**S1 Appendix. The questionnaire (in Dutch) completed by patients at the Early Arthritis Recognition Clinic (EARC).**

## *EARC vragenlijst*

**U komt bij de reumatoloog aan de beurt als u deze vragenlijst heeft ingevuld.**

Heeft u een **LUMC** nummer? Zo ja: wat is uw LUMC nr: ☐☐☐☐☐☐☐

Wat is uw geboortedatum: ☐☐-☐☐-☐☐☐☐

Wat is uw geslacht: ☐ vrouw ☐ man

Wat is de datum van uw eerste klacht? ☐☐-☐☐-☐☐☐☐

Wat is de datum van uw eerste bezoek aan de huisarts in verband met uw gewrichtsklachten? ☐☐-☐☐-☐☐☐☐

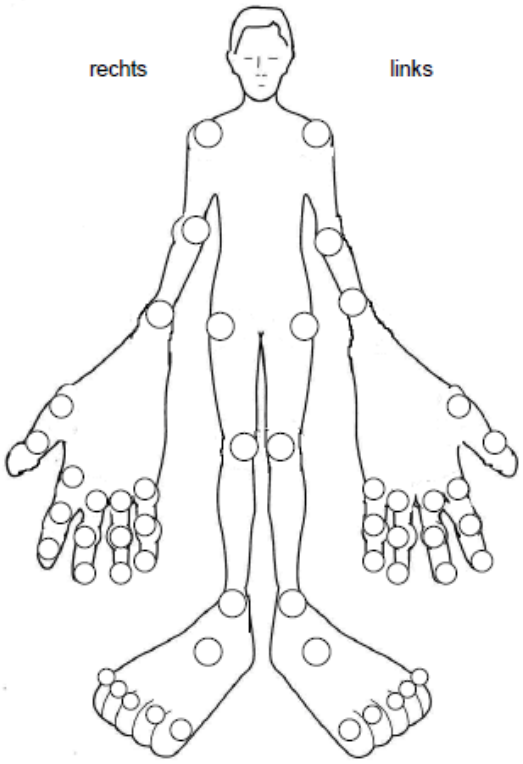
Ontstonden uw klachten plotseling of geleidelijk? (kies één van de twee) ☐ plotseling ☐ geleidelijk

Heeft u last van stijfheid als u 's morgens opstaat? ☐ nee ☐ ja; hoeveel minuten? ☐☐☐

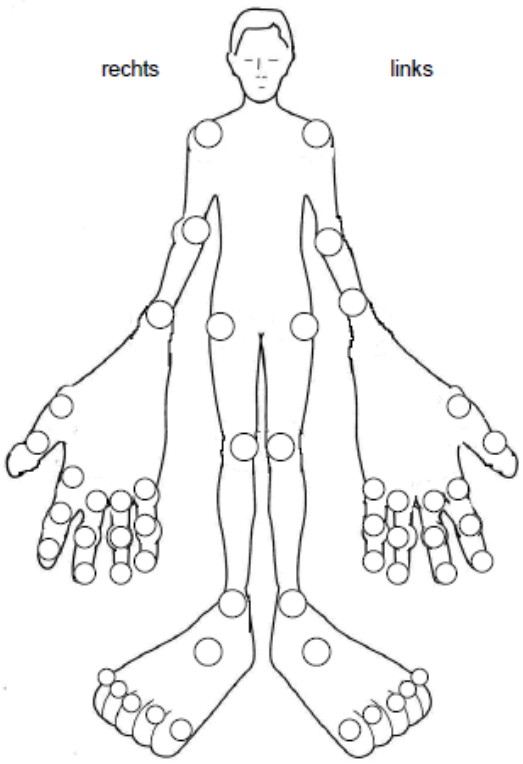
Kost het u moeite om een vuist te maken? ☐ nee ☐ ja

Wanneer heeft u de meeste last van uw gewrichtsklachten? (kies één van de twee) ☐ vroege ochtend ☐ einde van de dag

Wilt u in de pop (in de rondjes) aankruisen in welke gewrichten u **pijn** heeft?




Wilt u in de pop (in de rondjes) aankruisen welke gewrichten u **gezwollen** vindt?

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**Legend:**

Patients filled this questionnaire at the Early Arthritis *Recognition* Clinic, before they were seen for joint examination by a rheumatologist. This version was used from April 2012 onwards. The question on ‘difficulty with making a fist’ and the mannequin for ‘self-reported joint swelling’ were added to the questionnaire at April 1st 2012 and were not included before this date. All other questions were similar before and after April 2012.

**S2 Appendix. Frequencies of missing variables.**

| | Derivation (N=644) | Validation (N=644) |
|---|---|---|
| **Gender** | 0 (0) | 0 (0) |
| **Age** | 0 (0) | 0 (0) |
| **Symptom duration** | 48 (8) | 32 (5) |
| **Acute onset of symptoms** | 12 (2) | 17 (3) |
| **Morning stiffness in minutes** | 95 (15) | 79 (12) |
| **Number of painful joints** | 5 (1) | 7 (1) |
| **Number of swollen joints** | 234 (36) | 238 (37) |
| **Difficulty with making a fist** | 249 (39) | 254 (39) |
| **Arthritis present** | 0 (0) | 0 (0) |

**Legend:**

Variables are indicated as number of patients with missing data (percentage) unless otherwise indicated. Patient reported swollen-joint count and difficulty with making a fist were added to the questionnaire after April 1st 2012; therefore these missing data was completely at random.

**S3 Appendix. Frequency of synovitis per number of visits per year.**

| | **Nr. of visits** | **Arthritis present (% of visits per year)** |
|---|---|---|
| 2010 (starting from 31 August) | 136 | 61 (45) |
| 2011 | 264 | 103 (39) |
| 2012 | 296 | 132 (45) |
| 2013 | 252 | 105 (42) |
| 2014 | 203 | 72 (36) |
| 2015 (up to and including 24 September) | 137 | 50 (37) |
| **Total** | **1288** | **523 (41)** |

**S4 Appendix. Simplified model based on the derivation dataset, with arthritis upon examination as dependent variable using backward stepwise logistic regression.**

| Step 2. | **Derivation (N=644)** | |
|---|---|---|
| | **OR (95%CI)** | **B** |
| **Male** | 1.7 (1.1–2.4) | 0.503 |
| **Age, years** | | |
| 0 – 59.9 | *(ref)* | (*ref*) |
| ≥ 60 | 2.1 (1.5–3.2) | 0.762 |
| **Symptom duration, weeks** | | |
| < 6 | 3.5 (2.1–5.6) | 1.246 |
| 6–51.9 | 2.2 (1.4–3.5) | 0.783 |
| ≥ 52 | *(ref)* | (*ref*) |
| **Acute onset of complaints** | *Excluded at step 1* | *N/A* |
| **Morning stiffness >60 min** | 1.7 (1.0–2.7) | 0.523 |
| **Number of painful joints** | | |
| 0 | *(ref)* | (*ref*) |
| 1–3 | 10.6 (1.3–87.8) | 2.361 |
| ≥ 4 | 4.6 (0.56–37.7) | 1.527 |
| **Number of swollen joints** | | |
| 0 | *(ref)* | (*ref*) |
| ≥ 1 | 3.1 (1.7–5.6) | 1.142 |
| **Difficulty with making a fist** | 1.5 (1.0–2.1) | 0.372 |

**Legend:**

Abbreviations: B = beta; CI = confidence interval; OR = odds ratio.

**S5 Appendix. Simplified model based on the derivation dataset, with arthritis upon examination as dependent variable.**

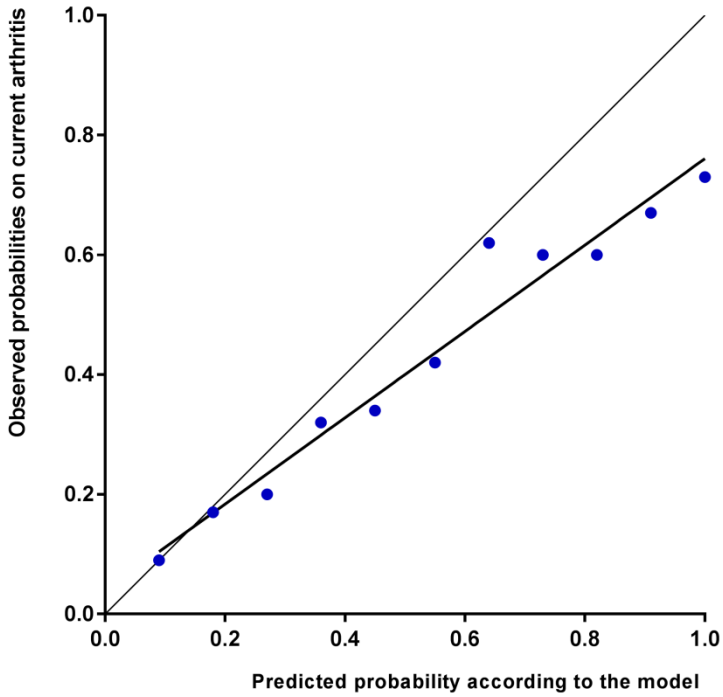
| | Derivation (N=644) | | |
|---|---|---|---|
| | **OR (95%CI)** | **B** | **points** |
| **Male** | 1.7 (1.1–2.5) | 0.517 | 0.5 |
| **Age, years** | | | |
| 0 – 59.9 | *(ref)* | (*ref*) | 0 |
| ≥ 60 | 2.1 (1.4–3.1) | 0.750 | 0.5 |
| **Symptom duration, weeks** | | | |
| < 6 | 3.6 (2.2–6.0) | 1.279 | 1.5 |
| 6–51.9 | 2.2 (1.4–3.6) | 0.797 | 1 |
| ≥ 52 | *(ref)* | (*ref*) | 0 |
| **Acute onset of complaints** | 0.99 (0.66–1.5) | -0.015 | 0 |
| **Morning stiffness >60 min** | 1.6 (0.91–2.9) | 0.485 | 0.5 |
| **Number of painful joints** | | | |
| 0 | *(ref)* | (*ref)* | 0 |
| 1–3 | 10.0 (1.2–83.4) | 2.300 | 2.5 |
| ≥ 4 | 4.5 (0.54–37.1) | 1.497 | 1.5 |
| **Number of swollen joints** | | | |
| 0 | *(ref)* | (*ref*) | 0 |
| ≥ 1 | 3.5 (1.9–6.6) | 1.253 | 1.5 |
| **Difficulty with making a fist** | 1.6 (0.99–2.6) | 0.467 | 0.5 |

**Legend:**

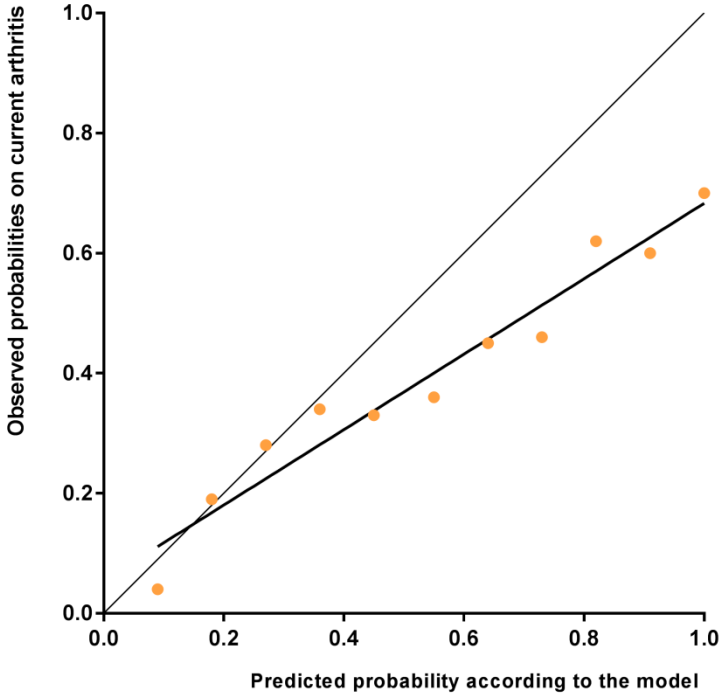
Abbreviations: B = beta; CI = confidence interval; OR = odds ratio.

**S6 Appendix. Calibration plot showing the observed probabilities on current inflammatory arthritis in the derivation (A) and validation dataset (B) versus the predicted probabilities according to the model.**

A.




B.




**Legend:**

Predicted probabilities using the final fitted multivariable model in the validation dataset were partitioned in 10 equally sized groups. In each group, the average predicted probability on inflammatory arthritis was compared with observed prevalence of inflammatory arthritis in the validation dataset. Regression lines were fitted to the calibration plot and revealed a coefficient of 0.73 and an intercept of 0.03 in the derivation dataset and a coefficient of 0.62 and an intercept of 0.061 in the validation dataset.

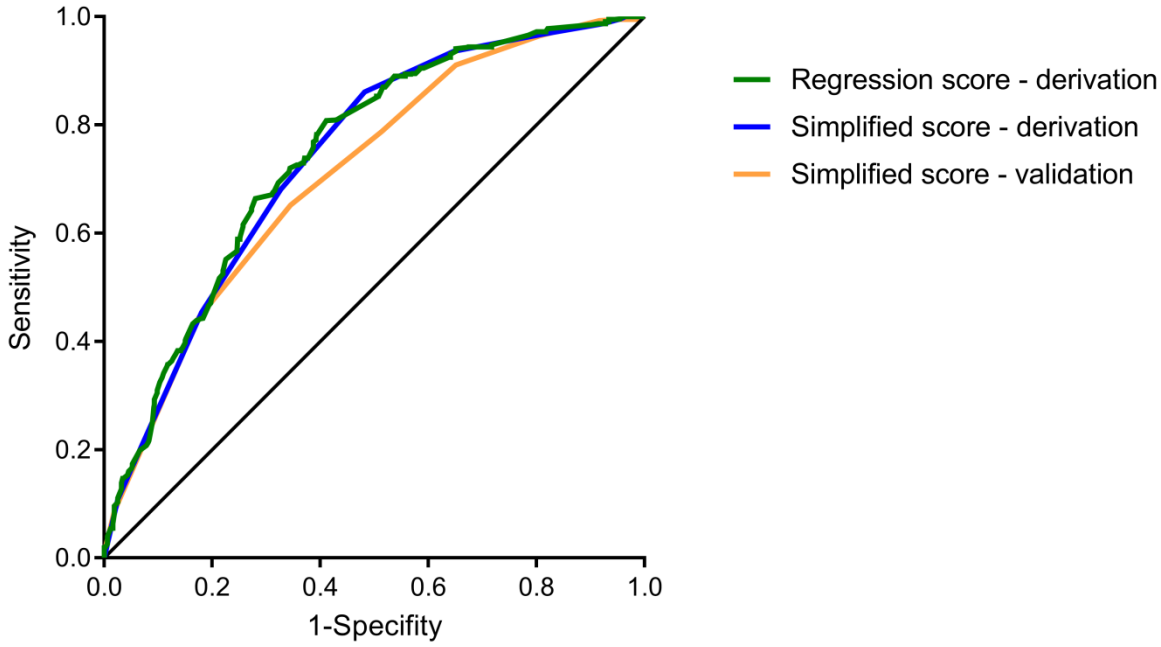
**S7 Appendix. Test characteristics of the simplified model in both the derivation and validation dataset with presence of synovitis upon joint examination as outcome.**

| | Derivation (N=644) | | Validation (N=644) | |
|---|---|---|---|---|
| Cut-off (≥) | Sensitivity (%) | Specificity (%) | Sensitivity (%) | Specificity (%) |
| 1 | 100 | 0.8 | | |
| 2 | 99.9 | 3.3 | 99.5 | 1.5 |
| 3 | 98.7 | 7.7 | 99.3 | 7.8 |
| 4 | 93.6 | 35.6 | 90.8 | 35.9 |
| 4.5 | 85.8 | 52.8 | 78.1 | 50.0 |
| 5 | 67.6 | 68.0 | 63.9 | 67.0 |
| 5.5 | 45.0 | 82.7 | 43.5 | 83.4 |
| 6 | 23.1 | 92.1 | 21.6 | 92.8 |
| 7 | 2.5 | 99.4 | 2.1 | 99.7 |

**Legend:**

Sensitivity was obtained by calculating the probability that the Clinical Arthritis RulE indicated 'disease' positive among those actually identified with inflammatory by the rheumatologist. Specificity was obtained by calculating the fraction of those without inflammatory arthritis that had a negative test result on the Clinical Arthritis RulE.

**S8 Appendix. Receiver operator characteristics curves for the logistic regression models with presence of synovitis upon joint examination as outcome, showing sensitivity and specificity of both regression score and simplified tool score in the derivation and validation dataset.**




**Legend:**

The Area Under Receiver Operator Curve (AUC) for the different models was: for the regression model in the derivation dataset 0.75 (95%CI 0.70–0.79), for the simplified score in the derivation dataset 0.74 (95%CI 0.70–0.78), and for the simplified score in the validation dataset 0.71 (95%CI 0.67–0.75).