Stanford

Robert Michael Fairchild

Associate Professor of Medicine (Immunology and Rheumatology)

Medicine - Immunology & Rheumatology

CLINICAL OFFICE (PRIMARY)

- **Immunology and Rheumatology Clinic**

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Bio

BIO

Dr. Robert Fairchild is Clinical Chief of the Division of Immunology and Rheumatology and an Assistant Professor of Medicine at Stanford University. He specializes in the diagnosis and management of rheumatologic diseases with a clinical and research focus on musculoskeletal ultrasound (MSKUS), systemic autoimmune disease, and advanced imaging techniques.

Dr. Fairchild is the founding Director of Stanford's Rheumatology Ultrasound Diagnostic and Interventional Clinic, established in 2017. Under his leadership, MSK ultrasound has become a core component of Stanford Rheumatology's clinical practice, supporting diagnostic evaluations, procedural guidance, and disease monitoring. He also developed and directs Stanford's comprehensive rheumatology ultrasound fellowship curriculum, which trains fellows and faculty in diagnostic and interventional ultrasound techniques. In addition, Dr. Fairchild serves as Medical Director for Stanford's Value-Based Care Program, where he leads initiatives aimed at delivering high-quality, cost-effective care across specialties.

Dr. Fairchild's research spans a broad range of clinical and translational topics, including lung ultrasound in interstitial lung disease (ILD), ultrasound detection of vascular disease and calcinosis in systemic sclerosis (SSc), and the use of ultrasound to assess joint and soft tissue pathology in inflammatory and connective tissue diseases. He has led observational cohort studies evaluating the clinical significance of ultrasound-detected pathology in SSc, including the association between ulnar artery occlusion and calcinosis burden, and the contribution of tendon and joint abnormalities to musculoskeletal symptoms.

He is also actively engaged in research at the intersection of imaging and artificial intelligence. His ongoing work includes the development of deep learning and explainable AI (XAI) models to support automated interpretation of MSK ultrasound images in arthritis and connective tissue disease, with the goal of improving diagnostic precision and standardization across diverse clinical settings. He is a co-investigator on multiple interdisciplinary projects applying AI to the detection and subtyping of inflammatory arthritis, calcinosis, and other rheumatologic conditions.

Dr. Fairchild performs ultrasound-guided synovial biopsies as part of Stanford's translational rheumatology research program and has contributed to the development of ultrasound-based outcome measures for clinical trials in diseases such as IgG4-related disease, Sjögren's syndrome, and systemic sclerosis.

He received his PhD in Immunology from Georgetown University and his MD from Columbia University Vagelos College of Physicians and Surgeons. He completed internal medicine residency and rheumatology fellowship at Stanford. He trained in rheumatologic ultrasonography through the USSONAR program and holds RhMSUS certification from the American College of Rheumatology.

CLINICAL FOCUS

- Diagnostic and Interventional Rheumatologic Ultrasonography
- Rheumatoid Arthritis
- Rheumatology

ACADEMIC APPOINTMENTS

- Associate Prof-Univ Med Line, Medicine - Immunology & Rheumatology
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Clinic Chief, Immunology and Rheumatology Clinic, Stanford Health Care, (2024- present)
- Medical Director, Rheumatology POCUS program, Stanford Health Care, (2024- present)
- Director, Rheumatology Ultrasound Program, Stanford University, (2017- present)
- Director of Value Based Care for the Department of Medicine, Stanford University/Stanford Hospital, (2023-2024)
- Medical Director, Value Based Care Program, Stanford Hospital and Clinics, (2021-2023)

PROFESSIONAL EDUCATION

- Board Certification: Rheumatology, American Board of Internal Medicine (2017)
- Board Certification: Internal Medicine, American Board of Internal Medicine (2015)
- Fellowship: Stanford University Immunology and Rheumatology Fellowship (2017) CA
- Residency: Stanford University Internal Medicine Residency (2015) CA
- Internship: Stanford University Internal Medicine Residency (2013) CA
- Medical Education: Columbia University College of Physicians and Surgeons (2012) NY
- PhD, Georgetown University , Host-Guest and Organometallic Chemistry (2008)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Fairchild's research focuses on advancing musculoskeletal and organ-based ultrasound applications in rheumatology, with the goal of improving diagnostic precision, monitoring, and treatment stratification in systemic autoimmune disease. His work bridges clinical imaging, translational research, and applied machine learning.

He has led multiple studies applying ultrasound to systemic sclerosis (SSc), including the assessment of arthritis, tendinopathy, skin involvement, and vascular pathology. His research has demonstrated that vascular ultrasound can sensitively detect ulnar artery occlusion and that this is strongly

associated with the burden of calcinosis in SSc. He has also shown that ultrasound is more sensitive than radiographs in detecting calcinosis and has explored the relationship between joint pathology and musculoskeletal symptoms in connective tissue disease.

Dr. Fairchild has an extensive research portfolio in lung ultrasound for rheumatologic interstitial lung disease (ILD), including the development and validation of lung ultrasound scoring criteria for systemic sclerosis and pediatric ILD. His work has shown high concordance between ultrasound and CT findings and has established lung ultrasound as a practical and reliable modality for detecting ILD in both adult and pediatric populations.

He is also actively involved in the development of ultrasound-based outcome measures for clinical trials and disease monitoring. These efforts include salivary gland ultrasound for IgG4-related disease and Sjögren's syndrome, lung ultrasound for systemic sclerosis–associated ILD, and calcinosis scoring tools for SSc clinical research.

In parallel, Dr. Fairchild conducts interdisciplinary research in artificial intelligence and explainable machine learning. He leads projects applying deep learning and XAI techniques to musculoskeletal ultrasound for the detection and classification of inflammatory arthritis, including rheumatoid arthritis, spondyloarthritis, osteoarthritis, and crystalline arthritis. His work integrates imaging and structured clinical data to build interpretable diagnostic models and improve real-world usability of AI tools in rheumatology.

Dr. Fairchild also performs ultrasound-guided synovial biopsies, which serve as a key platform for translational research in arthritis and support biomarker discovery, mechanistic studies, and integration with advanced imaging data.

CLINICAL TRIALS

- Ultrasound Therapy Effects to Modulate the Inflammatory Reflex, Not Recruiting

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Immunology/Rheumatology (Fellowship Program)

Publications

PUBLICATIONS

- **Artificial Intelligence-Aided Lung Ultrasound Detection of Interstitial Lung Disease in Systemic Sclerosis and Inflammatory Myopathy.** *Arthritis care & research*
  Fairchild, R. M., Deluna, M. D., Fazli, M., Mar, D. A., Chung, M., Davuluri, S., Kawano, Y., Guo, H., Baker, M. C., Fiorentino, D., Tamang, S., Chung, L.
  2026

- **Validation of Lung Ultrasound Interpretation Criteria for Interstitial Lung Disease in Systemic Sclerosis and Inflammatory Myopathy.** *Arthritis care & research*
  Fairchild, R. M., Mar, D. A., Deluna, M. D., Chung, M., Davuluri, S., Kawano, Y., Guo, H., Baker, M. C., Fiorentino, D., Chung, L.
  2025

- **Evolution and impact of a dedicated ultrasound clinic on clinical rheumatology practice at an academic medical center.** *Seminars in arthritis and rheumatism*
  Fairchild, R. M., Deluna, M. D., Golovko, V., Mar, D. A., Baker, M. C., Nishio, J., Horomanski, A. L.
  2023; 63: 152276

- **Lung Ultrasound in Children with Systemic Juvenile Idiopathic Arthritis Associated Interstitial Lung Disease.** *Arthritis care & research*
  Vega-Fernandez, P., Ting, T. V., Mar, D. A., Schapiro, A. H., Deluna, M. D., Saper, V. E., Grom, A. A., Schulert, G. S., Fairchild, R. M.
  2022

- **Ultrasound evaluation of the hands and wrists in patients with systemic sclerosis: Osteophytosis is a major contributor to tender joints.** *Seminars in arthritis and rheumatism*
  Fairchild, R., Horomanski, A., Sharpless, L., Chung, M., Li, S., Hong, J., Sheth, K., Chung, L.
  2021; 51 (4): 735-740

- **Prevalence and significance of pulmonary disease on lung ultrasonography in outpatients with SARS-CoV-2 infection.** *BMJ open respiratory research*
  Fairchild, R. M., Horomanski, A., Mar, D. A., Triant, G. R., Lu, R., Lu, D., Guo, H. H., Baker, M. C.
  2021; 8 (1)

- **Ultrasound Detection of Calcinosis and Association with Ulnar Artery Occlusion in Patients with Systemic Sclerosis.** *Arthritis care & research*
  Fairchild, R. n., Chung, M. n., Sharpless, L. n., Li, S. n., Chung, L. n.
  2020

- **Development and Assessment of a Novel Lung Ultrasound Interpretation Criteria for the Detection of Interstitial Lung Disease in Systemic Sclerosis.** *Arthritis care & research*
  Fairchild, R. n., Chung, M. n., Yang, D. n., Sharpless, L. n., Li, S. n., Chung, L. n.
  2020

- **Zanubrutinib monotherapy for IgG4-related head and neck disease.** *Annals of the rheumatic diseases*
  Baker, M. C., Gawde, S., Horomanski, A., Fairchild, R. M., Liu, Y., Mikelov, A., Sun, Y., Vitale, M. R., Maestri, E., Held, F., Deluna, M., Park, W. G., Siddiqi, et al
  2026

- **A Phase II, Single-site, Open-label Study of Zanubrutinib in Patients with igg4-related Disease**
  Baker, M., Horomanski, A., Fairchild, R., Liu, Y., Deluna, M., Lanz, T., Gawde, S., Khalighi, M., Franc, B., Penta, M., Pham, N., Guja, K.
  WILEY.2025: 2286-2288

- **SynovAI: A Revolutionary AI Framework for Enhanced Detection and Differentiation of Rheumatoid Arthritis, Osteoarthritis, and Spondyloarthritis via Advanced Ultrasound Imaging**
  Fazli, M. S., Deluna, M., Tamang, S., Fairchild, R.
  WILEY.2025: 157-159

- **Reply to Letter to the Editor: Validation of Lung Ultrasound Interpretation Criteria for Interstitial Lung Disease in Systemic Sclerosis and Inflammatory Myopathy.** *Arthritis care & research*
  Fairchild, R. M., Chung, L.
  2025

- **Imaging Revolutions in Modern Rheumatology.** *Rheumatic diseases clinics of North America*
  Quinn, K. A., Fairchild, R. M.
  2024; 50 (4): xiii-xiv

- **Imaging of the Major Salivary Glands in Rheumatic Disease.** *Rheumatic diseases clinics of North America*
  Mar, D., Fairchild, R. M.
  2024; 50 (4): 701-720

- **Artificial Intelligence Assisted Interpretation of Lung Ultrasound Imaging for the Detection of Interstitial Lung Disease**
  Fairchild, R., Mar, D., Deluna, M., Baker, M., Tamang, S., Guo, H., Fiorentino, D., Chung, L.
  WILEY.2024: 3994-3996

- **Validation of a Lung Ultrasound Interpretation Criteria for Interstitial Lung Disease Screening in Systemic Sclerosis and Inflammatory Myopathy**
  Fairchild, R., Mar, D., Deluna, M., Guo, H., Fiorentino, D., Chung, L.
  WILEY.2024: 3250-3252

- **A double-blind, placebo-controlled, randomized withdrawal trial of sarilumab for the treatment of glucocorticoid-dependent sarcoidosis.** *Rheumatology (Oxford, England)*
  Baker, M. C., Horomanski, A., Wang, Y., Yuhan, L., Parsafar, S., Fairchild, R., Mooney, J. J., Raj, R., Witteles, R., Genovese, M. C.
  2023

- **Biologics Initiation in Rheumatoid Arthritis by Race and Ethnicity: Results From a Randomized Survey Study.** *ACR open rheumatology*
  Simard, J. F., Lu, R., Falasinnu, T. O., Baker, M. C., Hawa, S., Deluna, M. D., Horomanski, A., Fairchild, R. M.
  2023

- **North American musculoskeletal ultrasound scanning protocol of the shoulder, elbow, wrist, and hand: update of a Delphi Consensus Study.** *Clinical rheumatology*
  Bethina, N. K., Torralba, K. D., Choi, K. S., Fairchild, R. M., Cannella, A. C., Salto, L., Kissin, E. Y., Yinh, J., Aggarwal, M., Thiele, R., Nishio, M. J., for USSONAR
  2022

- **Comparison of Adverse Events Among Home- vs Facility-Administered Biologic Infusions, 2007-2017.** *JAMA network open*
  Baker, M. C., Weng, Y., Fairchild, R., Ahuja, N., Rohatgi, N.
  2021; 4 (6): e2110268

- **Strongyloides Hyperinfection After Immunosuppression in an Immigrant From El Salvador A Case for Early Diagnosis and Treatment** *JCR-JOURNAL OF CLINICAL RHEUMATOLOGY*
  Hoppenfeld, M., Kennedy, V., Sheth, K., Chang, A., Nelson, J., Fairchild, R.
  2021; 27 (4): E128-+

- **North American musculoskeletal ultrasound scanning protocol of the hip, knee, ankle, and foot: update of a Delphi consensus study.** *Clinical rheumatology*
  Yinh, J., Torralba, K. D., Choi, K. S., Fairchild, R. M., Cannella, A., Salto, L., Kissin, E. Y., Thiele, R., Oberle, E. J., Marston, B., Nishio, M. J., for USSONAR
  2021

- **A narrative review of imaging in calcinosis associated with systemic sclerosis.** *Clinical rheumatology*
  Mar, D., Valenzuela, A., Stevens, K. J., Chung, L., Fairchild, R. M.
  2021

- **Ultrasound Doppler and tenosynovial fluid analysis in tenosynovitis.** *Annals of the rheumatic diseases*
  Aslam, F. n., England, B. R., Cannella, A. n., Sharp, V. n., Kao, L. n., Arnason, J. n., Albayda, J. n., Bakewell, C. n., Sanghvi, S. n., Fairchild, R. n., Torralba, K. D., Evangelisto, A. n., DeMarco, et al
  2020

- **Painful Panniculitis and Polyarthritis in Pancreatic Adenocarcinoma: A Case Report.** *Journal of clinical rheumatology : practical reports on rheumatic & musculoskeletal diseases*
  Ku, S. n., Balijepally, R. n., Horomanski, A. n., Fairchild, R. n., Brown, R. A., Liao, C. E.
  2020

- **Development and Preliminary Validation of a Novel Lung Ultrasound Interpretation Criteria for the Detection of Interstitial Lung Disease in Patients with Systemic Sclerosis**
  Fairchild, R., Yang, D., Chung, M., Sharpless, L., Li, S., Chung, L.
  WILEY.2019

- **Tenosynovial Aspiration by Ultrasound Guidance: Correlation and Diagnostic Implications of Tenosynovial Analysis and Ultrasound Doppler Signal**
  Aslam, F., England, B., Cannella, A., Sharp, V., Kao, L., Arnason, J., Albayda, J., Bakewell, C., Sanghvi, S., Fairchild, R., Torralba, K., Evangelisto, A., DeMarco, et al
  WILEY.2019

- **Ultrasound Evaluation of the Hands in Patients with Systemic Sclerosis: Osteophytosis Is a Major Contributor to Tender Joints**
  Fairchild, R., Chung, M., Sharpless, L., Li, S., Hong, J., Sheth, K., Chung, L.
  WILEY.2019

- **Ultrasound Detection of Calcinosis and Correlation with Ulnar Artery Occlusion in Patients with Systemic Sclerosis**
  Fairchild, R., Chung, M., Sharpless, L., Li, S., Chung, L.
  WILEY.2019

- **Musculoskeletal Ultrasound Scanning Protocol Consensus Statements on Scanning Conventions and Documentation in the U.S.** *Arthritis care & research*
  Torralba, K. D., Choi, K. S., Salto, L. M., Fairchild, R. n., Cannella, A. C., Kissin, E. Y., Thiele, R. n., Evangelisto, A. n., Nishio, M. J.

2019

- **Consensus Statements on Scanning Conventions and Documentation in Musculoskeletal Ultrasound**
  Torralba, K., Nishio, M., Thiele, R. G., Fairchild, R., Choi, K., Salto, L., Cannella, A. C., Kissin, E.
  WILEY.2018

- **Strongyloides Hyperinfection After Immunosuppression in an Immigrant From El Salvador: A Case for Early Diagnosis and Treatment.** *Journal of clinical rheumatology : practical reports on rheumatic & musculoskeletal diseases*
  Hoppenfeld, M. S., Kennedy, V., Sheth, K., Chang, A., Nelson, J., Fairchild, R. M.
  2018

- **Consensus-Building on a Rheumatology Musculoskeletal Ultrasound Scanning Protocol for Rheumatology Fellowship Programs**
  Torralba, K., Nishio, M., Thiele, R. G., Fairchild, R., Choi, K., Salto, L., Cannella, A. C., Kissin, E. Y.
  WILEY.2017

- **Utility of B-type natriuretic peptides in the assessment of patients with systemic sclerosis-associated pulmonary hypertension in the PHAROS registry** *CLINICAL AND EXPERIMENTAL RHEUMATOLOGY*
  Chung, L., Fairchild, R. M., Furst, D. E., Li, S., Alkassab, F., Bolster, M. B., Csuka, M. E., Derk, C. T., Domsic, R. T., Fischer, A., Frech, T. M., Gomberg-Maitland, M., Gordon, et al
  2017; 35 (4): S106–S113