Insurance Coverage of Dermabrasion and Chemical Peel Procedures: A Critical Analysis of 58 American Insurance Companies

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Research Article

Keywords: Insurance, Dermabrasion, Chemical Peels, Resurfacing

Posted Date: November 15th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2259245/v1

Abstract

Background: Dermabrasion and chemical peels are infrequently utilized methods of treatment for medical grade conditions despite demonstrations of favorable outcomes. This may be due to the discrepancy of insurance coverage for these procedures.

Objective: To evaluate the frequency of insurance coverage for dermabrasion and chemical peel procedures in the treatment of acne, acne scarring, and non-melanoma skin cancers (NMSC).

Methods and Materials: A cross-sectional analysis of 58 insurance companies by web-based search or phone interview determined the number of insurers with a publicly available policy on dermabrasion or chemical peels. For each policy, the coverage status and any corresponding criteria were extracted.

Results: Dermabrasion to treat basal cell carcinoma and actinic keratosis was discussed by 13 (16%) and 21 (36%) insurers respectively. Twenty of twenty-three companies (87%) with a chemical peel policy for premalignant lesions provided coverage. Of the 25 companies (43%) that discussed treatment of acne with chemical peels, 14 (56%) provided reimbursement and 11 (44%) denied coverage. Coverage of acne was denied significantly less for chemical peels than for dermabrasion ($p<0.006$).

Conclusion: Inconsistencies in both inclusion and coverage between insurance companies may create an artificial barrier to receiving care.

Introduction

Dermabrasion and chemical peel procedures are popular methods of skin resurfacing performed in the United States by dermatologists and plastic surgeons [1, 2]. These skin resurfacing techniques improve skin quality, texture, and appearance by ablating part of the epidermis or epidermis and superficial dermis, allowing for subsequent regeneration and reepithelization [1, 3]. The high concentration of pilosebaceous glands and rich vascular networks of the face make it an excellent area for the wound healing processes that are necessary to achieve these desired results following ablation [4].

Skin Resurfacing procedures, such as dermabrasion and chemical peels, have shown to be therapeutic for nonmelanoma skin cancers (NMSC), with clearance of precancerous or cancerous lesions demonstrated in up to 96% of patients [5–12]. These procedures may also play a large role in protection against the development of new precancerous lesions [5–7, 9–12]. In patients suffering from chronic acne, studies have investigated resurfacing procedures as either monotherapy or complementary treatment to current acne regimens. These prospective studies have shown statistically significant reductions in in active acne lesions up to twelve weeks following skin resurfacing, suggesting a potential longevity and cost-effective aspect of this treatment [13–16]. Furthermore, dermabrasion and chemical peel procedures have demonstrated substantial reductions in the appearance of acne scarring that occurs with longstanding disease [13, 17–19].

Despite being a recognized form of treatment, dermabrasion and chemical peel procedures are uncommonly selected as a treatment for acne, acne scarring, and various types of NMSC [12]. A potential barrier to receiving these procedures may be the cost, which could be discouraging patients from obtaining this form of treatment [20, 21]. Previous literature has recognized that low rates of insurance coverage and variable criteria can hinder a patient's ability to receive certain treatments due to substantial associated out of pocket costs [22–24]. To further investigate cost as a limiting factor to receiving dermabrasion and chemical peel procedures, we evaluated the number of insurance companies that will cover treatment with skin resurfacing, and whether required criteria present in policies may be a barrier to receiving care.

Methods

This study was exempt from Institutional Review Board approval. Fifty-eight American insurance companies were selected and determined to be representative of the vast majority of Americans with health insurance. To begin, the top 50 insurance companies with the greatest market share were selected [25, 26]. These companies were then cross-referenced with the principal insurer per enrolment in each state, leading to the evaluation of eight additional companies that were not included in the original list of companies with the greatest market share.

Separate web-based searches were conducted to determine whether each company had a publicly available policy on dermabrasion and chemical peel procedures. If no policy was identified by web-based search, a phone interview or email to the company was made to locate the public policy if available. All companies with a public policy were further assessed for a coverage status on specific medical indications, in which the coverage status was extracted from policies and categorized accordingly. Any applicable CPT codes for dermabrasion and chemical peels were also extracted from policies at this time. Companies that did not have a statement regarding coverage but included corresponding covered or non-covered CPT codes were grouped with those companies that had a policy for the purposes of this study.

Each company with a statement regarding coverage for an indication was classified into one of three categories; covered with or without criteria, not covered, or covered on a case-by-case basis. An insurer was considered to not cover a treatment for a given indication only when a company declared that coverage would not be provided under any circumstances. A company was grouped into the coverage on a case-by-case basis category if this type of coverage was specifically mentioned by the insurer for a given indication. For companies that would provide coverage, any required criteria were extracted and categorized.

All data was compiled and analyzed using Microsoft Excel (Microsoft Corp., Redmond, Wash.). A chi-squared test or Fisher's exact test was used to compare categorical variables when appropriate. Statistical significance was defined as a value of $p < 0.05$ for either test.

Results

Fifty-eight insurance companies including Medicare and Medicaid were evaluated in this study. Forty-seven (81%) of these insurers had a publicly available policy that included at least one statement on coverage of either dermabrasion or chemical peel procedures to treat acne, acne scarring, or NMSC.

Dermabrasion

Forty of the fifty-eight insurance companies (69%) included at least one statement on coverage for dermabrasion (Fig. 1). Thirteen (22%) and twenty-two (38%) policies specifically discussed dermabrasion in the treatment of basal cell carcinoma and actinic keratosis. There was no significant difference in the frequency of inclusion within policies (22%, 38%; *p = 0.106*) or the number of insurance companies offering to provide coverage for dermabrasion (62%, 73%; *p = 0.755*) between these indications (Fig. 2). Criteria to qualify for coverage were required by five (63%) of the companies that covered basal cell carcinoma and nine (56%) of the companies that provided coverage for actinic keratosis (Table 1).

Table 1
Criteria required for Coverage of Dermabrasion According to Indication

Criteria for Coverage	Criteria Stratification	No. Policies	
		BCC	AK
Cryotherapy, curettage, and excision are impractical		4	6
Prior failed trial: topical retinoid, topical chemotherapeutic agents, or cryotherapy		4	8
	Topical 5-FU or imiquimod ineffective or contraindicated	3	7
Documented evidence of 10 or more BCC or AK		1	4
BCC: Basal cell carcinoma			
AK: Actinic keratosis			
5-FU: 5-flurouracil			
No.: Number			

Twenty-three (40%) and twenty-six (45%) insurance companies incorporated a statement on coverage of dermabrasion as treatment for acne and acne scarring. Dermabrasion for acne scarring was discussed in policies significantly more often than dermabrasion for treatment of basal cell carcinoma (*p = 0.018*). Coverage would be denied significantly more often for both active acne and acne scarring than it would be for either basal cell carcinoma or actinic keratosis (*p < 0.001*) (Fig. 2). Furthermore, no companies would extend coverage for dermabrasion when used as management for acne or acne scarring.

Sixteen (28%) insurers denied coverage for dermabrasion if performed for the following indications: wrinkling of the skin (*n = 10*), uneven pigmentation (*n = 10*), non-traumatic tattoo removal (*n = 4*), rosacea (*n = 4*), photoaged skin (*n = 3*), traumatic scar revision (*n = 2*), and melasma (*n = 2*). Four companies (7%) would cover these additional indications: previous trauma (Highmark), certain scar revisions (Independence Blue Cross), rhinophyma (Medicare), and restoration following a medically necessary procedure (Neighborhood Health). Thirty companies (52%) had CPT codes listed in a policy related to one of the indications under investigation in this study (Table 2).

Table 2
CPT Codes Included in Company Policies

CPT Codes	Code Description	Covered Codes	Denied Codes
Dermabrasion			
15780	Dermabrasion; total face	22	6
15781	Dermabrasion; segmental, face	23	6
15782	Dermabrasion; regional, other than face	22	6
15783	Dermabrasion; superficial, any site	19	7
15786	Surgery, integumentary - scraping of skin growth	7	1
15787	Surgery, integumentary - scraping multiple growths	6	1
Chemical Peels			
15788	Chemical peel, facial; epidermis	22	9
15789	Chemical peel, facial; dermis	24	7
15792	Chemical peel, nonfacial; epidermal	21	10
15793	Chemical peel, nonfacial; dermal	24	8
17360	Chemical Exfoliation for acne	8	5

Chemical Peels

Forty-five (78%) insurance companies incorporated a statement on coverage of chemical peels within a company policy (Fig. 3). Of the 23 insurers (40%) that discussed coverage of chemical peel treatments for actinic keratosis, 20 companies (87%) would provide coverage (Fig. 4). This did not significantly differ from the proportion of insurance companies providing coverage for dermabrasion if performed for this indication (*p = 0.412*). Criteria required for coverage were present in 95% (*n = 19*) of the policies that covered chemical peels for the management of actinic keratosis (Table 3).

Table 3
Criteria required for Coverage of Chemical Peel Procedures According to Indication

Indication	Criteria for Coverage	Criteria Stratification	No. Policies
AK and BCC			
	Greater than 10 lesions		18
	Prior failed trial of other therapies		9
		Topical 5-FU or imiquimod ineffective or contraindicated	6
Active Acne			
	Prior failed trial of other therapies		13
		Topical or oral antibiotics ineffective or contraindicated	12
	Use of epidermal peels		10
		Use of 40–70% alpha hydroxy acids	5
	To treat comedomal acne		4
No.: Number			
AK: Actinic keratosis			
5-FU: 5-flurouracil			

Chemical peel procedures to treat active acne were included in 25 (43%) insurance company policies, being covered by 14 (56%) companies, and denied coverage in the remaining 11 (44%). Significantly fewer companies would deny coverage of active acne treatment with chemical peels than with dermabrasion ($p < 0.006$). Of the companies that would provide coverage for this indication, all but one company ($n = 13$, 93%) had required criteria to be met before coverage would be granted (Table 2). Twenty-six insurance companies (45%) discussed coverage of chemical peels for treatment of acne scarring, with significantly more companies denying coverage for this indication when compared to active acne ($n = 25$, $n = 11$; $p < 0.001$). No insurers would extend coverage for chemical peels when used as management for acne scarring.

Nineteen companies (33%) denied coverage for dermabrasion if performed for the following indications: wrinkling ($n = 17$), photoaged skin ($n = 15$), uneven pigmentation ($n = 7$), lentigines ($n = 3$), and rosacea ($n = 2$). Two companies (Highmark & Independence Blue Cross) provided alternative indications that would

be considered for reimbursement, being rosacea and irregularities caused by trauma or accidents. Thirty-three companies (57%) had CPT codes listed in a policy related to one of the indications under investigation in this study (Table 2).

Discussion

Most of the American insurance companies evaluated in this study provided a publicly available policy on dermabrasion or chemical peel procedures. Coverage of either procedure for the treatment of NMSC was discussed by fewer than half of evaluated insurers, though coverage was usually provided. While no companies would cover the treatment of active acne with dermabrasion, insurers were about evenly divided on whether they would provide or deny coverage for the treatment of acne with chemical peels. In general, the majority of companies that extended coverage for active acne or NMSC have one or more criteria to be met before coverage would be provided. Our study highlights great inconsistencies in the rates of inclusion in policies and coverage of skin resurfacing procedures for medical grade conditions between United States insurance companies. These incongruencies, along with multiple criteria required for coverage, may discourage patients from utilizing skin resurfacing procedures as a method of treatment.

Skin cancer is the most common malignancy in the United States, with basal cell carcinoma, squamous cell carcinoma, and actinic keratoses comprising the majority cases [13]. Over one-half of American insurers did not have a statement on whether they would provide coverage of skin resurfacing procedures for the management of NMSC, leaving the coverage status ambiguous. Surgical excision is the current mainstay of treatment for NMSC [27]. Although it has some of the lowest recurrence rates recorded in the literature, patients are at risk for undesirable cosmetic outcomes, disfigurement, and dysfunction in the operative area [7, 27]. As with other well-known treatment options such as cryosurgery and 5-Fluorouracil (5-FU), skin resurfacing procedures are an alternative to surgical treatment with promising evidence of efficacy demonstrated in the literature [5–9]. In addition to infrequent treatment requirements and a low overall cost of treatment, dermabrasion and chemical peels are set apart from the other nonsurgical methods by their ability to provide both eradication and prophylaxis against future lesions [6, 9, 27, 28]. Lawrence et al. demonstrated that a combination of Jessner's solution with 35% trichloroacetic acid (TCA) is as effective as a three-week course of topical 5% 5-FU in the treatment of actinic keratosis [11]. In addition to finding that 96% of patients would remain free of lesions at one year, Coleman et al. concluded that dermabrasion may be more effective in preventing the development of new lesions than treatment with either cryosurgery or 5-FU [10]. However, when evaluating the clinical utility skin resurfacing procedures, it is imperative to address the paucity of large randomized controlled trials conducted for the treatment of NMSC specifically [8]. Insurers may be less willing to discuss coverage of these resurfacing techniques for this reason.

Over 50 million Americans suffer from active acne, with up to 95% of these individuals experiencing some degree of residual scarring [19, 29, 30]. While no companies would cover dermabrasion for the treatment of active acne, insurers were almost evenly divided on whether coverage would be extended or denied if

chemical peels were instead used for management. The literature surrounding dermabrasion tends to focus on its utility in acne scarring rather than active acne, likely contributing to the absence of insurers willing to provide coverage for the latter indication [17–19]. Alternatively, chemical peel procedures have demonstrated promising results for both the resolution and prevention of recurrent acne [13–16]. In a prospective clinical trial testing a single treatment of TCA 35%, most patients saw a statistically significant reduction in their acne by at least 75% [13]. There were no relapses of active lesions from any of the study participants at 12 weeks, demonstrating its long-term viability and possible cost-effectiveness [13]. There may also be an additive effect when multiple peels are used simultaneously, creating a higher and earlier therapeutic response that lasts longer than a single peel alone [31]. These benefits, coupled with evidence from clinical trials, may be one reason why some insurers were willing to provide coverage of chemical peels for this indication. However, several insurers still denied coverage of chemical peel treatments for active acne, considering this indication to be cosmetic. What these companies might fail to consider is the detrimental psychological distress that patients with longstanding acne frequently face. The severity of the anxiety and depression attributed to longstanding acne being compared to that of life-threatening or physically disabling diseases [32, 33]. With increased awareness surrounding the topic of appropriate management for mental health in recent years [34, 35], it is possible that we will see a rise in the number of insurance companies that consider the treatment of acne to be medically necessary for this reason.

Regardless of the indication, most of the insurance companies that extended coverage for dermabrasion or chemical peels had certain criteria to fulfill before patients would be eligible for reimbursement. Among the most frequently mentioned in policies was the prerequisite of ten or more precancerous or cancerous lesions before coverage of treatment would be considered, required by 90% of policies offering coverage of chemical peel procedures. In addition to an absence of concrete guidelines for the treatment of NMSC with either skin resurfacing procedure, no insurer provided evidence from the literature supporting the requirement of ten or more lesions, leaving one to question the basis of this criterion [27, 28]. Despite the quantity of lesions not being found to influence the efficacy of treatment, insurance companies may have based this requirement on the high average number of lesions that are present in certain study populations [7, 11, 12]. Nonetheless, there are patients in these studies with less than ten lesions that had significant reductions or eradication of their cancer following these interventions [7, 11, 12]. Even if a patient meets this necessary number of lesions to qualify for coverage, most available policies also required a prior failed trial of other common therapies such as topical retinoids, topical chemotherapy, or cryotherapy. Therefore, one's ability to receive coverage for skin resurfacing procedures may also be dependent on whether the insurance company will cover the initial alternative treatments required by these trials. Another common criterion that appeared in policies was a prior failed trial of topical and oral antibiotics, required by 93% of companies that would extend coverage for chemical peels in patients with active acne. However, chemical peel procedures may be a suitable alternative for the numerous patients with acne struggle with medication noncompliance. Reasons for this noncompliance include high costs of medication, hassles associated taking daily pills, and concerns over potential medication side effects [36–38]. While the American healthcare system spends over $1.74 billion annually on prescription drugs

for acne, the average cost of a single dermabrasion and chemical peel procedure in 2020 was $1786 and $519 [20, 21, 39, 40]. Infrequent treatment requirements and low overall cost in comparison therefore make these procedures an attractive, cost-effective option for both the patient and the healthcare system at large [20, 21]. In replacing the need for medication regimens, treatment with skin resurfacing procedures may benefit patients that struggle with the management of daily prescriptions. As more randomized controlled trials are performed demonstrating more definitive evidence of efficacy, we may see a shift in coverage and required criteria to reflect these advantages.

The main limitation of this study is the cross-sectional nature of its design. We are therefore unable to account for policies that have evolved or have made periodic changes since the time of original data collection. There is also the possibility of written policy not reflecting the true coverage practices of a company. Since we were only able to account for publicly available policies and not those policies that are private, the true estimated coverage of these resurfacing treatments may be underestimated. Lastly, we did not incorporate every insurance company in the United States within our analysis. Nonetheless, this study shows overall strength due to the large number, popularity, and market share of insurance companies that were included, which together represent the majority of Americans with health insurance.

Conclusion

Most American insurance companies have a publicly available policy on either dermabrasion or chemical peel procedures for the treatment of acne, acne scarring, or NMSC. Though less frequently mentioned in policies, NMSC was usually a covered indication. Insurers were almost equally divided on whether they would extend or deny coverage for chemical peels as a treatment for active acne. In general, the majority of companies that did extend coverage had one or more criteria to be met before coverage would be provided. Inconsistencies in both inclusion and coverage between insurance companies, along with various required criteria, may create an artificial barrier to receiving care.

Declarations

Statements and Declarations: No financial or non-financial interests directly or indirectly related to the work submitted for publication.

Data Sharing: Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

Author Contributions: All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by MH, EF, MW, AQ, MB, JE. The first draft of the manuscript was written by MH, EF and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding: No sources of funding

Conflict of Interest: Michael Ha, Emily R. Finkelstein, Mark Wieland, Aasheen Qadri, Madeline Brown, Jason Ejimogu, and Yvonne M. Rasko declare that they have no conflict of interest.

Declarations: This is an observational study. No ethnical approval was required for this manuscript.

References

1. Landau M (2008) Chemical peels. Clin Dermatol 26(2):200–208. 10.1016/j.clindermatol.2007.09.012
2. Soleymani T, Lanoue J, Rahman Z (2018) A practical approach to chemical peels: A review of fundamentals and step-by-step algorithmic protocol for treatment. J Clin Aesthet Dermatol 11(8):21–28.
3. Leake DS, Baker SR (2007) Scar revision and local flap refinement. In: Baker, SR (ed) Local Flaps in Facial Reconstruction, 2nd edn. Philadelphia, Pennsylvania.
4. Bharti G (2018) Dermabrasion treatment & management. In: Medscape. https://emedicine.medscape.com/article/1297069-treatment. Accessed 5 June 2022.
5. De Berker D, McGregor JM, Hughes BR (2007) Guidelines for the management of actinic keratoses. Br J Dermatol 156:220–30. 10.1111/j.1365-2133.2006.07692.x
6. Warino L, Tusa M, Camacho F, Teuschler H, et al (2006) Frequency and Cost of Actinic Keratosis Treatment. Dermatol Surg 32(8):1045–49. 10.1111/j.1524-4725.2006.32228.x
7. Yu N, Wei T, Zhang Q, Yu J, et al (2022) Dermabrasion combined with photodynamic therapy: a new option for the treatment of non-melanoma skin cancer. Lasers Med Sci 37:1255–63. 10.1007/s10103-021-03381-3
8. Uhlenhake EE (2013) Optimal Treatment of Actinic Keratoses. Clin Interv Aging 8:29–35. 10.2147/CIA.S31930
9. Winton GB, Salasche SJ (1986) Dermabrasion of the scalp as a treatment for actinic damage. J Am Acad Dermatol 14:661–68. 10.1016/s0190-9622(86)70083-2
10. Coleman WP, Yarborough JM, Mandy SH (1996) Dermabrasion for prophylaxis and treatment of actinic keratoses. Dermatol Surg 22:17–21. 10.1111/j.1524-4725.1996.tb00565.x
11. Lawrence N, Cox SE, Cockerell CJ, et al (1995) A comparison of the efficacy and safety of Jessner's solution and 35% trichloracetic acid vs. 5% fluorouracil in the treatment of widespread facial actinic keratoses. Arch Dermatol 131:173–81.
12. Hantash BM, Stewart DB, Cooper ZA, et al (2006) Facial resurfacing for nonmelanoma skin cancer prophylaxis. Arch Dermatol 142(8):976–82. 10.1001/archderm.142.8.976
13. Sharquie KE, Noaimi AA, Al-Janabi EA (2013) Treatment of Active Acne Vulgaris by Chemical Peeling Using TCA 35%. J Cosmet Dermatol Sci Appl 3:32–5. 10.4236/jcdsa.2013.33A2008
14. Khunger N (2008) Standard guidelines of care for acne surgery. Indian J Dermatol Venereol Leprol 74:28–36.

15. Dreno B, Castell A, Tsankov N, et al (2009) Interest of the association retinaldehyde/glycolic acid in adult acne. J Eur Acad Dermatol Venereol 23(5):529–32. 10.1111/j.1468-3083.2009.03099.x
16. Abels C, Kaszuba A, Michalak I, et al (2011) A 10% glycolic acid containing oil-in-water emulsion improves mild acne: a randomized double-blind placebo-controlled trial. J Cosmet Dermatol 10:202–9. 10.1111/j.1473-2165.2011.00572.x
17. Rivera AE (2008) Acne Scarring: A review and current treatment modalities. J Am Acad Derm 59(4):659–76. 10.1016/j.jaad.2008.05.029
18. Hession MT, Graber EM (2015) Atrophic acne scarring: a review of treatment options. J Clin Aesthet Dermatol 8(1):50–8.
19. Gozali MV, Zhou B (2015) Effective treatments of atrophic acne scars. J Clin Aesthet Dermatol 8(5):33–40.
20. American Society of Plastic Surgeons. How much does a chemical peel cost? https://www.plasticsurgery.org/cosmetic-procedures/chemical-peel/cost. Accessed 5 June 2022.
21. American Society of Plastic Surgeons. How much does dermabrasion cost? https://www.plasticsurgery.org/cosmetic-procedures/dermabrasion/cost. Accessed 5 June 2022.
22. Finkelstein ER, Ha M, Hanwright P, et al (2022) A review of American insurance coverage and criteria for conservative management of lymphedema. J Vasc Surg Venous Lymphat Disord 10(4):929–36. 10.1016/j.jvsv.2022.03.008
23. Finkelstein ER, Ha M, Hanwright P, et al (2022) A critical analysis of American insurance coverage for imaging and surgical treatment of lymphedema. J Vasc Surg Venous Lymphat Disord S2213-333X(22)00348-1. 10.1016/j.jvsv.2022.07.007
24. Ha M, Ngaage LM, Badiei B, et al (2021) A cross-sectional analysis of American insurance coverage of prominauris otoplasty. J Craniofac Surg 32(8):2741–43. 10.1097/SCS.0000000000007822
25. Henry J Kaiser Foundation. Market Share and Enrollment of Largest Three Insurers - Individual Market. 2017. Available at: https://www.kff.org/private-insurance/state- indicator/market-share-and-enrollment-of-largest-three-insurers-individual- market/?currentTimeframe = 0&sortModel=%7B%22colId%22:%22Location%22,%22 sort%22:%22asc%22%7D Accessed February 28, 2021.
26. National Association of Insurance Commissioners. 2017 Market share reports for the top 125 accident and health insurance groups and companies by state and countrywide. 2018. Available at: https://www.naic.org/prod_serv/MSR-HB-18.pdf Accessed February 28, 2021.
27. Kim JYS, Kozlow JH, Mittal B, et al (2018) Guidelines of care for the management of basal cell carcinoma. J Am Acad Derm 78(3):540–59. 10.1016/j.jaad.2017.10.006
28. Eisen DB, Asgari MM, Bennett DD, et al (2021) Guidelines of care for the management of actinic keratosis. J Am Acad Derm 85(4):E209-E233. 10.1016/j.jaad.2021.02.082
29. American Academy of Dermatology Association. Skin Conditions by the Numbers. https://www.aad.org/media/stats-numbers. Accessed 1 Jun 2022.

30. Bickers DR, Lim HW, Margolis D, et al (2006) The burden of skin diseases: 2004 a joint project of the American Academy of Dermatology Association and the Society for Investigative Dermatology. J Am Acad Dermatol 55:490–500. 10.1016/j.jaad.2006.05.048
31. Nofal E, Nofal A, Gharib K, et al (2018) Combination chemical peels are more effective than single chemical peel in treatment of mild-to-moderate acne vulgaris: A split face comparative clinical trial. J Cosmet Dermatol 17(5):802–10. 10.1111/jocd.12763
32. Niemeier V, Kupfer J, Gieler U (2006) Acne Vulgaris – Psychosomatic aspects. J Dtsch Dermatol Ges 4(12):1027–36. 10.1111/j.1610-0387.2006.06110.x
33. Lee IA, Maibach HI (2006) Pharmionics in dermatology: a review of topical medication adherence. Am J Clin Dermatol 7(4):231. 10.2165/00128071-200607040-00004
34. Young people's mental health is finally getting the attention it needs. https://www.nature.com/articles/d41586-021-02690-5. Accessed 1 Sept 2022.
35. Russell E, Patrick K (2018) Mental health needs our attention. CMAJ 190(2):E34. 10.1503/cmaj.171469
36. Ryskina KL, Goldberg E, Lott B (2018) The Role of the Physician in Patient Perceptions of Barriers to Primary Adherence with Acne Medications. JAMA Dermatol 154(4):456–59. 10.1001/jamadermatol.2017.6144
37. Anderson KL, Dothard EH, Huang KE, Feldman SR (2015) Frequency of primary nonadherence to acne treatment. JAMA Dermatol 151(6):623–26. 10.1001/jamadermatol.2014.5254
38. Richmond NA, Lamel SA, Braun LR, et al (2014) Primary nonadherence (failure to obtain prescribed medicines) among dermatology patients. J Am Acad Dermatol 70(1):201–3. 10.1016/j.jaad.2013.09.053
39. Lee YH, Liu G, Thiboutot DM, et al (2014) A retrospective analysis of the duration of oral antibiotic therapy for the treatment of acne among adolescents: investigating practice gaps and potential cost-savings. J Am Acad Dermatol 71(1):70–6. 10.1016/j.jaad.2014.02.031
40. Qureshi AA, Freedberg I, Goldsmith L, Moshell A (2004) Report on "Burden of Skin Disease" Workshop. NIAMS, September 2002. J Investig Dermatol Symp Proc 9(2):111–9. 10.1046/j.1087-0024.2003.09104.x

Figures

Available Policy		No Policy
Aetna	HealthPartners	Arkansas BCBS
Amerihealth	Highmark	BCBS KS
Anthem Blue Cross	Horizon BCBS NJ	BCBS MA
BCBS AL	Humana	BCBS SC
BCBS MI	Independence Blue cross	BCBS TN
BCBS MN	Kaiser	Blue Cross ID
BCBS NC	Louisiana Health (BCBS LA)	Blue Shield of CA
BCBS ND	Medical Mutual of Ohio	Caresource
BCBS Regence	Medicare	Geisinger
BCBS VT	Molina Healthcare Inc	HealthFirst Inc
BCBS WY	Neighborhood Health	Lifetime Healthcare
Carefirst	Premera Blue Cross	Maine Common Health Group
Cigna Health	Priority Health	Medica
Common Ground Healthcare	Providence Health	Medicaid
Emblem	Ucare	Montana Health Cooperative
Excellus	UnitedHealth	Tricare
HealthNET	Univera	Tufts
Guidewell/Florida Blue (BCBS FL)	UPMC	
Harvard Pilgram Health Care	Wellcare (Centene)	
Hawaii Medical	Wellmark Inc	
HealthcareService Corp		

BCBS: Blue Cross Blue Shield
UPMC: University of Pittsburgh Medical Center

Figure 1

Insurance Companies with a Policy Regarding Coverage of Dermabrasion Procedures

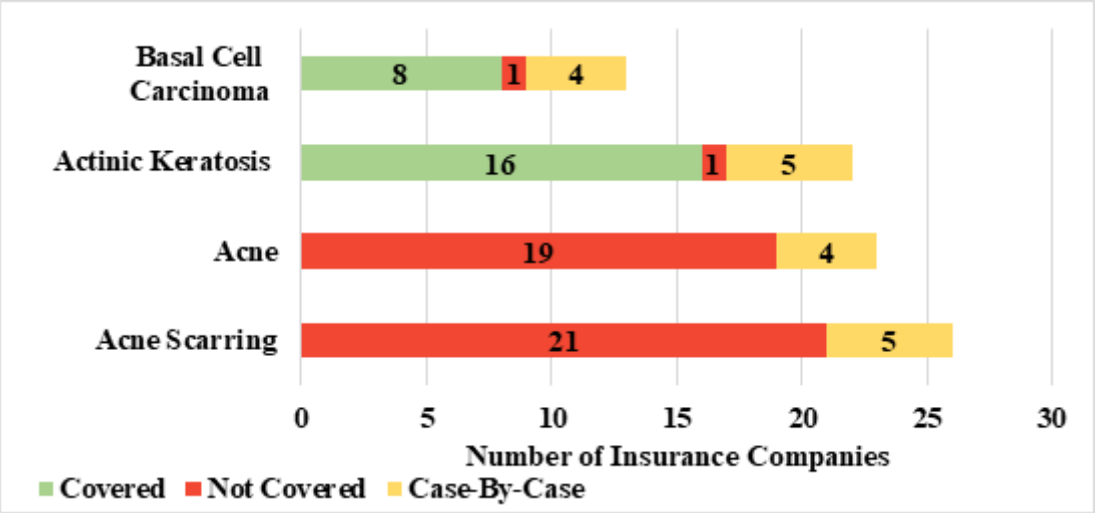

Figure 2

Number of Companies Providing and Denying Coverage of Dermabrasion for Medical Grade Conditions

Available Policy		No Policy
Aetna	Highmark	BCBS KS
Amerihealth	Horizon BCBS NJ	BCBS TN
Anthem Blue Cross	Humana	Blue Cross ID
Arkansas BCBS	Independence Blue Cross	Caresource
BCBS AL	Kaiser	Geisinger
BCBS MA	Louisiana Health (BCBS LA)	Harvard Pilgram Health Care
BCBS MI	Maine Common Health Group	HealthFirst Inc
BCBS MN	Medical Mutual of Ohio	Lifetime Healthcare
BCBS NC	Medicare	Medica
BCBS ND	Montana Health Cooperative	Medicaid
BCBS Regence	Neighborhood Health	Molina Healthcare Inc
BCBS SC	Priority Health	Premera Blue Cross
BCBS VT	Providence Health	Tufts
BCBS WY	Tricare	
Blue Shield of CA	Ucare	
Carefirst	UnitedHealth	
Cigna Health	Univera	
Common Ground Healthcare	UPMC	
Emblem	Wellcare (Centene)	
Excellus	Wellmark Inc	
HealthNET		
Guidewell (BCBS FL)		
Hawaii Medical		
HealthcareService Corp		
HealthPartners		

BCBS: Blue Cross Blue Shield
UPMC: University of Pittsburgh Medical Center

Figure 3

Insurance Companies with a Policy Regarding Coverage of Chemical Peel Procedures

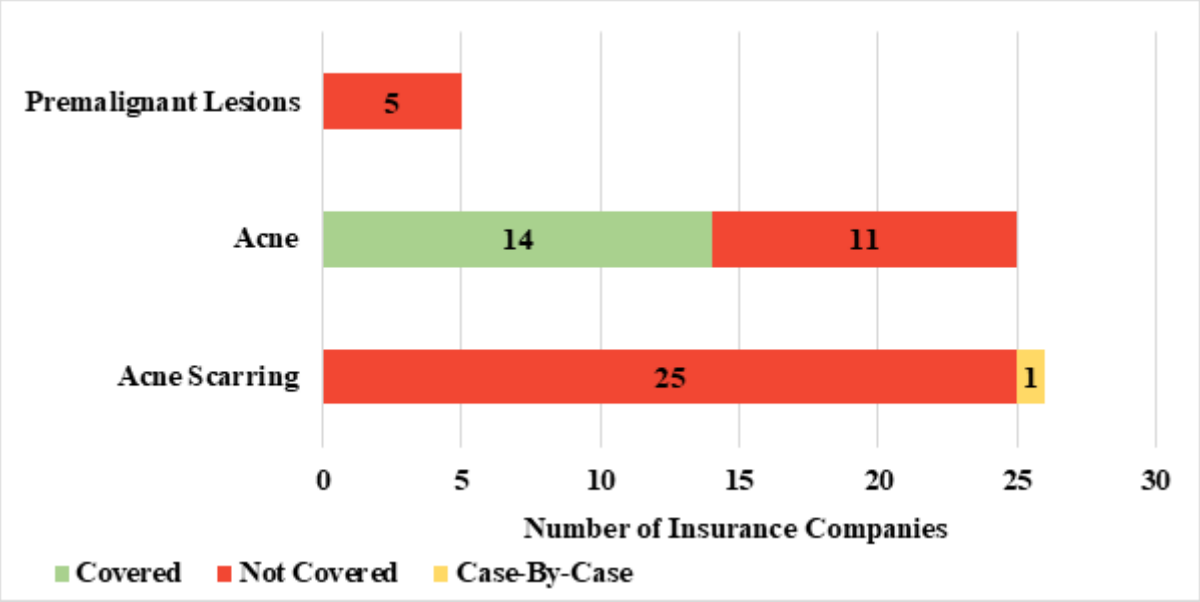

Figure 4

Number of Companies Providing and Denying Coverage of Chemical Peel Procedures for Medical Grade Conditions