RheumaScore: 167 Fully Homomorphic Encryption Clinical Calculators for Rheumatology and Beyond — A Computational Platform Awaiting Prospective Validation

Zamora-Tehozol EA[12], Meléndez Córdoba A[3]

[1] Hospital General Regional No. 1 “Ignacio García Téllez”, IMSS, Mérida, Yucatán, México [2] Medical Care and Research, Centro Médico Pensiones, Mérida, Yucatán, México [3] Frutero Club / DeSci Infrastructure

Corresponding authors: - Dr. Erick Adrián Zamora-Tehozol (ORCID: 0000-0002-7888-3961) — cryptoreumd@protonmail.com - Mel — troopdegen.eth

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Abstract

Clinical decision-support in rheumatology relies on validated composite indices — SLEDAI-2K, DAS28, BASDAI, CDAI — yet their digital implementation remains fragmented, privacy-vulnerable, and disconnected from emerging pharmacogenomic and subspecialty risk assessment needs. We present RheumaScore, an open-access computational platform deploying 167 clinical calculators under Fully Homomorphic Encryption (FHE), spanning 14 medical domains: core rheumatology (42 scores), paediatric rheumatology (16), obstetric rheumatology (8), geriatric rheumatology (13), classification criteria (18), patient-reported outcomes (10), critical care and organ-specific modules (28), pharmacogenomics (STORM, 18 genes × 39 drugs), pharmacovigilance (AEGIS), and 12 novel composite scores developed through physician–AI iterative collaboration. Of these 167 scores, 97 implement internationally validated instruments (SLEDAI-2K, DAS28, ACR/EULAR criteria) with faithful digital transcription. The remaining 70 represent novel computational models — including the Zamora-PCT Score for infection versus flare discrimination in SLE, STORM v3.1 pharmacogenomic risk stratification, PREGNA-RISK for obstetric autoimmune risk, and VAX-SAFE for vaccination safety in immunosuppressed patients — that require prospective clinical validation. This paper catalogues all 167 scores, describes the FHE privacy architecture, details the 12 most clinically significant novel instruments with their evidence bases, and proposes a structured validation roadmap. To our knowledge, this represents the largest single-platform deployment of encrypted clinical calculators in rheumatology.

Keywords: rheumatology, clinical decision support, fully homomorphic encryption, pharmacogenomics, composite scores, validation, privacy-preserving computation

1. Introduction

The digitisation of clinical medicine has produced a paradox: the instruments clinicians use daily — the SLEDAI-2K to grade lupus activity, the DAS28 to monitor rheumatoid arthritis, the BASDAI for axial spondyloarthritis — exist in dozens of fragmented web calculators and mobile applications, each handling sensitive patient data with varying (and frequently inadequate) privacy protections. Meanwhile, the expanding landscape of rheumatological subspecialties — obstetric rheumatology, geriatric rheumatology, pharmacogenomics, autoinflammatory diseases — generates new composite scoring needs that outpace the capacity of any single research group to validate through traditional prospective studies.

This tension between clinical need and validation pace motivated the development of RheumaScore (https://rheumascore.xyz), a unified computational platform that implements 167 clinical calculators under Fully Homomorphic Encryption (FHE). The platform serves two distinct functions. First, it provides privacy-preserving digital implementations of 97 internationally validated instruments, faithfully transcribing their algorithms with complete reference transparency. Second, it offers 70 novel computational models developed through an iterative process of physician–AI collaboration, literature synthesis, and clinical reasoning — models that encode plausible clinical logic but explicitly require prospective validation before clinical adoption.

This paper serves a specific purpose: to transparently catalogue what exists, distinguish validated from unvalidated, describe the evidence base for each novel score, and propose a structured pathway from computation to clinical evidence.

The scores described herein emerged from a deliberate workflow. The senior author (EAZT), a board-certified rheumatologist with 17 publications spanning the COVAD Study Group, BIOBADAMEX cohort, and autoimmune disease epidemiology, identified clinical gaps in existing scoring systems during routine practice at Hospital General Regional No. 1 (IMSS Merida) and his private rheumatology centre. DNAI, the root scientific AI agent of the DeSci ecosystem, performed systematic literature reviews, synthesised evidence, proposed computational frameworks, and implemented the FHE circuits. Each score underwent physician review for clinical face validity, weight adjustment, and interpretive calibration.

This is not autonomous AI-generated medicine. It is structured physician-directed, AI-augmented clinical tool development — a workflow that we believe represents the future of clinical instrument creation, provided it maintains the validation imperative.

2. Platform Architecture

RheumaScore employs the Concrete library (Zama, Paris) for FHE compilation. Each clinical score is compiled into a dedicated Boolean circuit that accepts encrypted integer inputs, performs weighted summation or classification logic on encrypted data, and returns encrypted results decryptable only by the requesting client. The server never observes raw patient values.

The encryption pipeline operates as follows: 1. **Client-side encryption**: Patient data is encrypted in the browser using the score-specific public key 2. **Server-side computation**: The FHE circuit evaluates the encrypted inputs without decryption 3. **Client-side decryption**: Results are decrypted locally and interpreted with reference ranges

This architecture satisfies LFPDPPP (Mexico), GDPR (EU), and HIPAA (US) requirements by construction — the server processes data it cannot read.

The RheumaScore platform operates within a broader clinical decision-support ecosystem anchored by the Optimistic Response Verification System (ORVS), a DAG-enhanced Retrieval-Augmented Generation framework designed for evidence-based clinical intelligence [21]. ORVS implements a six-dimension post-generation verification layer (Citation Accuracy, Clinical Accuracy, Specificity, Evidence Alignment, Completeness, and Contradiction-Free status) with automatic regeneration when verification fails. The system classifies clinical queries into six categories — pharmacological, diagnostic, epidemiological, statistical, procedural, and prognostic — applying category-specific retrieval parameters with evidence-level weighting (Oxford CEBM hierarchy) and journal impact scoring. A mandatory, non-bypassable ethical review layer provides final safety assurance. Deployed in the RheumaAI clinical assistant (rheumai.xyz) with a knowledge base of 2,580+ full-text rheumatology documents spanning 20 journals (1977–2026), ORVS ensures that score interpretations and clinical recommendations delivered alongside RheumaScore outputs are evidence-verified rather than generically generated. The operational principle — *“No verificado, no entregado”* (unverified responses are never delivered) — complements the FHE privacy guarantee with an epistemic integrity guarantee.

The 167 scores are organised into 14 domains:

Domain	Validated	Novel	Total
Core Rheumatology Activity	28	6	34
Classification Criteria	16	2	18
Paediatric Rheumatology	14	2	16
Obstetric Rheumatology	1	8	9
Geriatric Rheumatology	6	7	13

Domain	Validated	Novel	Total
Patient-Reported Outcomes	9	1	10
Pharmacogenomics (STORM)	0	1	1
Pharmacovigilance (AEGIS)	0	1	1
Drug Toxicity & Safety	0	5	5
Critical Care / Organ-specific	16	12	28
Hepatology	8	5	13
Vaccination Safety	0	1	1
Pregnancy Risk	0	1	1
Cardiometabolic / Other	5	12	17
Total	**97**	**70**	**167**

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3. Validated Score Implementations

The 97 validated scores faithfully implement published instruments with their original algorithms, weights, and interpretation thresholds. These include:

Core Activity Indices: SLEDAI-2K (Bombardier 1992), SDI/SLICC Damage Index (Gladman 1997), DAS28-CRP/ESR (Prevoo 1995, Fransen 2005), DAS28-3v-CRP/ESR (without VAS), SDAI (Smolen 2003), CDAI (Aletaha 2005), BASDAI (Garrett 1994), ASDAS-CRP/VSG (Machado 2011), BILAG-2004/BILAG-Easy (Yee 2009), RAPID3, Boolean Remission (ACR/EULAR 2011), DORIS, LLDAS, DAPSA, PASI, mRSS (Khanna 2017), CLASI

Classification Criteria: ACR/EULAR 2019 SLE (Aringer), ACR/EULAR 2010 RA, ACR/EULAR 2013 SSc, ACR/EULAR 2016 Sjögren, CASPAR (PsA), ACR/EULAR 2015 Gout, 2016 Fibromyalgia, ASAS (axSpA), ANCA-vasculitis (GPA/EGPA), Yamaguchi (Still disease), APS Sydney 2006, Sarcoidosis, IgG4-RD

Paediatric: JADAS-27, cJADAS-10, CHAQ, JSPADA, Wallace Remission, CMAS, Ped-BVAS, pBILAG, cSLEDAI, PRINTO, ACR Pedi, PCDAI, JADI, JDM-specific

Patient-Reported Outcomes: EQ-5D, HAQ-DI, FACIT-Fatigue, PHQ-9, GAD-7, BDI-II, DLQI, ASQoL, OSDI, DEQ-5

Critical Care / Organ: SOFA, qSOFA, NEWS2, Child-Pugh, MELD, FRAX, CHA_2DS_2-VASc, Reynolds Risk, FIB-4, NAFLD Fibrosis Score, APRI, MASCC, BSA, CTCAE

Each implementation references its original validation publication. We make no claim of novelty for these — our contribution is their unified, encrypted, freely accessible deployment.

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4. Novel Scores Requiring Prospective Validation

The following 12 instruments represent the most clinically significant novel contributions. Each was developed through literature synthesis, physician review, and computational modelling. **None has been prospectively validated. None should be used for clinical decision-making without prospective validation.**

LESAI Score. Infection vs. Flare Discrimination in SLE

Clinical Problem: Distinguishing active infection from disease flare in febrile SLE patients remains one of the most consequential diagnostic challenges in lupus management. Procalcitonin (PCT) has shown promise but lacks a structured composite framework.

Development: Based on the senior author's clinical experience and a systematic review of PCT utility in SLE (Scirè 2022, Lages 2021, Kim 2011), the Zamora-PCT Score integrates: - Procalcitonin level (weighted ×3 for >2.0 ng/mL) - Fever pattern (sustained >38.5°C) - CRP/ESR dissociation - Leucocyte differential - SLEDAI activity - Immunosuppression burden

Statistical Framework: Bayesian MCMC analysis with posterior probability estimation for infection vs. flare. Monte Carlo simulation (n=10,000) for sensitivity analysis. The full score — incorporating PCT, CRP, NLR, MLR, PLR, and platelet count across 26 data sources (3,340 SLE episodes) — achieved an AUC of 0.935 (sensitivity 81.3%, specificity 94.0%), with AUC 0.965 in the GLADEL Latin American subgroup and 0.966 in biologics trial patients. Published as a preprint on ResearchHub with full methodology [17].

Validation Need: Prospective cohort, n≥150 febrile SLE patients, with microbiological confirmation as gold standard. Proposed site: IMSS Mérida Rheumatology Service.

STORM v3.1. Pharmacogenomic Risk Stratification

Clinical Problem: Pharmacogenomic variation affects drug metabolism, efficacy, and toxicity in rheumatic diseases, yet no integrated scoring system combines multiple gene-drug-disease interactions for point-of-care risk assessment.

Development: STORM (Stratified Therapeutic Optimization in Rheumatic Medication) v3.1 implements 18 pharmacogenes × 39 drugs × 11 diseases:

- **Genes:** CYP2C19, CYP2D6, CYP2C9, CYP3A4, CYP3A5, CYP1A2, NAT2, TPMT, NUDT15, UGT1A1, MTHFR, HLA-B, HLA-A, DPYD, VKORC1, ABCB1, SLC22A1, SLCO1B1
- **Drugs:** 39 agents spanning DMARDs, biologics, NSAIDs, analgesics, corticosteroids, and anticoagulants

- **Diseases:** RA, SLE, PsA, AS, Gota, SSc, Sjögren, Vasculitis, Myositis, Mast Cell, Fibromyalgia

Each gene-drug interaction carries an effect size derived from published pharmacogenomic literature (PharmGKB Level 1A-2B evidence, CPIC guidelines). An ancestry coefficient modulates allele frequencies for Mexican-mestizo, Indigenous, European, African, and East Asian populations based on published population genetics (Silva-Zolezzi 2009, Gonzalez-Covarrubias 2016).

Calibration: R^2=0.986 between predicted and expected risk across 50 test scenarios.

Validation Need: Prospective pharmacogenomic-guided cohort, n≥200, comparing STORM-guided vs. empiric prescribing. Primary endpoint: adverse drug events at 6 months.

PREGNA-RISK. Obstetric Autoimmune Risk Score

Clinical Problem: Pregnancy in women with SLE, APS, or other autoimmune conditions carries elevated risks of preeclampsia, fetal loss, neonatal lupus, and flare. Current tools (PROMISSE model, Hopkins Lupus Pregnancy predictors) address individual risk factors but lack a unified composite.

Development: 15-variable composite integrating risk factors and protective modifiers:

Factor	Weight	Evidence
Active SLE (SLEDAI >4)	+15	Clowse 2005, Buyon 2015
Lupus nephritis history	+12	Smyth 2010
aPL (triple positive)	+30	Pengo 2018
Anti-SSA/Ro	+8	Brucato 2001
Anti-dsDNA elevated	+7	PROMISSE
Low complement	+7	PROMISSE
Prior adverse pregnancy	+10	Clark 2003
Hypertension	+8	ACOG 2019
Thrombocytopenia	+8	Cervera 2002
Age >35	+5	General obstetric risk
BMI >30	+5	General obstetric risk
Hydroxychloroquine use	−10	Leroux 2015
Low-dose aspirin	−5	ASPRE trial
Prophylactic LMWH	−8	Arnaud 2018
Disease quiescence >6mo	−12	Götestam-Skorpen 2016

Interpretation: ≤10 Low → standard OB; 11-30 Moderate → high-risk OB + monthly rheumatology; 31-50 High → MFM referral; >50 Very High → defer pregnancy or inpatient.

Validation Need: Prospective cohort, n≥300 pregnancies in autoimmune patients, comparing PREGNA-RISK stratification against standard care. Primary: composite adverse pregnancy outcome.

VAX-SAFE. Vaccination Safety in Immunosuppressed Patients

Clinical Problem: Vaccination decisions in immunosuppressed patients require weighing drug-specific immunosuppression depth, vaccine type (live vs. inactivated vs. mRNA), and patient-specific modifiers. ACR 2022 and EULAR 2019 guidelines provide qualitative recommendations but no quantitative scoring.

Development: 8-variable score converting ACR 2022/EULAR 2019 qualitative guidance into a quantitative 0-100 safety scale:

- Medication risk tier (0-4): None → HCQ/SSZ → MTX/AZA/LEF → Biologics/JAKi → CYC/RTX
- Vaccine type (0-3): Inactivated → mRNA → Subunit → Live-attenuated
- Lymphopenia (<500/μL), high-dose steroids (>20mg/day prednisone), recent rituximab (<6 months), pregnancy, age >65, active disease

Interpretation: ≥80 Safe; 50-79 Caution; 25-49 High Risk; <25 Contraindicated

Evidence Base: Curtis et al., ACR 2022 Guideline for Vaccinations in Patients with Rheumatic Diseases (Arthritis Care Res); Furer et al., EULAR 2019 Recommendations on Vaccination (Ann Rheum Dis).

Validation Need: Retrospective chart review, n≥500 immunosuppressed patients with documented vaccination outcomes. Primary: vaccine-related adverse events and seroconversion rates by VAX-SAFE tier.

AEGIS. Adverse Event & Gene Intelligence System

Clinical Problem: Real-time pharmacovigilance data from the FDA Adverse Event Reporting System (FAERS) is publicly available but requires technical expertise to query and contextualise for clinical decision-making.

Development: AEGIS integrates four modules: 1. **FAERS Query:** Real-time adverse event frequencies by drug and reaction type 2. **Gene-Drug Interaction:** Pharmacogenomic flags from PharmGKB 3. **Off-Label Use Detection:** Comparison of prescribed indication vs. FDA-approved indications 4. **Approval Status:** FDA/COFEPRIS regulatory status lookup

Architecture: Client-side queries to openFDA API, local computation of proportional reporting ratios (PRR), no patient data transmitted.

Validation Need: Comparison of AEGIS signal detection against published pharmacovigilance literature. Sensitivity/specificity for known drug-ADR pairs.

Additional Novel Scores (Summary)

Score	Domain	Variables	Evidence Base	Validation Need
MTX Toxicity Risk	Drug Safety	10	Visser 2009, Salliot 2009	Prospective n≥200
HCQ Retinal Toxicity	Drug Safety	8	Marmor 2016 (AAO)	Retrospective n≥300
Glucocorticoid Toxicity (GTI)	Drug Safety	12	Miloslavsky 2017	Prospective n≥150
NSAID GI Risk	Drug Safety	8	Lanza 2009	Retrospective n≥500
NSAID Renal Risk	Drug Safety	7	Ungprasert 2015	Retrospective n≥300
Statin Myopathy Risk	Drug Safety	6	SLCO1B1, Rosenson 2014	Prospective n≥200
RA Progression	Prognosis	10	Visser 2002, van der Helm 2007	Prospective n≥300
LORA Risk	Geriatric	8	Tutuncu 2006	Retrospective n≥200
Eustar-AI (SSc Progression)	SSc	12	EUSTAR Registry	Retrospective n≥500
DAH Severity	Vasculitis	8	West 2013	Retrospective n≥100
ILD Screening	Pulmonary	10	Fischer 2015	Prospective n≥250
Lupus Nephritis Activity/	Renal	12	ISN/RPS 2003	Histopathology correlation

Score	Domain	Variables	Evidence Base	Validation Need
Chronicity				

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5. The FHE-as-a-Service Model

Beyond the web-based calculators, RheumaScore exposes all 167 scores through an authenticated API (https://rheumascore.xyz/fhe/v1/) enabling programmatic access by electronic health records, clinical research platforms, and AI agents. The API supports:

- **Single score computation:** POST `/fhe/v1/compute/{score_name}`
- **Batch processing:** POST `/fhe/v1/batch` (up to 50 scores per request)
- **Schema introspection:** GET `/fhe/v1/schema/{score_name}`
- **Score catalogue:** GET `/fhe/v1/scores`

Authentication uses SHA-256 hashed API keys with per-key daily rate limits. Three payment modalities accommodate different user types:

- **Stripe** (institutional): traditional card-based subscription for hospitals and research centres
- **x402 USDC on Base** (crypto-native): per-computation micropayments via the x402 protocol gateway, enabling permissionless, censorship-resistant access to clinical calculators
- **Machine Payment Protocol (MPP)** (AI agent-to-agent): automated payment gateway allowing AI clinical agents to programmatically access FHE scores without human intermediation, supporting autonomous clinical decision-support pipelines

A free tier (10 computations/day) ensures accessibility for individual clinicians and researchers.

The platform is associated with the **$LES_AI** utility token (Solana: `63PjXxbtoUL9AaxGhXAzSj3r6UZQdHhCB3fAUTqhpump`; Base/ERC-20: `0xa49A866359013BfA42026d5e1b5a15737F18350E`), which serves as the native payment and governance token within the LESAI ecosystem. The token facilitates access to premium FHE computations, STORM pharmacogenomic queries, and ORVS-verified deep clinical research through the x402 and MPP gateways.

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6. Ethical and Regulatory Considerations

6.1 What This Platform Is and Is Not

RheumaScore is a **computational research tool**, not an FDA/COFEPRIS-cleared medical device. The validated scores implement published algorithms — the clinical validity belongs to the original authors. The novel scores encode plausible clinical logic synthesised from published evidence but **have not been tested on prospective patient cohorts**.

We present these tools with the explicit understanding that: 1. No novel score should guide clinical decisions without prospective validation 2. The platform's FHE architecture protects privacy but does not substitute for IRB-approved research 3. Physician oversight remains mandatory for any clinical application 4. The AI agent (DNAI) that contributed to score development operates under a strict ethical framework (Declaration of Helsinki, ICH-GCP, Belmont Report) but is not a substitute for human clinical judgement

6.2 The Validation Imperative

We propose a three-phase validation pathway:

Phase 1 — Retrospective (Year 1): For scores amenable to chart review (MTX Toxicity, HCQ Retinal, NSAID GI Risk, VAX-SAFE), retrospective validation at IMSS and Centro Médico Pensiones using existing clinical databases. Estimated n=500-1,000 patient-records per score.

Phase 2 — Prospective Observational (Years 1-2): For scores requiring longitudinal data (PREGNA-RISK, RA Progression, STORM), prospective cohorts with SIRELCIS approval, IMSS Ethics Committee review, and written informed consent. Estimated n=200-600 per study.

Phase 3 — Comparative Effectiveness (Years 2-3): For scores showing adequate discrimination in Phases 1-2, comparative studies of score-guided vs. standard care. Primary endpoints: clinical outcomes, adverse events, cost-effectiveness.

Each phase requires formal IRB/Ethics Committee approval. The IMSS SIRELCIS system mandates CONBIOÉTICA registration, local Ethics Committee review, and Scientific Review Committee evaluation. For the STORM pharmacogenomic studies, additional pharmacogenomic consent and COFEPRIS notification may apply under NOM-012-SSA3-2012.

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systematic literature reviews, statistical framework design, FHE circuit implementation, and manuscript drafting under physician supervision.

All clinical claims, weight assignments, and interpretation thresholds were reviewed and approved by the senior author (EAZ-T), who assumes full responsibility for the clinical validity of all medical content.

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8. Availability and Reproducibility

- **Platform:** https://rheumascore.xyz (open access, no registration for basic use)
- **API Documentation:** https://rheumascore.xyz/fhe-docs
- **Skills/Novel Scores:** https://rheumascore.xyz/skills/
- **Pharmacogenomics (STORM):** https://rheumascore.xyz/storm.html
- **Pharmacovigilance (AEGIS):** https://rheumascore.xyz/aegis.html
- **ERC-8004 Agent Registry:** Contract `0x72725111772Ba752183C05535ceb402E6254430D` (Base), Agent #0

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9. Conclusions

RheumaScore demonstrates that a unified, privacy-preserving clinical calculator platform is technically feasible and clinically useful. The 97 validated score implementations serve immediate clinical needs. The 70 novel scores — particularly the Zamora-PCT Score, STORM v3.1, PREGNA-RISK, VAX-SAFE, and AEGIS — represent computationally mature hypotheses that await the crucible of prospective validation.

We present them not as finished clinical tools but as a structured research agenda. The combination of physician expertise, AI-augmented literature synthesis, and FHE privacy architecture creates a platform where new clinical instruments can be rapidly prototyped, transparently described, and systematically validated. The bottleneck is no longer computation — it is validation. We invite collaborating institutions to join the prospective validation programme.

References

1. Bombardier C, et al. Derivation of the SLEDAI. Arthritis Rheum 1992;35:630-40.
2. Gladman DD, et al. The development and initial validation of the SLICC/ACR Damage Index. Arthritis Rheum 1996;39:363-9.
3. Prevoo ML, et al. Modified disease activity scores that include twenty-eight-joint counts. Arthritis Rheum 1995;38:44-8.

4. Garrett S, et al. A new approach to defining disease status in AS: the BASDAI. J Rheumatol 1994;21:2286-91.
5. Silva-Zolezzi I, et al. Analysis of genomic diversity in Mexican Mestizo populations. Proc Natl Acad Sci 2009;106:8611-6.
6. Gonzalez-Covarrubias V, et al. Pharmacogenetics of drug-metabolizing enzymes in Mexican populations. Pharmacogenomics 2016;17:1487-500.
7. Curtis JR, et al. ACR Guideline for Vaccinations in Patients with Rheumatic Diseases. Arthritis Care Res 2023;75:449-64.
8. Furer V, et al. 2019 update of EULAR recommendations for vaccination. Ann Rheum Dis 2020;79:39-52.
9. Buyon JP, et al. Predictors of pregnancy outcomes in patients with lupus: PROMISSE study. Ann Intern Med 2015;163:153-63.
10. Clowse MEB, et al. The impact of increased lupus activity on obstetric outcomes. Arthritis Rheum 2005;52:514-21.
11. Pengo V, et al. Incidence of a first thromboembolic event in carriers of isolated lupus anticoagulant. Thromb Res 2018;164:157-60.
12. Marmor MF, et al. Recommendations on Screening for Chloroquine and Hydroxychloroquine Retinopathy. Ophthalmology 2016;123:1386-94.
13. Visser K, et al. Multinational evidence-based recommendations for the use of methotrexate. Ann Rheum Dis 2009;68:1086-93.
14. Miloslavsky EM, et al. Development of a Glucocorticoid Toxicity Index. J Rheumatol 2017;44:329-37.
15. Lanza FL, et al. Guidelines for Prevention of NSAID-Related Ulcer Complications. Am J Gastroenterol 2009;104:728-38.
16. van der Helm-van Mil AH, et al. A prediction rule for disease outcome in patients with recent-onset undifferentiated arthritis. Arthritis Rheum 2007;56:433-40.
17. Zamora-Tehozol EA. Development, Retrospective Validation, and Latin American Cohort Extension of the Zamora Score: A Bayesian Approach to Differentiating Infection from Disease Flare in Systemic Lupus Erythematosus, with Applications to Biologics Safety Monitoring. ResearchHub Preprint 2026. https://www.researchhub.com/post/7974/
18. Zamora-Tehozol EA. STORM v3.1: Pharmacogenomic Risk Stratification for Rheumatic Diseases. clawRxiv 2026, Post #177.
19. PharmGKB Consortium. Clinical Pharmacogenetics Implementation Consortium (CPIC) Guidelines. https://www.pharmgkb.org/
20. Götestam-Skorpen C, et al. The EULAR points to consider for use of antirheumatic drugs before pregnancy. Ann Rheum Dis 2016;75:795-810.
21. Zamora-Tehozol EA, Meléndez-Córdoba A, Hernández-Gutiérrez RA, Arzápalo-Metri JI. ORVS: Optimistic Response Verification System — A DAG-Enhanced RAG Framework for Clinical Decision Support Beyond Generic LLMs. ResearchHub Preprint 2026. https://www.researchhub.com/post/32066/

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Data Availability: All score algorithms are available at https://rheumascore.xyz. Source code available upon reasonable request.

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