Gelfand and Abuabara[1] suggest that cyclosporine blood levels could be used to control for the effect of weight loss on cyclosporine levels. One might think this would also control for adherence, but blood levels are notoriously problematic owing to white-coat compliance. Just as patients floss before seeing the dentist, patients take their medications before seeing the dermatologist.[3] Accordingly, noncompliant patients often have therapeutic blood levels because they ingested medication for a few days before being tested, a major limitation for adherence assessments of drugs with short half-lives (approximately 19 hours in the case of cyclosporine).[4] In evidence-based dermatology, patient adherence should be one of the first factors we consider when analyzing outcomes observed in clinical trials or clinical practice.

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Financial Disclosure: None reported.
Funding/Support: The Center for Dermatology Research is supported by an unrestricted educational grant from Galderma Laboratories LP.

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In reply

In a letter regarding our evidence-based medicine commentary[1] about a clinical trial by Gisondi et al,[2] Rajpara and Feldman highlight the issue of poor adherence to treatment. Researchers should consider patient adherence when interpreting trial results in regard to both internal and external validity. In the trial by Gisondi et al, if patients were not adherent to the prescribed intervention, the beneficial effect of the overall approach might have been underestimated. More importantly, adherence is likely to be optimized in the highly artificial setting of a clinical trial, and therefore the efficacy of an intervention as measured by a trial is likely to overestimate the effectiveness of the same intervention in clinical practice, especially if adherence to the regimen is a major issue. Factors that may improve adherence include educational interventions and simplification of treatment regimens.[3-5]

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Financial Disclosure: Dr Gelfand receives grant support or is an investigator for Amgen, Novartis, Abbott, and Pfizer. He is a consultant for Celgene, Amgen, Abbott, and Centocor.

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Teaching Dermatology Using 3-Dimensional Virtual Reality

We read with great interest the article by Garg et al[1] in the February issue of the *Archives*, in which the authors demonstrate that a medical student teaching program using 3-dimensional (3D) silicon prosthetics leads to both initially better diagnostic recognition rates and improved knowledge retention compared with traditional 2-dimensional photographic methods. Improving medical student dermatologic teaching is essential; dermatology is currently underrepresented in most curricula, and this is likely one of the major reasons why primary care physicians have reported poor diagnostic accuracy for common skin diseases.[2] Garg et al[1] describe a useful method of improving medical school education; we would like to suggest another more modern technology that might rival and supplant traditional moulages.

For our undergraduate teaching, we use a method of 3D surface image capture called Passive Stereo Photogrammetry (Dimensional Imaging, Glasgow, Scotland), which allows extremely dense 3D models to be recovered from a stereo pair of standard digital still camera images and is thus nearly as simple as taking an ordinary clinical photograph (**Figure**). Once the 3D image is generated, it can be "zoomed in" and "panned around" by the user to be viewed from different angles on any personal computer, just as in virtual reality computer games. The depth data can also be extracted and used for informatics applications such as improved segmentation and classification.[3,4]

We believe that this approach may hold the same educational benefits as the prosthetics described by Garg et al[1] because our images not only hold the 3D depth data but also allow the students to see the lesion from the mul-

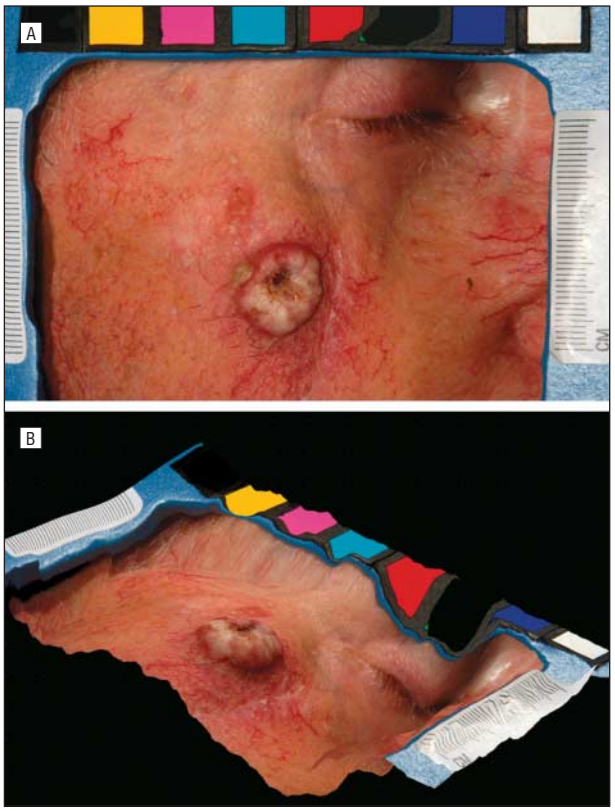

Figure. Two screenshots from the same 3-dimensional (3D) virtual reality computer-generated model of a squamous cell carcinoma of the right cheek. A and B, Note the additional depth perspective and the variability in viewing angles that these models hold over traditional photography. By definition, our 3D models of skin lesions are highly interactive, and so these 2-dimensional images are unable to illustrate the full functionality of the educational software.

tiple angles that would be achieved in a clinical setting. While we acknowledge that our model does not allow palpation, it has the major advantages of saving on the time and costs associated with manufacturing and displaying the prosthetic models, and it crucially has the potential to be Web based to allow widespread access. Currently, we have a library of over 3000 lesions developed as part of a content-based image system to facilitate improvement of clinical skills.[5] Although we have not formally tested this approach, our cohorts of undergraduates that have experienced this tool have preferred it to conventional teaching methods.

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Author Contributions: Drs Rees and Aldridge had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Financial Disclosure: Dr Fisher is a minor stockholder in Dimensional Imaging. Drs Aldridge, Ballerini, Fisher, and Rees have received grant funding from Wellcome Trust, and Drs Fisher and Rees have received funding from the Foundation for Skin Research, Edinburgh.
Funding/Support: This study was supported in part by grant 083928/Z/07/Z from the Wellcome Trust (Drs Aldridge and Ballerini) and by the Foundation for Skin Research (Ms Li).
Role of the Sponsors: The sponsors had no role in the design and conduct of the study; in the collection, analysis, and interpretation of data; or in the preparation, review, or approval of the manuscript.

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In reply

We are pleased that the topic of educational outcomes in dermatology for medical students has generated additional interest. It is becoming increasingly important that medical students acquire functional knowledge and training in the recognition and initial management of important lesions and eruptions. This may be achieved by at least ensuring that medical students across the country graduate with specific and similar competencies in dermatology. In recent years, there has been progress toward identifying and agreeing on relevant content to teach medical students.[1,2] In the context of restricted curricular time, there is also a parallel need to develop effective standardized teaching methods that do not use more time and resources and still improve long-term practical outcomes.

Our application of simulated learning in dermatology represents a novel approach to undergraduate medical education. Virtual simulations are now being used at one-third of all US medical schools.[3] The method is considered by students to be extremely helpful in identifying gaps in knowledge and in integrating clinical knowledge.[4] Through simulation and the use of 3D prosthetics mimicking lesions and eruptions, we demonstrated improved immediate and long-term practical outcomes, in particular lesion recognition performance, among second-year medical students. Patient simulation through moulage is accessible and affordable. Moreover, the method facilitates face-to-face interaction, higher-order thinking, spontaneous teaching and learning, and immediate feedback—all important components of an experiential learning process similar to practical, clinic-based training.

We are captivated by the prospect of applying 3D image capture technology to undergraduate medical education, and we hope that this technology will prove to offer the same long-term educational benefits as prostheses. While it is unlikely that any teaching method would effectively substitute for the clinic training experience, those under development should aim to offer a similar experiential learning, which is more likely to result in long-term retention of knowledge and skill.

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Moist Toilet Paper: Allergy to the Nonhalogenated Derivative Methylisothiazolinone Preservative Alone

We read with great interest the article by Gardner et al[1] in the August issue of the *Archives*. In our opinion, the authors fail to distinguish between 2 different preservatives: the mixture in a 3:1 ratio of methylchloroisothiazolinone/methylisothiazolinone (MCI/MI) and the nonhalogenated derivative MI alone, which is, according to the article, contained in Cottonelle moist toilet paper (Kimberly-Clark Corporation, Neenah, Wisconsin).

In Europe, MCI/MI has been widely used in cosmetics at a maximum concentration of 15 ppm.[2] In both Europe and the United States, MI alone has recently been approved for use in cosmetics at up to 100 ppm, either in leave-on or rinse-off products.[2] As a biocide, it is less effective than MCI/MI, and hence it requires a higher use concentration, which was believed to be safe because MI alone is a much weaker sensitizer than MCI and therefore has been considered a good alternative to the MCI/MI combination.[3]

We recently have observed 7 cases of allergic contact dermatitis (ACD) induced by MI, 6 of which occurred after the use of MI-containing moist toilet paper.[4] As in 3 of the 4 cases reported by Gardner et al,[1] Kimberly-Clark was the manufacturer of the involved product in our cases. Five of the 6 patients were patch tested with MI at 1000 ppm, which resulted in strong positive reactions in all cases. However, results of patch testing with the MCI/MI mixture at 100 ppm were negative in 2 patients, which is probably explained by a too-low MI concentration.

Occupational ACD caused by MI has been previously reported,[5,6] thus demonstrating the potential of this substance to elicit and induce contact allergy. We estimate that the inclusion of MI as a preservative in cosmetics might not represent the solution to the problem of ACD from isothiazolinones. Moreover, considering both our European cases or the American patients described by Gardner et al,[1] we may be witnessing an epidemic of ACD from this "brand new" substance. Furthermore, not only patients who are previously sensitized to the MCI/MI mixture may react to products containing MI alone but also patients who were primarily sensitized to MI may react to products containing the MCI/MI combination chemical. We strongly believe that the use of MI as a preservative in cosmetics, especially in leave-on products and wipes, might thus need to be more thoroughly regulated.

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Financial Disclosure: None reported.

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VIGNETTES

Treatment of Sebaceous Adenoma With Topical Photodynamic Therapy

Report of Cases. *Case 1.* A 47-year-old woman was seen with a 2-year history of a solitary 1.0×0.7-cm yellowish papule on the face (**Figure 1**A). Histopathologic examination revealed irregular sebaceous lobules with peripheral lining of the basaloid cells in the dermis (**Figure 2**A and B). The lesion was treated with photodynamic therapy (PDT). Methyl aminolevulinate (MAL) (Metvix; Galderma, Paris, France) was applied to the lesion and covered with occlusive film. After 3 hours, the