

Challenge 2 - you will create a concept set expression for: (this is the input you get for both humans and AI)

Clinical Description: Rheumatoid Arthritis (RA) – Active, Persistent, Moderate-to-Severe

Synonyms: Severe, persistent RA

1. Clinical Case Definition

This phenotype defines established Rheumatoid Arthritis (RA) characterized by ongoing, active inflammation and persistent symptoms. It requires a prior confirmed diagnosis of RA (e.g., meeting ACR/EULAR classification criteria).

The clinical presentation includes persistent synovitis (objective joint swelling and tenderness), significant morning stiffness, fatigue, and polyarticular pain, frequently resulting in functional impairment and diminished quality of life.

The defining feature is objectively measured, persistent disease activity. This is confirmed by standardized composite measures (e.g., DAS28-CRP/ESR, CDAI, SDAI) consistently indicating moderate or high disease activity. Laboratory findings must support the presence of active systemic inflammation, typically evidenced by elevated acute phase reactants (C-reactive protein [CRP] and Erythrocyte Sedimentation Rate [ESR]). Imaging (ultrasound, MRI) is crucial for confirming the presence of active synovitis and distinguishing it from structural damage. Further evidence of this active state may include rapid radiographic progression or a persistent reliance on glucocorticoids due to underlying inflammation (e.g., inability to taper doses below 7.5mg prednisone equivalent/day). While common, seropositivity (Rheumatoid Factor [RF] or anti-citrullinated protein antibodies [ACPA]) is not required.

2. Phenotype Scope & Granularity

- **Temporal Context:** Prevalent. Focuses on patients with established disease and persistent, ongoing activity.
- **Severity:** Moderate or High disease activity only. This scope is not inclusive of mild RA or RA in remission/low disease activity.
- **Acuity / Chronicity:** Chronic, persistent disease state.
- **Etiology:** Autoimmune/Idiopathic (standard RA).
- **Population Context:** Adults.

3. Related Conditions & Scope Boundaries

The intent of this phenotype is to identify active inflammatory synovitis. Related conditions that may present with similar symptoms but lack objective evidence of inflammation (sometimes termed "pseudo-refractory" RA) are not within the scope of this phenotype.

- **Fibromyalgia and Central Pain Syndromes:** These non-inflammatory pain conditions are distinct from the inflammatory state defined here.
- **Secondary Osteoarthritis or Mechanical Joint Damage:** These represent structural issues and are distinct from active inflammatory synovitis.
- **Early or Treatment-Naïve Rheumatoid Arthritis:** These represent different phases of the disease trajectory and are not within the direct scope of this established, persistent phenotype.
- **Rheumatoid Arthritis in Remission:** Patients who have achieved remission are not within the scope of this active phenotype.

4. Key Complications & Common Comorbidities

The persistent inflammation characterizing this phenotype is associated with significant complications and comorbidities. These should be recognized as consequences or associations, not part of the core definition of the active RA state as they may represent a past active state which may currently be inactive.

- **Complications:** Irreversible joint damage, progressive disability.
- **Comorbidities:** Cardiovascular disease, serious infections (often exacerbated by chronic inflammation and/or immunosuppression), osteoporosis, interstitial lung disease.

5. Intended Data Sources

This clinical description is intended for building concept sets against real-world administrative claims, electronic health record (EHR) databases, and patient registries. The target data should be standardized to the OMOP Common Data Model. Examples of licensable data sources where this concept set would be applied include:

- **Optum®** (Clinformatics® Data Mart, SES, Pan-Therapeutic)
- **Merative™** (MarketScan® Commercial Claims and Encounters)
- **Veradigm** (Health Verity, Practice Fusion EHR)
- **IQVIA** (AmbEMR, PharMetrics Plus)
- **HealthVerity**