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ARTIFICIAL INTELLIGENCE IN RHEUMATOLOGY IN 2025: MODELS FOR RESEARCH AND CLINICAL PRACTICE

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Artificial intelligence (AI) is reshaping rheumatology research and is beginning to inform day-to-day clinical workflows. Building on recent evidence, this lecture presents an integrated framework connecting two complementary pillars of AI. First, discriminative models, including classical machine learning and deep learning, which have shown promise for disease classification, prognostic stratification and prediction of treatment response using structured data, medical imaging and clinical text. Second, generative AI based on large language and multimodal models is emerging as an accelerator for research tasks (literature synthesis, study design and documentation, variable extraction and harmonisation from electronic health records) and as a support tool in clinical practice (drafting notes, patient-facing summaries, triage and decision support under expert supervision). Illustrative use cases in rheumatoid arthritis, systemic lupus erythematosus, axial spondyloarthritis and psoriatic arthritis will be discussed, together with applications in imaging and EHR phenotyping via natural language processing. A pragmatic roadmap for responsible adoption will be proposed, including human-in-the-loop processes. The aim is to offer practical, evidence-informed criteria to integrate AI into rheumatology research and the clinic.

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