Accepted Manuscript

Future considerations for clinical dermatology in the setting of 21st century American policy reform: corporatization and the rise of private equity in dermatology

Sailesh Konda, MD, Joseph Francis, MD, Kiran Motaparthi, MD, Jane M. Grant-Kels, MD

PII: S0190-9622(18)32667-7

DOI: 10.1016/j.jaad.2018.09.052

Reference: YMJD 12848

To appear in: *Journal of the American Academy of Dermatology*

Received Date: 7 February 2018

Revised Date: 24 September 2018

Accepted Date: 27 September 2018

Please cite this article as: Konda S, Francis J, Motaparthi K, Grant-Kels JM, Group for Research of Corporatization and Private Equity in Dermatology, Future considerations for clinical dermatology in the setting of 21st century American policy reform: corporatization and the rise of private equity in dermatology, *Journal of the American Academy of Dermatology* (2018), doi: https://doi.org/10.1016/j.jaad.2018.09.052.

Future considerations for clinical dermatology in the setting of 21st century American policy reform: corporatization and the rise of private equity in dermatology

Sailesh Konda, MD[1*]; Joseph Francis, MD[1]; Kiran Motaparthi, MD[1]; Jane M. Grant-Kels, MD[2]

Group for Research of Corporatization and Private Equity in Dermatology

* Corresponding author:

[1] Department of Dermatology, University of Florida College of Medicine, 4037 NW 86th Terrace, 4th Floor, Gainesville, FL 32606

Phone: 352-594-1942; Fax: 352-594-1926

Email: sailesh.konda@dermatology.med.ufl.edu

[2] Department of Dermatology, University of Connecticut School of Medicine, 21 South Road, 2nd Floor, Farmington, CT 06030

Key words: corporatization, consolidation, dermatology, dermatopathology, venture capital, private equity, outlier practice patterns

Funding sources: None

Conflicts of interest: None

Abstract word count: 99

Manuscript word count: 2481

Tables: 5

Abstract

Within the last two decades, for-profit financial groups have become increasingly involved in health care. Outlier dermatology practices with high volumes of well-reimbursed procedures are attractive to consolidation backed by private equity. With fewer choices for independent or group private practice, junior dermatologists are increasingly seeking employment without ownership in private equity-backed corporate groups, whose primary fiscal responsibility lies with investors. Medicare's response to corporatization and consolidation has already changed the practice of dermatopathology. Dermatologists should be aware of this history, given the ability of corporations and private equity groups to shape the present and future of our field.

Introduction

During the last decade, venture capital (VC) and private equity (PE) have fueled the consolidation and corporatization of dermatology. PE is composed of pooled funds from investors that directly invest in established private companies or that engage in buyouts of public companies. VC is a subset of PE that invests in start-ups with strong growth potential. PE is attracted to dermatology because of an aging population, expanded insurance coverage, dermatologist scarcity, and profitable medical, surgical, and cosmetic procedures. [1] Dermatology generated $12.7 billion in revenue in 2015 and is projected to generate $16.3 billion by 2020. [2] Furthermore, the dermatology market is highly fragmented, which has attracted some dermatologists to team up with PE as consolidators. This relationship may be inherently challenging given that PE's primary accountability is to investors.

The dermatology-industrial complex

The American Medical Association (AMA) created the Corporate Practice of Medicine Doctrine (CPOM Doctrine) in 1847, which "prohibits corporations from practicing medicine or employing a physician to provide professional medical services." The CPOM Doctrine was created due to: 1) commercialization of the practice of medicine, 2) difficulty aligning a corporation's obligation to its shareholders and an employed physician's obligation to his or her patients, and 3) the possibility of a corporation interfering with an employed physician's independent medical judgement. [3] While many states followed suit and enacted laws prohibiting CPOM [4], there are broad exceptions. This has allowed some to successfully navigate around CPOM laws and structure

relationships with physicians through employment, ownership, or practice management agreements. Over three decades ago, Relman, a longtime editor of the New England Journal of Medicine and health system critic, warned of a "new-medical-industrial complex" and a "large and growing network of private corporations engaged in the business of supplying health care services to patients for a profit," which lends to the phenomenon of "cream-skimming," which is the over-provision of services to low severity patients. [5-7] While many facets of medicine have undergone consolidation and corporatization, dermatology remained below the radar of investors and relatively independent until the end of the twentieth century.

Changing landscape of dermatology

Generational differences in the practice of medicine and economic pressures may have helped fuel consolidation. Baby Boomers who *lived to work* were worrying about retirement while Generation X'ers *work to live* and Generation Y/Millennials desired a *work-life blend*. [8] Ehrlich and colleagues found 44% of dermatologists were in solo practice in 2005 compared to 35% in 2014. Solo practice dermatologists were likely 50 years of age or older and dermatology group, multispecialty group, or academic dermatologists were likely 49 years of age or younger. [9] This dichotomy enabled the corporate structure to insert itself between the generations. Company models revolved around acquiring independent dermatology practices and pathology laboratories of retiring physicians or opening new offices. Many were given equity in the larger company. Recent dermatology graduates, many with accrued student loans desiring a

stable salary, were hired to replace acquired, retiring dermatologists and secure longevity of these companies. Younger recruits may also be enticed with shares of equity (albeit smaller) at the time of signing or after working for the company for a set number of years. Employment of physician extenders in dermatology also steadily increased across all practice models from 28% in 2005 to 46% in 2014 with 34% of solo practitioners employing a physician assistant compared to 54% of dermatologists in group practices. [9]

Economies of scale in dermatology

Consolidation into large groups can theoretically take advantage of economies of scale by centralizing services, such as billing, marketing, information technology, scheduling and call centers, regional managers for multiple offices, electronic health records, and Mohs and dermatopathology. The in-house exemption to the Stark law allows physicians to legally self-refer to an entity where the physician has a financial relationship. While this exemption was initially envisioned to enhance collaboration and patient convenience, many dermatology practice models, including corporate dermatology groups, take advantage of this loophole which allows them to legally refer all biopsy specimens and Mohs cases to themselves. This potentially encourages overutilization of these referral services to generate more revenue. [10] Large groups can take advantage of group purchasing contracts and are able to negotiate better insurance reimbursements. Some groups have even negotiated for all the patients seeking dermatology services from managed care companies for lower than market

rates in exchange for relative exclusivity. [11] Over time, some consolidators realized they could expand more quickly and maximize profits by partnering with PE.

The rise of private equity in dermatology

PE did not become mainstream until the leveraged buyout boom of financially troubled companies in the 1980s. [12] This was followed by the cyclical nature of the leveraged buyout bust of 1990-1992, boom in the late 1990s, crash in the early 2000s, boom of 2003-2007, and another bust in 2008. Physician practice management groups including PhyCor, Innovative Clinical Solutions (previously called PhyMatrix), and ProMedCo also suffered financially and filed chapter 11 bankruptcies during the early 2000s. [13-16] Presently, PE has attracted capital from high-net worth individuals because the stock market may be overvalued, hedge-funds are offering mixed results, and interest rates are near all-time lows. PE has steep fees – they take up to 1.5-2% of the assets under management and 20% of profits above a certain threshold known as the "hurdle rate," which is the expected return for their investors. [17] Bain & Company summarized the ultimate goal of PE: "All PE firms want to create value as quickly as possible – to grow revenue and take out cost – and a strong playbook helps to accomplish that." [18] Value is increased by purchasing businesses, adding debt, minimizing taxes, and cutting costs with an end game of extracting large fees. [19] Historically, PE has consolidated other fields of medicine including, but not limited to, primary care, orthopedics, ophthalmology, anesthesiology, emergency medicine, gastroenterology, urology,

obstetrics and gynecology, addiction treatment, pain management, nephrology, and dentistry. [20, 21]

The first known entry of PE in dermatology was Vicente Capital Partners, LLC, which invested in US Dermatology Medical Management, Inc. (Arlington, TX) in October 2009; the company became insolvent and sold its practices to independent dermatologists near the end of 2011. Since then, there have been numerous other entries of PE in dermatology with 32 known PE-backed dermatology groups, two of which are now defunct (Supplemental Table 1; available at http://www.jaad.org). Twenty-four of these 32 PE-backed groups were newly formed or acquired in 2015 or thereafter. Models may revolve around acquisition of “platform practices” followed by add-on acquisitions. [22] Late-career dermatologists may be enticed to sell to PE with compensation taxed at capital gains rates. Upon acquisition, collections are typically split as 40% for the employed dermatologist and 40% for overhead, leaving 20% as profit for the PE firm. [11]

In their quest to increase productivity, some PE-backed groups enlist general dermatologists and Mohs surgeons to work in more than one office and, on occasion, in multiple distant states. Dermatopathology specimens may be referred to distant regional laboratories that are owned by the entity, regardless of expert opinion, in order to capture pathology fees. [13] Companies may also employ non-dermatologist physicians to deliver dermatologic care. [23-25] This strategy is not consistent across or limited to PE firms and has been seen in other practice settings. Ancillary revenue streams include

dermatologic procedures of questionable medical necessity performed on nursing home patients as can be seen with Bedside Dermatology in Michigan, owned by Advanced Dermatology and Cosmetic Surgery (ADCS) . [26, 27] Physician extenders employed by Bedside Dermatology performed intralesional injections with averages ranging from at least 5.8 to 17.68 injections per Medicare patient in 2015 and 75% of treated patients had a diagnosis of Alzheimer's disease (Table 2). [28, 29]

PE-backed practices, similar to other dermatology practice models, may employ physician extenders on a larger scale given their lower compensations compared to dermatologists (Supplemental Table 1). Physician extenders may be leveraged to the maximum extent allowable by state law with varying degrees of supervision. This generates larger profits for the company with minimal financial gain and increased risk for the employed supervising physician. Interestingly, physician extenders may be conveniently listed under the physician category on a company's webpage, which misleads prospective patients. [23, 30, 31] PE-backed practices may also have their own physician assistant and nurse practitioner "fellowship" training programs. [28, 32] Even though two separate studies have shown physician extenders have a significantly higher number needed to biopsy (NNB) compared to dermatologists for skin cancers, this may not be a concern for their employers as a higher NNB translates to greater revenue. [33, 34]

PE firms may also benefit financially by having residency or fellowship programs associated with their offices (Supplemental Table 1). [35-42] ADCS has its own Orlando-based ACGME dermatology residency program remotely affiliated with Kansas City University of Medicine and Biosciences (Kansas City, MO). [35] Residents receive a yearly salary of $10,000 and a loan of $30,000 per year, and in return have to work for ADCS for three years after graduating or pay back their entire loan. If financially strapped residents decide to sign a post-residency contract with a noncompete clause, the residency program may be considered to have a restrictive covenant. [43] This arrangement creates a continuous pipeline of new dermatologists working for ADCS. [44]

Several influential dermatology leaders have also been recruited to work for and promote these companies or may have an immediate family member that serves as a director of an actively investing PE firm, creating potentially undisclosed conflicts of interest on a regional or national scale (Supplemental Table 1). [22, 32, 45-49] Interestingly, the Dermatology Practice Support Alliance, Inc. (DPSA) was founded by the CEO of West Dermatology as a corporation in May 2016 and represents a coalition of the largest dermatology management companies, many of which are PE-backed (Table 3). [50, 51] DPSA companies have acquired offices from each other to optimize consolidation in their respective geographic markets (Supplemental Table 1). The CEO of West Dermatology was previously CEO of Pacific Pulmonary Services, which agreed to pay $11.4 million to settle government allegations of violating the False Claims Act during his leadership. [52]

Consolidation of outliers by private equity

High outlier practice patterns may be harmful to patients and increase healthcare costs. As discussed above, both individual and corporate dermatology practices have learned to take advantage of exemptions to self-referral or Stark laws by opening labs to process their own pathology specimens. Table 4 is derived from 2015 Medicare Part B physician payment dataset and shows the link between biopsies, pathologic examination of tissue, group size, and the presence of an employed pathologist in a group. [53] Data is provided at the level of the provider and is sorted by mean number of biopsies per patient.

The most striking finding in this analysis is that the majority of providers in the top 25 either billed 88305 themselves, or were part of a corporation that employed a pathologist, or both (19/25). The driving force behind these practice patterns appears to be the additional financial benefit to the individual or corporation from self-referred pathology fees. The majority of providers in the top 25 (14/25) were also in groups of 1 or 2 providers. Although physicians in small groups can practice outside of the scrutiny of their peers [54], 6 of these extreme outliers practiced in groups of 10 or more and 5 are now in large PE-backed practices in 2018. The fact that 5 of the 29 currently PE-backed practices are represented in the top 25 suggests that PE firms may overlook billing practices and focus more on profitability rather than due diligence when consolidating practices. Further research is needed to examine healthcare resource utilization by PE-

backed practices. Notably, one of the dermatologists on this list has been sentenced to three years in prison after pleading guilty to Medicare fraud as part of a qui tam lawsuit brought on by another dermatologist whose PE-backed practice also owns an outlier practice on this list. [55-57] While some outliers are sentenced to prison, others are rewarded financially for their aberrant practice patterns (Table 2).

The end game of private equity in dermatology

Dermatology-specific models revolve around quickly acquiring or opening new practices with the goal of selling to another entity in 3-7 years. [58] In 2015, the average PE holding period for all North America- and Europe-based portfolio companies was 5.6 years. [59] For dermatology-specific PE investments, holding periods are shorter with some PE firms exiting within 2-3 years (Supplemental Table 1). Purchase offers are typically 3-5 times earnings before interest, taxes, depreciation and amortization (EBITDA) for solo practices, 5-7 times EBITDA for small dermatology groups, and over 13 times EBITDA for large, integrated, multisite groups. [58] In February 2016, Forefront Dermatology commanded over 13 times EBITDA with its $450 million purchase by OMERS. [60] Presently, PE has one trillion dollars of committed capital awaiting deployment, which may lead to overvaluations and diminishing returns for investors. [61, 62]

The future of PE's relationship with dermatology depends upon reimbursement. In 2014, the global payment for CPT code 88305 was cut by 33%; a 7% reduction followed in 2017. [63, 64] Prior to the CMS cuts, Caris Life Sciences, Inc., sold its anatomic pathology

division to Miraca Life Holdings, Inc. for $725 million in 2011. [65] Miraca Life Holdings, Inc. sold this division to Avista Capital Partners in 2017 for $175.6 million, 24.2% of its initial purchase price (Table 5). [66, 67] After "cream skimming" an annualized return on its investment, a PE firm can still benefit if they have to sell the corporation at a loss by offsetting capital gains from another investment. On the other hand, shares given to dermatologists only translate to financial gains if they are liquidated at an opportune time.

Ultimately, PE's exit strategy involves selling its company to another private equity firm, a larger healthcare conglomerate, the public via an initial public offering, or an insurance company. If UnitedHealth Group's Optum completes its acquisition of DaVita Medical Group, which acquired some of its physicians from a PE firm (Summit Partners) in 2012, there will be at least 42 board-certified dermatologists employed by a publicly traded insurance company. [68-70] Upon acquiring dermatologists, insurance companies may attempt to further narrow their networks and restrict patient access to only their employed dermatologists. [71]

Conclusion

Medicare has not been able to find a way to pay physicians based on the quality of care they provide. The Medicare Payment Advisory Commission voted in January of 2018 to dissolve the Merit Based Incentive Payments System program and replace it with yet another alternative model. [72] This leaves group size as the main way to negotiate better

reimbursements from insurers, especially cost-cutting Medicare Advantage plans. This incentivizes consolidation, and over-leveraging of extenders; it may also provide shelter for high-cost outliers and creative ways to subvert the Stark Law to further increase profits. When PE is enlisted to participate in the complex relationship between physicians and insurers, quality of care may suffer, and value-based care may be destroyed. [13, 28] In response to growing concerns from the medical community, the AMA recently passed a resolution to examine the effects on the healthcare marketplace of corporate investors, including PE firms, acquiring a majority and/or controlling interest in entities that manage physician practices. [73, 74] Ultimately, the solutions to PE exploration of our field will be the elusive quality-based payments which do not incentivize consolidation or large cuts in common dermatology procedure codes and subsequent loss of interest by PE.

References

1. Margosian E. Pulling back the curtain on private equity. *Dermatology World.* Schaumburg: American Academy of Dermatology and American Academy of Dermatology Association; 2018;28:32-41. Available from: http://digitaleditions.walsworthprintgroup.com/publication/?i=464847. Accessed January 14, 2018.

2. Margosian E. Skin in the game. *Dermatology World.* Schaumburg: American Academy of Dermatology and American Academy of Dermatology Association; 2016;26:40-46. Available from: https://www.aad.org/File%20Library/Dermworld/July-2016-dw.pdf. Accessed January 14, 2018.

3. American Medical Association - Issue brief: Corporate practice of medicine. Available at: https://www.ama-assn.org/sites/default/files/media-browser/premium/arc/corporate-practice-of-medicine-issue-brief_1.pdf. Accessed January 14, 2018.

4. Brunkow J. State by State Analysis of Corporate Practice of Medicine and Physician Employment. Available at: https://conciergemedicinenews.files.wordpress.com/2016/01/corporate-practice-of-med-summary-addendum-c.pdf. Accessed January 14, 2018.

5. Relman AS. The new medical-industrial complex. *N Engl J Me*d. 1980;303:963-970.

6. Ellis RP. Creaming, skimping and dumping: provider competition on the intensive and extensive margins. *J Health Eco*n. 1998;17:537-555.

7. Martin D. Dr. Arnold Relman, 91, Journal Editor and Health System Critic, Dies. Available at: https://www.nytimes.com/2014/06/22/us/dr-arnold-relman-outspoken-medical-editor-dies-at-91.html. Accessed June 24, 2018.

8. Boysen PG,2nd, Daste L, Northern T. Multigenerational Challenges and the Future of Graduate Medical Education. *Ochsner* J. 2016;16:101-107.

9. Ehrlich A, Kostecki J, Olkaba H. Trends in dermatology practices and the implications for the workforce. *J Am Acad Dermato*l. 2017;77:746-752.

10. Mannava KA, Bercovitch L, Grant-Kels JM. Kickbacks, stark violations, client billing, and joint ventures: facts and controversies. *Clin Dermato*l. 2013;31:764-768.

11. Coldiron BM. Well, I figured it out...I owe my soul to the company store. Available at: https://www.mdedge.com/edermatologynews/article/152321/business-medicine/well-i-figured-it-out-i-owe-my-soul-company-store. Accessed January 14, 2018.

12. Taylor III AL. Buyout binge. *TIME Magazine.* New York City: Time Inc; 1984;124. Available from: http://content.time.com/time/magazine/article/0,9171,951242,00.html. Accessed January 14, 2018.

13. Court E. Medical practices have become a hot investment - are profits being put ahead of patients? Available at: https://marketwatch.com/story/doctors-are-being-bought-up-by-private-equity-and-its-your-health-on-the-line-2018-06-08. Accessed June 24, 2018.

14. Under heavy debt, PhyCor files Chapter 11. Available at: https://www.bizjournals.com/nashville/stories/2002/01/28/daily26.html. Accessed June 29, 2018.

15. Connolly A. Gosman venture seeks Chapter 11 protection. Available at: https://www.bizjournals.com/boston/stories/2000/07/24/story4.html. Accessed June 29, 2018.

16. ProMedCo files Chapter 11. Available at: https://www.bizjournals.com/dallas/stories/2001/04/02/daily24.html. Accessed July 24, 2018.

17. Steinman B. Private equity fund fees. Available at: https://www.duanemorris.com/site/static/private_equity_fund_fees.pdf. Accessed January 14, 2018.

18. Bain and Company. Global Private Equity Report 2017. Available at: http://www.bain.com/publications/articles/global-private-equity-report-2017.aspx. Accessed January 14, 2018.

19. Private equity - the barbarian establishment. Available at: https://www.economist.com/news/briefing/21709007-private-equity-has-prospered-while-almost-every-other-approach-business-has-stumbled. Accessed January 14, 2018.

20. M'Bodj AM, Patel A. Provident Healthcare Partners and Epstein Becker Green - The future of health care: physician practices and private equity investments: private equity

in gastroenterology. Available at: https://www.ebglaw.com/content/uploads/2017/09/The-Future-of-Health-Care-Gastroenterology-The-Newest-Focus-of-Private-Equity-Investment-20170920-1700-1.pdf. Accessed January 14, 2018.

21. Walsh A, Cockrell G. The Healthcare Investor - Leading Private Equity Firms that Invest in Healthcare. Available at: https://www.thehealthcareinvestor.com/2016/02/articles/healthcare-services-investing/leading-private-equity-firms-that-invest-in-healthcare-part-i. Accessed April 24, 2018.

22. QualDerm Partners. Available at: http://qualderm.com. Accessed January 14, 2018.

23. Advanced Dermatology and Cosmetic Surgery. Available at: https://www.advancedderm.com/. Accessed January 14, 2018.

24. Dermatologists of Central States completes transformative partnership with Dermatology and Skin Surgery Center. Available at: https://www.businesswire.com/news/home/20170725005114/en/Dermatologists-Central-States-Completes-Transformative-Partnership-Dermatology. Accessed January 14, 2018.

25. Dermatology and Skin Surgery Center, PLC. Available at: http://dermatologyskinsurgerycenter.net/providers/3661202. Accessed January 14, 2018.

363 26. Bedside Dermatology. Available at:
364 http://www.grekinskininstitute.com/BedsideDermatology/. Accessed January 14, 2018.

365 27. OnSite Dermatology. Available at: http://onsitedermatology.com/. Accessed January
366 14, 2018.

367 28. Hafner K, Palmer G. Skin cancers rise, along with questionable treatments. *New*
368 *York Time*s. November 20, 2017 2017;Health. Available from:
369 https://www.nytimes.com/2017/11/20/health/dermatology-skin-cancer.html. Accessed
370 January 14, 2018.

371 29. The Wall Street Journal. Medicare unmasked: behind the numbers. Available at:
372 https://graphics.wsj.com/medicare-billing. Accessed June 24, 2018.

373 30. Northeast Dermatology Associates. Available at: http://www.nedermatology.com/.
374 Accessed January 14, 2018.

375 31. Dermatologists of Southwest Ohio, Inc. Available at:
376 http://www.dermswohio.com/physicians. Accessed April 24, 2018.

377 32. Schweiger Dermatology Group. Available at: https://www.schweigerderm.com/.
378 Accessed January 14, 2018.

379 33. Nault A, Zhang C, Kim K, Saha S, Bennett DD, Xu YG. Biopsy Use in Skin Cancer
380 Diagnosis: Comparing Dermatology Physicians and Advanced Practice Professionals.
381 *JAMA Dermato*l. 2015;151:899-902.

382 34. Anderson AM, Matsumoto M, Saul MI, Secrest AM, Ferris LK. Accuracy of Skin
383 Cancer Diagnosis by Physician Assistants Compared With Dermatologists in a Large
384 Health Care System. *JAMA Dermato*l. Published online April 18, 2018.

385 35. ACGME Kansas City University of Medicine & Biosciences-GME Consortium (KCU-
386 GME Consortium)/ADCS-Orlando Program. Available at:
387 https://apps.acgme.org/ads/Public/Programs/Detail?programId=31694. Accessed
388 January 14, 2018.

389 36. ACGME Wright State University Program. Available at:
390 https://apps.acgme.org/ads/Public/Programs/Detail?programId=619. Accessed August
391 25, 2018.

392 37. ACGME Campbell University Program. Available at:
393 https://apps.acgme.org/ads/Public/Programs/Detail?programId=32690. Accessed July
394 2, 2018.

395 38. ACGME Larkin Community Hospital Palm Springs Campus Program. Available at:
396 https://apps.acgme.org/ads/Public/Programs/Detail?programId=38510. Accessed April
397 24, 2018.

398 39. ACGME Larkin Community Hospital Program. Available at:
399 https://apps.acgme.org/ads/Public/Programs/Detail?programId=33360. Accessed
400 August 25, 2018.

40. ACGME The Skin Institute of South Florida Program. Available at: https://apps.acgme.org/ads/Public/Programs/Detail?programId=10213. Accessed April 24, 2018.

41. ACGME Larkin Community Hospital Program. Available at: https://apps.acgme-i.org/ads/Public/Programs/Detail?programId=39656. Accessed September 21, 2018.

42. ACGME Beaumont Health (Trenton) Program. Available at: https://apps.acgme.org/ads/Public/Programs/Detail?programId=31695. Accessed September 21, 2018.

43. Accreditation Council for Graduate Medical Education. ACGME Institutional Requirements. Available at: https://www.acgme.org/Portals/0/PDFs/FAQ/InstitutionalRequirements_07012015.pdf. Accessed February 18, 2018.

44. Waldman R, Grant-Kels JM. Indentured servitude or junior faculty extension of a residency? An ethical evaluation of the 3 + 3 program structure. *J Am Acad Dermato*l. 2018;78:823-825.

45. West Dermatology. Available at: https://westdermatology.com/. Accessed January 14, 2018.

46. United Skin Specialists. Available at: https://unitedskinspecialists.com/. Accessed January 14, 2018.

47. The Dermatology Group. Available at: http://www.thedermatologygroup.com. Accessed January 14, 2018.

48. Susquehanna Private Capital. Available at: https://spcllc.com. Accessed January 14, 2018.

49. Skin and Cancer Associates and the Center for Cosmetic Enhancement. Available at: http://www.scacce.com. Accessed April 4, 2018.

50. Delaware Lookup. Dermatology Practice Support Alliance, Inc. Available at: https://www.delawarelookup.com/company/6037645/dermatology-practice-support-alliance-inc. Accessed April 4, 2018.

51. McDermott Will & Emery. Realizing maximum business value: dermatology practice management. Available at: https://www.mwe.com/~/media/files/experience/ppm/dermatology.pdf. Accessed April 4, 2018.

52. Oxygen equipment provider pays $11.4 million to resolve False Claims Act allegations. Available at: https://www.justice.gov/opa/pr/oxygen-equipment-provider-pays-114-million-resolve-false-claims-act-allegations. Accessed July 2, 2018.

53. Centers for Medicare and Medicaid Services. Physician and Other Supplier Data CY 2015. Available at: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Physician-and-Other-Supplier2015.html. Accessed October 10, 2016.

54. Krishnan A, Xu T, Hutfless S, et al. Outlier Practice Patterns in Mohs Micrographic Surgery: Defining the Problem and a Proposed Solution. *JAMA Dermato*l. 2017.

442 55. Musgrave J. Palm beach dermatologist pleads guilty to health care fraud,
443 obstruction. *The Palm Beach Pos*t. December 13, 2017 ;Local. Available from:
444 http://www.mypalmbeachpost.com/news/crime--law/palm-beach-dermatologist-pleads-
445 guilty-health-care-fraud-obstruction/aoI5KcqA7WylodtFKWDwfI. Accessed January 14,
446 2018.

447 56. Musgrave J. Claiming abuse from holocaust survivor, dr. marder seeks judge's
448 mercy. *The Palm Beach Post*. February 16, 2018 ;Local. Available from:
449 https://www.mypalmbeachpost.com/news/crime--law/claiming-abuse-from-holocaust-
450 survivor-marder-seeks-judge-mercy/Tex1aaFoSDD51qx6sS7RyK. Accessed February
451 22, 2018.

452 57. Musgrave J. Palm beach dermatologist gets 3 years in prison for health-care fraud.
453 *The Palm Beach Post*. February 22, 2018 ;Local. Available from:
454 http://www.mypalmbeachpost.com/news/crime--law/palm-beach-dermatologist-gets-
455 years-prison-for-health-care-fraud/3Eh0Fu0Gm3AMnxWLJAZ4rL/. Accessed February
456 22, 2018.

457 58. Resneck JS,Jr. Dermatology Practice Consolidation Fueled by Private Equity
458 Investment: Potential Consequences for the Specialty and Patients. *JAMA Dermato*l.
459 2018;154:13-14.

460 59. Prequin - Private equity spotlight. Available at:
461 http://docs.preqin.com/newsletters/pe/Preqin-Private-Equity-Spotlight-May-2016.pdf.
462 Accessed January 14, 2018.

60. Or A. Omers PE takes advantage of hot dermatology sector with $450M purchase of Varsity-backed Forefront Management. Available at: https://blogs.wsj.com/privateequity/2016/01/14/omers-pe-takes-advantage-of-hot-dermatology-sector-with-450m-purchase-of-varsity-backed-forefront-management/. Accessed January 14, 2018.

61. The trillion-dollar question: What does record dry powder mean for PE & VC fund managers? Available at: https://pitchbook.com/news/articles/the-trillion-dollar-question-what-does-record-dry-powder-mean-for-pe-vc-fund-managers. Accessed April 24, 2018.

62. Prequin Special Report: Private Equity Fund Manager Outlook. Available at: http://docs.preqin.com/reports/Preqin-Special-Report-Private-Equity-Fund-Manager-Outlook-H1-2018.pdf. Accessed April 24, 2018.

63. Jesitus J. Dermatopathology sits in healthcare reform crosshairs. Available at: http://dermatologytimes.modernmedicine.com/dermatology-times/content/tags/biopsy/dermatopathology-sits-healthcare-reform-crosshairs. Accessed January 14, 2018.

64. Siegel DM. The Proposed Rule and payments for 2017: the good, the bad, and the ugly. *Cuti*s. 2016;98:245-248.

65. Caris Life Sciences and Miraca Holdings complete sale of anatomic pathology business. Available at: https://www.carislifesciences.com/news/caris-life-sciences-and-miraca-holdings-complete-sale-of-anatomic-pathology-business/. Accessed January 14, 2018.

66. Private equity firm buying Miraca Life Sciences for $177M. Available at: https://www.360dx.com/business-news/private-equity-firm-buying-miraca-life-sciences-177m. Accessed January 14, 2018.

67. Dorbian I. Avista buys Miraca Life Sciences. Available at: https://www.pehub.com/2017/11/avista-buys-miraca-life-sciences/. Accessed January 14, 2018.

68. DaVita Medical Group to Join Optum. Available at: http://www.unitedhealthgroup.com/Newsroom/Articles/Feed/Optum/2017/1206DaVita.aspx. Accessed April 24, 2018.

69. Case Study: HealthCare Partners. Available at: https://www.summitpartners.com/companies/healthcare-partners. Accessed April 24, 2018.

70. DaVita Medical Group. Available at: https://davitamedicalgroup.com. Accessed April 24, 2018.

71. With 8k more physicians than Kaiser, Optum is 'scaring the crap out of hospitals'. Available at: https://www.beckershospitalreview.com/payer-issues/with-8k-more-physicians-than-kaiser-optum-is-scaring-the-crap-out-of-hospitals.html. Accessed September 21, 2018.

72. Firth S. MedPAC sinks MIPS, recommends alternative program. Available at: http://www.healthleadersmedia.com/finance/medpac-sinks-mips-recommends-alternative-program. Accessed January 20, 2018.

505 73. Rheinstein PH. American Medical Association House of Delegates (A-18) - Report
506 of Reference Committee on Amendments to Constitution and Bylaws - Resolution 713 -
507 Private Equity Firms. Available at: https://www.ama-assn.org/sites/default/files/media-
508 browser/public/hod/a18-ref-comm-combined.pdf. Accessed June 24, 2018.

509 74. Court E. American Medical Association to investigate whether private-equity-owned
510 practices put profits over patients. Available at:
511 https://www.marketwatch.com/story/responding-to-doctors-concerns-american-medical-
512 association-will-investigate-role-of-private-equity-and-other-companies-2018-06-18.
513 Accessed June 24, 2018.

514 75. Ameriderm. Available at: http://www.ameridermmanagement.com/. Accessed
515 January 14, 2018.

516 76. Medical school gets approval for 1st dermatology residency program. Available at:
517 https://news.campbell.edu/articles/medical-school-gets-approval-for-1st-dermatology-
518 residency-program. Accessed July 2, 2018.

519 77. Forefront Dermatology - Find a Forefront location near you. Available at:
520 https://forefrontdermatology.com/locations. Accessed July 2, 2018.

521 78. U.S. Path Labs. Available at: http://uspathlabs.com. Accessed January 14, 2018.

522 79. eDerm Systems. Available at: http://www.edermsystems.com. Accessed January
523 14, 2018.

524 80. Health Watch separates from Response USA. Available at:
525 https://www.bizjournals.com/southflorida/stories/2001/08/27/daily39.html. Accessed July
526 2, 2018.

527 81. Ayotte KM. Creditor Control and Conflict in Chapter 11. *J Legal Analysis*.
528 2009;1:511-551.

529 82. In Re Response USA, Inc., 288 B.R. 88 (D.N.J. 2003). Available at:
530 https://law.justia.com/cases/federal/district-courts/BR/288/88/1917232. Accessed July 2,
531 2018.

532 83. SEC FORM 10-K - Orthodontic Centers of America. Available at:
533 https://www.sec.gov/Archives/edgar/data/931702/000095014404002564/g87772e10vk.
534 htm. Accessed August 25, 2018.

535 84. Orthodontists Win Key Ruling Against Dental Management Company. Available at:
536 https://www.businesswire.com/news/home/20030403005511/en/Orthodontists-Win-Key-
537 Ruling-Dental-Management-Company. Accessed August 25, 2018.

538 85. Penny v. Orthalliance, Inc., 255 F. Supp. 2d 579 (N.D. Tex. 2003). Available at:
539 https://law.justia.com/cases/federal/district-courts/FSupp2/255/579/2562501/. Accessed
540 August 25, 2018.

541 86. HMP Global - Our Portfolio. Available at: https://www.hmpglobal.com/portfolio.
542 Accessed July 30, 2018.

543 87. In the United States Bankruptcy Court for the District of Delaware in re: DSI Renal
544 Holdings, LLC, et al., Debtors. Alfred T. Giuliano, as Chapter 7 Trustee, Plaintiff, v.

545 Michael Schnabel, et al., Defendants. Available at:
546 https://www.deb.uscourts.gov/sites/default/files/opinions/judge-kevin-j-carey/dsi-renal-
547 dismissal-combined.pdf. Accessed August 25, 2018.

548 88. Bartlett J. Oliver Street Dermatology raises $13.4M in equity, debt. Available at:
549 https://www.bizjournals.com/boston/blog/health-care/2015/02/oliver-street-dermatology-
550 raises-13-4m-in-equity.html. Accessed January 14, 2018.

551 89. Cooper L. Water's Edge Dermatology Considers a Sale. Available at:
552 https://www.wsj.com/articles/waters-edge-dermatology-considers-a-sale-1517575500.
553 Accessed April 24, 2018.

554 90. Pacific Pulmonary Services. Available at: http://www.ppsc.com. Accessed August 4,
555 2018.

556 91. Council for Quality Respiratory Care. Available at: http://www.cqrc.org. Accessed
557 August 4, 2018.

558 92. The Center for Responsive Politics. Available at: http://www.opensecrets.org.
559 Accessed August 4, 2018.

560 93. FBI raids Pacific Pulmonary. Available at: http://www.hmenews.com/article/fbi-raids-
561 pacific-pulmonary. Accessed August 4, 2018.

562 94. Turmoil continues at Pacific Pulmonary. Available at:
563 http://www.hmenews.com/article/turmoil-continues-pacific-pulmonary. Accessed August
564 4, 2018.

95. Corporate Integrity Agreement between the Office of Inspector General of the Department of Health and Human Services and Braden Partners, LP, Doing Business As Pacific Pulmonary Services. Available at: https://oig.hhs.gov/fraud/cia/agreements/Braden_Partners_LP_Doing_Business_As_Pacific_Pulmonary_Services_03312017.pdf. Accessed August 25, 2018.

96. Bloomberg. Available at: https://www.bloomberg.com. Accessed January 14, 2018.

97. Crunchbase. Available at: https://www.crunchbase.com. Accessed January 14, 2018.

98. Medicare physician compare datasets. Available at: https://data.medicare.gov/data/physician-compare. Accessed November 15, 2015, January 14, 2018, and August 25, 2018.

99. The PE Hub Network. Available at: https://www.pehub.com. Accessed January 14, 2018.

100. Downing SP, DeGrande C, McGuireWoods LLP. 2017 Physician practice consolidation: A mid-year review. Available at: https://www.beckershospitalreview.com/hospital-physician-relationships/2017-physician-practice-consolidation-a-mid-year-review.html. Accessed January 14, 2018.

101. Lab Soft News. New ownership model for derm practices; ClearPath manages digital images. Available at: http://labsoftnews.typepad.com/lab_soft_news/2017/12/is-venture-capital-the-future-of-dermatology-practices.html. Accessed February 20, 2018.

585 102. Quest Diagnostics to Acquire AmeriPath in a Transaction Valued at $2 Billion.
586 Available at: http://ir.questdiagnostics.com/phoenix.zhtml?c=82068&p=irol-
587 newsArticle&ID=985011. Accessed February 27, 2018.

588

589

590

591

592

593

594

595

596

597

598

599

600

601

602

Abbreviations used:

Advanced Dermatology and Cosmetic Surgery (ADCS)

Accreditation Council for Graduate Medical Education (ACGME)

American Medical Association (AMA)

Chief Executive Officer (CEO)

Corporate Practice of Medicine (CPOM)

CMS (Centers for Medicare and Medicaid Services)

CPT (Current Procedural Terminology)

Dermatology Practice Support Alliance, Inc. (DPSA)

Earnings before interest, taxes, depreciation and amortization (EBITDA)

Number Needed to Biopsy (NNB)

Ontario Municipal Employees Retirement System (OMERS)

Private equity (PE)

Venture capital (VC)

617 **Supplemental Table 1: Summary of Consolidation, Corporatization, and Venture Capital/Private Equity in Dermatology**
618

Group [Year Founded][a]	Estimated Number of Offices[b]	Known Locations[b]	Estimated Number of Physicians[b,c]	Estimated Number of Physician Extenders[b]	Estimated Number of ACGME-Approved Trainees	PE + Comments[d,e,f]
Advanced Dermatology and Cosmetic Surgery (ADCS) [1989]	193	AZ, CO, FL, GA, MD, MI, NV, OH, PA, RI, SC, TX, VA, WY	188	156	30 [35, 39, 41, 42]	**NXT Capital funded Audax Private Equity's acquisition (February 2012)** **Majority stake sold to Harvest Partners for $600 million (May 2016)** ADCS owns Bedside Dermatology [26], Ameriderm [2009], and Ameriderm Research [2009]; Ameriderm is a coding, collection, and billing service for dermatologists [75] Estimated number of offices decreased from 203 in May 2018 to 193 in July 2018 [23]
Adult & Pediatric Dermatology, PC (APDerm) [1992]	10	MA, NH	19	9		**Waud Capital Partners (October 2017)**
Anne Arundel Dermatology [1980]	34	MD, TN, VA	62	42		**New Mainstream Capital (June 2015)** **Sought new buyer (November 2017)** **New Mainstream Capital recapitalized; Pantheon acquired minority stake; New Mainstream Capital remains as lead and**

						control investor (January 2018)
California Skin Institute [2007]	28	CA	43	14		**Goldman Sachs (May 2017)**
Dermatologists of Central States (DOCS) [2017]	38	IN, MI, OH	35	21	6 [36]	**Sheridan Capital Partners (May 2017)** CEO of DOCS is also CEO of Dermpath Lab of Central States (DLCS)
Dermatology Medical Partners (DMP) [2015]	N/A	FL, GA, TX	N/A	N/A		**Tyree & D'Angelo Partners (December 2015)** Acquired practices within DMP network retain their names
Dermatology Specialists [2006] Rebranded from Gulf Coast Dermatology Group	24	AL, FL, GA, MS	12	17		**Cressey & Company recapitalized in August 2013 and exited in May 2015** Dermatology Solutions Group is the management services organization of Dermatology Specialists FBI searched (December 2014)
DermCare Management [2016]	15	South FL	22	10	22 [38-40]	**Gemini Investors (July 2017)**
DermOne Dermatology [1986]	23	NJ, NC, TX, VA	24	15	6 [37, 76]	**Westwind Investors (February 2012)** Accredited Dermatology in NJ was acquired by DermOne Dermatology (2012)

						DermOne Dermatology dissolved (2018) DermOne Dermatology transferred NJ locations to Schweiger Dermatology Group (March 2018) and Certified Dermatology (2018), VA location to Forefront Dermatology (2018), and patient medical records from TX locations to U.S. Dermatology Partners (March 2018)
Epiphany Dermatology [2014]	37	AZ, CO, IA, MO, NM, OK, TX	31	30		**CI Capital Partners (June 2016)**
Forefront Dermatology [2001] Formerly Dermatology Associates of Manitowoc, Dermatology Associates of Wisconsin	114	AL, DC, FL, IL, IN, IA, KY, MD, MI, MN, MO, OH, PA, VA, WI	124	74		**Varsity Healthcare Partners (May 2014)** **Goldman Sachs (May 2014)** **OMERS Private Equity (Canadian pension fund for government employees) purchases for $450 million; > 13x EBITDA (February 2016)** **BMO Harris Bank lent $195 million in first lien credit (February 2016)** **Canadian PE firm Penfund invested $47 million of second lien debt and equity February 2016)** CEO of Forefront Dermatology is also an Operating Partner at Shore Capital Partners, a Chicago-based PE firm focused exclusively on microcap (publicly traded) healthcare investments Two offices in MO and WI offices have closed [77]

Golden State Dermatology [2015]	5	CA	8	9		**Pouschine Cook Capital Management + Yukon Partners (February 2015)**
Integrated Dermatology Group (IDG) [2006]	~100	AZ, CA, CO, CT, DC, FL, ID, IL, IN, IA, LA, MD, MA, MI, NV, NJ, NM, NY, NC, OH, PA, TN, UT, VA, WA	~64	~73		**No known PE (founders are two brothers)** Some practices within IDG network retain their names Same founders started OnSite Dermatology [2005], US Path Labs [2004], and eDerm Systems [2006] [27, 78, 79]; OnSite Dermatology has locations in thirteen states (CA, CO, DC, DE, FL, MD, NC, NH, NJ, PA, TX, VA, WA) and provides mobile dermatology care to seniors living in independent retirement, assisted, and skilled nursing communities Same founders previously resigned their positions as officers and directors of Response USA, Inc., a supplier of personal response systems and monitoring services, and filed for voluntary chapter 11 bankruptcy (August 2001) [80-82]
NavaDerm [2018]	5	NJ, NY	19	2		**BelHealth Investment Partners (July 2018)** Executive Vice President of Business Development and Recruiting of NavaDerm is currently CEO of Dermatology Authority, which provides recruiting services for dermatology practices
Northeast Dermatology Associates (NEDA) [1999]	19	ME, MA, NH	27	12		**NEDA explored sale (May 2017)** **Ontario Teacher's Pension Plan (September 2017)** **Century Equity Partners (September 2017)**

						PhyNet Dermatology is the management services organization of NEDA Reportedly fetched ~13x EBITDA CEO of PhyNet Dermatology was previously President and CEO of OrthAlliance, Inc., a dental services organization acquired by publicly traded Orthodontic Centers of America, Inc. (OCA) in 2001; Dallas federal court ruled OrthAlliance, Inc. was practicing dentistry without a license and declared management contracts "illegal in their entirety" (March 2003); OCA filed for chapter 11 bankruptcy protection (March 2006) and exited chapter 11 bankruptcy (January 2007) [83-85]
Pinnacle Dermatology [2004]	23	IL, IN, MI	24	22		**Chicago Pacific Founders (March 2017)**
Platinum Dermatology Partners [2016]	31	AZ, TX	47	24		**Sterling Partners (May 2016)**
QualDerm Partners (QDP) [2014]	21	NC, OH, SC, TN, VA	36	24		**Raised $31.88 million in capital from investors including funds from Cressey & Company + Apple Tree Partners (February 2016)** **Granite Growth Health Partners (date unknown)** ACMS Presidents (2015-2016 + 2018-2019) are "platform practice" for QDP
Riverchase	37	FL	40	32		**Prairie Capital (December 2012)**

Dermatology and Cosmetic Surgery [2000]						**GTCR (October 2016)**
Sanova Dermatology [2012]	9	LA, TX	15	6		**Ampersand Capital (2017)** AAD Board Member is employed by Sanova Dermatology
Select Dermatology [2017]	1	TX	1	2		**Welsh, Carson, Anderson & Stowe (2017)** **Riata Capital Group (2017)**
Schweiger Dermatology Group [2010]	42	NJ, NY	61	60		**SV Life Sciences led $12.4 million Series A financing (January 2015)** **Square 1 Bank provided $8 million in debt financing (December 2015)** **LLR Partners led $35 million investment (April 2016)** **Triangle Capital closed $20 million unitranche debt investment (June 2017)** **LNK Partners invests $100 million (May 2018)** Past President of AAD (1999-2000) and ASDS (2007-2008) previously served as Medical Director for and currently employed by Schweiger Dermatology Group
Skin & Beauty Center [2006]	6	CA	10	3		**Gemini Investors (March 2017)**

Skin and Cancer Associates (SCA) and Center for Cosmetic Enhancement (CCE) [1970]	28	FL	40	N/A – see comments	21 [38, 39, 41]	**Susquehanna Private Capital (April 2018)** Advanced Dermatology Management is the management services organization of SCA SCA/CCE is comprised of 80 dermatologists, nurse practitioners, and physician assistants CEO of SCA is board-certified radiologist and was previously Vice President of PE-backed Sheridan Healthcare Radiology Services Director of Susquehanna Private Capital is brother of two influential dermatologists at Penn State University and University of Pennsylvania Susquehanna Growth Equity, LLC is lead investor of HMP Global, which produces The Dermatologist magazine [86]
Sona Dermatology Med Spa [1997]	18	AR, NC, TN, TX, VA	2	1		**Initially owned by Carousel Capital Partners along with current CEO and Chief Financial Officer** **Pharos Capital Group, LLC (January 2016)** Currently assembling medical dermatology teams
Summit Dermatology Partners [2018]	4	IN	3	4		**Alpine Investors (2018)**
The Dermatology Group (TDG) [1992]	24	CT, NJ, NY, PA	39	13		**The Riverside Company (January 2016)** Tricenna is the management services organization of TDG; some practices within TDG network retain their names

						AAD Board Member is Chief Medical Officer at Tricenna CEO of TDG is also CEO of Illinois Dermatology Institute (currently independent with 16 offices, 20 MDs/DOs, and 10 physician extenders); CEO of TDG is also President of Grand Cru Physician Advisors, which consults in healthcare finance, management, mergers and acquisitions, and practice management
United Derm Partners [2016]	20	CA, ID, NV, OR, TX	33	20		**Frazier Healthcare Partners (December 2016)** CEO of United Derm Partners was previously Executive Vice President and Chief Operating Officer of PE-backed DSI Renal, which filed for voluntary Chapter 7 bankruptcy and sold to DaVita, Inc. (February 2011) [87]
United Skin Specialists [2015]	9	IL, MN, MO	15	7		**Tonka Bay Equity Partners (September 2015)** **Clearwater Equity Group (2015)** AAD President (2019-2020) serves on board of directors of United Skin Specialists
U.S. Dermatology Medical Management, Inc. [2009]	~6	CA, HI, TX	N/A	N/A		**Vicente Capital Partners, LLC (October 2009)** U.S. Dermatology Medical Management, Inc. became insolvent and sold its practices to independent dermatologists near the end of 2011
U.S. Dermatology Partners (USDP)	~90	AZ, CO, KS, LA, MD, MO,	~175	~61		**Candescent Partners, Eagle Private Capital, and Harbert Mezzanine Partners (January 2013)**

[1996] Formerly Dermatology Associates, Dermatology Associates of Tyler		OK, TX, VA				**Brookside Mezzanine Partners (May 2014)** **ARBY Partners secures majority stake for > $300 million (May 2016)** USDP doing business as Oliver Street Dermatology Holdings, LLC [88]; Oliver Street Dermatology Holdings, LLC 5.01(a) is registered with the Texas Medical Board as a non-profit health organization
Water's Edge Dermatology [1998]	34	FL	32	26		**Considering a sale (February 2018)** [89] **Sold to Gryphon Investors (June 2018)**
West Dermatology [1962]	35	AZ, CA, NV	41	40		**Enhanced Equity Funds (December 2014)** Past President of ASDS serves as California Medical Director for West Dermatology AAD and ASDS Board Members employed by West Dermatology CEO of West Dermatology was previously CEO of Pacific Pulmonary Services (PPS) and established a CEO-led industry coalition, the Council for Quality Respiratory Care, which lobbied for their interests; FBI raided PPS (February 2012); PPS agreed to pay $11.4 million to resolve allegations of violating the False Claims Act and for a cross-referral kickback scheme (April 2017); PPS laid off 170 employees (May 2017) [50-52, 90-95]

[a] Estimates acquired from publicly available practice websites, state corporations divisions, Bloomberg [96], and Crunchbase [97]

[b] Estimates acquired from publicly available practice websites, Dermatology World January 2018 [1], and Physician Compare accessed August 2018

[98]

[c] Includes primarily dermatologists – both ABD and non-ABD – as of August 2018

[d] PE partnerships from publicly available practice websites, The PE Hub Network [99], Becker's Hospital Review [100], Bloomberg [96], and Internet search queries

[e] PE deals in dermatology may include secondary buyouts, recapitalizations, management buyouts, corporate divestitures, platform practices with add-on acquisitions, and/or leveraged buyouts

[f] AAD, American Academy of Dermatology; ACMS, American College of Mohs Surgery; ASDS, American Society of Dermatologic Surgery; CEO, Chief Executive Officer

643 **Table 2: High Outliers in Intralesional Injections per Traditional Medicare Patient in 2015[a]**
644

Title	City	State	Provider Type	Total Medicare Payment in 2015	Percentage of patients with Alzheimer's Disease	Mean Intralesional injections per patient in 2015[b]	# of Standard Deviations from the Mean[c]
MD	FARMINGTON HILLS	MI	Dermatology	$26,884	N/A[d]	18.1	20.1
NP[e]	WYANDOTTE	MI	Nurse Practitioner	$210,628	75	17.7	19.7
MD	BRONX	NY	Dermatology	$127,950	5	14.5	16.1
PA-C[e]	WARREN	MI	Physician Assistant	$270,023	75	13.6	15.1
NP	NEW YORK	NY	Nurse Practitioner	$29,019	4	13.1	14.5
PA-C[e]	CLINTON TOWNSHIP	MI	Physician Assistant	$290,660	75	13.0	14.4
MD	TROY	MI	Dermatology	$97,839	9	12.5	13.8
MD	NEW YORK	NY	Dermatology	$51,665	N/A[d]	11.2	12.4
PA-C	WEST BLOOMFIELD	MI	Physician Assistant	$30,864	10	11.2	12.4
PA-C	DETROIT	MI	Physician Assistant	$23,601	N/A[d]	10.6	11.7
MD	BALTIMORE	MD	Dermatology	$156,998	3	10.1	11.1

MD	DETROIT	MI	Dermatology	$313,055	10	10.0	11
MD	SOUTHFIELD	MI	Dermatology	$65,413	8	9.3	10.2
DO	FLINT	MI	Dermatology	$92,856	8	9.1	10
DO	HOWELL	MI	Dermatology	$197,881	7	8.5	9.3
MD	CAROLINA	PR	Dermatology	$181,369	14	7.7	8.4
MD	NEW YORK	NY	Dermatology	$45,191	N/A[d]	7.6	8.3
MD	GREENVILLE	MS	Dermatology	$816,554	7	7.2	7.9
MD	NEW YORK	NY	Dermatology	$34,973	5	7.1	7.8
MD	PHILADELPHIA	PA	Dermatology	$3,233	0	7.1	7.8
PA-C	HOWELL	MI	Physician Assistant	$122,605	7	6.5	7.1
MD	NEW YORK	NY	Dermatology	$29,107	5	5.9	6.4
PA-C[e]	WAYNE	MI	Physician Assistant	$84,635	75	5.8	6.3
MD	DELRAY BEACH	FL	Dermatology	$229,306	12	5.6	6.1
FNP	KENNER	LA	Nurse Practitioner	$32,141	N/A[d]	5.0	5.4

[a] Derived from Physician Compare accessed November 2015 and January 2018 [98] and 2015 Medicare Part B physician payment data PUF [53]

[b] CPT Codes (11900 + (11901*8)) divided by the total number of unique Medicare Part B beneficiaries seen in 2015; calculation is an underestimate as it assumes CPT 11900 is injection of only one lesion and CPT 11901 is injection of only eight lesions; actual number of lesions injected may be higher

[c] mean=0.19, median=0.04, stDev=0.89, n=4138

[d] Data not available from CMS

[e] PE-backed physician extender billing independently for intralesional injections where 75% of Medicare patients have diagnosis of Alzheimer's disease

671 **Table 3: Corporate Dermatology Groups in the Dermatology Practice Support Alliance[a,b,c]**

672

Board of Directors and Officers
Advanced Dermatology and Cosmetic Surgery
Anne Arundel Dermatology
DermOne Dermatology (dissolved in 2018)
Forefront Dermatology
Integrated Dermatology Group
Riverchase Dermatology and Cosmetic Surgery
Schweiger Dermatology Group
Skin and Cancer Associates and Center for Cosmetic Enhancement
The Dermatology Group
U.S. Dermatology Partners
West Dermatology

673

674 [a] Annual Franchise Tax Report requested from State of Delaware Division of Corporations, which includes a publicly available document of
675 directors and officers of which a majority are non-physicians; members may include other corporate dermatology groups [50]
676 [b] Incorporated on May 9, 2016 and report filed on April 14, 2017 by CEO of West Dermatology [50]
677 [c] Principal place of business: 18831 Von Karman Avenue, Suite 300, Irvine, CA 92612 [50]
678

679 **Table 4: High Outliers in Skin Biopsies per Traditional Medicare Patient in 2015[a]**
680

Title	City	State	Provider Type	Total Medicare Payment in 2015	Mean biopsies per patient in 2015[b]	# of Standard Deviations from the Mean[c]	Pathologic Examination of Tissue (88305)[d]	# of group practice members in 2015	Entity had other Pathologist in 2015?
DO	BOYNTON BEACH	FL	Dermatology	$902,150	11.4	22.8	7839	1	NO
MD[e]	NEWPORT BEACH	CA	Dermatology	$495,601	10.3	20.5	91	25	YES
MD	CHESTER	NJ	Dermatology	$1,262,309	9.1	18	8071	1	NO
MD	CORAL GABLES	FL	Dermatology	$815,483	8.3	16.3	4322	1	NO
MD	DENVER	CO	Dermatology	$965,323	7.5	14.6	3483	1	NO
MD	PHILADELPHIA	PA	Dermatology	$403,030	7.4	14.4	0	3	YES
MD	BEVERLY HILLS	CA	Dermatology	$445,124	6.9	13.4	1696	1	NO
MD[e]	LAKE WORTH	FL	Dermatology	$1,046,053	6.5	12.5	0	15	YES
MD	HOLLIS HILLS	NY	Dermatology	$534,016	6.1	11.7	0	2	NO
MD	GLENDORA	CA	Dermatology	$1,225,860	5.6	10.7	4158	1	NA

PA-C	PORT RICHEY	FL	Physician Assistant	$533,273	5.5	10.5	0	2	NO
MD[e]	DELRAY BEACH	FL	Dermatology	$1,858,077	5.5	10.5	10006	123	YES
MD	MEMPHIS	TN	General Practice	$689,819	5.5	10.5	0	1	NO
MD	WEST LONG BRANCH	NJ	Dermatology	$1,093,604	5.3	10	4288	1	NO
DO[f]	PORT SAINT LUCIE	FL	Radiation Oncology	$1,263,047	5.1	9.6	3159	1	NO
DO	GREAT BARRINGTON	MA	Dermatology	$1,145,777	5.1	9.6	0	1	NO
MD	FLORHAM PARK	NJ	Dermatology	$2,517,455	4.8	9	4138	4	YES
MD	VICTORVILLE	CA	Dermatology	$995,327	4.7	8.8	5101	3	NO
MD	HUNTINGTON BEACH	CA	Dermatology	$1,128,493	4.6	8.6	5194	5	NO
MD	WAYNE	PA	Dermatology	$353,526	4.4	8.2	0	7	NO
MD	TALLAHASSEE	FL	Dermatology	$551,207	4.3	8	0	11	YES
MD[e]	BOCA RATON	FL	Dermatology	$262,980	4.2	7.8	0	1	NO

MD	BOCA RATON	FL	Dermatology	$358,028	4.1	7.5	0	18	YES
MD	MEDIA	PA	Dermatology	$493,595	4.0	7.3	1183	2	NO
MD[e]	AVENTURA	FL	Dermatology	$304,176	4.0	7.3	0	50	YES

[a] Derived from Physician Compare accessed November 2015 and January 2018 [98] and 2015 Medicare Part B physician payment data PUF [53] limited to providers seeing at least 100 unique patients in 2015

[b] CPT Codes (11100, 11101, 11300-11313, 11755 (nail), 40490 (lip), 67810 (eyelid), 69100 (ear)) divided by the total number of unique Medicare Part B beneficiaries seen in 2015

[c] mean=0.48, median=0.39, stDev=0.48, n=16024

[d] Number of times provider billed 88305 in 2015. This may reflect a charge for the professional or technical component, or the global fee

[e] Provider in a PE-backed dermatology practice in 2018

[f] Plead guilty to federal charges of health care fraud and obstruction of a criminal heath care investigation [55-57]

699 **Table 5: Major corporate laboratories with dermatopathology services[a]**
700

Laboratory[b]	Estimated Number of Offices[b]	Locations[b]	Estimated Number of Dermatopathologists[b]	PE + Comments[b,c]
Aurora Diagnostics (Founded in 2006 by GSO Capital Partners and Summit Partners)	17	AL, AZ, FL, MA, MI, MN, NV, NJ, NY, NC, OH, OR, RI, SC, TX, VA	55	Explored sale (August 2016) and reexploring sale (August 2018) Entered into five-year credit facility of $220 million with Cerberus Business Finance (July 2014) and added $40 million delayed draw term loan (April 2015) to fund lab acquisitions Withdrew plans for initial public offering (June 2012) Filed for $150 million initial public offering (April 2010) **KRG Capital Partners (2009 – current)** **Summit Partners (2006 – current)** **GSO Capital Partners (hedge fund, 2006 – 2009)**
Dermpath Lab of Central States (DLCS) (Founded in 1984; part of large	2	MI, OH	7	**Sheridan Capital Partners (May 2017)**

dermatology entity called DOCS [101])				
Inform Diagnostics (Miraca Life Sciences 2012 – 2017) (Caris Diagnostics 2006-2012) (Pathology Partners 1996-2006)	3	AZ, MA, TX	28	**Avista Capital Partners (2017)**
Laboratory Corporation of America Holdings (LabCorp; Dianon Pathology) (Founded in 1978 as National Health Laboratories, owned by Revlon Health Care Group; merged with Roche Biomedical Laboratories in 1995 to become LabCorp)	5	CA, CT, FL, NC, TX	15	Publicly trades on the New York Stock Exchange Shore Capital Partners invested in ClearPath Diagnostics (September 2011); sold to LabCorp (October 2016)
ProPath Services, LLC (Founded in 1966; became a corporation in 2002)	1	TX	7	No known PE
Quest Diagnostics (Ameripath; Dermpath Diagnostics) (Founded in 1967 as Metropolitan Pathology Laboratory; became a corporation in 1996)	14	AZ, FL, GA, IN, KS, MA, NY, OH, PA, TX, WI	71	Publicly trades on the New York Stock Exchange **Oroco Capital (date unknown)** Ameripath formerly VC-backed by **CHL Medical Partners (date unknown)** and PE-backed by **Welsh Carson Anderson & Stowe (2003-2007)**; sold to Quest

				Diagnostics in an all cash transaction at $2 billion valuation (April 2007) [102]

[a] Does not include dermatopathology services offered by corporations primarily focused on clinical dermatology

[b] Estimates acquired from publicly available corporate laboratory websites – as of August 2018

[c] PE partnerships from publicly available corporate laboratory websites, The PE Hub Network [99], and Internet search queries