that approximately 20 to 30 NMEs were approved each year from 2000 through 2013. Topical NMEs are developed at a much lower rate (0.9 NMEs per year). These findings are consistent with prior studies5 illustrating the underrepresentation of all drugs developed for primarily dermatological uses.

Dermatological illnesses are not often fatal and may be considered lower priority by policymakers. Priority designations are assigned by the US Food and Drug Administration to new drugs that represent significant improvements over existing options and command more resource investment and regulatory attention. Only 5 total topical applications and 1 topical NME were given the priority review designation compared with 45% of all pharmaceutical and biological NMEs from 2000 through 2009.6 Beyond being considered lower priority, traditional metrics of blood and urine drug levels often do not apply to topical therapies. The lack of accepted surrogate end points may explain why the median approval time for topical medications is comparable with oral and intravenous therapies despite representing a lower systemic risk. Given these regulatory challenges, the low number of active companies with the necessary expertise to develop topical therapeutics likely contributes to the continued high cost and low availability of these drugs.

Prior studies on medical innovation of devices, small molecules, and biotechnology suggest a multifaceted approach to spur future development.7 Strategies most likely to succeed include continued research funding to study diseases that are likely to be responsive to topical therapeutics and increased collaboration between academic and industry professionals. In the short term, adoption of more surrogate end points reduces the regulatory burden and may encourage companies to invest more resources in this underserved area.

Jessica R. Walter, MD
Shuai Xu, MD, MSc

Author Affiliations: Department of Obstetrics and Gynecology, Northwestern University Feinberg School of Medicine, Chicago, Illinois (Walter); Department of Internal Medicine, Presence Saint Joseph Hospital, Chicago, Illinois (Xu); Department of Dermatology, Northwestern University Feinberg School of Medicine, Chicago, Illinois (Xu).

Accepted for Publication: January 28, 2015.

Corresponding Author: Shuai Xu, MD, MSc, Department of Internal Medicine, Presence Saint Joseph Hospital, 2900 N Lake Shore Dr, Chicago, IL 60657 (shuai.xu@presencehealth.org).


Author Contributions: Drs Xu and Walter had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Xu.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Xu.

Administrative, technical, or material support: All authors.

Study supervision: Xu.

Conflict of Interest Disclosures: None reported.


Feasibility and Acceptability of Google Glass for Emergency Department Dermatology Consultations

Emergency department (ED)-based teledermatology has become more common in recent years because patients who present to the ED with skin concerns often require prompt diagnosis and treatment. Skin concerns make up 3.2% of ED visits; most of these patients wait months to see a dermatologist.1 Recent studies have demonstrated the feasibility of using mobile telephones for ED teledermatology.2

Google Glass, a pair of eyeglasses with a computer, camera, and microphone built into the frame, is a wearable form of mobile video communication introduced in 2012.2 Despite significant media attention related to the use of Glass in health care settings, its value for patients and physicians has not been established.4 This study aimed to assess the feasibility and acceptability of Glass as a communication tool for ED dermatology consultations.

Methods | This was a prospective cohort study of patients who presented to our urban academic ED with a chief concern of rash from March 1, 2014, through July 4, 2014. Patients were eligible for participation if they were aged between 18 and 89 years, spoke English, were able to provide consent, and presented with a dermatosis that required a dermatology consultation. The protocol was approved by Lifespan–Rhode Island Hospital Institutional Review Board.

Study investigators obtained written informed consent. Participants had an initial standard dermatology consultation (a telephone call and, when necessary, a static photograph of the rash) with the dermatology consultation resident. Patients were then evaluated by a separate teledermatologist (the dermatology chief resident) through a real-time video link using Glass and running a third-party, Health Insurance Portability and Accountability Act–compliant video platform (Pristine IO; Pristine). The video link was sent to the teledermatologist through a Google Nexus 7 tablet (Google). After completing the 2 consultations, patients completed a brief survey on attitudes and beliefs regarding this teledermatology experience.

Results | A total of 348 patients presented to the ED with a chief concern of rash during the study; 41 patients required a dermatology consultation (Figure). Thirty-nine patients were eligible for the study and 31 patients consented. Most participants (18 of 31 [58%]) had never seen a dermatologist. Most participants (28 of 31 [90.3%]) did not have a dermatologist with whom they could follow up.

Feasibility and Acceptability of Google Glass for Emergency Department Dermatology Consultations

Emergency department (ED)-based teledermatology has become more common in recent years because patients who present to the ED with skin concerns often require prompt diagnosis and treatment. Skin concerns make up 3.2% of ED visits; most of these patients wait months to see a dermatologist.1 Recent studies have demonstrated the feasibility of using mobile telephones for ED teledermatology.2

Google Glass, a pair of eyeglasses with a computer, camera, and microphone built into the frame, is a wearable form of mobile video communication introduced in 2012.2 Despite significant media attention related to the use of Glass in health care settings, its value for patients and physicians has not been established.4 This study aimed to assess the feasibility and acceptability of Glass as a communication tool for ED dermatology consultations.

Methods | This was a prospective cohort study of patients who presented to our urban academic ED with a chief concern of rash from March 1, 2014, through July 4, 2014. Patients were eligible for participation if they were aged between 18 and 89 years, spoke English, were able to provide consent, and presented with a dermatosis that required a dermatology consultation. The protocol was approved by Lifespan–Rhode Island Hospital Institutional Review Board.

Study investigators obtained written informed consent. Participants had an initial standard dermatology consultation (a telephone call and, when necessary, a static photograph of the rash) with the dermatology consultation resident. Patients were then evaluated by a separate teledermatologist (the dermatology chief resident) through a real-time video link using Glass and running a third-party, Health Insurance Portability and Accountability Act–compliant video platform (Pristine IO; Pristine). The video link was sent to the teledermatologist through a Google Nexus 7 tablet (Google). After completing the 2 consultations, patients completed a brief survey on attitudes and beliefs regarding this teledermatology experience.

Results | A total of 348 patients presented to the ED with a chief concern of rash during the study; 41 patients required a dermatology consultation (Figure). Thirty-nine patients were eligible for the study and 31 patients consented. Most participants (18 of 31 [58%]) had never seen a dermatologist. Most participants (28 of 31 [90.3%]) did not have a dermatologist with whom they could follow up.

Feasibility and Acceptability of Google Glass for Emergency Department Dermatology Consultations

Emergency department (ED)-based teledermatology has become more common in recent years because patients who present to the ED with skin concerns often require prompt diagnosis and treatment. Skin concerns make up 3.2% of ED visits; most of these patients wait months to see a dermatologist.1 Recent studies have demonstrated the feasibility of using mobile telephones for ED teledermatology.2

Google Glass, a pair of eyeglasses with a computer, camera, and microphone built into the frame, is a wearable form of mobile video communication introduced in 2012.2 Despite significant media attention related to the use of Glass in health care settings, its value for patients and physicians has not been established.4 This study aimed to assess the feasibility and acceptability of Glass as a communication tool for ED dermatology consultations.

Methods | This was a prospective cohort study of patients who presented to our urban academic ED with a chief concern of rash from March 1, 2014, through July 4, 2014. Patients were eligible for participation if they were aged between 18 and 89 years, spoke English, were able to provide consent, and presented with a dermatosis that required a dermatology consultation. The protocol was approved by Lifespan–Rhode Island Hospital Institutional Review Board.

Study investigators obtained written informed consent. Participants had an initial standard dermatology consultation (a telephone call and, when necessary, a static photograph of the rash) with the dermatology consultation resident. Patients were then evaluated by a separate teledermatologist (the dermatology chief resident) through a real-time video link using Glass and running a third-party, Health Insurance Portability and Accountability Act–compliant video platform (Pristine IO; Pristine). The video link was sent to the teledermatologist through a Google Nexus 7 tablet (Google). After completing the 2 consultations, patients completed a brief survey on attitudes and beliefs regarding this teledermatology experience.

Results | A total of 348 patients presented to the ED with a chief concern of rash during the study; 41 patients required a dermatology consultation (Figure). Thirty-nine patients were eligible for the study and 31 patients consented. Most participants (18 of 31 [58%]) had never seen a dermatologist. Most participants (28 of 31 [90.3%]) did not have a dermatologist with whom they could follow up.
Thirty-one of 34 (91%) attempted connections were completed and considered successful. All participants (n = 31) who completed a Glass teleconsultation also completed the survey (Table).

Discussion | This study demonstrates that Glass is a feasible and acceptable platform for real-time ED teledermatology. Participants overwhelmingly believed that their privacy was protected while using the modified Health Insurance Portability and Accountability Act–compliant version of Glass. While patients prefer face-to-face visits, when a dermatologist is not immediately available for an in-person evaluation—as is typical in the ED setting—participants preferred the Glass video consultation to the standard telephone consultation.5

Because of the interactive nature of Glass, the teledermatologist was able to appreciate both the gestalt of nonspecific skin eruptions and specific dermatoses. The teledermatologist could also expand the medical history and physical examination by directing the ED physician to ask specific questions or examine additional locations.

This study has several limitations. First, as a single-center study, feasibility results may not be generalizable to other institutions, especially given significant variability among hospital information technology infrastructures. Second, this study did not address the accuracy of diagnosis using Glass. Third, this study did not address the effect of the device on revenues, costs, or workflow. Future studies should examine the diagnostic accuracy, costs, and workflow implications and physician satisfaction related to using wearables such as Glass for ED dermatology consultations.

Peter R. Chai, MD, MMS
Roger Y. Wu, MD, MBA
Megan L. Ranney, MD, MPH
Jayne Bird, MD
Sandy Chai, MD
Brian Zink, MD
Paul S. Porter, MD, MBA

Author Affiliations: Division of Medical Toxicology, Department of Emergency Medicine, University of Massachusetts School of Medicine, Worcester (P. R. Chai); Department of Emergency Medicine, The Warren Alpert Medical School of Brown University, Rhode Island Hospital, Providence (Wu, Ranney, Zink, Porter); Department of Dermatology, The Warren Alpert Medical School of Brown University, Rhode Island Hospital, Providence (Bird, S. Chai).

Accepted for Publication: January 28, 2015.

Corresponding Author: Paul S. Porter, MD, MBA, 55 Claverick St, Providence, RI 02903 (pporter@lifespan.org).

Published Online: April 15, 2015. doi: 10.1001/jamadermatol.2015.0248.

Author Contributions: Drs P. R. Chai and Wu had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Drs P. R. Chai and Wu share first authorship. Study concept and design: P. R. Chai, Wu, Ranney, Zink, Porter. Acquisition, analysis, or interpretation of data: P. R. Chai, Wu, Ranney, Bird, S. Chai, Porter. Drafting of the manuscript: P. R. Chai, Wu, Ranney, Zink, Porter. Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Wu, Ranney, Porter. Obtained funding: Porter. Administrative, technical, or material support: P. R. Chai, Ranney, S. Chai, Porter. Study supervision: P. R. Chai, Zink, Porter.

Funding/Support: This study was supported by the University Emergency Medicine Foundation for the purchase and use of Google Glass.

Role of the Funder/Sponsor: The University Emergency Medicine Foundation had a role in the design and conduct of the study, but not in the collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Contributions: Derek Merck, PhD, The Warren Alpert Medical School of Brown University and School of Engineering, Brown University, provided information technology, network, and cybersecurity advice, implementation assistance, and technical support; Ignacio Santana, M52, The Warren Alpert Medical School of Brown University, provided assistance with patient recruitment, data collection, and Glass technical support; and John Kawakoa, MD, The Warren Alpert Medical School of Brown University, Rhode Island Hospital, contributed medical and research advice along with allocation of resident priority. None were financially compensated.

Correction: This article was corrected on June 9, 2015, to fix the Figure.

OBSERVATION

Prurigo Pigmentosa After Bariatric Surgery

Prurigo pigmentosa (PP) is a rare idiopathic inflammatory dermatosis that typically presents as pruritic erythematous papulovesicles in a reticular pattern predominantly on the trunk of young women.1-3 The lesions then resolve with residual hyperpigmentation. The pathogenesis of PP is not completely clear. However, it has mainly been associated with ketotic states such as those seen in dieting, fasting, diabetes mellitus, and soft-drink ketosis.1-3 Herein we report the first case to our knowledge of PP occurring after bariatric surgery, which provides further evidence of a possible role of ketosis in PP pathogenesis.

Report of a Case | A woman in her 40s presented with a 1-week history of an itchy skin eruption on her trunk. The patient reported having had bariatric surgery (laparoscopic sleeve gastrectomy) 1 week earlier, with significant decrease in food intake since the day of surgery. The patient was otherwise healthy. Skin examination revealed erythematous papulovesicles and hyperpigmented macules (Figure 1) arranged in a reticular pattern and symmetrically distributed on the chest and back. Punch biopsy specimens obtained from a representative lesion on the chest revealed focal parakeratosis, mild epidermal hyperplasia, mild focal spongiosis, and a mild to moderately dense superficial and mid-dermal perivascular and interstitial focally band-like lymphocyte neutrophilic infiltrate with scattered eosinophils (Figure 2). Taken together, the clinical and histopathologic features were consistent with PP diagnosis.

Laboratory studies including complete blood cell count, liver function tests, comprehensive metabolic panel, and autoimmune evaluation showed no abnormalities. Direct immunofluorescence testing was not performed because autoimmune bullous disease was not considered. Patch testing was not performed for logistical reasons. The patient improved significantly after beginning treatment with doxycycline (100 mg, twice daily) and after resuming a balanced diet after surgery. The eruption had not recurred at last follow-up 6 months following surgery.

Discussion | Since its first description by Nagashima et al in 1971,1 more than 300 PP cases have been reported.2-6 Though largely