

Trends in dermatology eponyms



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Background: Eponyms are ubiquitous in dermatology; however, their usage trends have not been studied.

Objective: To characterize the usage of eponyms in dermatology from 1880 to 2020.

Methods: Candidate eponyms were collected from a textbook and an online resource. A subset of these eponyms was deemed to be dermatology-focused by a panel of experienced dermatologists. Python scripts were used to permute eponyms into multiple variations and automatically search PubMed using BioPython's Entrez library.

Results: The dermatologist panel designated 373 of 529 candidate eponyms as dermatology-focused. These eponyms were permuted into 3159 variations and searched in PubMed. The highest occurring dermatology-focused eponyms (DFEs) in the year 2020 included Leishmania, Behçet syndrome, Kaposi sarcoma, Langerhans cell histiocytosis, and Mohs surgery. Increased DFE usage in the general medical literature parallels the overall increase in the use of other eponyms in the medical literature. However, in the most cited dermatology journals, DFE usage did not increase in the past decade. There were several eponyms with decreased usage.

Limitations: This study is limited to the publications in PubMed; only titles and abstracts could be queried.

Conclusion: DFEs are increasing in usage in the general medical literature, but the usage of eponyms in the most cited dermatology journals has plateaued. (JAAD Int 2022;7:137-43.)

Key words: BioPython; citation; dermatology; eponym; PubMed.

INTRODUCTION

Eponyms are terms named after a person or persons with whom they are significantly associated. In medicine, eponyms typically recognize the pioneers and may or may not be coined by those who made a discovery or an observation; however, their usage is only established once they are widely endorsed and used by experts in the field. Rarely, eponyms are named after patients. Similar to other medical specialties, eponyms are commonly used in dermatology.^{1,2} While eponyms are historically widespread in medicine, their coinage and usage

are increasingly discouraged because of ethical/moral offenses committed by some eponymous figures.³⁻⁵ Some have recommended reducing the usage or renaming of eponyms,⁶ but the effectiveness of these efforts is uncertain as robust methods to quantify changes in eponym usage are lacking. A manual search of the medical literature can be used to quantify eponym usage; however, this process is time-consuming and fraught with issues, including the need to match exact phrases and to include the many variants of each eponym that appear in the literature.⁷ To address these issues, an automated

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method was developed to standardize terms, create permutations, and automatically search for eponyms in PubMed using the NCBI's Entrez E-utilities application programming interface.⁸ This BioPython based tool was used to examine the dermatology-focused eponym (DFE) usage trends since 1880.

METHOD

DFEs were collected from a textbook, *Andrew's Diseases of the Skin*,⁹ and an online resource, DermNet NZ.¹⁰ A dermatologist panel reviewed the list of candidate eponyms excluding those that were not dermatology-focused. The study definition for DFEs included one of the following: (1) disease and/or syndrome that exclusively involves the skin; (2) multisystemic disease whose primary manifestation includes the skin; (3) sign and/or finding related to the skin; (4) product and/or technique that involves the skin. Two dermatologists (TWV, KN) individually determined whether the eponyms were dermatology-focused based on the study definition. Eponyms with a conflicting determination were then subjected to a tiebreaker evaluation by a third dermatologist (KY).

The DFEs were imported into a Python-based process for querying PubMed.⁸ First, the DFEs were exhaustively permuted into common variant forms that might appear in the literature. Permutations included the addition and omission of possessives (eg, Paget's or Paget), reciprocal substitution of "syndrome" and "disease" (eg, Behçet syndrome or Behçet disease), and various forms of combining multiple surnames. "Mohs surgery," in particular, was also permuted based on several variants including "Mohs surgery," "Mohs micrographic surgery," "Mohs cancer resection," "Mohs excision," and "Mohs cancer excision." PubMed titles and abstracts were then automatically searched for the permuted eponyms using the BioPython Entrez library¹¹; duplicate citations were removed. The PubMed search was performed on December 6, 2021.

From the PubMed-based search, the annual total citations of DFEs were calculated and compared with those of all PubMed articles in the same year. Changes in the frequency of annual citations were defined as the average annual PubMed citations after 2001 (2001-2020) compared with a baseline defined by a 95% confidence interval of the average annual PubMed citations before 2001. In addition, individual

eponyms were examined with a focus on eponyms that showed the greatest changes in PubMed citations in the past 20 years (2001-2020) compared with each eponym's maximum annual citation before 2021.

A subset analysis was conducted for 5 dermatology-focused journals with the highest 2020 Web of Science (ISI) impact factors (highest citations). The total number of PubMed entries and the number of entries with DFEs were enumerated for the *Journal of the American Academy of Dermatology*, *JAMA Dermatology*, *British Journal of Dermatology*, *Journal of Investigative Dermatology*, and *Journal of the European Academy of Dermatology and Venereology*.

The rate of eponym usage compared with the overall citations was evaluated for all the journals indexed in PubMed and those 5 dermatology journals. The rate of increase in citations per year was calculated by slopes of linear regression for 2 time periods (1981-2000 and 2001-2020), both of which have a 2-decade span.

Statistical analysis was performed in R,¹² and ggplot2 was used for data visualization.¹³

RESULTS

A total of 529 unique eponyms were identified from the dermatology textbook and web resource (Fig 1). The dermatologist panel identified 373 of 529 (70.5%) as dermatology-focused. The 373 DFEs were permuted to generate 3,173 total variations. An automated search of PubMed for these variant eponyms identified 174,578 results in 7711 unique journals. The number of annual dermatology-focused citations ranged from 0 to 7055 (Fig 2, A). The top-cited DFEs in the year 2020 included Leishmania, Behçet syndrome, Kaposi sarcoma, Langerhans cell histiocytosis, and Mohs surgery (Table I).

Since 1945, 0.46% of all PubMed entries have had a DFE. The increased number of PubMed entries with DFEs correlates with the overall increase in all PubMed entries (Fig 2, A). Among the 5 most cited dermatology journals, the usage trends of DFEs have not been correlated with the total number of citations from these journals (Fig 2, B). From 2001 to 2020, DFE usage has remained flat, whereas the total citations of the 5 journals have increased. As a percentage of the total articles published in the 5

CAPSULE SUMMARY

- Dermatology-focused eponym usage in the general medical literature parallels the overall increase in the use of other eponyms in medical literature.
- The usage of dermatology-focused eponyms plateaued in the 5 most cited dermatology journals.

Abbreviation used:

DFE: dermatology-focused eponyms

journals, DFEs reached their peak in the 1980s-2000s and the lowest percentages were in more recent years (Table II). The rate of occurrence of DFE usage from 1981 to 2000 was compared with that of 2001 to 2020. This revealed that the 5 journals had annual increases in the overall PubMed entries. However, the usage of DFEs has plateaued in the last decade without growth. This is indicated by the slope of the linear regression, which is not statistically significant from 0 (Table III).

Since 2001, 69 of 373 eponyms (18.5%) have not been cited in PubMed. Of the remaining DFEs, 200 (53.6%) have increased in usage and 24 (6.4%) have decreased in usage. The remaining 80 DFEs did not significantly change (within 95% confidence interval). The eponyms with the greatest percentage increase included Meibomian gland (+324%), Mohs surgery (+169%), Merkel cell carcinoma (+155%), Stevens-Johnson syndrome (+137%), Leishmania (+83%), and Still disease (+80%) (Fig 3, A). All 6 eponyms were also in the top 20 eponyms in 2020 (Table I). The eponyms with the greatest percentage decrease included Duhring-Brocq disease (-99%), Boeck disease (-98%), Letterer-Siwe disease (-88%), Reiter syndrome (-85%), Bourneville disease (-84%), and Weber-Christian disease (-79%) (Fig 3, B). Of these, Reiter syndrome had the highest number of citations in any year of PubMed (71 citations both in 1983 and in 1990).

DISCUSSION

This survey of the trends in DFEs demonstrates the value of an automated method for examining PubMed citations. Our analysis shows that DFEs continue to be commonly used. Additionally, the usage of some eponyms is rising while others are in decline. We believe that the trends in eponym usage over time are explained by multiple factors: improved understanding of diseases and their origins, fluctuations in the frequency of certain diseases, changes in cultural norms, and increased recognition of the ethically fraught backgrounds of a few eponymous figures.

For example, before the 1980s, Histiocytosis X was used to describe a group of histologically similar histiocytic diseases; the unknown pathophysiology resulted in the description as “X.”¹⁴ The disease nomenclature shifted toward the term “Langerhans cell histiocytosis” with the recognition of the

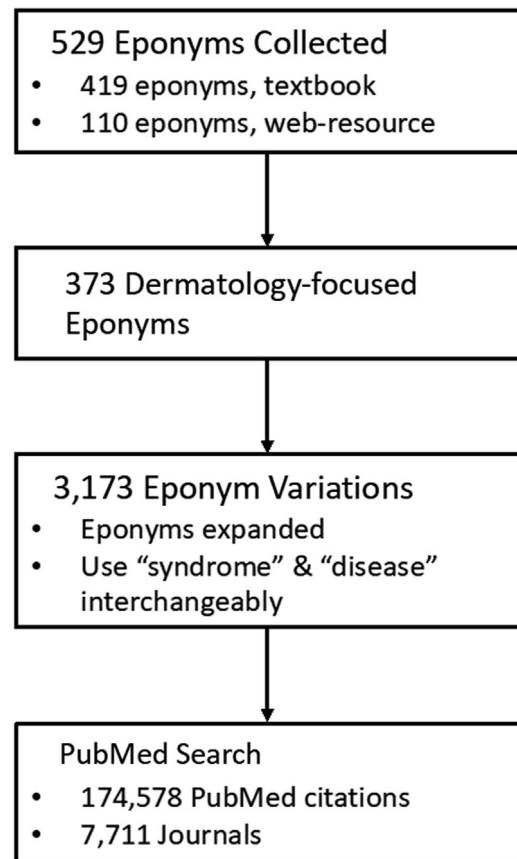


Fig 1. Flowchart of eponym identification. An initial set of 529 eponyms were collected from several source materials. A subset of 373 was deemed to be dermatology-focused by a panel of experienced dermatologists. Variations in these eponyms were permuted into multiple forms, resulting in 3173 terms which were then searched in PubMed via BioPython. A total of 174,578 citations were identified among more than 30 million journal articles in PubMed. The eponyms are cited in 7711 journals.

constituent cells as Langerhans cells.¹⁴ Similarly, there has been a dramatic increase in the usage of the terms “Merkel cell polyomavirus” and “Merkel cell carcinoma” with an improved understanding of the viral origins of this malignancy.¹⁵ Usage of a few eponyms such as “Weber-Christian disease” has become increasingly rare as the entities themselves are now widely regarded as dubious. Changes in the prevalence of some diseases may also influence the usage trends of certain eponyms. The increased usage of “Reiter syndrome” may be attributable to the rise of HIV-associated reactive arthritis in the 1980s.

Eponym usage also reflects changes in cultural norms. Reiter syndrome was once a highly cited DFE; however, its usage has decreased over the past 20 years. The eponymous individual, Hans Reiter, was a German physician and a member of the Nazi

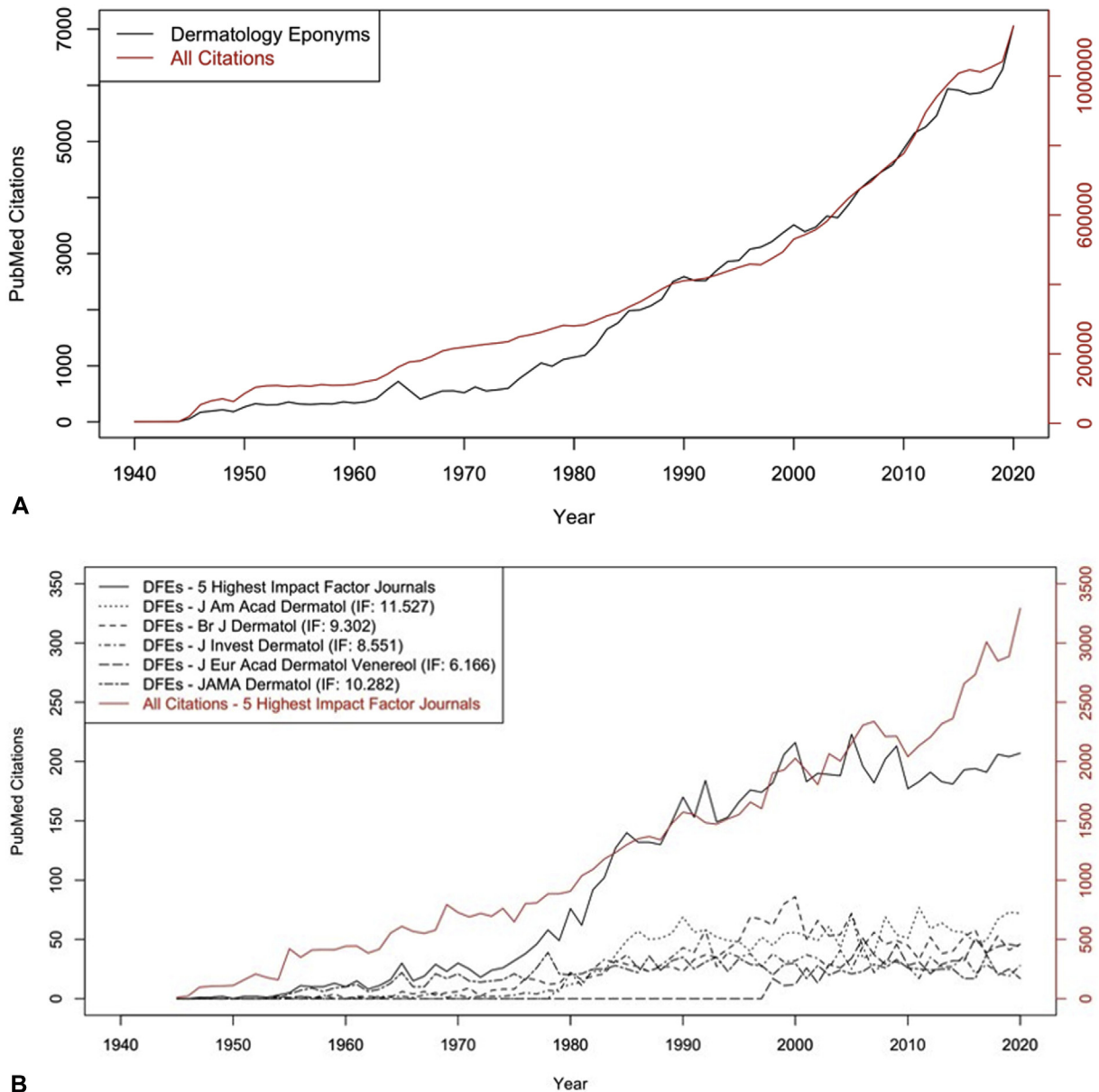


Fig 2. **A**, Citations of dermatology-focused eponyms (DFEs) compared with all citations. In PubMed, the overall trend for citations with DFEs (*black line*) is comparable to the total number of citations of all medical articles (*red line*). **B**, In comparison, the trend of DFEs in a subset of 5 dermatology journals (*black solid line*) with the highest impact factor, shows no growth in the past decade and is decreasing compared with the total number of citations from these 5 journals (*red solid line*).

party who was later discovered to have conducted human experiments at the Buchenwald concentration camp during World War II.⁴ An official denouncement of the usage of the term “Reiter syndrome” was requested by one of the individuals who initially coined the eponym in 1942.⁴ Similarly, a troubling legacy relating to human experimentation has prompted a reconsideration of other DFEs.⁵ Our data show the possible impact of increased scrutiny of ethical backgrounds on eponym usage.

In addition to ethical issues, another possible explanation for the declined usage of eponyms is the decreased acceptance of their use in medical writing. In 2007, *BMJ* had a point-counter-point both for¹⁶ and against¹⁷ the continued use of eponyms. The principal argument for keeping eponyms in medicine is that they “bring color to medicine, and they embed medical traditions and culture in our history.”¹⁶ Furthermore, it was argued that not only in medicine but throughout culture, eponyms are

Table I. Twenty most cited dermatology focused eponyms

2020 rank	1880-2020 rank	Eponym	Eponymous individual (Country, year of birth)*	Year of seminal publication	2020 PubMed citations
1	1	Leishmania	Leishman, William Boog (UK, 1865)	1903	1320
2	3	Behçet syndrome	Behçet, Hulushi (Turkey, 1889)	1937	488
3	2	Kaposi sarcoma	Kaposi, Moritz (Hungary, 1837)	1872	360
4	8	Langerhans cell histiocytosis	Langerhans, Paul (Germany, 1847)	1985	251
5	12	Mohs surgery	Mohs, Frederic E (USA, 1910)	1941	239
6	11	Merkel cell carcinoma	Merkel, Friedrich Sigmund (Germany, 1845)	1875	234
7	4	Paget disease [†]	Paget, James BT (UK, 1814)	1874	225
8	9	Stevens-Johnson syndrome	Stevens, Albert Mason (USA, 1884) Johnson, Frank Chambliss (USA, 1894)	1922	211
9	25	Meibomian gland	Meibom, Johann Heinrich (Germany, 1638)	1666	210
10	10	Ehlers-Danlos syndrome	Ehlers, Edvard L (Denmark, 1863) Danlos, Henri Alexander (France, 1844)	1901 1908	203
11	14	Still disease	Still, George Frederick (UK, 1868)	1897	167
11	7	Raynaud phenomenon	Raynaud, AG Maurice (France, 1834)	1862	167
13	20	Peyronie disease	Peyronie, Francois, De La (France, 1678)	1743	155
14	13	Henoch-Schönlein purpura	Henoch, Eduard Heinrich (Germany, 1820) Schönlein, Johann Lukas (Germany, 1793)	1868 1832	134
15	5	Langerhans cells	Langerhans, Paul (Germany, 1847)	1868	128
16	16	Sézary syndrome	Sézary, Albert (France, 1880)	1938	103
17	40	Merkel cell polyomavirus	Merkel, Friedrich Sigmund (Germany, 1845)	2008	93
18	21	Sweet syndrome	Sweet, Robert Douglas (UK, 1918)	1964	90
19	28	Vogt-Koyanagi-Harada syndrome	Vogt, Alfred (Switzerland, 1879) Koyanagi, Yoshizo (Japan, 1880) Harada, Einosuke (Japan, 1892)	1906 1929 1926	89
20	27	Fournier gangrene	Fournier, Jean Alfred (France, 1832)	1883	74

*Barankin B, Stedman TL, Metelitsa AI, Lin AN. Stedman's Illustrated Dictionary of Dermatology Eponyms. Lippincott Williams & Wilkins; 2005.
[†]Search term of "Paget disease" may also include a similar but distinct disease entity "extramammary Paget disease" and the non-dermatology-focused eponym entity "Paget disease of bone."

Table II. Dermatology-focused eponym usage in 5 dermatology journals*

Journal (year of first publication)	First PubMed indexed year	Publication year (%)			
		1960	1980	2000	2020
<i>Journal of the American Academy of Dermatology</i> (1979)	1979	[†]	6.4	11.9	7.0
<i>British Journal of Dermatology</i> (1888)	1951	0.0	9.5	12.7	6.3
<i>Journal of Investigative Dermatology</i> (1938)	1945	0.0	10.8	8.5	7.6
<i>Journal of the European Academy of Dermatology and Venereology</i> (1991)	1998	[†]	[†]	7.9	5.0
<i>JAMA Dermatology</i> (1920) [‡]	1955	3.6	7.0	8.4	5.9

*The years when the 5 journals were first indexed in PubMed are also listed. The frequency of dermatology-focused eponyms among 5 dermatology journals was calculated as a percentage of total citations in those 5 journals in the years 1960, 1980, 2000, and 2000.

[†]Articles not indexed in PubMed that year.

[‡]*JAMA Dermatology* has had several name changes; it was established in 1920 as Archives of Dermatology and Syphilology, and next in 1960 it became Archives of Dermatology, and finally its current name was set in 2013; the publication year (%) in this table is from Archives of Dermatology or *JAMA Dermatology*.

Table III. Rate of eponym usage compared with the overall citations*

Citations	New citations per year		P value
	1981-2000	2001-2020	
PubMed, all citations	11,520	31,603	<.001
PubMed, DFE citations	111	178	<.001
5 dermatology journals, [†] all citations	42.3	59.8	.036
5 dermatology journals, DFE citations	5.80	0.36 [‡]	<.001

DFE, Dermatology-focused eponym.

*The rate of increase in citations per year was calculated by slopes of linear regression from the 2 time periods (1981-2000 and 2001-2020); these were further tested for statistical difference by analysis of covariance.

[†]See Materials and Methods and Table 2.

[‡]Not statistically different from 0 while all the rest slopes are statistically different from 0 ($P < .001$).



Fig 3. Eponyms with the most dynamic change over time. Eponyms with the greatest percentage increase **(A)**, and eponyms with the greatest percentage decrease **(B)** in PubMed citations from 1940 through 2020. The lines depict the 5-year moving average of the annual PubMed citation indicated by the barplots. Note that the search terms for “Mohs surgery” include other variants such as “Mohs micrographic surgery,” “Mohs cancer resection,” “Mohs excision,” and “Mohs cancer excision.” *DFE*, Dermatology-focused eponym.

ubiquitous and embedded. The arguments against eponyms in medicine were that they “lack accuracy, lead to confusion, and hamper scientific discussion in a globalized world.”¹⁷ The current 11th edition of the *AMA Manual of Style* does not prohibit the use of

eponyms but recommends that “descriptive terms are often more useful for a reader.”¹⁸ Similarly, the National Library of Medicine, in a description of the Medical Subject Headings thesaurus, notes that their practice is to “avoid eponyms whenever and

wherever possible.” However, many eponyms are in the Medical Subject Headings thesaurus because “in a great many instances satisfactory substitutes are unavailable.”¹⁹ Overall, this tension between the acceptance and abandonment of eponyms may encourage the authors of medical journal articles to rethink their usage of eponyms. Alternative names have become more widely accepted. For example, “Churg-Strauss syndrome” has become “eosinophilic granulomatosis with polyangiitis” and “Wegener’s granulomatosis” has become “granulomatosis with polyangiitis,” although the latter example may also have ethical pressures similar to “Reiter syndrome.”

Large-scale studies of eponym usage in the medical literature are not practical without an automated tool, but even with automated search tools, the current study had certain limitations. First, the search used in this study was limited to publications cataloged in PubMed. Second, the full text of an article was not searched as only the title and abstract of PubMed entries were available for querying. Ideally, the most comprehensive identification of eponym usage would be an automated search of the full text of journals and books. However, there is currently no tool available for an automated full-text query across all resources.

Interestingly, this study identifies that there is a continued growth in the usage of DFEs in the general medical literature. The DFEs which are frequently used in PubMed are dynamic with changes in usage for each eponym over time (Supplementary Fig 1, available via Mendeley at <https://data.mendeley.com/datasets/xyt93dc5gk/1>). However, in the 5 most cited dermatology journals, there has been a plateau with minimal growth in the usage of DFEs. Furthermore, because the total citations of these journals have increased, the percentage of articles with DFEs is decreasing. This discrepancy between the general medical and dermatology literature may reflect a trend of dermatologists departing from the use of eponyms and perhaps using alternative descriptive terminology.

CONCLUSIONS

In the general medical literature, there is a continuous growth in the usage of DFEs. However, in the dermatology literature, the use of DFEs has plateaued.

Conflicts of interest

Dr Park is on the scientific advisory board of HU Group (Tokyo, Japan; formerly known as Miraca Holdings); subsidiaries of HU Group include Baylor Genetics Laboratory, Fujirebio Inc, and SRL Labs.

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