the particular clinical presentation of lichenoid drug eruption, the differential diagnosis may also include a number of other conditions such as lichen sclerosus, psoriasis, discoid lupus, graft-vs-host disease, and secondary syphilis.

The intention of our article was to provide a clear and concise introduction to lichenoid drug eruption, rather than dwell on the subtleties of the differential diagnosis. We agree that in cases in which the clinical diagnosis "was so clinically clear that no other diagnosis was considered," there is little point in subjecting a patient to a skin biopsy. We would go 1 step further to recommend that a biopsy not be performed unless the results could alter clinical management. However, when considering inflammatory dermatoses (including lichenoid drug eruption) with overlapping clinical patterns and divergent treatment approaches, the skin biopsy is of tremendous importance in reaching an accurate diagnosis, especially when performed by a dermatologist.[3,4]

With respect to our patient, we would have recommended discontinuation of lisinopril with every differential diagnosis. However, our definitive diagnosis allowed us to (1) more accurately counsel the patient regarding the expected time course and resolution of her eruption, (2) advise her of potential associated symptoms, (3) recommend alternative antihypertensives that are not likely to induce her particular eruption, and (4) have a treatment plan in place in the event that her eruption failed to resolve or worsened. In general, a biopsy early in the clinical course of an eruption—and prior to any physician- or patient-initiated treatment—provides the most definitive, accurate, and cost-effective result.

Finally, although our patient's history was relatively straightforward and lent itself well to the teaching purposes of the article, most cases are not so clear-cut. Lichenoid drug eruptions have an extremely variable latency period (from weeks to years) and can be induced by numerous medications. It is frequently much more difficult to determine whether the eruption is drug-induced than it was in this case. In addition, the discontinuation of a potential culprit medication may have much more serious implications for the patient. As discussed in the article, histological features are often helpful in differentiating idiopathic lichen planus from lichenoid drug eruption.

Jeffrey B. Shackelton, MD
Joseph C. English III, MD

Author Affiliations: Department of Dermatology, University of Pittsburgh, Pittsburgh, Pennsylvania (englishjc@upmc.edu).
Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

1. Vedove CD, Del Giglio M, Schena D, Girolomoni G. Drug-induced lupus erythematosus. *Arch Dermatol Res*. 2009;301(1):99-105.
2. Magro CM, Crowson AN, Schapiro BL. The interstitial granulomatous drug reaction: a distinctive clinical and pathological entity. *J Cutan Pathol*. 1998;25(2):72-78.
3. Rajaratnam R, Smith AG, Biswas A, Stephens M. The value of skin biopsy in inflammatory dermatoses. *Am J Dermatopathol*. 2009;31(4):350-353.
4. Sellheyer K, Bergfeld WF. A retrospective biopsy study of the clinical diagnostic accuracy of common skin diseases by different specialties compared with dermatology. *J Am Acad Dermatol*. 2005;52(5):823-830.

RESEARCH LETTER

National Trends in Ambulance Use by Patients With Stroke, 1997-2008

To the Editor: Thrombolytic therapy improves outcomes after ischemic stroke, but most patients are ineligible because they do not present in time.[1] This has prompted efforts to educate people to call 911 for signs of stroke because ambulance transportation results in faster arrival at the emergency department (ED).[2] Regional studies have suggested suboptimal ambulance use among patients with stroke,[3] but none has examined a nationally representative population or temporal trends since the approval of thrombolysis.

Methods. We analyzed data collected by the National Hospital Ambulatory Medical Care Survey (NHAMCS) between 1997 and 2008.[4] A nationally representative random sample of 340 to 408 EDs was surveyed annually, reflecting a participation rate of 87% to 98% and constituting approximately 10% of US EDs. Staff used structured forms to collect data about a systematic random sample of patients over a random 4-week period. Analysis of this publicly available deidentified data set was exempt from evaluation by our institutional review boards.

We included patients with a primary diagnosis of ischemic stroke, defined by *International Classification of Diseases, Ninth Revision* codes that have been validated for identifying patients with acute stroke and used in other studies.[5] Additionally, we included patients with subarachnoid hemorrhage, intracerebral hemorrhage, and transient ischemic attack because these can present similarly to ischemic stroke. Our outcome was arrival at the ED via ambulance. We used survey visit weights provided by the NHAMCS to estimate the national proportion of patients diagnosed with stroke in the ED each year who arrived by ambulance. We examined trends within subgroups defined by characteristics associated with ambulance use: age, sex, race, payment source, geographic region, and stroke subtype.[6] We performed sensitivity analyses limited to ischemic stroke and excluding patients not admitted to the hospital or with additional ED diagnoses besides stroke.

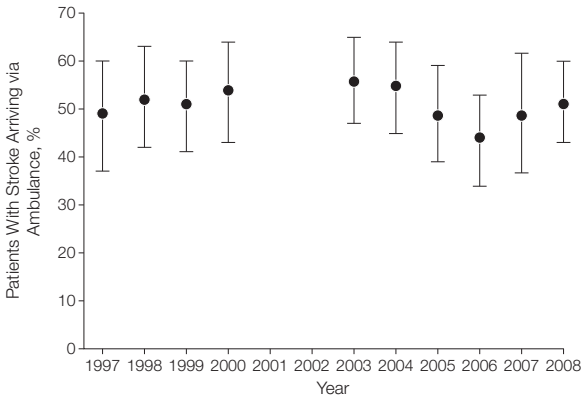
A survey-weighted χ^2 test for trend was used to examine the statistical significance of changes in ambulance use over time. We used multiple logistic regression to analyze yearly trends in ambulance use for stroke while controlling for covariates. The threshold of statistical significance was a 2-sided α level of .05. Statistical analysis was performed with Stata SE version 11 (StataCorp).

Results. Overall, 19% (95% CI, 18%-19%) of adults nationwide presented to the ED via ambulance, with no significant change between 1997 and 2008 ($P = .18$). Based on 1605 cases, 51% (95% CI, 48%-54%) of patients with stroke arrived at the ED via ambulance. This proportion did not change significantly between 1997 and 2008 (49% vs 51%, $P = .92$; FIGURE). This was true in all subgroups, with the

exception of downward trends among young patients and patients with a payment source other than private insurance, Medicare, or Medicaid (TABLE). Multiple logistic regression confirmed that overall rates of ambulance use did not change over time (odds ratio [OR] per year, 0.99; 95% CI, 0.96-1.03). Results were similar in analyses limited to patients with ischemic stroke (OR per year, 0.99; 95% CI, 0.95-1.04), without any secondary ED diagnoses (OR per year, 0.98; 95% CI, 0.93-1.04), or admitted to the hospital (OR per year, 1.00; 95% CI, 0.96-1.05).

Comment. Using data from a nationally representative sample of ED visits, we found that the proportion of patients with stroke who present via ambulance has not significantly changed over the past decade. Our analysis lacked power to detect temporal changes in subgroups. We could not determine what proportion of stroke diagnoses represented miscoding or mimics of stroke; however, our results were robust across sensitivity analyses addressing possible misclassification of cases.

Figure. Proportion of Patients With Stroke Presenting to the Emergency Department via Ambulance From 1997 Through 2008



Data represent national estimates. Error bars indicate 95% confidence intervals. The annual number of sampled cases ranged from 130 to 185. Data regarding patients' modes of arrival were not available for 2001 and 2002.

Table. National Trends in Ambulance Use by Patients With Stroke From 1997 Through 2008[a]

	Unweighted No. of Patients Arriving by Ambulance From 1997-2008	Patients Arriving by Ambulance Nationwide, % (95% CI)			
		1997-2000	2003-2005	2006-2008	*P* Value[b]
Stroke	769	51 (46-57)	53 (47-59)	48 (42-54)	.92
Age, y					
18-44	42	53 (29-77)	44 (25-63)	33 (18-49)	.04
45-64	166	42 (29-55)	46 (35-56)	38 (28-48)	.39
≥65	561	54 (47-60)	57 (51-64)	55 (48-62)	.16
Sex					
Female	453	54 (47-61)	55 (49-62)	46 (38-54)	.30
Male	316	47 (39-55)	50 (41-59)	52 (42-61)	.83
Race[c]					
White, non-Hispanic	590	53 (47-59)	52 (45-58)	50 (43-56)	.78
Black, non-Hispanic	115	48 (35-62)	68 (57-79)	49 (35-64)	.19
Hispanic	37	35 (13-58)	47 (23-71)	34 (13-55)	.29
Other[d]	27	37 (0-74)	30 (7-54)	47 (25-69)	.23
Payment source					
Private insurance	147	37 (27-46)	41 (29-53)	38 (27-50)	.88
Medicare	470	56 (49-63)	54 (47-62)	57 (50-64)	.62
Medicaid	73	61 (38-85)	68 (50-86)	50 (36-65)	.43
Other	79	59 (45-73)	59 (45-73)	22 (6-37)	.01
Hospital region					
Northeast	205	59 (48-70)	70 (61-80)	54 (43-65)	.06
Midwest	167	53 (40-66)	43 (30-56)	53 (40-66)	.11
South	254	48 (40-57)	52 (44-60)	47 (38-57)	.82
West	143	49 (39-60)	44 (29-58)	41 (28-54)	.26
Stroke subtype[e]					
Ischemic	455	56 (49-64)	58 (50-66)	53 (46-60)	.28
Transient ischemic attack	233	37 (29-45)	43 (35-52)	43 (34-52)	.63
Intracerebral hemorrhage	57	83 (62-100)	66 (42-90)	45 (15-74)	.08
Subarachnoid hemorrhage	24	77 (53-100)	83 (66-100)	38 (5-70)	.24
Diagnostic category					
Isolated stroke diagnosis[f]	393	50 (43-58)	49 (40-57)	44 (36-52)	.56
Admitted to hospital	586	55 (47-62)	60 (53-67)	53 (47-60)	.39

[a] Data regarding patients' modes of arrival were not available for 2001 and 2002. All analyses were performed using individual years but are presented here as discrete periods for simplicity.
[b] χ^2 Test for trend across individual years from 1997 through 2008.
[c] Classified by emergency department staff using definitions from the US Census Bureau.
[d] Defined as Asian, Native Hawaiian/other Pacific Islander, American Indian/Alaska Native, or more than 1 race.
[e] Defined by *International Classification of Diseases, Ninth Revision* codes; acute ischemic stroke: 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.01, 434.11, 434.91, and 436; transient ischemic attack: 435; intracerebral hemorrhage: 431; and subarachnoid hemorrhage: 430.
[f] Defined as a primary emergency department diagnosis of stroke without any accompanying secondary diagnoses. This sensitivity analysis was performed to address possible miscoding of chronic cerebrovascular disease as acute stroke.

Several factors may explain static ambulance use since the approval of time-sensitive therapy for ischemic stroke. Educational efforts may not be adequately addressing poor public knowledge about stroke, additional behavioral barriers may remain among those with adequate knowledge, or the response of health care providers to patients with stroke symptoms may be imperfect.[3] Our findings suggest that national efforts to address barriers to ambulance use among patients with stroke need to be intensified or adjusted.

Hooman Kamel, MD
Babak B. Navi, MD
Jahan Fahimi, MD, MPH

Author Affiliations: Department of Neurology and Neuroscience, Weill Cornell Medical College, New York (Drs Kamel and Navi) (hok9010@med.cornell.edu); and Department of Emergency Medicine, University of California, San Francisco (Dr Fahimi).

Author Contributions: Drs Kamel and Fahimi 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.
Study concept and design: Kamel, Navi, Fahimi.
Acquisition of data: Fahimi.
Analysis and interpretation of data: Kamel, Fahimi.
Drafting of the manuscript: Kamel.
Critical revision of the manuscript for important intellectual content: Navi, Fahimi.
Statistical analysis: Kamel, Fahimi.
Administrative, technical or material support: Kamel, Navi.
Study supervision: Navi.
Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

1. Deng YZ, Reeves MJ, Jacobs BS, et al; Paul Coverdell National Acute Stroke Registry Michigan Prototype Investigators. IV tissue plasminogen activator use in acute stroke: experience from a statewide registry. *Neurology*. 2006;66(3):306-312.
2. Lacy CR, Suh DC, Bueno M, Kostis JB. Delay in presentation and evaluation for acute stroke: Stroke Time Registry for Outcomes Knowledge and Epidemiology (S.T.R.O.K.E.). *Stroke*. 2001;32(1):63-69.
3. Wojner-Alexandrov AW, Alexandrov AV, Rodriguez D, Persse D, Grotta JC. Houston paramedic and emergency stroke treatment and outcomes study (HoPSTO). *Stroke*. 2005;36(7):1512-1518.
4. Centers for Disease Control and Prevention. About the National Ambulatory Medical Care Survey. http://www.cdc.gov/nchs/ahcd/about_ahcd.htm. Accessed January 16, 2012.
5. Ovbiagele B. Nationwide trends in in-hospital mortality among patients with stroke. *Stroke*. 2010;41(8):1748-1754.
6. Concannon TW, Griffith JL, Kent DM, et al. Elapsed time in emergency medical services for patients with cardiac complaints: are some patients at greater risk for delay? *Circ Cardiovasc Qual Outcomes*. 2009;2(1):9-15.

CORRECTIONS

Percentage Error: In the Original Contribution entitled "Effect of Dietary Protein Content on Weight Gain, Energy Expenditure, and Body Composition During Overeating: A Randomized Controlled Trial" published in the January 4, 2012, issue of *JAMA* (2012;307[1]:47-55), a percentage was reported in error. In the Methods section, under the heading "Protocol," the last sentence should have read "After the final day of overfeeding, participants remained in the unit for 1 day during which their diets were returned to baseline energy levels and diet compositions (15% from protein, 25% from fat, and 60% from carbohydrates)." This article was corrected online.

Word Error and Incorrect/Omitted References. In the Editorial titled "Inadequacy of BMI as an Indicator for Bariatric Surgery" published in the January 4, 2012, issue of *JAMA* (2012;307[1]:88-89), the word "truncal" should have been "peripheral" in the second and final paragraphs. In addition, 3 references were inadvertently omitted. These citations have been added and the references renumbered in the online version.