3.6)	0.3
Comorbidities	1.9 (1.5)	1.9 (1.8)	0.7
Number of painful joints:			
1	262 (30)	46 (34)	
2	370 (43)	55 (41)	
3	125 (14)	19 (14)	
4	111 (13)	14 (10)	0.8
Maximal Kellgren and Lawrence score:			
0	302 (35)	10 (8)	
1	566 (65)	10 (8)	0.2
WOMAC subscales			
Pain	25 (17)	29 (19)	0.01
Function	23 (17)	27 (20)	0.01
Stiffness	33 (21)	36 (23)	0.1

WOMAC; Western Ontario and McMaster Universities Osteoarthritis Index. Continuous variables are shown as mean (SD), categorical variables are shown as number (percentage)

Table 5. Sensitivity analyses

	HR (95% CI) adjusted for maximal K&L at baseline	HR (95% CI) corrected for maximal K&L during follow-up
Joint Model with slope included for pain		
Pain	1.08 (1.06–1.10)	1.07 (1.05–1.09)
Pain slope	225 (0–276×10⁶)	2.46 (0–15×10⁶)
Sex [a]	0.60 (0.34–1.05)	0.68 (0.39–1.20)
Age (years)	1.06 (1.01–1.10)	1.05 (1.01–1.10)
BMI	0.94 (0.89–0.99)	0.95 (0.90–1.00)
Maximal K&L score	2.93 (1.53–5.61)	1.85 (1.38–2.47)
Number of painful joints	0.73 (0.57–0.93)	0.76 (0.60–0.98)
Comorbidities	0.78 (0.67– 0.92)	0.79 (0.67–0.93)
Joint Model with slope included for function		
Function	1.06 (1.05–1.08)	1.06 (1.04–1.07)
Function slope	1,801 (0–683×10⁶)	33.5 (0–52×10⁶)
Sex [a]	0.75 (0.43–1.30)	0.81 (0.46–1.40)
Age (years)	1.05 (1.01: 1.10)	1.05 (1.00: 1.10)
BMI	0.95 (0.90–1.00)	0.95 (0.90–1.00)
Maximal K&L score	2.95 (1.54–5.64)	1.85 (1.39–2.46)
Number of painful joints	0.73 (0.57–0.94)	0.78 (0.61–1.00)
Comorbidities	0.81 (0.69–0.94)	0.82 (0.71–0.96)

HR: hazard ratio.
K&L: Kellgren and Lawrence
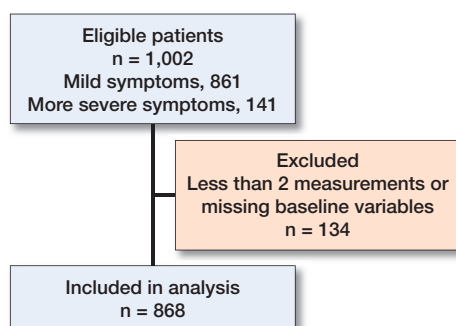[a] Men as reference category
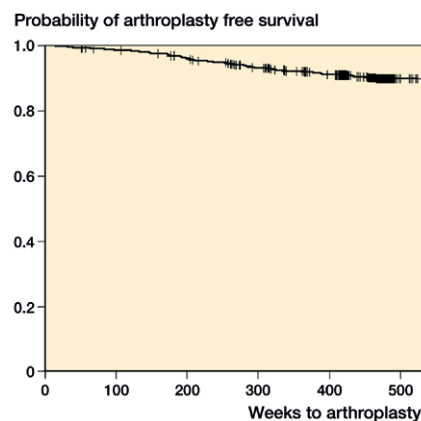

Figure 1. Flow chart.

Figure 2. Kaplan–Meier curve for arthroplasty free survival. Censoring is symbolized by "+".

SUPPLEMENTARY FILE

R-code mixed effects model and joint model.

#Mixed model pain:
```
fitlmecov <- lme(womacpain~timetofollowup+gender+age+bmi+max_kl+painfulljoints+comorbidities, random=~timetofollowup |patientid,
data=d2, na.action=na.omit)
```

#Mixed model function:
```
fitlmecov2 <- lme(womacfunction~timetofollowup +gender+age+bmi+max_kl+painfulljoints+comorbidities, random=~timetofollowup |patientid,
data=d2, na.action=na.omit)
```

#Cox regression:
```
coxFit <- coxph(Surv(timetoevent, arthroplasy) ~ gender + age +bmi+max_kl+painfulljoints+comorbidities, data = ds2, x = TRUE)
```

#Joint Model pain:
```
fit.JM <- jointModel(fitlmecov, coxFit, timeVar="timetofollowup", method="piecewise-PH-aGH", verbose=TRUE)
summary(fit.JM)
confint(fit.JM, parm = "Event")
round(exp(confint(fit.JM, parm = "Event")), 2)
```

#Joint Model pain + slope:
```
dForm <- list(fixed = ~ 1,
        indFixed = 2,
        random = ~ 1,
        indRandom = 2)
fit.JM.slope <- jointModel(fitlmecov, coxFit,
            timeVar="timetofollowup",
            method="piecewise-PH-aGH",
            parameterization = "slope",
            derivForm = dForm,
            verbose=TRUE)
summary(fit.JM.slope)

fit.JM.both <- jointModel(fitlmecov, coxFit,
            timeVar="timetofollowup",
            method="piecewise-PH-aGH",
            parameterization = "both",
            derivForm = dForm,
            verbose=TRUE,
            control = list(GHk = 9))
summary(fit.JM.both)
confint(fit.JM.both, parm = "Event")
round(exp(confint(fit.JM.both, parm = "Event")), 2)
```

#Joint Model function:
```
fit.JM2 <- jointModel(fitlmecov2, coxFit, timeVar="timetofollowup", method="piecewise-PH-aGH", verbose=TRUE)
summary(fit.JM2)
confint(fit.JM2, parm = "Event")
round(exp(confint(fit.JM2, parm = "Event")), 2)
```

#Joint Model function + slope:
```
fit.JM.slope2 <- jointModel(fitlmecov2, coxFit,
            timeVar="timetofollowup",
            method="piecewise-PH-aGH",
            parameterization = "slope",
            derivForm = dForm,
            verbose=TRUE)
summary(fit.JM.slope2)

fit.JM.both2 <- jointModel(fitlmecov2, coxFit,
            timeVar="timetofollowup",
            method="piecewise-PH-aGH",
            parameterization = "both",
            derivForm = dForm,
            verbose=TRUE,
            control = list(GHk = 9))
summary(fit.JM.both2)
confint(fit.JM.both2, parm = "Event")
round(exp(confint(fit.JM.both2, parm = "Event")), 2)
```