## BIOGRAPHICAL SKETCH

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NAME: Daniel B. Shin

eRA COMMONS USER NAME (credential, e.g., agency login): dbshin

POSITION TITLE: Research Assistant Professor of Dermatology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| University of Pennsylvania | BA | 1998-2002 | Biology |
| University of Pennsylvania | MS | 2010-2012 | Biostatistics |
| University of Pennsylvania | PhD | 2012-2016 | Biostatistics |

### A. Personal Statement

I am a biostatistician working primarily in the field of dermatology. My primary collaborative work focuses on epidemiological studies and clinical trials of psoriasis and other systemic inflammatory skin diseases. I am an expert in research using large electronic medical records databases (EMRs), and I have collaborated on numerous studies using EMRs since 2005. A significant portion of my work to date has focused on long term outcomes among patients with psoriasis, psoriatic arthritis, and atopic dermatitis in several United Kingdom databases (Clinical Practice Research Datalink (CPRD), The Health Improvement Network (THIN), IQVIA Medical Research Data (IMRD)), as well as in U.S. databases (Medicare claims database of the Centers for Medicare & Medicaid Services (CMS) and Optum Clinical/EHR database). During this work, I have helped train many pre- and post-doctoral research fellows in study design, data management, and statistical modeling.

I am also heavily involved in designing and analyzing multiple randomized controlled trials in psoriasis. Much of the earlier clinical trials involved studying the effects of psoriasis treatments on systemic inflammation as measured by positron emission tomography (PET). My research focused on various aspects of quantitative analysis of PET imaging, with emphasis on signal normalization in the context of objectively quantifying treatment effects in chronic inflammatory diseases. Recent clinical studies include a large, multi-center pragmatic non-inferiority trial comparing efficacy of home phototherapy devices to that of office-based phototherapy (the LITE Study), an open label study of biological therapy on nail psoriasis, and a multi-center study to develop and evaluate the effectiveness of care coordination models to reduce cardiovascular disease risk in patients with psoriasis (the CP3 Study). Furthermore, I have extensive experience in developing and navigating various clinical trial research databases.

In addition to having collaborated with Dr. Gelfand as an integral part of his research team over the span of nearly two decades, I have collaborated as statistician and data manager for many physician scientists in dermatology and other fields such as cardiology, rheumatology, and radiology, often leading teams of quantitative analysts and research fellows. I am committed to contributing my experience and expertise in complex analyses with a variety of data sets, designing and overseeing clinical trials, and multi-disciplinary leadership to the methodological work proposed in this P30 CCCR application.

Some recent examples of my collaborations include:

a. Wan J, **Shin DB**, Syed MN, Abuabara K, Lemeshow AR, Fuxench ZCC, Gelfand JM. Malignancy risk in patients with atopic dermatitis: a population-based cohort study. Br J Dermatol. 2023 Jul 7;189(1):53-61. PMID: 37418646.
b. Gelfand JM, **Shin DB**, Armstrong AW, et. al. Association of Apremilast With Vascular Inflammation and Cardiometabolic Function in Patients With Psoriasis: The VIP-A Phase 4, Open-label, Nonrandomized Clinical Trial. JAMA Dermatol. 2022 Dec 1;158(12):1394-1403 PMID: 36129688. PMCID: PMC9494263.
c. Barbieri JS, **Shin DB**, Margolis DJ. Atopic Dermatitis Is Associated with Preeclampsia and Endometriosis. JID Innov. 2022 Jul;2(4):100123. PMID: 35620705. PMCID: PMC9127404.

Ongoing and recently completed projects that I would like to highlight include:

NCT03726489
Title: Light Treatment Effectiveness (LITE) Study
Goal: To compare the effectiveness, safety (tolerability), and duration of treatment response at 12 weeks of home versus office-based narrowband ultraviolet B phototherapy for the treatment of psoriasis
Source: PCORI
Gelfand (PI), Role: Statistician

NCT05908240
Title: Prevention of Cardiovascular Disease and Mortality in Patients with Psoriasis or Psoriatic Arthritis: Translating Guidelines of Care to Better Outcomes for Patients with Psoriatic Disease (CP3 Study)
Goal: To develop and test a care coordination model to reduce cardiovascular risk in patients with psoriasis or psoriatic arthritis
Source: National Psoriasis Foundation
Principal investigator: Joel Gelfand
Role: Statistician

NCT03082729
Title: The Vascular Inflammation in Psoriasis Apemilast Trial
Goal: To determine the association between apremilast and aortic vascular inflammation as assessed by PET/CT, cardiometabolic markers, and abdominal fat composition
Source: Industry grant (Amgen)
Principle investigator: Joel Gelfand
Role: Statistician

## B. Positions, Scientific Appointments, and Honors

**Positions and Employment**

| | |
|---|---|
| 2019-Present | Research Assistant Professor, UPenn, Dermatology |
| 2016-2019 | Research Associate, UPenn, Dermatology, Dr. Joel Gelfand |
| 2010-2016 | Graduate Research Assistantship, UPenn, Dermatology, Dr Joel Gelfand |
| 2008-2010 | Sr. Research Coordinator & Data Manager, UPenn, Dermatology, Dr Joel Gelfand |
| 2004-2008 | Research Coordinator, UPenn, Dermatology, Drs Joel Gelfand and Michael Ming |
| 2000-2004 | Research Specialist, UPenn, Radiation Oncology, Dr Theresa Busch |

**Other Experience and Professional Memberships**

| | |
|---|---|
| 2023- Present | Statistical Editor, JID Innovations |
| 2022- Present | Statistical Editor, Journal of Investigative Dermatology |
| 2014- Present | International Biometric Society, Eastern North American Region |
| 2011- Present | American Statistical Society |

**Honors and Awards**

| | |
|---|---|
| 2002 | Graduated Cum Laude, Dean's List |

## C. Contributions to Science

1. Much of my work to date has focused on long-term outcomes in psoriasis in collaboration with Dr. Joel Gelfand, in particular cardiovascular outcomes. I have worked extensively with The Health Improvement Network (THIN) and CPRD (previously known as General Practice Research Database or GPRD), two highly used databases for pharmacoepidemological research, to study various cardiovascular comorbidities and outcomes associated with psoriasis. These studies have demonstrated that patients with psoriasis have higher risk of various cardiovascular morbidities and mortality, with dose-dependent relationship with psoriatic disease severity.
    a. Gelfand JM, **Shin DB**, Neimann AL, Wang X, Margolis DJ, Troxel AB. The Risk of Lymphoma in Patients with Psoriasis. J Invest Dermatol. 2006 Oct;126(10):2194-201.
    b. Gelfand JM, Neimann AL, **Shin DB**, Wang X, Margolis DJ, Troxel AB. Risk of myocardial infarction in patients with psoriasis. JAMA. 2006 Oct 11;296(14):1735-41.
    c. Mehta NN, Azfar RS, **Shin DB**, Neimann AL, Troxel AB, Gelfand JM. Patients with severe psoriasis are at increased risk of cardiovascular mortality: cohort study using the General Practice Research Database. Eur Heart J. 2010 Apr;31(8):1000-6.
    d. Takeshita J, Wang S, **Shin DB**, Mehta NN, Kimmel SE, Margolis DJ, Troxel AB, Gelfand JM. Effect of psoriasis severity on hypertension control: a population-based study in the United Kingdom. JAMA Dermatol. 2015 Feb;151(2):161-9.

2. In addition to examination of long-term outcomes in psoriasis, I have also worked with Drs. Gelfand and Alexis Ogdie to examine long term outcomes in psoriatic arthritis (PsA) and rheumatoid arthritis (RA). These studies have demonstrated increased prevalence of cardiovascular risk factors in patients with PsA, increased incidence of new diagnosis of cardiovascular risk factors in patients with PsA and RA, and increased risk of cause-specific mortality in patients with RA.
    a. Ogdie A, Langan S, Love T, Haynes K, **Shin D**, Seminara N, Mehta NN, Troxel A, Choi H, Gelfand JM. Prevalence and treatment patterns of psoriatic arthritis in the UK. Rheumatology (Oxford). 2013 Mar;52(3):568-75.
    b. Jafri K, Bartels CM, **Shin D**, Gelfand JM, Ogdie A. The Incidence and Management of Cardiovascular Risk Factors in Psoriatic Arthritis and Rheumatoid Arthritis: A Population-Based Study. Arthritis Care Res (Hoboken). 2017 Jan;69(1):51-57.
    c. Ogdie A, Maliha S, **Shin D**, Love TJ, Baker J, Jiang Y, Choi H, Gelfand JM. Cause-specific mortality in patients with psoriatic arthritis and rheumatoid arthritis. Rheumatology (Oxford). 2017 Jun 1;56(6):907-911
    d. Ogdie A, Kay McGill N, **Shin DB**, Takeshita J, Jon Love T, Noe MH, Chiesa Fuxench ZC, Choi HK, Mehta NN, Gelfand JM. Risk of venous thromboembolism in patients with psoriatic arthritis, psoriasis and rheumatoid arthritis: a general population-based cohort study. Eur Heart J. 2018 Oct 14;39(39):3608-3614.

3. I was the lead statistician on a series of clinical trials (the VIP trials) conducted to examine the effect of psoriasis treatment on vascular inflammation as measured by radionuclide imaging (FDG-PET/CT) and biomarkers of inflammation. We characterized the changes in vascular inflammation due to psoriasis therapies that target TNF, IL12/23, IL17, and PDE4 as well as UVB phototherapy.
    a. Mehta NN, **Shin DB**, Joshi AA, Dey AK, Armstrong AW, Duffin KC, Fuxench ZC, Harrington CL, Hubbard RA, Kalb RE, Menter A, Rader DJ, Reilly MP, Simpson EL, Takeshita J, Torigian DA, Werner TJ, Troxel AB, Tyring SK, Vanderbeek SB, Van Voorhees AS, Playford MP, Ahlman MA, Alavi A, Gelfand JM. Effect of 2 Psoriasis Treatments on Vascular Inflammation and Novel Inflammatory Cardiovascular Biomarkers: A Randomized Placebo-Controlled Trial. Circ Cardiovasc Imaging. 2018 Jun;11(6) (PMC5991103)
    b. Gelfand JM, **Shin DB**, Alavi A, Torigian DA, Werner T, Papadopoulos M, Takeshita J, Noe MH, Dey AK, Playford MP, Mehta NN. A Phase IV, Randomized, Double-Blind, Placebo-Controlled Crossover Study of the Effects of Ustekinumab on Vascular Inflammation in Psoriasis (the VIP-U Trial). J Invest Dermatol. 2020 Jan;140(1):85-93 PMC6926160
    c. Gelfand JM, **Shin DB**, Duffin KC, Armstrong AW, Blauvelt A, Tyring SK, Menter A, Gottlieb S, Lockshin BN, Simpson EL, Kianifard F, Sarkar RP, Muscianisi E, Steadman J, Ahlman MA, Playford MP, Joshi AA, Dey AK, Werner TJ, Alavi A, Mehta NN A Randomized Placebo Controlled Trial of

Secukinumab on Aortic Vascular Inflammation in Moderate to Severe Plaque Psoriasis (VIP-S). J Invest Dermatol. 2020;140:1784-1793. PMC7434644

d. Gelfand JM, **Shin DB**, Armstrong AW, Tyring SK, Blauvelt A, Gottlieb S, Lockshin BN, Kalb RE, Fitzsimmons R, Rodante J, Parel P, Manyak GA, Mendelsohn L, Noe MH, Papadopoulos M, Syed MN, Werner TJ, Wan J, Playford MP, Alavi A, Mehta NN. Association of Apremilast With Vascular Inflammation and Cardiometabolic Function in Patients With Psoriasis: The VIP-A Phase 4, Open-label, Nonrandomized Clinical Trial. JAMA Dermatol. 2022 Sep 21:e223862; PMCID: PMC9494263.

4. Our group has also worked to examine comparative effectiveness among treatments for psoriasis in a prospective multi-center cohort study using the Dermatology Clinical Effectiveness Network (DCERN) created in 2010 by Dr. Gelfand. We examined both physician and patient views on therapy effectiveness, tolerability, and preferences, and found that phototherapy is preferred as a first-line therapy for moderate-to-severe psoriasis. This has led to our currently ongoing pragmatic multi-center study of over 700 patients (NCT03726489) to evaluate whether home phototherapy, a patient-friendly treatment modality, is as effective as office-based phototherapy.
    a. Wan J, Abuabara K, Troxel AB, **Shin DB**, Van Vorhees AS, Bebo BF, Krueger GG, Duffin KC, Gelfand JM. Dermatologist preferences for first-line therapy of moderate-to-severe psoriasis in healthy adult patients. J Am Acad Dermatol. 2012 Mar;66(3):376-86.
    b. Gelfand JM, Wan J, Callis Duffin, K, Krueger GG, Kalb RE, Weisman JD, Sperber BR, Stierstorfer MB, Brod BA, Schleicher SM, Bebo BF, Troxel AB, **Shin DB**, Steinemann JM, Goldfarb J, Yeung H, Van Voorhees AS. Comparative effectiveness of commonly used systemic treatments or phototherapy for moderate to severe plaque psoriasis in the clinical practice setting. Arch Dermatol. 2012 Apr;148(4):487-94.
    c. Wan J, Abuabara K, Troxel AB, **Shin DB**, Van Voorhees AS, Bebo BF Jr, Krueger GG, Callis Duffin K, Gelfand JM. Dermatologist preferences for treatments to compare in future randomized controlled comparative effectiveness trials for moderate to severe psoriasis. Arch Dermatol. 2012 Apr;148(4):539-41.
    d. Takeshita J, Wang S, **Shin DB**, Callis Duffin K, Krueger GG, Kalb RE, Weisman JD, Sperber BR, Stierstorfer MB, Brod BA, Schleicher SM, Robertson AD, Linn KA, Shinohara RT, Troxel AB, Van Voorhees AS, Gelfand JM. Comparative effectiveness of less commonly used systemic monotherapies and common combination therapies for moderate to severe psoriasis in the clinical setting. J Am Acad Dermatol. 2014 Dec;71(6):1167-75.

**Complete List of Published Work:** http://tinyurl.com/BiblioDBS