

## **Predictors of Disease Relapse and Recapture of Remission Following Relapse in an Ontario Rheumatoid Arthritis Population**

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### **Abstract**

**Background/Purpose:** The timing and severity of relapse and likelihood of “recapturing” remission following a relapse in RA is not well known. We aimed to describe time to relapse, as well as factors associated with relapse and subsequent remission after disease relapse.

**Methods:** We performed a longitudinal analysis of patients enrolled in the Ontario Best Practices Research Initiative (OBRI), a clinical registry of RA patients in routine care. First clinical remission according to DAS28ESR <2.6 following cohort entry was determined. Patients achieving remission with  $\geq 1$  follow-up visit were observed for the average time until relapse (DAS28 >2.6). Disease activity at relapse as well as the prevalence and timing of subsequent remission was examined. Cox proportional hazards models calculated the hazard of remission and relapse adjusted for baseline variables and time varying disease activity and medication changes.

**Results:** The total cohort (N=2591) was 78% female with mean age 57 (13) years. Remission was achieved in 1258 patients (60%) with median Time to first remission of 314 days (IQR 153,552). Early RA was the only positive predictor of remission (Table). Among the remission group, 1117 had follow-up and 776 (69%) went on to experience a relapse. Median time to relapse was 204 days (IQR 129,390) and the majority switched from a state of remission to mild or moderate disease activity, in contrast to moderate or severe levels of disease activity they experienced at baseline. In the multivariable analysis, relapse was significantly associated with female sex, higher DAS28 preceding relapse and use of biologic DMARD (bioDMARD) monotherapy and/or corticosteroids in the interval between remission and relapse; combination conventional synthetic DMARD (csDMARD) appeared to protect against the risk of relapse (Table). 452 (58%) patients regained remission after spending a median of 209 days (IQR 126,386) in a state of relapse. Similar variables associated with first remission, including disease duration and receipt of combination csDMARD or bioDMARD after relapse, were negatively associated with regaining remission (Table).

**Conclusion:** Clinical remission in routine care is achievable but relapses to states of low or moderate disease activity are common and may last several months. High disease activity and need for biologics or corticosteroids may predict those at highest risk for relapse. Recapturing remission after a relapse appears possible but occurs at a lower frequency than initial remission. Additional investigation about the optimal timing, dosing and sequence of DMARD therapy needed to maintain and recapture remission will inform how to best manage and prevent disease flares.