
ORIGINAL ARTICLE

Postgraduate training opportunities for chiropractors: A description of United States programs

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ABSTRACT

Objective: The objective of this study was to describe and compare the current postgraduate training opportunities (PTOs) in the United States (US) for which doctors of chiropractic are eligible, namely, residencies, fellowships, and board certifications.

Methods: An internet search of publicly available English-language websites on Google.com was executed using a cache-cleared private browser and key search phrases. Following webpage data extraction, e-mail and telephone follow-up were completed with officials from institutions offering doctor of chiropractic programs possessing accreditation by the Council on Chiropractic Education (CCE) in the US. Additional programs identified were annotated and incorporated into the data set if they met the inclusion criteria. Descriptive statistics were generated following data aggregation.

Results: Three-hundred internet search results were screened, 70 of which were assessed for eligibility and 47 included for descriptive analysis. Among the 16 CCE-accredited institutions solicited, 13 returned correspondence (81.3% response rate), resulting in the addition of 2 programs to the data set ascertained by the initial web search. There were 49 PTOs for chiropractors. Of programs available, residencies represented 49.0% (24/49) of programs, and fellowships represented 12.2% (6/49) of programs. There were 19 board specialty diplomate programs, constituting 38.8% of PTOs.

Conclusion: This work details preliminary descriptive information on the current state of US-based PTOs for chiropractors.

Key Indexing Terms: Chiropractic; Education; Internship and Residency; Fellowships and Scholarships

J Chiropr Educ 2024;38(1):104–114 DOI 10.7899/JCE-23-23

INTRODUCTION

As with any health care profession, the field of chiropractic is constantly evolving, which has culminated in the expansion of numerous postgraduate training opportunities (PTOs) over the past decade.^{1–5} Residencies and fellowships are 2 forms of postgraduate training in the United States (US) that provide education beyond what is traditionally afforded in professional degree programs.⁶ These educational pursuits may be unfamiliar or entirely obscure to both new chiropractic graduates and practicing chiropractors, given that they are a relatively recent trend in postgraduate chiropractic pedagogy (the exception being diagnostic imaging residencies).^{7–9} Nevertheless, they appear to be valued by contemporary chiropractic students and clinicians, in the US and abroad, being viewed as critical for the advancement of the profession.^{9–11}

A residency is a supervised educational activity consisting of serial clinical and/or other learning experiences resulting in the attainment of higher-level competencies.^{12,13} A fellowship is a

type of advanced educational program, generally following a primary specialization or residency, that supports development in a particular field or subspecialty and may revolve around pedagogical, clinical, and/or research aims.¹³ Both direct and indirect costs associated with fellowship programs are traditionally funded by a specific organization, association, institution, or government office for a predetermined duration.¹⁴ Postdoctoral, or “postdoc,” training programs may be represented under the auspices of a fellowship (depending on the country and institution) and are research focused, in domains such as health policy, health care administration, and human services.¹⁵

Specialty board certifications (or postdoctoral diplomate certifications) constitute additional PTOs for chiropractors and stand distinct from the series of examinations by the National Board of Chiropractic Examiners that most graduates of a US chiropractic program are required to pass to qualify for individual state licensure.^{16–20} Postdoctoral diplomate certifications indicate an advanced level of competence following supplementary education in a specific discipline (eg, pediatrics, neurology, or sports medicine) and are generally recognized by state boards, public agencies, and insurance companies.^{17,21}

First Published Online January 23, 2024

Following certification, a chiropractor qualifies for advertisement of advanced practice status and is referred to as a diplomate of the respective board. The American Board of Chiropractic Specialties (ABCS) and the International Board of Chiropractic Specialties (IBCS) collaborate with the specialty boards and councils of professional associations to maintain quality and standards for diplomate certifications.

All PTOs are not necessarily created equal, as accreditation plays a vital role in ensuring the quality of these programs through an impartial evaluation of compliance to established standards in a discipline. Since 1974, the Council on Chiropractic Education (CCE) has been nationally recognized as the programmatic accrediting agency for doctor of chiropractic programs (DCPs) by the US Department of Education and Council for Higher Education Accreditation, providing a guarantee of meeting strict standards for academic quality, transparency, accountability, structure, and organization.²² More recently, CCE has accredited chiropractic residency programs as well.¹²

There is currently a paucity of descriptive research in the area of PTOs for chiropractors. The chiropractic profession in the US possesses no centralized clearinghouse with respect to residencies, fellowships, and diplomate certifications. Information on program characteristics, geographic distribution, and sponsoring institutions are scattered across individual webpages, making it difficult for interested applicants to compare opportunities in a time-efficient manner. This study seeks to begin filling this void by providing a quantitative analysis of residencies, fellowships, and board certifications eligible for chiropractors in the US.

METHODS

An internet search of publicly available English-language websites on Google.com was executed between March 2023 and May 2023 using a cache-cleared private browser and the following key search terms: “chiropractic residency program,” “chiropractic fellowship program,” “chiropractic board certification program,” “chiropractic diplomate,” “chiropractic postgraduate program,” and “chiropractic post-professional program.” This approximated the approaches used by other studies, although they queried individual websites rather than a search engine.^{23,24} The first 50 results of each term combination were screened for relevance and eligibility by the author. Duplicate hyperlinks were removed.

Residency programs were included if they (1) are physically located in the US, (2) are eligible to chiropractors, (3) contain the word “residency” in the name, (4) are currently accepting applications or show evidence of current residents (ie, appear active), and (5) possess a landing page or document on the sponsoring organization’s website with basic information regarding curriculum, duration, accreditation, and/or monetary considerations. Fellowship programs were included if they (1) are physically located in the US, (2) are eligible to chiropractors, (3) contain the word “fellowship” in the name, (4) are currently accepting applications or show evidence of current fellows (ie, appear active), and (5) possess a landing page or document on the sponsoring or funding organization’s website with basic information regarding curriculum, duration, accreditation, and/or monetary considerations. Board specialty certifications were included if they (1) are represented by credentialing boards

physically headquartered in the US, (2) are eligible to chiropractors, (3) contain the word “diplomate” or “board certification” in the name, (4) are currently accepting applicants or show evidence of current diplomates (ie, appear active), and (5) possess a landing page or document on the respective credentialing board’s website with basic information regarding credit hour requirements, acceptable coursework, examination dates, and/or associated costs.

Data relevant to residency and fellowship training opportunities were imported into Microsoft Excel (Microsoft Corp, Redmond, WA, USA) to synthesize the following: sponsoring organization (free text), location (free text), affiliated institution (free text), program duration (count), stipend (Y = yes, N = no), and CCE-accreditation status (free text or none). Locations were reported for the main campus of the sponsoring organization, unless otherwise indicated during the discovery stage, and plotted on a map of the US, with regions delineated according to the US Census.²⁵ Data relevant to diplomate programs were also imported into Microsoft Excel (Microsoft Corp, Redmond, WA, USA) to synthesize the following: credentialing board (free text), recognizing or certifying body (free text), and education credit hours required (free text). Descriptive statistics were subsequently generated with proportions reported for categorical variables and mean and median for continuous variables. The only exception to this being that the duration of residencies was treated as a categorical variable to better depict the actual duration of these PTOs.

Following webpage-related data extraction, email and telephone follow-up was completed with officials from institutions possessing CCE-accredited DCPs in the US. These institutions were identified from the CCE website.²⁶ The reason for including this was to confirm the active status of programs identified during the internet search protocol and to investigate any additional opportunities affiliated with their institution but undiscovered during the internet search. Attempts for communication with directors or deans of postgraduate or continuing education department were completed by the author. In the event these departments were not available or did not exist, personnel from graduate admissions, career services, professional studies, alumni relations, or human resource departments were attempted. Four separate attempts at contact, 1 by email and 3 by telephone, were made to each institution with an interim of at least 7 days between attempts. If adequate information was obtained on the first contact, consecutive attempts were not carried out. In the event no response was received, the public-facing information was proceeded with. Additional information on PTOs ascertained through personal correspondence with these institutions was merged with the data set but remain denoted in Table 1 with an asterisk, indicating that this information was not originally discovered via the internet search alone. Apart from this exception, all other information was garnered through the publicly accessible sites.

RESULTS

Three-hundred internet search results were screened, with 71 duplicate webpages removed (Fig. 1). Sixty-eight results were assessed for eligibility after 161 were excluded due to obvious content irrelevance (eg, links to business products, scholarship opportunities, or collegiate ranking services). Twenty-one results were excluded from eligibility since they did not meet 1 or more of the inclusion criteria, with the most common reason being

Table 1 - Residency Programs in the US (N = 24)

Residency Program	Sponsoring Organization	Location	Affiliated Institution	Program Duration (mo)	Stipend	CCE Accreditation Status
Integrated Clinical Practice	Aurora Health Care	Milwaukee, WI	Southern California University of Health Sciences	12	Y	Application approved February 2023
	VA Fingerlakes Healthcare System	Canandaigua, NY	Northeast College of Health Sciences	12	Y	Initial accreditation: July 2016; reaffirmation of accreditation: July 2020
	VA Western New York Healthcare System	Buffalo, NY	Northeast College of Health Sciences	12	Y	Initial accreditation: July 2016; reaffirmation of accreditation: January 2020
	VA Connecticut Healthcare System	West Haven, CT	University of Bridgeport	12	Y	Initial accreditation: July 2016; reaffirmation of accreditation: July 2019
	Miami VA Healthcare System	Miami, FL	Keiser University	12	Y	Initial accreditation: July 2022
	Cincinnati VA Medical Center	Cincinnati, OH	Logan University	12	Y	Initial accreditation: January 2022
	VA St. Louis Health Care System	St. Louis, MO	Logan University	12	Y	Initial accreditation: July 2016; reaffirmation of accreditation: July 2019
	VA Central Iowa Health Care System	Des Moines, IA	Palmer College of Chiropractic	12	Y	Initial accreditation: January 2022
	VA Greater Los Angeles Healthcare System	Los Angeles, CA	Southern California University of Health Sciences	12	Y	Initial accreditation: July 2016; reaffirmation of accreditation: July 2019
	VA Palo Alto Health Care System	Palo Alto, CA	Palmer College of Chiropractic	12	Y	Initial accreditation: January 2023
	VA Puget Sound Health Care System	American Lake, WA	University of Western States	12	Y	Initial accreditation: July 2022
Diagnostic Imaging	National University of Health Sciences	Lombard, IL	N/A	36	Y	None
	Palmer College of Chiropractic	Davenport, IA	N/A	36	Y ^a	None
	Northeast College of Health Sciences	Seneca Falls, NY	N/A	36	Y	None
	Parker University	Dallas, TX	N/A	36	Y	None
	Logan University	Chesterfield, MO	N/A	36	Y	None
	Life Chiropractic College West	Hayward, CA	N/A	36	Y ^a	None
Chiropractic Sports Medicine	Southern California University of Health Sciences	Whittier, CA	N/A	24	Y ^a	None
Sports Injury & Rehabilitation	Palmer College of Chiropractic	Davenport, IA	N/A	36	Y ^a	None
Chiropractic Multidisciplinary	Elevate Life Chiropractic Clinic	Annapolis, MD	Southern California University of Health Sciences	12	Y ^b	Application denied February 2023
Neuromusculoskeletal Medicine	University of Bridgeport	Bridgeport, CT	N/A	36	Y	None

Table 1 - Continued.

Residency Program	Sponsoring Organization	Location	Affiliated Institution	Program Duration (mo)	Stipend	CCE Accreditation Status
Clinical Anatomy	Northeast College of Health Sciences	Seneca Falls, NY	N/A	36	Y ^a	None
Family Practice ^a	National University of Health Sciences	Lombard, IL	N/A	36	Y	None
Clinical Research ^a	National University of Health Sciences	Lombard, IL	N/A	36	Y	None

CCE, Council on Chiropractic Education; Y, yes; N, no; N/A, not applicable.

^a This information was obtained through correspondence with the sponsoring organization.

^b This information was obtained through correspondence with the affiliated institution.

that the resultant webpage detailed a program located internationally or virtually (ie, not physically in the US). Ultimately, 47 results were included for descriptive analysis.

The term “chiropractic residency program” yielded 23 residencies, 1 fellowship, and 1 board specialization. The term “chiropractic fellowship program” yielded 10 fellowships, 11 residencies, and 2 board specializations. The term “chiropractic board certification program” yielded 13 board specializations and 1 residency. The term “chiropractic diplomate” yielded 19 board specializations. The term “chiropractic postgraduate program” yielded 3 residencies. The term “chiropractic postdoc program” yielded 4 residencies, 8 fellowships, and 3 board specializations. More than half (59.6%; 28/47) of the programs were identified by at least 2 separate search phrases.

Among the 16 CCE-accredited institutions elicited for postgraduate program information, 13 returned correspondence either through e-mail or telephone call (81.3% response rate), verifying the status of PTOs and resulting in the discovery of 6 additional programs. Four of these programs did not meet the requirements for incorporation in the data set due to a lack of webpage or document detailing basic program information. The other 2 programs were added to the data set ascertained by the initial web search. Seven institutions confirmed that they did not currently offer any PTOs.

As of May 2023, a total of 49 PTOs for chiropractors exist in the US with readily accessible information online. Individual attributes of these programs can be found in Tables 1 to 3. Appendix 1 (available online accompanying this article as supplementary material) contains the hyperlink for each program’s webpage or informational document. Of the 49 postgraduate education programs available, residencies represented 49.0% (24/49) of programs and fellowships represented 12.2% (6/49) of programs. There were 19 board specialty diplomate programs, constituting 38.8% of total postprofessional opportunities. Twenty-nine postprofessional training opportunities were represented in 15 different states throughout each region of the US. PTOs organized by US state distribution (excluding board certifications and US Department of Veterans Affairs [VA] advanced fellowships) are visually displayed in Figure 2. The Midwestern region of the US boasted the highest prevalence of PTOs (11/29), followed by the Northeastern region (10/29). The Southern region contained the fewest amount (3/29).

Residency Programs

Twenty-four residencies were represented across both public and private sectors (Table 1). Twelve residencies (50.0%) were 12 months in duration, 11 residencies (45.8%) were 36 months, and 1 residency (4.2%) was 24 months. Every residency displayed evidence of a stipend or salary. Information regarding stipends for 6 programs was corroborated through personal correspondence with sponsoring or affiliated institutions because explicit information was often unclear online. The only residency programs in the public sector were in the VA and constituted 10 of the 11 programs integrated in a hospital system, the other being at Aurora Health Care. The VA Integrated Clinical Practice residencies were the only CCE-accredited residencies in the US; however, the Aurora Integrated Clinical Practice residency has received initial application approval.²⁷

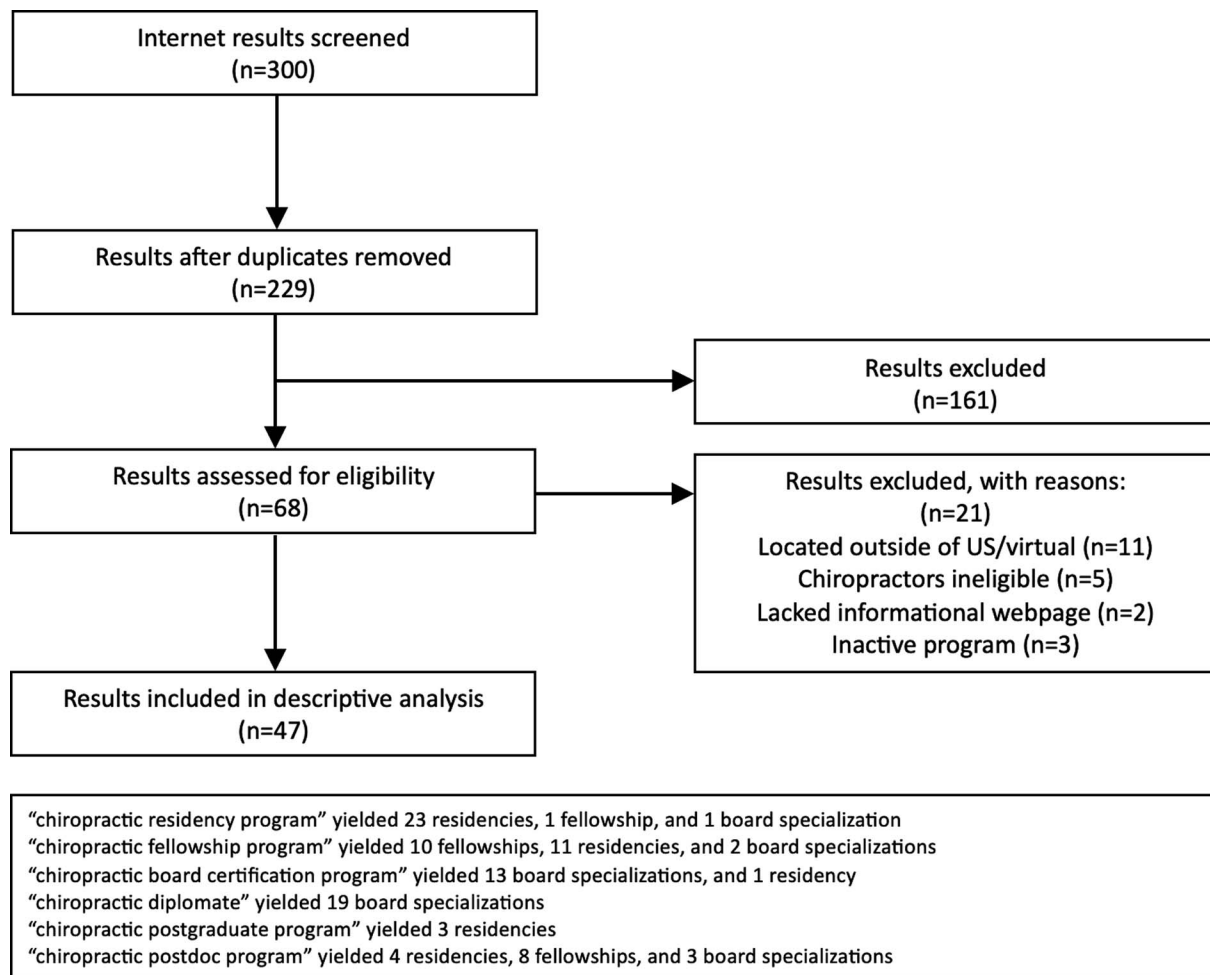


Figure 1 - Flow diagram of search result screening and inclusion.

The most prevalent private sector residencies were institutional programs at colleges or universities with DCPs (85.7%; 12/14). Diagnostic imaging residency programs were represented at 6 different institutions and were the most common area of focus among private sector residencies. The remaining programs' areas of focus included sports medicine, clinical anatomy, and family practice, among others.

Nine programs result in residents becoming qualified to apply for board certification following completion of the residency program. Graduate residents of any of the diagnostic imaging residency programs are eligible for examination conferring diplomate status of the American Chiropractic Board of Radiology. Graduate residents of the sports medicine residency at Southern California University of Health Sciences are eligible to sit for board certification by the American Chiropractic Board of Sports Physicians, assuming other prerequisites are met.²⁸ Graduate residents of the sports injury and rehabilitation residency at Palmer College of Chiropractic are eligible to take the American Chiropractic Rehabilitation Board certification examination. Graduate residents of the neuromusculoskeletal medicine residency at the University of Bridgeport meet the requisite requirements for board certification examination by the International Academy of Neuromusculoskeletal Medicine.

Fellowship Programs

Six fellowship programs were represented across both public and private sectors (Table 2). The mean duration of the fellowships was 30.0 (median 30.0) months. Most (83.3%; 5/6) of the programs were explicitly research focused, although between 10% and 25% of the fellow's time remained protected for patient care. Two of the fellowships (the VA Advanced Fellowships and the Integrative Health Research Fellowship at the University of Minnesota within the Earl E. Bakken Center for Spirituality & Healing) were in public sector and the remaining 4 in the private sector. The VA Advanced Fellowships, which are available for clinical and nonclinical health care professionals (including chiropractors), are summarized as a single entity in Table 3 but are represented in actuality by various programs under discrete areas of focus. Fellowships potentially applicable to chiropractors (“post-doctoral associate health fellows”) include Advanced Geriatrics, Health Services Research & Development, Health Systems Engineering, Health Professions Education Evaluation and Research, Medical Informatics, Patient Safety, Polytrauma/Traumatic Brain Injury, Rehabilitation, Health & Aging Policy, Addiction Treatment, Spinal Cord Injury Research, Women's Health, War Related & Unexplained Illnesses.²⁹

One fellowship was located at a private university with a doctor of chiropractic program (Northeast College of Health

Table 2 - Fellowship Programs in the US (N = 6)

Fellowship Program	Sponsoring Organization	Location	Affiliated Institution	Program Duration (mo)	Stipend	CCE Accreditation Status
Chiropractic Research Fellowship	Dartmouth College	Hanover, NH	N/A	36	Y	None
Innovations in Musculoskeletal Pain Administration, Analytics, and Care Training (IMPAACT) Fellowship	Yale University	New Haven, CT	N/A	24	Y	None
Osher Center for Integrative Medicine Chiropractic Research Fellowship	Harvard University	Cambridge, MA	N/A	36	Y	None
Integrative Health Research (IHR) Chiropractic Fellowship	University of Minnesota	Minneapolis, MN	N/A	24	Y	None
Veterans Affairs Advanced Fellowships	Location dependent	Multiple	N/A	24	Y	None
Postdoctoral Fellowship	Northeast College of Health Sciences	Seneca Falls, NY	N/A	36	Y	None

CCE, Council on Chiropractic Education; Y, yes; N, no; N/A, not applicable.

Sciences). No fellowships were CCE accredited. Stipends or salaries were offered in all 6 programs. Four fellowships were funded externally via private-foundational grants or awards. Three of these awards were from the National Chiropractic Mutual Insurance Company (NCMIC) Foundation, and 1 was from the Chiropractic Future Foundation. The VA Advanced Fellowships are funded through the Office of Academic Affiliations. The remaining fellowship, at Northeastern College of Health Sciences, is presumed to be funded internally.

Four fellowships result in the attainment of a master's degree at successful completion of the program. Fellows in the programs sponsored by Yale University and Harvard University are concurrently enrolled in a Master of Public Health degree program. Following completion of formal coursework, fellows at Dartmouth College's program will earn a Master of Science degree in health care research. Through personal correspondence with the sponsoring organization, it was discovered that the postdoctoral fellowship at Northeast College of Health Sciences has historically funded several different master's degree programs, including those in the domain of clinical anatomy, education, and business administration.

Board Specializations

Nineteen separate board specialization programs were identified in this study (Table 3). Twelve (63.2%) of the chiropractic specialties were recognized by ABCS or IBCS. The remaining 5 diplomate programs were not recognized by an external board. Two programs exhibited dual recognition through ABCS and the National Commission for Certifying Agencies (NCCA), with an additional program possessing triune recognition through the 2 former organizations and the International Accreditation Service.

The vast majority (89.5%) of diplomate certifications required at minimum 300 hours of devoted training through a combination of distance learning formats, seminars, online reading material, or degree programs to be eligible for board examination. Areas of specialty were spread equally among the board certifications, with the exception of 3 realms:

neurology, pediatrics, and nutrition. Each of these specialties was composed of 2 separate diplomate programs.

Both ABCS- and NCCA-recognized diplomates demonstrated procedures for board examinations consistent with the Standards for Educational and Psychological Testing developed jointly by the American Education Research Association, American Psychological Association, and National Council on Measurement in Education.³⁰ None of the other board specialties defined published standards for testing policies.

DISCUSSION

This descriptive study collated the current landscape of PTOs for chiropractors and demonstrated almost 50 programs currently exist, composed of both accredited and nonaccredited trainings. These PTOs are represented across public-facing websites and dispersed throughout the US at either public or private institutions. While speculative, chiropractic graduates or practicing clinicians interested in pursuing residencies or fellowships may be more competitive for these positions when (1) they have a strong academic background and hands-on experience in the subject matter of the program, (2) they display evidence of commitment to the field and relevant research scholarship, (3) they possess strong letters of recommendation from key professionals in the profession who can attest to their abilities and accomplishments, and/or (4) the program is housed at a facility that boasts a well-integrated chiropractic clinic.³¹ Competition for admission to residency and fellowship spots may be high due to the limited availability of these opportunities for DCs.

VA is the largest health care training system in the US.³² It is unsurprising, then, that they possess numerous fellowships for which chiropractors are eligible and comprised nearly half (45.5%; 10/22) of all chiropractic residencies. The VA Advanced Fellowships enable fellows in these programs to develop skills in specific clinical areas and gain experience in policy development, system redesign, and research methodology, through hands-on, mentored educational experiences.²⁹ A decade ago, a

Table 3 - Board Certification Programs in the US (N = 19)

Program	Credentialing Board	Recognizing or Certifying Body	Education Credit Hours Required
American Board of Chiropractic Acupuncture Diplomate (DABCA)	American Board of Chiropractic Acupuncture	American Board of Chiropractic Specialties	300 hours
American Board of Chiropractic Internists Diplomate (DABCI)	American Board of Chiropractic Internists	American Board of Chiropractic Specialties	300 hours
American Chiropractic Neurology Board Diplomate (DACNB)	American Chiropractic Neurology Board	American Board of Chiropractic Specialties/NCCA/IAS	300 hours
Chiropractic Board of Clinical Nutrition Diplomate (DCBCN)	Chiropractic Board of Clinical Nutrition	American Board of Chiropractic Specialties	300 hours or MS degree in nutrition
American Chiropractic Board of Occupational Health Diplomate (DACBOH)	American Chiropractic Board of Occupational Health	American Board of Chiropractic Specialties	300 hours
American Board of Chiropractic Pediatrics Diplomate (DABCP)	American Board of Chiropractic Pediatrics	American Board of Chiropractic Specialties	300 hours
American Board of Forensic Professionals Diplomate (DABFP)	American Board of Forensic Professionals	American Board of Chiropractic Specialties	300 hours
American Chiropractic Rehabilitation Board Diplomate (DACRB)	American Chiropractic Rehabilitation Board	American Board of Chiropractic Specialties	150 hours or completion of residency
American Chiropractic Board of Radiology Diplomate (DACBR)	American Chiropractic Board of Radiology	American Board of Chiropractic Specialties	3000–4000 hours ^a
International Academy of Neuromusculoskeletal Medicine Diplomate (DIANM)	International Academy of Neuromusculoskeletal Medicine	American Board of Chiropractic Specialties	300 hours or completion of residency
American Clinical Board of Nutrition Diplomate (DACBN)	American Clinical Board of Nutrition	American Board of Chiropractic Specialties/NCCA	300 hours
American Chiropractic Board of Sports Physicians Diplomate (DACBSP)	American Chiropractic Board of Sports Physicians	American Board of Chiropractic Specialties/NCCA	450 hours ^b
International Board of Chiropractic Neurology Diplomate (DIBCN)	International Board of Chiropractic Neurology	International Board of Chiropractic Specialties	300 hours
International Board of Electrodiagnosis Diplomate (DIBE)	International Board of Electrodiagnosis	International Board of Chiropractic Specialties	300 hours
Diplomate in Clinical Chiropractic Pediatrics (DICCP)	International College of Chiropractic Pediatrics	None	360 hours
Diplomate in Chiropractic Craniocervical Junction Procedures (DCCJP)	International Chiropractors Association Upper Cervical Council	None	300 hours
Diplomate in Philosophical Chiropractic Standards (DPHCS)	International Chiropractors Association Chiropractic Philosophy Council	None	300 hours
Diplomate of Academy Council of Chiropractic Pediatrics (DACCP)	Academy of Chiropractic Family Practice	None	400 hours
Gonstead Clinical Studies Society Diplomate (Gonstead Diplomate)	Gonstead Clinical Studies Society	None	238 hours ^c

MS, Master's of science degree; NCCA, National Commission for Certifying Agencies; IAS, International Accreditation Service.

^a Estimation based on mandatory requirement of 3-year residency completion.

^b Required to first complete Certified Chiropractic Sports Physician certification followed by completion of an additional 200 hours of postgraduate education, completion of a MS degree in sports medicine or related field, or completion of a sports medicine residency program.

^c Minimum of 3 years active Gonstead practice.



Figure 2 - Countrywide distribution of residency and fellowship training opportunities. The numeral contained within either shape reflects the number of each type of program located in the city.

request for proposals was announced by the Office of Academic Affiliations regarding a chiropractic residency pilot initiative in the VA.⁷ Over the past decade, 5 additional residency sites have been added to the initial pilot locations, expanding the total number to 10 locations, represented in multiple regions of the US (Fig. 2). Factors that may be apropos to the strength of VA representation in PTOs have been discussed elsewhere.^{23,33}

This study appears to be the first of its kind in the chiropractic profession. However, other health professions have published similar resources, either in the peer-reviewed literature or on profession association websites, documenting postgraduate educational opportunities. Westervelt et al reported 242 residency and 49 fellowship opportunities for physical therapists in the US.⁶ In their 2021 *Data Resource Book*, the Accreditation Council for Graduate Medical Education reported 12,740 total accredited specialty and subspecialty training programs for medical doctors and doctors of osteopathy in all 50 states, the District of Columbia, and Puerto Rico.³⁴ At the time of writing, the American Society of Hospital Pharmacists list 2872 accredited and candidate residency opportunities for pharmacists in a multitude of subcategories and settings nationwide.³⁵

Twenty-one results were excluded from this study due to falling outside of predetermined criteria (Fig. 1). Nevertheless, several of these opportunities screened merit brief discussion. Through an administrative supplemental grant provided by the National Institutes of Health/National Center for Complimentary and Integrative Health, a chiropractor was appointed as a post-doctoral research fellow at the Yale Center for Medical Informatics to work on a pragmatic randomized trial.³⁶ Similarly, through funding by Palmer College of Chiropractic and with support from the Inter-institutional Network for Chiropractic Research, a

chiropractor was awarded a postdoctoral research fellowship to pursue innovations in nonpharmacologic pain management options.³⁷ Another fellowship afforded an 18-month integrative clinical program for chiropractors through a Ohio-based private medical group to develop proficiency in functional medicine, although it appears to be inactive.³⁸ Two separate fellowships provided training in spinal biomechanics/trauma and primary spine care, with the former being an amalgamation of online didactic material and a clinical rotation component and the latter being entirely online. The online coursework for these fellowships is approved by the Accreditation Council on Continue Medical Education for continuing medical education credit through a joint providership with the Jacobs School of Medicine and Biomedical Sciences at the State University of New York (Buffalo). Both of these fellowships require fellows to pay for the program and do not offer a salary or stipend.^{39,40}

Four additional training programs were identified during follow-up with officials from institutions possessing CCE-accredited DCPs in the US but were not included in the descriptive analysis since each lacked a digital footprint (ie, no landing page or document detailing basic program information). A clinical fellowship opportunity exists at the University of Western States, within their Connected Whole Health clinic. An integrated health care residency at Logan University confers the opportunity to rotate through several multidisciplinary health care entities including Affinia Healthcare, CareSTL Health, the Mercy JFK Clinic, and the St. Louis County Department of Health. Northwestern Health Sciences University possesses a chiropractic sports medicine residency and displayed online evidence of a current resident at their Human Performance Center but did not exhibit a dedicated informational page to a residency.⁴¹ The Master in Clinical

Neuroscience degree program at Parker University possesses a 3-credit-hour clinical residency elective requiring at least 90 hours of supervised clinical practice in a facility approved by the university. The lack of digital fingerprint of these PTOs may limit the number of applicants to them, regardless of individual eligibility. In addition, a clear spokesperson for PTOs was difficult to ascertain in many cases, making it challenging to identify relevant PTO characteristics.

The chiropractic profession would likely benefit from a centralized resource, akin to the aforementioned ones in other health disciplines, that is curated on a publicly accessible online domain and updated regularly to ensure new programmatic offerings were appended and retired programs were removed. Institutions with CCE-accredited DCPs could be elicited annually for the addition or removal of programmatic offerings affiliated with their sites. However, more consistent and homogenous administrative alignment of individuals possessing knowledge of PTOs may be required for this to be successful. In addition, further research is needed to substantiate the considerable administrative burden this may pose and whether it would substantially impact the socialization of these programs among chiropractic graduates and practicing clinicians.

Limitations

This study possesses several limitations. Internet-based searches are subject to search engine optimization (SEO) ranking. SEO influences the sequential ordering of webpages during search queries and may have influenced the discoverability of PTOs since screening was restricted a priori to the first 50 results.⁴² This limitation was attempted to be mitigated by clearing cache memory prior to initiating the data search on a private browser and contacting each institution with a CCE-accredited doctor of chiropractic program in the US to obviate missing programs due to incongruent focus words or SEO practices.⁴³ Furthermore, since these were the only institutions followed up with individually, all residency and fellowship offerings domestically for which chiropractors are eligible may not have been captured, regardless of online presence. In addition, the internet search was conducted by the author without duplication by multiple investigators. Therefore, it cannot be certain that all relevant results were thoroughly exhausted, without error. This may affect the repeatability of this study and introduced sampling bias.

Only US-based training programs were considered for inclusion, and thus, this study does not represent the entirety of chiropractic PTOs abroad, irrespective of CCE-accreditation status. For example, Canadian Chiropractic Memorial College (Toronto, Ontario, Canada) is CCE accredited, but PTOs sponsored by this institution were not included due to residing outside of the US.

A final limitation is that the data collection stage of this study took place during a 2-month period, from March 2023 to May 2023. Consequently, any programs unveiled past that time frame were excluded from analysis, further emphasizing the need for a continuously updated database of PTOs for chiropractors, as journal publications may lag behind new training program development. Three additional programs open to chiropractors were uncovered after data collection. A 3-year clinical research training program in complementary and integrative health through the University of Washington is available to chiropractors and aims to support doctoral-level clinicians in complementary and integrative health who are

interested in learning how to conduct clinical complementary and integrative health research.⁴⁴ The Medical College of Wisconsin announced a fellowship for chiropractors interested in advanced training as a member of a multidisciplinary health care team.⁴⁵ A chiropractor is currently participating in a clinical research training program through Duke University under an Administrative Supplement for Complementary Health Practitioner Research Experience from the National Center for Complementary and Integrative Health with additional funding in pursuing a Master of Health Science in Clinical Research provided by the NCMIC Foundation.⁴⁶

CONCLUSION

This work details preliminary descriptive information on the current state of US-based PTOs for chiropractors. As of May 2023, a total of 49 PTOs for chiropractors exist in the US and are readily accessible online. However, many lack verification of quality and standards by external accrediting bodies. In addition, the profession currently lacks a consolidated resource of applicable training programs, potentially precluding many eligible applicants.

ACKNOWLEDGMENTS

The author thanks Dr Anthony Lisi for his valuable advice during the writing of this manuscript.

FUNDING AND CONFLICTS OF INTEREST

The author declares that there are no competing interests to disclose.

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Author Contributions

Concept development: SMS. Design: SMS. Supervision: SMS. Data collection/processing: SMS. Analysis/interpretation: SMS. Literature search: SMS. Writing: SMS. Critical review: SMS.

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