Acne Adherence Research Wins International Recognition!

This year marked the publication of our research on weekly Internet surveys to improve adherence to topical acne treatment (Yentzer BA, Wood AA, Sagransky MJ, et al., An internet-based survey and improvement of acne treatment outcomes. Arch Dermatol. 2011 Oct; 147 (10): 1223-4.) In addition, our poster based on the study won first prize at the Poster Walk during the European Society for Patient Adherence, Compliance, and Persistence (ESPACOMP) in Utrecht, Netherlands. We are also looking forward to presenting this work at the 2012 Association for Psychocutaneous Medicine of North America (APMNA) and AAD Annual Meeting in San Diego. The Internet survey research has also been featured in a variety of media, including Pharmacy Times, Skin & Aging, and Practical Dermatology.

Several other CDR publications received media attention in 2011. Skin & Allergy News highlighted all three CDR posters presented at the Summer AAD in New York: a review of race and adherence, a survey of attitudes toward a multidisciplinary cosmetic center, and a report on underutilization of combination fluorouracil and cryotherapy for actinic keratoses. Our article on pediatric psoriasis treatment was featured in HealthDay, Health.com, Medical News Today, and Doctors’ Lounge.
Psoriasis

Patients' Educational Needs About Topical Treatment

Topical medications are a mainstay of psoriasis treatment. Many patients lack education about topicals. This may contribute to low adherence with long-term disease management. We did a study to describe psoriasis patients' educational needs concerning topical treatment. Patients' questions regarding topical therapy were collected from a National Psoriasis Foundation webcast on topical medications. The pre-broadcast question responses and the post-webcast survey responses were categorized into common themes and ranked by frequency. 30% asked about side effects, with a major emphasis on topical steroids; 16% asked about proper use; and 11% asked about efficacy. Popular new and useful information concerned specific medication information and "pearls" such as safety (especially steroid) material, the need for medication adherence, and the variety of options available in topical form. A limitation was that the study population consisted of online users expressing interest in the National Psoriasis Foundation educational material, not the general population of patients with psoriasis. Patient needs can be better met by providing information regarding side effects, proper use, and efficacy of topical medications. Communication regarding treatment changes and adherence to the treatment regimen should also occur.

Medication Use and Associated Costs

The impacts of use of pharmacotherapy for psoriasis on patient outcomes and medication costs need further examination using up-to-date large nationally representative data. We did a study to examine the impacts of patient demographics and medication use on patient's health status and associated medication costs. A retrospective cross-sectional study was conducted using the 2007 Medical Expenditure Panel Survey (MEPS) database. Information on patient demographics, health status, medication utilization, and medication costs were obtained representing 543,231 patients with psoriasis. Weighted multiple linear regression analyses indicated that the use of biological/systemic agents yielded an increase in patient health status among all types of medications ($\beta = 7.9, p < 0.05$). Use of biological/systemic agents also yielded an increase in annual medication spending ($\beta = 2.5, p < 0.01$). Use of biological agents was elevated compared to previous studies. We observed an association between medication use for psoriasis treatment and its related patient health status and medication spending. The study findings could imply that encouraging the use of topical treatments may be an effective means to increase patient health status. The use of biologics needs further cost-effectiveness studies given the findings that biologics contribute to substantial increases in both drug expenditures and patient health status.
In another study, we aimed to determine the most cost-effective sequence of biologic treatments. Through modeling of the clinical pathway of biologic agents, adalimumab, alefacept, efalizumab, etanercept, and infliximab, the costs and benefits (quality-adjusted life-years [QALYs]) were determined. A decision rule determined the optimal treatment sequence comparing costs and QALYs. While infliximab was found to provide the most incremental QALY and etanercept was found to be the least costly, on balance, the incremental cost-effectiveness ratio of adalimumab was the most favorable (ICER = $544/QALY). Consequently, the optimal sequence would begin with adalimumab and be followed by etanercept, infliximab, efalizumab, and alefacept, respectively. The limitations of this study are that evidence was based on indirect comparisons of biologic effectiveness, and toxicities were not included in the model. In consideration of cost-effectiveness in prescribing biologics for moderate to severe psoriasis, the optimal sequence would begin with adalimumab.

**Psoriasis Adherence**

An upcoming case series will discuss adherence to adalimumab for psoriasis. In our study, we measured adherence to a regimen of adalimumab every other week for psoriasis. Patients were randomized to receive additional nurse education or standard-of-care only. Adherence behaviors varied widely across the patients in both groups.

(Below: MEMS® caps were applied to the disposal containers to measure adherence to injectable biologics.)
Psoriasis and Phototherapy

This year we completed three review articles on phototherapy. Targeted ultraviolet (UV) B phototherapy devices provide a practical means to treat localized psoriasis while sparing harmful effects to unaffected skin. The objective of this study was to characterize the efficacy and safety of targeted phototherapy devices for psoriasis. We conducted a PubMed search for broadband UVB, narrowband UVB, and localized phototherapy, and a Google search for handheld phototherapy. The most common targeted phototherapy devices were characterized as 308-nm excimer laser, 308-nm excimer nonlaser, or nonexcimer light subtypes. Nine clinical trials met inclusion criteria and all found targeted phototherapy efficacious. In a nonexcimer light study, high doses cleared the most plaques. The 308-nm excimer laser had long-term clearance in 13 of 26 patients. The mean number of UVB treatments in all 9 studies and highest cumulative dose was less than those same parameters in nontargeted phototherapies. Common adverse effects included erythema, blisters, hyperpigmentation, erosion, mild burning, and itching. The predominant setting for excimer units is the office; however, the majority of nonexcimer light devices can also be used at home. Targeted phototherapy should be considered among the treatment options for localized variants of psoriasis.

In the second review article, we considered protocols for 308 nm excimer laser phototherapy. 308 nm excimer laser phototherapy is efficacious in the treatment of localized psoriasis. Different approaches regarding dose fluency, number of treatments, and maintenance have been utilized, and there is yet to be a consensus on standard protocol. The objective was to characterize treatment parameters for 308 nm excimer laser phototherapy. We performed a PubMed search for studies describing excimer laser treatment protocol with particular attention to dosage determination, dose adjustment, dose fluency, number of treatments, and maintenance. Seven prospective studies were found describing the excimer efficacy for psoriasis. All studies determined the initial treatment dose using either the minimal erythema dose (MED) or induration. Fluency ranged from 0.5 MED (low) to 16 MED (high); one study demonstrated that medium to high fluencies yielded better improvement in fewer number of treatments. Fluency adjustments during the course of treatment were important to minimize phototherapy-associated side effects. The use of higher fluencies was reported to result in higher occurrences of blistering. One study implemented a maintenance tapering of dose-frequency phase to better manage psoriasis flare-ups. The 308 nm excimer laser is an effective therapy for psoriasis regardless of the method used to determine initial dosage, dose fluency, or number of treatments. As its usage as a targeted monotherapy increases, future trials should consider evaluating and modifying these parameters to determine the most optimal management of localized psoriasis. Based on our reviewed studies, there is no consensus for a single excimer laser therapy protocol and as a result, patient preferences should continue to be an important consideration for phototherapy regimen planning.
The third article compared efficacy of 308-nm excimer laser phototherapy with non-targeted phototherapy. Whole body ultraviolet (UV) phototherapy for localized psoriasis requires a high number of treatments and unnecessarily exposes uninvolved skin. 308-nm excimer laser phototherapy offers rapidly delivered targeted, high UVB doses while sparing healthy skin. A PubMed search for studies evaluating the efficacy and safety of narrowband 308-nm excimer laser phototherapy was conducted. Included studies administered both 308-nm excimer laser and non-targeted phototherapies to patients. Three prospective, non-randomized studies compared NBUVB with excimer laser. One trial reports greater efficacy of the 308-nm excimer laser over NBUVB with fewer treatments (8.33 vs. 30.1), lower mean cumulative dose (4.81 vs. 31.1 J/cm²), and lower treatment duration (2.27x less). Two trials report no statistically significant differences regarding improvements or number of treatments for clearance. No study showed significant differences in side effects. Both the 308-nm excimer laser and non-targeted phototherapies effectively clear localized psoriasis. Although it is proposed that excimer laser exclusively treats diseased skin with better response rates, split-body trials reveal no differences. Long-term studies are necessary to compare the effects of high-dose excimer laser regimens with non-targeted phototherapies.
Psoriasis—NAMCS and MarketScan Studies

A study is underway using data from the MarketScan database to assess treatments, comorbidities, and adverse events associated with psoriasis. A special focus will be the rates of opportunistic infection in patients treated with TNF inhibitors. Safety of each psoriasis treatment will be examined based on adverse events.

Guidelines to screen for cardiovascular (CV) risk factors in psoriasis patients have been established, but the frequency with which dermatologists and non-dermatologists screen psoriasis patients for CV risk factors is not well characterized. We did a study to determine how frequently psoriasis patients are screened for CV risk factors in the ambulatory care setting and to identify factors affecting screening rates. Data from the 2005-2009 National Ambulatory Medical Care Survey (NAMCS) were used to determine screening rates for blood pressure, glucose, cholesterol, and body mass index. A composite percentage was used to determine the likelihood a patient would have at least one of the four risk factors screened. Screening rates were assessed by physician specialty, patient demographics and clinical practice characteristics. There were an estimated 11.4 million psoriasis patient visits from 2005-2009. Blood pressure, glucose, cholesterol, and body mass index were evaluated at 32.2%, 5.9%, 9.0%, and 26.0% of psoriasis visits, respectively. Patients without psoriasis were screened for these CV risk factors at 58.9%, 6.0%, 8.0%, and 38.1% of outpatient visits, respectively. Screening rates were higher if the patient was of male gender, Asian race, Hispanic ethnicity, or less than 60 years of age. Higher screening rates were also associated with primary care specialties, faculty practice or community health clinics with employed physicians, clinics that utilized Electronic Medical Records, practices with a higher percentage of revenue from a Medicare/Medicaid payer, or offices with discounted fees and capitation payment structures. A limitation is that NAMCS data is cross-sectional permitting assessment of screening rates based on visits but not based on patients. Screening for high blood pressure, diabetes, hypercholesterolemia and obesity are not performed at most outpatient visits for psoriasis. Care should be taken to ensure that patients receive appropriate screening for the comorbidities associated with psoriasis.

Psoriasis and rosacea are both common, chronic skin conditions that may affect a patient’s overall health. Since psoriasis has been well documented in the literature to have associated comorbid disease, we did a study to describe the frequency of comorbidities amongst all patients without psoriasis and compare them to patients with psoriasis. This study was conducted using the 2003-2007 MarketScan dataset. Patients with at least one outpatient visit during the time period of 2003-2007 were included in this study. A patient was identified as having a comorbidity if he or she ever had an outpatient visit associated with this comorbidity during the study period. We identified the top ten comorbidities associated with the following patient populations: (1) all patients without psoriasis; (2) psoriasis patients; (3) rosacea patients. In psoriasis patients, the top three reported associated diagnoses were abdominal pain, hypertension and acute upper respiratory infection. The three most frequently reported diagnoses associated with rosacea were abdominal pain, acute upper respiratory infection, and hypertension. Overall, five of the top ten diagnoses were shared in common amongst patients with psoriasis or rosacea compared to patients without psoriasis. Psoriasis and rosacea patients share multiple comorbidities in common with the general patient population without psoriasis, as well as with each other. Although psoriasis and rosacea have five out of their respective top 10 rankings in common, these diagnoses are mostly infectious or musculoskeletal in nature.
Another study aimed to characterize patterns of childhood psoriasis health care delivery from 1979-2007 using the NAMCS. There were an estimated 3.8 million visits for psoriasis over the study interval with a median of 123,420 visits per year. Dermatologists saw 63% of patients, pediatricians saw 17%, and internists, 14%. The numbers of visits were equal between sexes but ranged by age group: patients ages 13 to 18 years accounted for 47% of visits, those ages 8 to 12 years for 35%, and those ages 0 to 7 for 18%. Ninety-three percent of patients were white. Topical corticosteroids were the most commonly prescribed medications. Children 0 to 9 years old received equally potent corticosteroids as children 10 to 18 years old. Among all patients, the most prescribed medication was topical betamethasone; among those ages 0 to 9 years, tacrolimus; and among those ages 10 to 18 years, betamethasone. By physician specialty, the most prescribed medications were high-potency steroids for dermatologists and internists, and topical tacrolimus for pediatricians. Topical calcineurin inhibitors were not among the top 20 most prescribed medications by dermatologists, and systemic antipsoriatic agents were not among the top 20 most prescribed medications in any age group. Over the 28-year interval, outpatient visits for pediatric psoriasis were attended primarily by white children older than 8 years in equal number by sex. Dermatologists and pediatricians saw the majority, and treatment approach differed by physician specialty and patient age. Treatment guidelines for childhood psoriasis may help reduce treatment variability.

Given that psoriasis medications vary widely in cost, patients' health insurance status is likely to affect the treatments they receive. We did a study to compare the treatments prescribed to psoriasis patients with different types of insurance using NAMCS data for 1997-2009. Psoriasis patients most frequently had private insurance (67%), followed by Medicare (16%), self-pay (7%), and Medicaid/SCHIP (5%). The top five treatments for patients with private insurance were calcipotriene, brand name clobetasol, generic clobetasol, halobetasol, and betamethasone. For patients with Medicare, the top five were calcipotriene, triamcinolone, calcipotriene/betamethasone combination, diflorasone, and etanercept. Medicaid patients most often received triamcinolone, clobetasol, etanercept, fluocinonide, and calcipotriene. The use of topical vitamin D analogs and corticosteroids is the standard of care across all payment types, while combination products are relatively infrequently prescribed across all payment types. Payer status has an impact on the specific products chosen, but vitamin D products and corticosteroids are the most common for visits associated with each type of payer.

In another study, we assessed recent trends in the use of phototherapy. Phototherapy is an effective and established treatment modality for psoriasis and other dermatologic disorders. Despite this, its use for psoriasis declined considerably from 1993 to 1998. Since then, the National Psoriasis Foundation has advocated for decreased copayments for phototherapy treatments, however insurance reimbursements are still variable. To characterize the use of phototherapy by dermatologists in the outpatient setting over the last decade, we analyzed the National Ambulatory Medical Care Survey (NAMCS) data to determine the number of outpatient phototherapy visits to non-federal physicians from 1997-2008. Between 1997 and 2008, there were an estimated 1.5 million outpatient phototherapy visits, 85% of which were administered by dermatologists. The most common diagnoses were psoriasis (37%), actinic keratosis (11%) dermatitis NOS (10%), dyshidrosis (5%), and pruritus, pityriasis rosea, and dyschromia (all at 3%). For psoriasis, out of pocket or other costs for phototherapy and the relative inconvenience of traveling to an outpatient clinic multiple times per week may be limiting the use of this treatment modality. However, phototherapy use seems to be increasing for certain conditions other than psoriasis.
**Other Psoriasis Studies**

Safe and effective long-term psoriasis treatments are needed. Biological treatments that inhibit the immunopathogenesis of psoriasis have helped meet this need. We did a review to compare the effectiveness of biologic therapies used for psoriasis. A literature search was performed using Pubmed and keywords “(PASI-75 or efficacy) AND psoriasis AND (adalimumab OR alefacept OR etanercept OR infliximab OR ustekinumab)”. Randomized, double blind, and placebo-controlled studies on FDA-approved biologics were selected. Studies assessing the proportion of subjects achieving 75% improvement in Psoriasis Area and Severity Index (PASI-75) within a 12-week period were included. Studies on pediatric populations and psoriatic arthritis were excluded. The weighted average of PASI-75 for each reported regimen was calculated to determine the effectiveness of biologic agents used for moderate-to-severe psoriasis. Tolerance and secondary efficacy measures were also examined for the selected studies. FDA-approved regimens of adalimumab, infliximab, ustekinumab, and alefacept were effective in treating moderate-to-severe psoriasis. Calculated PASI-75 for infliximab, ustekinumab, adalimumab, etanercept, and alefacept were 78.6%, 72.1%, 70.5%, 48.1%, and 21%, respectively. A limitation was that the comparative effectiveness of biologic agents data were limited to 12 weeks; thus, generalizing the results to longer treatment periods may not be accurate.

Various biologic agents for psoriasis were effective at 12 weeks in placebo-controlled trials. Available data cannot fully account for situations in clinical practice, in which combination and longer duration of therapy may be required. When choosing the most effective or best agent, multiple factors should be considered including patient preference, cost, tolerance, side effects, dosing schedule, and mode of administration.

We did a review of combination therapy for psoriasis, reviewing the evidence for combinations of topical agents, topicals with systemic agents, and combinations of systemic agents. We found that combination therapy offers many advantages compared to monotherapy, such as synergistic or additive efficacy, and shorter exposure or lower doses of toxic agents. Combination products and vehicles that can be used in multiple areas can simplify combination regimens, thereby promoting medication adherence.

In a related study, we examined whether concomitant use of methotrexate and oral retinoids is dangerous. After consideration of the available data regarding the hepatotoxicity of methotrexate and retinoid combination treatment, we favor a precautionary warning with close monitoring of liver function, as stated in the package insert for methotrexate. There is no evidence that concurrent therapy with methotrexate and acitretin carries an increased risk of hepatotoxicity. The contraindication in the acitretin package insert is not evidence-based and may discourage appropriate use of this combination therapy for patients who require it for severe psoriasis. What we encourage instead is clinical discretion. If a patient has psoriasis but no psoriatic arthritis, light therapy and acitretin would be good choices for initial therapy, in addition to appropriate topical corticosteroids and vitamin D analogues. If adequate control is not achieved, then methotrexate can be added. Although there is one case report of acute toxic hepatitis occurring with methotrexate and etretinate therapy, the evidence is not strong enough to support a contraindication regarding the use of methotrexate and retinoids concomitantly. We encourage additional research to define actual risks of hepatotoxicity when methotrexate and retinoids are used together in order to develop evidence-based guidelines for its safe application in our patients.
The treatment of moderate to severe psoriasis often requires the administration of systemic agents. However, information is limited on the safety of systemic agents in patients with pre-existing cancers. In a review, we attempted to summarize the small body of data and urge organized study of this patient population. It is critical that an effort be made to fill this gap in the literature and include, rather than exclude, this patient population in future studies on biologics. In the meantime, treating patients with severe or refractory psoriasis and a history of pre-existing malignancy may sometimes require using these treatments, even though data about their malignancy risk is limited. The potential risks and benefits must be weighed carefully and in these cases, consultation with an oncologist is recommended.

Another review focused on safety and efficacy of biologics for psoriasis. An increasing body of evidence supports the safety and efficacy of using biologic agents to treat psoriasis. Although meta-analyses suggest infliximab may have the highest rate of inducing clinically significant improvement, the question of superiority may be further elucidated with more head-to-head comparisons of the various agents. Additional research must focus on safety and on identifying long-term risks – especially malignancy – potentially associated with these agents.

Another study sought to compare the cost per responder of ustekinumab with etanercept based on data from the active comparator ACCEPT trial. In ACCEPT, patients received ustekinumab 45 mg (n = 209) or 90 mg (n = 347) at weeks 0 and 4 or etanercept 50 mg (n = 347) twice weekly for 12 weeks. The proportions of patients achieving ≥75% improvement in the Psoriasis Area and Severity Index [PASI 75] were determined at week 12. The cost per PASI 75 responder was determined for week 16, a time coinciding with treatment coverage of both drugs and accounting for the different dosing intervals. Costs for 16 weeks of therapy were based on the Wholesale Acquisition Cost (WAC) in the United States. The analysis used weight-based efficacy results for ustekinumab (45 mg for patients ≤100 kg; 90 mg for patients > 100 kg) and overall efficacy for etanercept, consistent with the approved dosages. A total of 28% of patients weighed > 100 kg. The PASI 75 response rates at week 12 were 72.2% for the ustekinumab 45 mg group in patients ≤100 kg, 65.0% for the ustekinumab 90 mg group in patients > 100 kg, and 56.8% for the etanercept group. At week 16, the cost per responder was $17,842 for ustekinumab and $20,077 for etanercept. The cost per responder was lower for ustekinumab than for etanercept through 16 weeks in psoriasis patients.
A review examined studies on acitretin and its dosing. Clinical experience favors low doses of acitretin to reduce adverse events but still maintain efficacy. We revisited the pivotal acitretin trials to compare the efficacy of high- versus low-dose acitretin. We analyzed data from two large randomized trials which had an 8-week, double-blinded (DB), placebo-controlled phase followed by a 16-week open-label (OL) phase. During the DB phase, patients received placebo, 10, 25, 50, or 75 mg of acitretin daily. Dose adjustment was allowed during the OL phase, during which high-dose treatment was defined as approximately 50 mg/day and low-dose as approximately 25 mg/day. Primary end points were improvement of psoriasis based on investigator static global assessment (ISGA) and reduction in affected body surface area (BSA). At the end of the OL phase (week 24), treatment success rates were similar among all groups (29%-33%) - with the exception of the group receiving low-dose treatment for both DB and OL phases (47% success). Decrease in BSA was also highest in this group (73% vs. 28% to 54%). Individualization of acitretin dosing is crucial to minimize side effects and should lead to improved adherence and efficacy. This analysis supports the utility of low-dose acitretin for psoriasis over extended treatment periods.

Acitretin is widely used for severe psoriasis, and has also been used for a spectrum of other difficult-to-treat dermatoses, including hyperkeratotic and inflammatory dermatoses and non-melanoma skin cancers. We did a review of the available data regarding both FDA-approved and off-label uses of acitretin, clinically relevant adverse events, precautions and monitoring. A PubMed literature search was conducted utilizing the search term "acitretin," which yielded 714 hits. Results were further limited to English language clinical trials in human subjects. Of 78 articles evaluated for relevance, 60 were included for review. Acitretin is effective as monotherapy and in multidrug therapeutic regimens for the treatment of psoriasis and other hyperkeratotic and inflammatory disorders, as well as for malignancy chemoprevention. Its use is limited by its teratogenic potential and other adverse effects, including mucocutaneous effects and hepatotoxicity. Potential adverse effects may be reduced or avoided by using lower doses of acitretin or in combination with other therapies. The reviewed studies include many small trials and case reports of the use of acitretin for psoriasis. Studies of acitretin therapy for the treatment of other cutaneous disorders are limited. Acitretin is a beneficial treatment for psoriasis, and should be considered when not contraindicated. Particularly when used in combination with ultraviolet (UV) phototherapy, is a safe and cost effective therapeutic strategy.

We also presented a case report of a patient who developed a Koebner reaction at the site of a tattoo. Treatment with ustekinumab resulted in striking clearance of the psoriasis changes at the tattoo site. Physicians need to recognize strategies to deal with this subpopulation of psoriasis patients.

(Left: Dr. Feldman speaking to patients on “Psoriasis and Its Treatments”, March 21, 2011.)
Combination medications target multiple pathways of acne formation and may offer therapeutic benefit. We did a study to explore the efficacy and tolerability of combination retinoid plus antimicrobial treatments in acne vulgaris. A PubMed and Google search was conducted for combination therapies of clindamycin and tretinoin, with secondary analysis of related citations and references. Similar searches were completed for the combination medications of benzoyl peroxide (BPO) plus clindamycin or erythromycin, and for the combination therapy of adapalene and BPO. Combination clindamycin phosphate and tretinoin gel was found to be more efficacious than monotherapy of either drug or its vehicle for acne, including inflammatory acne, and has a greater onset of action than either drug alone. Clindamycin phosphate and tretinoin gel was well-tolerated, and adherence to its use exceeded that of using both medications in separate formulations. BPO-containing combination medications with clindamycin or erythromycin were both more effective in the treatment of acne than either drug alone. Both medications were well-tolerated, with dry skin being the most common adverse effect. Combination medications have superior efficacy and adherence, and have a similar tolerability profile compared with monotherapy of its components. Several studies have found antibiotic-containing combination products with a retinoid effective for acne. The use of antibiotic-containing combination medications for acne can lead to bacterial resistance, so BPO treatments are also recommended in combination with a retinoid.

Efficacy of Adapalene/Benzoyl Peroxide

There is no direct correlation between acne severity and lesion numbers and patients with moderate acne may present with varying lesion counts. Adapalene 0.1%-benzoyl peroxide (BPO) 2.5% combination gel is an efficacious and safe acne treatment. We sought to evaluate whether the benefit of adapalene-BPO relative to vehicle varies with baseline lesion counts. Data were pooled from 3 randomized, double-blind, controlled studies, which compared efficacy in 4 treatment groups (adapalene-BPO, adapalene, BPO, and the gel vehicle). Three lesion count subgroups (Low, Mid, and High) were defined based on the number of total, inflammatory, or noninflammatory lesion at baseline. Efficacy of each treatment and benefit of each treatment relative to vehicle were evaluated on the entire population and in all lesion count subgroups. Safety was assessed by local tolerability score and adverse events. Adapalene-BPO provided significant benefit relative to vehicle and monotherapies on the entire population and in all lesion count subgroups (P < .05). At study end point, the benefit of adapalene-BPO relative to vehicle was greatest in the High subgroup, suggesting that patients with the highest baseline lesion counts contributed the most to the treatment benefit observed in the entire population. This effect was only observed with adapalene-BPO and not with monotherapies. Higher baseline lesion counts did not lead to more related adverse event or worse tolerability score for adapalene-BPO. These results were generated from clinical trials. Results in clinical practice could differ. We conclude that the relative benefit of adapalene-BPO increases with higher lesion counts at baseline.
Prescribing Patterns for Combination Products

Acne is a common disease caused by multiple factors affecting the pilosebaceous follicles. As a result of the multifactorial nature of this disease, current treatment guidelines recommend using drugs from multiple classes. Adherence is a challenge when multiple drugs are needed in a treatment regimen. Newer combination products may help physicians combat this issue. We did a study to examine prescribing patterns in the treatment of acne focusing on combination product use. The National Ambulatory Medical Care Survey (NAMCS) database was queried for visits for acne. Visits were analyzed for patient demographics and treatment regimens. Prescription for common treatments and combination products were analyzed to determine changes in prescribing over time. The most common treatment for acne was topical retinoids. Two combination products, benzoyl peroxide/erythromycin and benzoyl peroxide/clindamycin, were within the top ten acne treatments. The use of combination products is increasing in primary care specialties (1.27% per year; p = 0.002) as well as among dermatologists (0.66% per year; p<0.001). Combination products were used in approximately 12% of patient encounters. The use of combination acne products is on the rise. The use of combination products is expected to continue increasing as a means of reducing treatment complexity and increasing adherence to treatment.

A related study assessed the role of combination products in the treatment of dermatologic diseases. We examined NAMCS data from 1993-2009 to determine the frequency of combination product prescribing in treatment of skin disease. At least one combination product was prescribed at an estimated 47,024,000 skin disease visits, or 6.2% of all skin disease visits. The frequency of prescribing at least one combination product increased over time (P<0.0001), rising from a low of 4.8% in 1993 to a high of 9.2% in 2009. Among the top 50 medications prescribed, eight were combination products: bacitracin zinc and polymyxin B (Polysporin®), erythromycin and benzoyl peroxide (Benzamycin®), trimethoprim and sulfamethoxazole (Bactrim®), clotrimazole and betamethasone (Lotrisone®), clindamycin and benzoyl peroxide (Benzaclin® or Duac®), fexofenadine and pseudoephedrine (Allegra®), acetaminophen and hydrocodone (Vicodin®), and lidocaine and epinephrine. Combination products are commonly used for a wide range of dermatologic conditions. The increasing availability of new combination products has the potential to further improve treatment outcomes in the future.
Acne in children under 12 appears to be increasing in prevalence. Few acne treatments are FDA approved for this age group, and little is known about what is actually prescribed for acne patients younger than 12. We did a study examining National Ambulatory Medical Care Survey (NAMCS) data to determine what treatments are used most in acne patients younger than 12, and how the treatment patterns compare to those in the 12-18 age group. We selected visits from the 1993-2009 NAMCS with a diagnosis of acne. The treatments used in acne patients were tabulated and stratified by age to compare treatment of pre-teen and teen patients. Physician specialty was also assessed to determine whether it was responsible for the differences noted. The leading acne treatments used in children ages 7-11 were adapalene, benzoyl peroxide, tretinoin, minocycline, and benzoyl peroxide/erythromycin combination. For teens ages 12-18, the leading treatments were tretinoin, isotretinoin, minocycline, benzoyl peroxide, and adapalene. Dermatologists managed only 38% of acne visits for children ages 7-11, as compared to 67% for children ages 12-18. The prescribing patterns differed between dermatologists and primary care physicians for both age groups, especially in the younger group. A limitation is that it was not possible to assess severity of patients’ acne and how it may have affected treatment choices. We conclude that the treatments presently used in pre-teen acne are similar to those used in teen acne, except that isotretinoin is rarely used in younger children. Topical retinoids were the most frequently used treatment in both age groups, but are less often used by nondermatologists, especially in pre-adolescents.

MarketScan

We are presently using the MarketScan database to assess acne treatment, comorbidities, and adverse events of treatment. One focus is comparing IBD rates among patients on isotretinoin, antimicrobial or subantimicrobial doses of antibiotics, and other treatments to test the hypothesis that subantimicrobial doses can confer clinical benefit with reduced risk of IBD. More generally, the safety of acne treatments will be compared based on observed rates of adverse events.

Epiduo Sample Study

We are beginning recruitment for the Epiduo Sample Study. The contract has been signed, IRB approval obtained and Clinicaltrials.gov registered, and medication received.

The purpose of the study is to compare adherence to treatment and efficacy with Epiduo® Gel in patients with mild to moderate acne who receive a medication sample and instructions on proper application with their stock size medication tube versus patients who receive only the stock size medication tube. We believe that using medication samples to demonstrate proper application will result in better adherence to treatment and consequently, improved treatment outcomes. Patients are randomized to receive either the sample plus stock size tube, or stock size tube alone, fitted with a MEMS® cap and adapter. Data are clearly needed to protect the practice of sampling in dermatology by showing that it enhances treatment outcomes.
Psychological Aspects of Acne

Acne vulgaris affects the majority of adolescents and is associated with a substantial psychosocial burden to the patient. Acne patients’ quality of life (QOL) is an important factor of patient care, and several measures of dermatological and acne-specific have been created to assist in acne research, management and care. We did a review that describes several skin disease and acne-specific QOL measures and their applications in clinical care or research. A MEDLINE literature search was performed using the key words “acne” and “quality of life.” The search was further narrowed using the keywords “depression,” “psychosocial,” or “anxiety.” Four dermatological QOL measures were identified for use with patients with psychosocial concerns and possibly multiple dermatological comorbidities. Six acne-specific QOL measures were described as the most sensitive measures of QOL in acne patients. Shorter scales, whether dermatological or acne-specific, appeared more appropriate for routine clinical use than were longer and more time-consuming measures. A limitation was that the review did not examine general health QOL measures and may not describe every QOL measure available for acne patients. We concluded that the ideal QOL measure for the management of acne patients is a concise questionnaire that places minimal burden on the respondent and allows the physician to track improvement in QOL with successful treatment.

Adolescence is an important period for the development of physical, mental, and psychosocial health including the development of self-esteem. Having low self-esteem in adolescence has been associated with delinquency, aggression, antisocial behavior, poor physical and emotional health, and lower economic success in adulthood when compared to individuals with high self-esteem. We did a study to determine how acne impacts self-esteem in this patient population. We reviewed the literature to determine if acne has an impact on adolescent self-esteem. A MEDLINE and psychINFO search was performed using the search terms “acne” along with key words “self-esteem” and “psychological” which resulted in five studies focused on adolescent self-esteem. All five studies found that having acne was correlated with lower levels of self-esteem. A majority of patients with acne were dissatisfied with their appearance and experienced significantly more emotional disturbance than their peers. Patient perception of disease severity was the most important and universal predictor of low self-esteem. Acne treatment was associated with improvement in self-esteem. Early and aggressive treatment for acne can have a positive impact on self-esteem. Patient beliefs about disease severity are important when considering a treatment regimen. Due to the high association between acne and psychosocial problems, patients with this disease should be assessed for low self-esteem and depression prior to treatment.
Economics of Acne Treatment

The patterns of pharmacotherapy for acne and similar conditions, and the effect of those patterns on cost, are not well characterized. This study examined the impacts of patient demographics and medication choices on patients' health status and associated medication costs. A retrospective cross-sectional study was conducted using the 2007 Medical Expenditure Panel Survey (MEPS) database. Information on patient demographics, health status, medication utilization and medication costs was obtained from the database representing 3,784,816 patients with acne and similar conditions. Weighted multiple linear regression analyses indicated that the use of topical retinoids was preferred in combination with other treatments rather than as monotherapy. Oral antibiotics were widely prescribed and their use was associated with a significant decrease in total annual prescription spending. Use of oral retinoids and oral contraceptives increased the annual prescription costs significantly. Increase in annual drug refills was not associated with the improvement in health status. We observed an association with medication choice for acne and acne-related conditions on medication spending. Pharmacologic treatment of acne significantly adds to acne-related annual healthcare costs compared to non-pharmacologic treatment.

Acne and Oral Contraceptives

Treatments available for acne in women include oral contraceptive pills (OCPs) and isotretinoin, a known teratogen. We did a study to determine whether OCPs are underutilized as a first line agent in the treatment of acne in women of reproductive age, how use of OCPs compared to use of isotretinoin, and whether adequate use and documentation of OCPs is occurring among patients treated with isotretinoin. Data was obtained through the NAMCS over the years 1993-2008 for females aged 12-55. Queries included first visits to a physician for the sole diagnosis of acne, overall visits for acne by physician specialty, and contraceptive and OCP use in patients in the study demographic with reported isotretinoin use. Isotretinoin was prescribed more often than OCPs at both first visits (4.7% vs. 3.3%) and overall visits (12.5% vs. 2.6%) for acne. Documentation of OCP or other contraceptive use occurred only 4.1% of the time overall in patients treated with isotretinoin. Notably, there were variations in both OCP use for acne and contraceptive use with isotretinoin by specialty, with ob/gyn specialists most likely to prescribe OCPs and isotretinoin for acne and most likely to report contraceptive use in patients using isotretinoin, and dermatologists least likely to prescribe OCPs. A significant trend was observed, however, for dermatologist prescription of OCPs for acne(p=.002). Limitations to the study include potential sampling bias, as patients with severe acne warranting isotretinoin may be most likely to seek the care of a dermatologist, whereas milder cases are more likely to be successfully treated by a primary care physician. The findings of the current study indicate that OCPs may be underutilized in reproductive aged women with acne, even as a preliminary treatment option.
How Patients Manage Dryness from Acne Treatment

Products that may cause irritation are widely used to treat acne. Irritation has the potential to reduce treatment adherence. How patients manage irritation and dryness is not well characterized. We did a study to assess self-reported irritation, its impact and coping mechanisms in patients who had been treated for acne with a clindamycin-5% benzoyl peroxide (BPO) product. We conducted an Internet-based survey of 200 subjects, aged 15-40 years who had used a clindamycin-5% BPO fixed combination product in the last six months on at least 50 percent of their face, at least five days per week. The majority of subjects (57%) had moderate acne, 28 percent had severe acne. Bothersome side effects of the clindamycin-5% BPO combination included dry skin (55%), flaky/peeling skin (45%), irritated skin (44%), itchy skin (39%) and redness (37%). As a result, subjects used the product only as a spot treatment (33%), only when breakouts seemed worse (28%), or less often than recommended (32%); stopped using from time to time (32%); switched to a different prescription medication and/or an over-the-counter acne product (28%); or stopped using altogether (10%). 41 percent of subjects reported using moisturizers to counteract dryness and redness. A limitation was that we queried patients concerning use of combination clindamycin/BPO products and not other products. Irritation to clindamycin-5% BPO is a common problem that reduces patients' use of the medication. Strategies to improve treatment include communication with patients on possible side effects, providing written instruction on how to manage irritation and dryness and consideration of alternative topical treatments and treatment regimens.

<table>
<thead>
<tr>
<th>Degree of Bother</th>
<th>Dry Skin</th>
<th>Redness</th>
<th>Flaky, Peeling Skin</th>
<th>Itchy Skin</th>
<th>Irritated Skin</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>7%</td>
<td>14%</td>
<td>10%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Mild (1-3)</td>
<td>26%</td>
<td>30%</td>
<td>29%</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td>Moderate (4-7)</td>
<td>34%</td>
<td>36%</td>
<td>34%</td>
<td>34%</td>
<td>42%</td>
</tr>
<tr>
<td>Severe (8-10)</td>
<td>34%</td>
<td>20%</td>
<td>27%</td>
<td>22%</td>
<td>22%</td>
</tr>
</tbody>
</table>
Actigraphy

This year saw great progress in demonstrating the feasibility of actigraphy monitors to measure severity of atopic dermatitis. Actigraphy monitors, which look like wrist watches, measure the amount of hand movement, which is used to determine how often the wearer is scratching during sleep. Our research showed that actigraphy is well-tolerated in children and the wrist monitors do not aggravate atopic dermatitis at the wrist sites. Future studies plan to examine the interaction between atopic dermatitis severity and adherence, using actigraphy to measure severity and MEMS® caps to monitor adherence.

AD Adherence

We published editorials in the JAAD and Pediatric Dermatology related to adherence in AD. The first focused on the importance of “thinking outside the box” to understand nonadherence. We reported the case of a 3-year-old who presented to our clinic with refractory eczema despite treatment with what should have been a highly effective regimen of topical triamcinolone to the body, desonide and tacrolimus for the face, and fluocinonide to the worst areas. We noted that the complexity of the regimen likely contributed to poor adherence. Prior researchers reported that patients surveyed did not cite treatment complexity, time requirements, or cosmetics of vehicles to be limiting factors at the time of the visit. However, it is likely that the survey design did not permit researchers to fully understand the patients’ thought process in their own compartment. Our 3-year-old patient improved rapidly after we simplified the regimen to triamcinolone only for 3 days. We concluded that physicians must question the assumption that patients need multiple medications to treat AD. In our other editorial, we emphasized that medication weights and self-reports are not a reliable method of assessing adherence behavior. For this reason, studies measuring the dose of corticosteroids required to cause HPA axis suppression may have overestimated the dose.
**MarketScan**

We are in the process of using the MarketScan database to assess treatment of AD over the last several years. We will also assess comorbidities and how they affect the treatments received. Use of unsafe drug combinations will also be reviewed to obtain data on how safety of AD treatment can be improved.

**Internet Surveys**

We are beginning a pilot study to assess the patented weekly Internet survey method, previously tested in acne, for children with AD. Twenty children ages 2-8 with AD, who are candidates for treatment with topical triamcinolone, are being recruited. Their parents will be randomized to complete weekly Internet surveys about the treatment regimen for 4 weeks, or receive standard-of-care treatment without surveys. All parents will be instructed to apply topical triamcinolone to their children’s AD daily. Adherence and disease outcomes will be assessed at baseline and the final Week 4 visit. We anticipate using the results of this pilot study to inform an NIH R21 or SBIR grant application later in 2012.
The Compliance Pyramid

It is important to consider how the population at each level of care, ranging from self-treatment to subspecialist care, may vary. People with the easiest-to-control, most minor disease may never see a doctor; they may not feel they need to be treated or they may effectively self-treat with over-the-counter medications or non-medical remedies. Primary care providers manage patients with common presentations of common conditions, the majority of patients in most health systems. Only a minority of patients sees a dermatologist, and an even smaller minority sees a dermatology subspecialist. The population seen by dermatologists or by dermatology subspecialists is generally highly selected and not representative of the general population. Dermatologists often treat the most troublesome cases in patients who have filtered through the various levels of care. It is possible that patients who proceed through the various levels of care are not presenting with a difficult diagnosis or disease but rather with an issue of poor adherence to treatment. At each successive level of more intensive care, there is greater selection for difficult-to-manage patients. Being a good specialist does not just entail being ready to offer another worthwhile treatment for a patient with resistant disease, but also involves being able to get patients to use their medications better.
**Adherence and Timing of Return Visits**

Good patient adherence is increasingly being recognized as essential to the success of dermatologic treatment regimens. Frequent office visits improve adherence to dermatologic treatment, and are more effective than electronic reminders. Despite the benefits of early follow-up, there remains little data on the timing of follow-up visits in U.S. medical practice. We analyzed data from the MarketScan Medicaid database from 2003-2007 to determine the frequency of early follow-up in skin disease visits. We identified first visits for patients with three common dermatologic diagnoses – psoriasis, acne, and atopic dermatitis – creating separate data sets for adults and children. We determined the length of time before the next visit for each patient with at least one follow-up visit. The average length of time to first follow-up visit in psoriasis was 153 days for adults and 142 days for children. In acne, it was 151 days for adults and 218 days for children. In atopic dermatitis, it was 161 days for adults and 209 days for children. Median lengths of time to first follow-up visit were 55 days for adults and 43 days for children in psoriasis, 62 days for adults and 103 days for children in acne, and 55 days for adults and 95 days for children in atopic dermatitis. Large numbers of patients did not return for a follow-up visit at all: 53.91% of adults and 67.32% of children with psoriasis, 65.34% of adults and 63.95% of children with acne, and 78.72% of adults and 68.30% of children with atopic dermatitis. These data suggest that few physicians routinely have their patients return for early follow-up visits. Guidelines emphasizing the benefit of early follow-up visits to improve adherence would probably be worthwhile. Physicians who do not have the capability to schedule early follow-up visits may derive an especially large benefit from other techniques, such as online “virtual office visits”, that can substitute for early follow-up visits.

**Effectiveness of Reminder Approaches for Adherence**

Patient adherence is an important component of the treatment of chronic disease. An understanding of patient adherence and its modulating factors is necessary to correctly interpret treatment efficacy and barriers to therapeutic success. We did a meta-analysis that aims to systematically review published randomized controlled trials of reminder interventions to assist patient adherence to prescribed medications. A Medline search was performed for randomized controlled trials published between 1968 and June 2011 that studied the effect of reminder-based interventions on adherence to self-administered daily medications. Eleven published randomized controlled trials were found between 1999 and 2009 which measured adherence to a daily medication in a group receiving reminder interventions compared to controls receiving no reminders. Medication adherence was measured as the number of doses taken compared to the number prescribed within a set period of time. Meta-analysis showed a statistically significant increase in adherence in groups receiving a reminder intervention compared to controls (66.61% vs 54.71%, 95% CI for mean: 0.8% to 22.4%). Self-reported and electronically monitored adherence rates did not significantly differ (68.04% vs. 63.67%) Eight of 11 studies showed a statistically significant increase in adherence for at least one of the reminder group arms compared to the control groups receiving no reminder intervention. The data is limited by imperfect measures of adherence due to variability in data collection methods. Reminder-based interventions may improve adherence to daily medications. However, the interventions used in these studies, which included reminder phone calls, text messages, pagers, interactive voice response systems, videotelephone calls, and programmed electronic audiovisual reminder devices, are impractical for widespread implementation, and their efficacy may be further improved when combined with alternative adherence-modifying strategies. More practical reminder-based interventions should be assessed to determine their value in improving patient adherence and treatment outcomes.
Adherence and Race

Patient medication adherence is a critical yet often overlooked factor that determines dermatologic treatment outcome. Likewise, the effects of poor medication adherence are ubiquitous across all fields of medicine. Overall, medication adherence is generally poor and costs the United States health care system billions of dollars annually. Several studies have evaluated the relationship between race and adherence in regards to specific medications or certain patient populations. However, there appears to be a paucity of studies investigating the general association between race and medication adherence. We did a study to assess the relationship between race and medication adherence. A PubMed literature search was conducted using the search terms “race” OR “ethnicity” AND “adherence.” Studies meeting inclusion criteria were subjectively reviewed to evaluate the association between patient race and medication adherence. 82 of the 103 articles reviewed (79.6%) found a significant relationship between race and adherence. Black race was the most common race/ethnicity to be significantly associated with poor adherence (58 articles), followed by Latino/Hispanic/Mexican American (17 articles). White race was the most common race/ethnicity to be significantly associated with good adherence (6 articles), followed by Japanese (2 articles) and black/African American (1 article). There appears to be substantial evidence of a relationship between race and medication adherence. Further research is needed to understand the confounding variables that may be involved, the full prevalence of this relationship within certain fields of medicine and certain subpopulations, and, most importantly, what providers can do to improve adherence across all races.

Importance of Patient Education for Adherence

We wrote a commentary on an article discussing the need for education on skin cancer monitoring in kidney transplant recipients. Although patients were hearing the message that they should see a dermatologist, they were baffled by these recommendations, thinking they had no need to seek dermatologic care. We noted that not only does inadequate information sharing contribute to poor adherence to treatment, but it results in decreased patient satisfaction. Patients have reported that "how well physician answered your questions" and "instructions on how to take care of your illness or health condition" are problem areas. When making recommendations or prescribing a medication, the reason for the recommendation or treatment should be clearly explained and written instructions provided; it's important that written instructions and handouts be legible. Improved patient education can be achieved quickly and easily through simple changes in practice and use of written materials and online resources and will result in great gains in outcomes, via improved adherence and patient satisfaction.
Dermatologic Surgery Safety

The study on adverse events in dermatologic surgery has been completed, and two manuscripts have been produced. Although office-based dermatological procedures are generally considered safe, there is a lack of prospective data on the rate of adverse events (AEs) associated with these procedures. We sought to determine the frequency of AEs after dermatologic surgery, and to characterize the most commonly encountered AEs. A web-based interface was designed to track AEs with the input of four dermatologic surgeons. Patient demographic and operative data were collected at the time of the dermatologic surgery procedure over 10 months. AEs occurring at any time during the data collection period were logged according to an a priori categorization scheme. The AE rate was 2.08% in this series of 2404 subjects undergoing dermatologic surgery. The most commonly reported AEs were suspicion of infection (64%), post-operative hemorrhage (20%), and wound dehiscence (8%). Suspicion of infection was reported slightly less frequently in subjects who received prophylactic pre-operative antibiotics (0.43%) versus those who did not (1.5%). There were no serious AEs and no deaths. AEs are uncommon after office-based dermatologic surgery procedures. Pre-operative prophylactic antibiotics may further decrease the infection rate after dermatologic surgery; however, the risks and benefits must be weighed given the already very low AE rate.

Our second manuscript focused on hemorrhage risk, since a particular concern is the risk of post-operative hemorrhage in patients treated with anticoagulants. We sought to compare the rate of post-operative hemorrhage in dermatologic surgery patients being treated with anticoagulant therapy, versus those not on anticoagulant medications. 1,139 (47.4%) of the 2,404 subjects were undergoing therapy with an anticoagulant medication at the time of a dermatologic surgery procedure, and of these, 957 were treated with aspirin, 136 with warfarin, and 46 with both warfarin and aspirin. Ten post-operative hemorrhages were logged in the study; seven occurred in subjects being treated with an anticoagulant. The rate of hemorrhage in these subjects (7/1139, 0.61%) was higher but not significantly different from the rate in subjects not treated with anticoagulants (3/1265, 0.24%, \( p=0.21 \)). We conclude that the rate of post-operative hemorrhage was so low in this prospective study that discontinuation of anticoagulants prior to dermatologic surgery does not appear necessary or warranted under usual circumstances.
Blood Pressure Screening

Hypertension is a common problem, with a prevalence of 29% in the United States. While it is a very treatable condition, as many as 1 in 4 hypertensives are unaware of their disease. It is recommended that adults undergo regular blood pressure screening to minimize the consequences of untreated hypertension. We did a study to assess whether outpatient medical providers are in compliance with current recommendations for blood pressure screening. The NAMCS database was checked at outpatient visits from 1993 to 2008. Visits were analyzed for provider specialty, patient demographics, and associated diagnoses and medications. Trends in blood pressure screening over time were analyzed by linear regression. Blood pressure was checked at 50.5% of visits to all specialties, with blood pressure screening reported at just 3.4% of visits to dermatologists. Blood pressure was checked significantly more often in Native Hawaiian/Other Pacific Islander and American Indian/Native Alaskan patients than all other races. There were no significant differences in frequency of blood pressure screening by patient gender or age. There was a significant increase in frequency of blood pressure screening over time among dermatologists and non-dermatologists. Physicians from many specialties, notably dermatology, are not in compliance with the current recommendations that patients undergo routine blood pressure screening. Dermatologists should consider modifying practices to incorporate this important, yet simple and inexpensive screening intervention, particularly for patients who are not actively seeing a primary care provider.

How Good Are Dermatologists at Discriminating Skin Cancers?

Identification of skin cancer requires discrimination of malignant lesions from benign lesions. The number of biopsies performed to yield one cancer diagnosis can be presented as a number needed to treat (NNT), and provides an assessment of the efficiency of skin cancer detection. We did a study to assess the clinical accuracy of US dermatologists screening for skin cancer, the NNT for both melanoma and non-melanoma skin cancer was examined. Pathology reports from 2021 biopsies performed at the Wake Forest University Department of Dermatology were reviewed, including the physician's differential diagnosis and final pathological diagnosis. The NNT was calculated for melanoma, non-melanoma skin cancer, and all skin cancer diagnosed. Of 1240 biopsies suspicious for skin cancer, 559 cancers were diagnosed, yielding a NNT of 2.22 for any cancer. The NNT specifically for non-melanoma skin cancer was 1.6, while the NNT for melanoma was 15. Patient age, anatomical location, sex and physician all significantly impacted on NNT values. The NNT for melanoma in our study was lower compared to recently published values obtained from general practitioners in Australian skin cancer clinics (NNT of 30). Variability amongst institutions, practice settings and physicians supports the need to establish a benchmark NNT.
Sunscreen is one of the key elements of photoprotection, yet only a small percentage of the U.S. population uses it well. Trends in sunscreen recommendation by physician specialty have not yet been well characterized in the literature. We did a study to characterize physician recommendation of sunscreen in the U.S. in regards to patient demographics, as well as to assess the different frequencies of sunscreen recommendation amongst various physician specialties. We also sought to determine trends in sunscreen recommendation by physicians over the years. NAMCS data from 1989 to 2008 were obtained to determine the frequencies of sunscreen recommendation amongst various physician specialties. Data was also evaluated to determine trends in patient demographics and diagnoses associated with visits where sunscreen usage was mentioned. There were an estimated total of 16.3 billion patient visits nationwide from 1989 to 2008. Sunscreen was recommended at 11.5 million visits (0.07%). Physicians mentioned sunscreen usage at 0.88% of visits associated with a diagnosis of skin disease. Dermatologists accounted for 86.6% of sunscreen recommendations. However, on average, dermatologists mentioned sunscreen at only 1.6% of visits. Sunscreen was mentioned most frequently to Caucasian patients, particularly those in their 8th decade of life; whereas children were recommended sunscreen the least. The most common diagnosis associated with sunscreen was actinic keratosis. Trends show a very minimal increase (0.03% per year) in the recommendation of sunscreen by physicians at patient visits for skin disease. Providers participating in NAMCS were instructed to record all products recommended at each visit, however, sunscreen use might be underestimated due to reporting error. Sunscreen is recommended infrequently, even in regards to patients with a history of skin cancer. While seeking shelter remains the mainstay of photoprotection, sunscreen is an important adjunct that appears underused by all physicians.

Nondermatologists Advertising Dermatologic Services

While it has long been recognized by dermatologists that nondermatologist physicians are independently managing skin disease, it is unknown how aware patients are of this fact. We examined yellowpages.com advertisements to determine how commonly nondermatologist physicians are advertising dermatologic care, to characterize what type of training these nondermatologist physicians have, and to determine whether the title of a practice is a potential indicator of the likelihood of receiving care by a dermatologist. We searched yellowpages.com for practices advertising dermatologic services within 20 miles of six major US cities. We identified individual practitioners and medical practices advertising within the “physicians & surgeons, dermatology” section of yellowpages.com. We also performed four separate searches for medical practices/businesses with “dermatology,” “skin,” “laser,” and “aesthetic” in their title. Across the six cities, 12.5% of physicians advertising the practice of skin care under “physicians & surgeons, dermatology” were nondermatologists. More than 10% of advertisements studied were for non-dermatologists. It is unclear how aware patients are that physicians advertising skin care services may not be dermatologists. The degree of disclosure of board certification and residency training of nondermatologist physicians varied greatly. Patients may benefit from clear, uniform delineation of physician credentials. The elimination of alternative board certification organizations like the ABPS should be considered in order to limit patient confusion regarding physician claims of “board certification”.

(Left: Cosmetic services are being offered by all kinds of physicians and even dentists. Patients should be directed to a well-trained dermatologist.)
Off-Label Use of Adapalene

Adapalene stimulates multiple actions in the skin: comedolytic, anti-inflammatory, antiproliferative, and immunomodulatory. The wide range of biological effects of adapalene lends itself to a plethora of off-label uses. We did a study to review the off label uses of adapalene. The National Ambulatory Medical Care Survey database was queried for diagnoses associated with the prescription of adapalene from 1997-2006. A Pubmed literature search was done with “adapalene” as the sole search criterion. The abstracts of all papers returned were examined for any uses of adapalene that were not for acne treatment. Adapalene has reported efficacy in the treatment of the rare keratotic conditions: acral Darier’s disease, milia en plaque, and Dowling-Degos disease. Adapalene has been successfully used for rosacea and rosacea-like peri-oral dermatitis. The premalignant conditions, actinic keratoses and cervical intra-epithelial neoplasia (CIN), have responded to treatment with adapalene. Adapalene may also be valuable in the treatment of some pigmentary disorders. A limitation is that there is a lack of randomized controlled trials that evaluate adapalene for non-acne indications. Adapalene’s comedolytic effect may explain its reported efficacy in the treatment of hyperkeratotic conditions, while its anti-inflammatory effect may explain its usefulness in the treatment of rosacea-like conditions. Finally, adapalene’s antiproliferative and immunomodulatory effects most likely account for its utility in the treatment of CIN, actinic keratoses, and pigmentary disorders.

Over-the-Counter Use in Dermatology

Over the counter (OTC) products play an important role in the treatment and prevention of disease in the U.S. Topical OTCs are widely used, but the use of such products in dermatology is not well-defined. We did a study to characterize topical OTC use in the U.S. The National Ambulatory Medical Care Survey (NAMCS) was queried for physician visits from 1989 to 2008 in which topical OTCs were recorded. Physician specialty, patient demographics, and diagnoses were examined and linear regressions were performed to determine trends over time. From 1989 to 2008, there were an estimated 353 million visits in which topical OTCs were used, of these the majority were visits to a dermatologist (31.8%). The most commonly used OTCs by dermatologists were: hydrocortisone (16.1%), benzoyl peroxide (12.6%), and sunscreen (7.1%). Dermatologists were more likely to use moisturizers in the treatment of dermatologic disease than other physicians. There has been a significant decrease over time in overall topical OTC use for all physicians (p<0.0001), however, dermatologists’ use of moisturizers and sunscreens has increased significantly. Topical OTC products have an important role in the prevention and treatment of dermatologic disease. Topical OTC use as therapeutic agents is decreasing over time while their use as complementary components (sunscreen/moisturizers) appears to be increasing. Efforts should be made to increase awareness of the utility of these agents to other health care providers treating dermatologic disease to ultimately improve patient outcomes.
AK Risk Questionnaire

Actinic keratosis is a highly prevalent epidermal neoplastic condition among people in the US with fair skin and a history of long term UV exposure, that is largely unrecognized as a problem. We did a study to develop and validate a self-assessed survey-based tool that can be used easily and effectively to raise awareness of actinic keratosis and help patients assess their risk of either having or developing actinic keratosis. A test questionnaire, comprised of 10 items, was initially developed using data obtained from subjects in routine clinical practice and interviews with dermatologists. The instrument was administered along with established and validated skin health assessment instruments (DLQI and Skindex-16) to 150 subjects prior to them being given a diagnosis of actinic keratosis by the dermatologist. A total of 75 subjects with actual actinic keratosis clinical diagnosis and 75 age/sex matched controls without actinic keratosis formed the sample for this study. Exploratory factor analyses, item response theory analyses, and other psychometric techniques were used to assess the reliability and validity of the Actinic Keratosis Risk Questionnaire (AKRQ). The final AKRQ instrument assessed was refined based on the results of exploratory factor analysis and item response techniques, ultimately limiting the scale to six items. The resulting scaled instrument demonstrated good internal consistency and correlated well with other validated measures of skin health status. Higher total AKRQ scores were associated with a 19% increase in the odds of an actinic keratosis diagnosis (p<0.001, CI: 1.12–1.27), indicating that the AKRQ was useful in identifying individuals at increased risk of actinic keratosis. The AKRQ is a reliable and valid tool that may help patients self-assess their risk of either having or developing actinic keratosis based on their skin health-related behavior and quality of life symptomatology. Widespread use of this tool may help raise awareness of patients at risk for actinic keratosis, helping them seek early medical attention and thereby reducing risks and morbidity of more advanced skin cancer.

AK and SCC

Changes in the appearance of actinic keratosis (AK) suggest progression to invasive squamous cell carcinoma (SCC), though some dermatologists and dermatopathologists consider AK to be SCC in situ. Actinic keratosis is an indicator of cumulative UV exposure and the initial lesion in the majority of invasive cutaneous SCCs. The development of SCC on sun-damaged skin is a gradual process; however, most AK lesions do not progress to invasive SCC and it currently is not possible to clinically or histopathologically determine which AK lesions will progress to SCC. Presently there is insufficient evidence to support the concept that AK is frank SCC. Although the rate of progression over time remains to be determined by large prospective studies, AK is a marker for an increased rate of nonmelanoma skin cancer (NMSC), even in the absence of specific lesion progression. Nevertheless, the risk for progression of AK to invasive SCC with the potential for metastasis provides the rationale for treatment, and AK lesions should be treated with lesion- or field-directed therapy or with a combined approach when indicated. In a review, we discussed the implications for treatment and review a variety of treatment options.
Patient Satisfaction

Residency represents the period when students transition into independent physicians. In order to assess and develop patient-centered care skills, feedback from patients is valuable. We did a study to characterize the quality of care provided by residents as perceived by patients and to identify ways to enhance that care. Patients were asked by dermatology residents to complete an online survey about the patients’ visit experience. The surveys queried patients for open comments about the patients’ overall experience and any problem areas they experienced. Of the 180 surveys received, 136 contained open comments. An overwhelming majority shared positive thoughts about the residents. Resonant themes included communication, professionalism, time, care and compassion, medical knowledge and procedural skill, attentiveness, patience and willingness to answer questions. Negative comments were few and mostly addressed other aspects of the clinic experience such as ancillary staff and cleanliness. A limitation was that the limited sample may not be representative of patients who were not surveyed, including non-dermatological patients or those who choose not to go to clinics affiliated with teaching hospitals. Patients think highly of dermatology residents and enjoy being seen by them. The survey responses suggest that patient-centered outcomes were important to patients and deserve focus in residency training.

While doctors strive to make their patients happy, the growing trend in healthcare towards “pay-for-performance” underscores the need to achieve patient satisfaction in the practice of medicine. Among other benefits, improved medication adherence and overall better outcomes are associated with patients’ satisfaction with their physicians. The Heisenberg Uncertainty Principle is a concept that may help to understand the principles at work in determining patient satisfaction. This principle, first described in 1927 by Werner Heisenberg, relates that the exact position and momentum of a particle cannot both be accurately measured at the same time, and it can be understood by examining how the position and momentum of an electron are measured. There is perhaps a similar principle at work in measuring patient satisfaction and how patients perceive physicians. Patients value doctors who are friendly and caring; these factors are the ones most closely tied to patient satisfaction. When physicians ask patients for their feedback, patients perceive this as demonstrations of care, respect and concern. Requesting their opinion augments patients’ perceptions that doctors care about doing what is best for their patients, thus patients respond positively to this effort and report higher satisfaction with their physicians.
Recruiting Underserved Populations

Recruitment of participants to dermatologic research studies can be challenging, particularly with historically underserved populations. Recruitment of these groups is essential to ethical, valid, and useful dermatologic research. We wrote an article discussing findings from a review of 78 studies that examined factors influencing participation in health research studies with an emphasis on underserved populations, particularly women and ethnic minorities. The most commonly encountered barriers to research participation are mistrust of research, lack of access to research programs, and culturally incompetent research design. Motives to participate in research include receipt of benefit from participation, perceived opportunities to help others, and culturally competent research design. Practical methods for addressing barriers and enhancing research participation include culturally competent research design, community-based recruitment, and easily understandable informed consent. These factors should be considered when recruiting subjects for dermatologic research, especially when recruitment of underserved populations is desired. In addition, the literature demonstrates a paucity of research among rural residents, infants, and children, as well as within clinical dermatologic research.

Lupus

Lupus therapy has changed little over the past 50 years. In March 2011, the US Food and Drug Administration (FDA) approved belimumab, complementing the three preexisting approved therapies: low dose aspirin, prednisone and hydroxychloroquine. Multiple physician specialties are involved in the treatment of lupus as the disease not only affects numerous organ systems, but is also associated with many comorbidities. The main objectives for this study were to evaluate trends in the medications prescribed for the management of lupus and to assess how treatment for lupus varies among different specialists. Outpatient visits for treatment of lupus and its comorbidities were identified in the NAMCS, a representative survey of visits to physician offices in the United States. Data was evaluated to determine patient demographics, treatments prescribed by each specialty, and comorbidities encountered during the study period of 1993-2009. The frequency of lupus visits typically ranged from 750,000 to 1.5 million visits per year. The majority of lupus patients were 30- to 59-years of age and were predominately female (90.1%). Although Caucasians accounted for 75.5% of lupus visits, the adjusted annual frequency of visits identified African Americans as having the highest frequency of visits per 100,000 people. Rheumatologists had the most lupus visits of all physicians. From 1993-2004, prednisone was the most frequently prescribed medication; however, prednisone became the second most frequently prescribed medication in 2005-2009, as hydroxychloroquine became the leading medication prescribed for lupus. Unspecified essential hypertension and myalgia were the most common comorbidities associated with lupus. Although Caucasians accounted for 75.5% of lupus visits, the adjusted annual frequency of visits identified African Americans as having the highest frequency of visits per 100,000 people. Rheumatologists had the most lupus visits of all physicians. From 1993-2004, prednisone was the most frequently prescribed medication; however, prednisone became the second most frequently prescribed medication in 2005-2009, as hydroxychloroquine became the leading medication prescribed for lupus. Unspecified essential hypertension and myalgia were the most common comorbidities associated with lupus. The NAMCS collects cross-sectional data, such that individual patients cannot be followed over time. Hence, it does not provide data regarding the incidence of disease, patient age at the time of diagnosis, or prognosis related to patient demographics. Medication trends regarding first-line treatment of lupus changed minimally from 1993 to 2009. Moreover, first-line lupus therapy did not differ significantly amongst various specialists, with the exception of dermatologists, who primarily focused on treating the cutaneous manifestations of lupus.
Contact Dermatitis

Contact dermatitis (CD) is a very common dermatologic condition that requires accurate diagnosis to choose appropriate treatment. We did a study to characterize the demographics and treatment of contact dermatitis in U.S. outpatient practice. We examined the National Ambulatory Medical Care Survey (NAMCS) for visits with a diagnosis of CD, and assessed the frequency of each related diagnosis code across demographic groups and physician specialties. Physicians managed an average of approximately 11,300,000 visits per year with a diagnosis of CD. Dermatologists annually managed 430 cases of CD, while pediatricians, family physicians, and internists annually managed 53, 44, and 21 cases respectively. Dermatologists managed 31% of CD visits, followed by family physicians (27%) and pediatricians (21%). About 80.8% of CD was recorded as “CD or eczema unspecified cause” (ICD-9 code 692.9), followed by CD due to plants except food (692.60; 12.1%), acute dermatitis due to solar radiation (692.72; 1.4%), other dermatitis due to solar radiation (692.79; 1.3%), and sunburn (692.71; 0.8%). The top five medications prescribed at CD visits were triamcinolone, prednisone, hydrocortisone, diphenhydramine, and methylprednisolone. The majority of CD is managed by generalists. The high rate of CD “unspecified cause” may suggest a need for better physician training in identifying the cause of CD.

Depression Screening

Depression is a very important global public health problem with significant costs both to individuals and society. Depression has a strong influence on patients’ health because depressed patients are 3 times more likely to be nonadherent to their treatment plans. We used data from the NAMCS to assess the frequency of depression screening in physician visits. The average frequency of depression screening across visits to all specialties was 1.5%. Psychiatrists and internists were the most likely to screen patients for depression. Despite the high levels of depression previously documented in dermatology patients, dermatologists screened patients for depression in only 0.14% of visits. The failure to routinely screen patients for depression, as observed in this study, represents a practice gap in the practice of U.S. dermatologists. Considering the high risk for depression that dermatology patients face, dermatologists need to be attentive to patients’ psychological needs in addition to treating the skin disease.

Office-Based Microscopy

Microscopy, including Tzanck smears and Gram stains, is useful for diagnosing a wide range of cutaneous conditions. Rates of office-based microscopy may be declining, possibly having an adverse effect on patient outcomes. Using the NAMCS, we did a study to determine the frequency of office-based microscopy in the United States and how it has varied over time. Office-based microscopy was mentioned at 1.37% of all dermatology visits in 1993 and 2.01% in 1994, but then declined to less than 0.5% of visits in all but one of the years 1995-2008 before rising again to 2.47% in 2009. The most common diagnoses in dermatology visits that mentioned microscopy were benign neoplasm of skin, unspecified dermatitis or eczema, nonmelanoma skin cancer, actinic keratosis, and dermatophytosis of nail. Use of office-based microscopy by dermatologists appears to have declined substantially in response to the CLIA regulations that went into effect in 1995. An apparent increase in office-based microscopy in 2009 may merit further investigation.
Mohs Surgery

In Mohs surgery, the histologic verification of tumor removal at the time of the procedure results in a lower rate of cancer recurrence compared to simple excision. We did a study using the NAMCS to investigate trends in the utilization of Mohs surgery. The NAMCS was queried for patient visits associated with Mohs surgery from 1995 to 2009. Primary endpoints included trends in the percentage of skin cancers managed with Mohs surgery, the most common locations of skin cancer managed with Mohs surgery, and patient demographics associated with Mohs surgery. Although there was an upward trend in the use of Mohs surgery, a low percentage of skin cancers (2.8%) were managed with this technique. When the surgical location was specified, Mohs surgery was most commonly utilized for the head and neck region. Compared to other age groups, patients in the 70-79 year range underwent the highest percentage (34.0%) of Mohs surgeries. Male patients (60.0%) underwent Mohs surgery more frequently than females. Patients of white race accounted for 90.2% of Mohs surgery cases. In comparison, patients of African American race accounted for 2.9% of Mohs surgical procedures. After adjusting NAMCS data to take into account the proportions of each race in the U.S. population, the percentage of white patients with skin cancer who underwent Mohs surgery was 2.7%, whereas Mohs surgery was utilized for 10.0% of African American patients with a diagnosis of skin cancer. Limitations included the fact that for more than half of diagnoses associated with the Mohs surgery cases, the location of the skin cancer was unspecified. National data support the conclusion that Mohs surgery is primarily being reserved for skin cancers involving body sites where tissue preservation is essential, such as the head and neck region. Evaluation of patient demographics demonstrates the frequency of Mohs surgery closely parallels the frequency of skin cancers such that patient subpopulations associated with higher rates of skin cancer are treated the most frequently with Mohs surgery.

Warts

Warts are a common dermatologic disease. They can be of cosmetic concern, cause physical discomfort and predispose patients to certain malignancies. Management of warts has traditionally been based on anatomic location, clinical appearance and patient preference. We did a study to investigate trends in the treatment of warts, as well as patient demographics associated with the diagnosis of warts. The NAMCS was queried for data regarding patient visits associated with the diagnosis of warts from 1990 to 2009. There was a significant increase in the use of imiquimod during the study period such that it became the most frequently used medical therapy for the treatment of warts. There were no statistically significant trends regarding the frequency of treatment with medication only, procedure only, or combination treatment. In terms of patient demographics, there was a trend in regards to increasing patient age and the diagnosis of warts. However, there were no noteworthy trends with respect to patient gender or race and the diagnosis of warts. A limitation was that warts not otherwise specified (NOS) was the reported diagnosis for more than eighty percent of patient visits for warts. The advent of a new therapy and shifts in population patterns have modified the epidemiologic profile and treatment of warts.
EMR and E-Prescription

Electronic medical records (EMR) may improve medical quality while reducing costs. Incentive programs are in place to encourage uptake of EMR. To assess differences in EMR use among medical specialties and practice settings, we performed a cross-sectional retrospective study using nationally representative data from the NAMCS for the period 2003-2009. Bivariate and multivariate analyses compared EMR use among physicians of fourteen specialties and assessed variation by practice setting. Trends in EMR use were examined over time and between medical specialties. Differences in EMR use among geographical region, patient characteristics, and physician office settings were also assessed. Bivariate and multivariate analysis demonstrated increased EMR use from 2003-2009, with 16% reporting at least partial use in 2003, rising to 52% in 2009 (p<0.001). Cardiologists, orthopedic surgeons, urologists, and family/general practitioners had higher rates of EMR use, whereas psychiatrists, ophthalmologists and dermatologists had the lowest EMR use. Patient demographics did not affect EMR use (p>.05). Uptake of EMR is increasing, although significantly slower in dermatology, ophthalmology, and psychiatry. Solo practitioners and owners of a practice have low rates of EMR use compared to non-solo practitioners and those who do not own their practice. Physicians in HMOs use EMR more than any other office setting. Despite incentives for EMR adoption, physicians should carefully weigh which, if any, EMR to adopt in their practices.

Electronic prescriptions may reduce medication errors, costs, and adverse drug events. Incentive programs exist to encourage electronic prescribing. To assess electronic prescription use among medical specialties, nationally representative data from the NAMCS were analyzed for 2007-2009. A logistic regression was used to assess e-prescription access among fourteen specialties, controlling for year, geographic region, primary source of payment, and office characteristics. Another logistic regression using a two-step Heckman method assessed whether physicians with access to computerized prescriptions sent prescriptions electronically to the pharmacy. Compared with 2007, increased e-prescription access occurred in 2008 (OR=1.77; 95% CI=1.69-1.86) and 2009 (OR=2.66; 95% CI=2.54-2.79). Compared to family medicine physicians, electronic prescription use is highest among internists (OR=1.28; 95% CI=1.19-1.37) and cardiologists (OR=1.25; 95% CI=1.15-1.36), while it is lowest among psychiatrists (OR=0.37; 95% CI=0.33-0.41) and ophthalmologists (OR=0.41; 95% CI=0.37-0.44). Physicians in metropolitan areas compared to rural areas (OR=1.59; 95% CI=1.5-1.68), and in the West compared to other geographical regions (OR=1.17; 95% CI=1.11-1.24) had greater e-prescription access. Medicaid as primary source of payment compared to private insurance (OR=0.82; 95% CI=0.77-0.88), and private solo or group practitioners compared to physicians employed by HMOs (OR=0.41; 95% CI=0.38-0.44), had lower access to electronic prescriptions. Similar results were found for prescriptions actually sent electronically to the pharmacy, except that the Midwest region had higher electronic transmission of prescriptions to the pharmacy compared to others (OR=1.19; 95% CI=1.07-1.33). E-prescribing access is growing, although use in certain specialties, including dermatology, lags behind others.
Services Available and Their Effectiveness

For a special issue of Dermatologic Clinics, we did a literature review to assess what is known about services available for the treatment of skin disease and their effectiveness. Services are available at four levels: self-care, generalist (primary) care, specialist care from a dermatologist, and subspecialist care from subspecialists such as cosmetic surgeons or Mohs surgeons. The benefits of dermatologists’ expertise include greater cost-effectiveness and more training and experience treating common skin conditions. Patients increasingly recognize the benefits of specialist care, and the demand for dermatologists’ services continues to rise. The supply of dermatologists has not kept up with the demand despite increases in use of non-physician clinicians. The role of self-care and primary care in skin disease remains significant. Approximately 56% of skin disease visits are to nondermatologists. However, nondermatologists refer patients to dermatologists frequently, even for very common skin conditions such as acne and eczema. Training of nondermatologists in dermatology topics is minimal and needs to be improved since nondermatologists will continue to oversee high percentages of skin disease visits for the foreseeable future. Meanwhile, efficacy of self-care depends on patients’ ability to understand and carry out appropriate self-treatment regimens.

In a related study of the NAMCS, we assessed changes in the frequency of cosmetic and non-cosmetic dermatologic procedures performed by different physicians in the U.S. between 1995 and 2008. Using NAMCS data from 1995-2004 and 2007-2008, cosmetic and non-cosmetic dermatologic procedures were identified. The volume of cosmetic and non-cosmetic procedures performed by particular physician specialties, and estimates of the number performed per physician, were calculated for each year. During the 12-year study period, an estimated 298 million total dermatologic procedures were performed. The number of dermatologic procedures performed per 1,000 people in the population increased from 56 procedures per 1,000 in 1995 to 116 in 2008 (p<0.001). Most procedures were performed by dermatologists (55%) and general/family practitioners (19%). Cosmetic procedures constituted 9% of all skin procedures and the annual frequency of cosmetic procedures has increased since 1995 (p<0.001). Dermatologists have performed a decreasing proportion of cosmetic procedures, whereas other physicians have performed an increasing proportion, surpassing dermatologists in 2002-2004, and 2008. However, dermatologists have performed an increasing overall number of procedures per physician annually since 1995. On average, dermatologists performed 1,699 dermatologic procedures per physician per year, compared to 70 for family practitioners and 68 for general surgeons. Limitations are that this study was limited to the provision of outpatient procedures only, and the nationally representative data were subject to sample bias. The volume of skin-related procedures performed in the outpatient setting in the United States is increasing. Although dermatologists are performing more procedures than in the past, they are not performing an increasing proportion of outpatient procedures.
Complementary and Alternative Medicine in Dermatology

It is disappointing and frustrating, for both the patient and the physician, when conventional medical treatments fail to provide adequate clinical responses. Consequently, many patients are integrating complementary and alternative medicine (CAM) into their treatment regimens. A recent survey regarding the implementation of CAM with conventional therapy found that most patients believe such a combination optimizes treatment outcomes. Physicians are often unaware of patients’ implementation of CAM, for few physicians query patients regarding usage of herbal products and/or dietary supplements. The implementation of CAM by patients with skin disease is relatively common. In the United States, the prevalence of CAM usage in adult patients reporting skin problems is approximately 49.4%. A thorough PubMed literature search was conducted utilizing the search terms “mare’s milk,” “lactoferrin supplementation,” “psoriasis,” “eczema,” “atopic dermatitis,” “skin disease,” “skin dermatoses,” and the product’s brand name. We identified one double-blind placebo-controlled trial assessing the efficacy of mare’s milk for the management of inflammatory skin dermatoses. Although the findings from this single, small clinical trial suggest that the supplement could be beneficial for the management of inflammatory skin dermatoses, larger randomized-controlled trials are needed, both in regards to efficacy and safety. Patients and physicians need to be wary of several potential problems that could be associated with CAM. Natural products are often marketed as having fewer side effects than conventional medications, which may be misleading. As complementary and alternative medicine continues to increase in popularity, dermatologists should educate themselves regarding new and long-standing natural products marketed for the treatment of skin disease. Dermatologists should also ask their patients if they are using any natural products on their own to treat their skin condition. Patients should be counseled regarding the risks/benefits of implementation of naturopathic products into their treatment regimens.

Building on the Internet Survey Technology

An upcoming study will examine the potential for a photo survey to improve adherence to topical treatment for actinic keratoses (AKs). Topical AK treatment commonly causes serious irritation that frequently causes patients to abandon the treatment regimen early. Patients who can be assured that their levels of irritation are within the normal range may feel more confident that they should continue adhering to the treatment, resulting in better adherence. The photo survey allows patients to choose from among a group of photos to express which one most nearly matches the level of irritation they experience. The photos vary in severity, but patients are told that all are within the normal range. This survey has the potential to minimize callbacks and unscheduled visits while preventing patients from prematurely discontinuing the treatment.

Subspecialties and Fungal Series

The “Subspecialties in Dermatology” series has continued in Skin & Aging. New articles have continued to highlight subspecialties including cosmetic surgery, dermatopathology, infectious disease, and photodynamic therapy in 2011. Articles on subspecialty clinics in pigmented lesions, ethnic skin, laser surgery, and international dermatology are planned for 2012.

The series on rare fungal infections kicked off with articles on Majocchi’s granuloma, botryomycosis, cryptococcosis, and sporotrichosis in 2011. Several more articles are planned for 2012.
CDR Publications for 2011


**CDR Publications for 2011**


CDR Publications for 2011 (cont.)


**CDR Manuscripts Accepted for 2011**


**CDR Manuscripts Submitted 2011**


6. Gustafson CJ, Davis SA, Feldman SR. Complete treatment approaches to seborrheic dermatitis. Skin & Aging


Abstracts/Posters

Photomedicine Pre-AAD Meeting, New Orleans, LA
- Phototherapy Trends in Dermatology

Annual Meeting of the AAD, New Orleans, LA
- Patterns of Vitamin D Analog Use for Treatment of Psoriasis
- Psychological Effects of Acne in Adolescents.
- The usefulness of adapalene outside of acne vulgaris
- Medication Adherence among Acne Patients: A Review
- Health behavior models: a framework for studying adherence in children with atopic dermatitis
- Physicians’ perception of an eczema action plan for atopic dermatitis
- Quantifying and characterizing adverse events in dermatologic surgery.

World Congress of Dermatology, Seoul, South Korea
- Dermatopathology Primer: A New Guidebook for the Beginner Resident
- Congenital Spiny Keratoderma of the Hands and Feet As a Paraneoplastic Sign
- Changing Age of Acne Vulgaris Visits: Another Sign of Earlier Puberty?
- Screening for hypertension at outpatient dermatology visits: A gap between current recommendations and clinical practice in the United States
- Use of topical antibiotics as prophylaxis in clean dermatologic procedures.

Summer AAD, New York, NY
- Practice trends in the treatment of actinic keratosis in the United States: 0.5% fluorouracil and combination fluorouracil with cryotherapy are underutilized despite evidence of benefit.
- Review: Timing of office visits can be a powerful tool to improve adherence, particularly in the treatment of dermatologic conditions.
- Academic physicians’ attitudes towards implementation of multidisciplinary cosmetic centers and the challenges of subspecialties working together.

European Academy of Dermatology and Venereology, Lisbon, Portugal
- Acitretin for the Treatment of Psoriasis: An Assessment of National Trends

Southeastern Conference for Dermatology, Atlanta, GA
- What Patients Think About Dermatology Resident Physicians: A Quantitative Analysis of Patient Surveys

European Society for Patient Adherence, Compliance, and Persistence (ESPACOMP), Utrecht, Netherlands, November 2011
- Using a Weekly Internet Survey to Improve Adherence in Acne

Orlando Dermatology (ODAC)
- The influence of health insurance on prescribed psoriasis medication

MauiDerm, Maui, HI
- Actinic Keratosis Risk Questionnaire: Developing a self-assessment tool to assess risk of having or developing actinic keratosis
Abstracts/Posters (cont.)

Annual Meeting of the AAD, San Diego, CA  
March 2012
- Investigator blinded study on the potential benefits of daily shaving with an advance shave regimen compared to shaving 2-3 times per week with a standard shave regimen in the management of the symptoms of pseudofolliculitis barbae
- Skin manifestations of outpatient adverse drug events in the United States: a national analysis
- Children’s Eczema Action Plan
- Treatment of Acne with Oral Contraceptive Pills
- Trends in the use of topical over the counter products in the management of dermatologic disease in the United States
- 308-nm Excimer Laser vs. Non-targeted Phototherapy for Localized Psoriasis: A Review
- A review of targeted ultraviolet B phototherapy for psoriasis
- A Review of Protocols for 308 nm Excimer Laser Phototherapy in Psoriasis
- Comparing the lifetime risks of TNF-alpha inhibitor use in patients with severe psoriasis to common benchmarks of risk
- Review of the effect of race/ethnicity on medication adherence
- An Internet-based survey and contest: A novel method for improving acne outcomes
- Interleukin-17, Interleukin-23, and Psoriasis: Current Prospects
- Retinoid plus antimicrobial combination treatments for acne

17th Annual International Society for Pharmacoeconomics and Outcomes Research  
June 2012
- Psychometrics of the Actinic Keratosis Risk Questionnaire: A risk assessment instrument

Summer AAD, Boston, MA (submitted)  
August 2012
- Clinicopathologic presentation of deep mycotic infections
- Psoriasis and Cardiovascular Screening Rates in the United States
- Trends in Demographics and Treatment of Warts
- Treatment of Pre-Adolescent Acne in the United States: An Analysis of Nationally Representative Data
- Medications Used for Acne Vulgaris: Practice Trends and the Use of Topical Combination Products
- Efficacy of Fluocinonide Cream 0.1% in Reducing Itch in Subjects With Atopic Dermatitis
- Effect of Samples on Acne Treatment with Adapalene/Benzoyl Peroxide Gel
- Prevalence of Sleep Disturbances in Psoriasis
- Nurse Education in Patients with Psoriasis Undergoing Treatment with Adalimumab
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Dermatopathology Primer

Dermatopathology Primer has been sent to press! This invaluable resource will be available soon to provide a new approach to dermatopathology for residents. Drawing upon the thousands of unique photos from the Graham Dermatopathology Library, Dermatopathology Primer provides a wealth of information organized in an ideal fashion for the beginner learning dermatopathology.