Practical Barriers to Timely Primary Care Access

Impact on Adult Use of Emergency Department Services

George Rust, MD, MPH; Jiali Ye, PhD; Peter Baltrus, PhD; Elvan Daniels, MD; Bamidele Adesunloye, MD; George Edward Fryer, PhD

Background: Most Americans report having a usual source of medical care, but many also report significant barriers to timely access to such care. This can lead patients to use the emergency department (ED) as a ready alternative to their usual source of medical care, even when such care could be provided more cost-effectively in a primary care setting. The purpose of this study was to examine the relationship between ED visits and perceived barriers to receiving timely primary care.

Methods: Among 30,677 adults 18 years or older participating in the adult sample section of the National Health Interview Survey, 23,413 who reported having a usual source of medical care other than the ED and answered the questions related to barriers were included in our analyses. Associations between perceived timely access barriers and reported use of ED in the previous 12 months were examined using logistic regression to control for covariates that also affect ED use.

Results: For those reporting no access barriers, 1 in 5 adult Americans in the noninstitutionalized civilian population visited an ED at least once during the preceding year. For those reporting 1 or more barriers, the proportion having an ED visit was 1 in 3. Four of the 5 following timely access barriers was independently associated with ED use, even after adjusting for other socioeconomic and health-related factors: (1) “couldn’t get through on phone” (OR [odds ratio], 1.27; 95% confidence interval [CI], 1.02-1.59); (2) “couldn’t get appointment soon enough” (OR, 1.45; 95% CI, 1.21-1.75); (3) “waiting too long in doctor’s office” (OR, 1.20; 95% CI, 1.02-1.41); (4) “not open when you could go” (OR, 1.24; 95% CI, 0.99-1.55); and (5) “no transportation” (OR, 1.88; 95% CI, 1.50-2.35).

Conclusions: The benefits of having a usual source of medical care are diminished by barriers that limit effective and timely access to such care. Interventions to improve effective access to medical care such as open access scheduling might have benefits not only for individual patients and practices but also for health policy related to cost-effective health care delivery systems and our need to relieve overcrowded conditions at EDs.

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Emergency Department (ED) crowding is a significant problem in the United States. The number of ED visits rose from 89.8 million in 1992 to 115.3 million in 2005, with over 85% of ED visits occurring in nonrural, metropolitan area EDs. A national survey in 2002 showed that 62% of all surveyed hospitals reported operating at or beyond their designed capacity. Nearly one-third of all hospitals experienced periods of “ED diversion,” that is, times when their EDs could not accept all or specific types of patients by ambulance, especially in urban areas. Data from the National Hospital Ambulatory Medical Care Survey projected that over half a million ambulances were diverted to alternate facilities during 2003, representing approximately 1 ambulance diverted every minute of every day.
also as an essential strategy for improving chronic disease care and outcomes. Simply being able to name a usual source of medical care is not the same as having effective and timely access to that same source of care.

Some small or local studies have suggested that barriers to timely access of primary care might lead patients to seek care in the ED as an accessible alternative. In a study that focused on Medicaid patients, Lowe et al found that modifiable access characteristics of primary care practices (such as longer evening hours and a lower ratio of the number of active patients per clinician-hour of practice time) were indeed associated with less ED use. Sarver et al attempted to evaluate this issue in 2002 using national data from the 1996 cohort of the Medical Expenditure Panel Survey (MEPS) and found that these barriers were associated with ED visits for nonurgent conditions, but the associations were not significant in multivariate analysis.

The 2005 National Health Interview Survey (NHIS) offers recent data with a substantially larger sample size than MEPS from a nationally representative sample of the US population. Therefore, we undertook this study to examine the links between ED visits and perceived barriers to receiving timely primary care.

### METHODS

**STUDY DESIGN AND SAMPLE**

We analyzed data from the 2005 NHIS, a continuing probability survey of American households that is representative of the US civilian noninstitutionalized population. The NHIS data are collected through a complex sample design involving stratification, clustering, and multistage sampling with a nonzero probability of selection for each person. Final sampling weights allow estimates from the NHIS to be generalized to the adult civilian population of the United States.

In this study we included only persons who reported having a non-ED usual source of medical care for illness events. Participants who identified a physician’s office or clinic or health center as “a usual place to go when sick” were included as having a usual medical care source, while patients who identified the ED or who did not identify any usual source were excluded from our analysis. Of the entire survey sample, 80.0% of the adults identified a physician’s office, clinic, or other usual source of medical care at least for episodes of illness. Only 0.9% identified the ED as their usual source of care, and 19.1% reported “other” or none as their usual place of care; these were excluded from our analyses.

A total of 30,677 adults aged 18 to 84 years participated in the 2005 NHIS adult sample. From these, the study population was reduced to 23,413 participants because some did not report a source for primary care (n=6,135) or because data were missing on barriers to timely medical care or covariates (n=1,129).

### MEASURES

The 2005 NHIS adult sample survey contained 5 specific questions focused on barriers to timely access to the respondent’s usual source of medical care: (1) “couldn’t get through on phone”; (2) “couldn’t get appointment soon enough”; (3) “waiting too long in doctor’s office”; (4) “not open when you could go”; and (5) “no transportation.” (A detailed list of questions in the adult sample section of the 2005 NHIS is available at ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS2005/English/QADULT.pdf.) These measures were consistent with the measures of access barriers used in previous studies. Emergency department use was defined as having 1 or more hospital ED visit in the previous 12 months. Participants were classified as nonusers (no visit) and ED users (1 or more visits).

Confounding variables included sex, age, race/ethnicity, education, insurance, household income, and reported health status. We used 3 age groups: 18 to 44 years, 45 to 64 years, and 65 years or older. Educational attainment was determined by asking participants to indicate the highest level of school completed, and the responses were grouped into less than high school, high school graduate, and higher than high school. Family income for the previous year was dichotomized at the level of $20,000 or more vs less than $20,000. Participants were considered insured if they reported private insurance or public insurance; others were coded as having no insurance. Health status was based on self-reported health condition (good-excellent or fair-poor).

### STATISTICAL ANALYSIS

Because the nonresponse rate was high for total family income, we reran analyses including respondents with missing income data and found no effect on the results of this study. Bivariate analyses were conducted to compare the sample’s sociodemographic characteristics, health status, and reported barriers to timely medical care. Multivariate logistic regression analyses were also conducted to assess the independent association of barriers to timely medical care with the likelihood of ED use. Data analyses and statistical tests were conducted using SPSS statistical software, version 15.0 (SPSS Inc, Chicago, Illinois). The SPSS complex analysis module was used to adjust for the complex survey design and population sampling weights. All P values are 2-tailed, and values less than .05 were considered significant.

### RESULTS

Among all adults aged 18 to 84 years, about 1 in 5 adult Americans (20.1%, or approximately 42.5 million persons) in the noninstitutionalized civilian population visited an ED at least once during the preceding year. Among those who claimed to have a non-ED usual source of medical care, 20.8% (approximately 34.2 million persons) made at least 1 ED visit during the past year. An estimated 16.6 million adults (10.1%) with a usual medical care source reported 1 or more barriers to timely care. Table 1 summarizes the estimated population who reported each of the barriers to timely care.

<table>
<thead>
<tr>
<th>Barriers to Timely Medical Care</th>
<th>Population, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Couldn’t get through on phone”</td>
<td>3,852,278 (2.3)</td>
</tr>
<tr>
<td>“ Couldn’t get appointment soon enough”</td>
<td>6,133,915 (5.2)</td>
</tr>
<tr>
<td>“Waiting too long in doctor’s office”</td>
<td>7,654,744 (4.7)</td>
</tr>
<tr>
<td>“Not open when you could go”</td>
<td>5,003,637 (3.0)</td>
</tr>
<tr>
<td>“No transportation”</td>
<td>2,418,986 (1.5)</td>
</tr>
</tbody>
</table>

*From The 2005 National Health Interview Survey (NHIS)*.
Table 2 compares ED visitors and non-ED visitors by demographic strata and barriers to medical care. Data from bivariate analyses listed in Table 2 demonstrate substantial differences in ED use according to demographic and socioeconomic characteristics of the sample. Women were somewhat more likely to be ED users than men (22.7% vs 19.9%) (P < .001), and older adults were more likely than middle-aged adults to make at least 1 ED visit (24.7% vs 19.0%) (P < .001). As self-identified in the survey, black or African American adults were somewhat more likely than white adults (26.9% vs 20.7%) (P < .001) and Hispanic adults (26.9% vs 22.4%, P < .001) to have visited the ED in the past year.

Both household income and education level were related to ED visits. People with low household incomes were more likely to report an ED visit than people with higher incomes (30.3% vs 19.1%) (P < .001). People with less than a high school degree were more likely (29.2%) than people with high school degree (21.8%) or postsecondary education (19.3%) to be an ED user (P < .001 for both comparisons). Health status had a larger impact on ED use, with people in poorer health being more than twice as likely as those in better health to be an ED user (40.4% vs 18.5%) (P < .001).

Those who reported at least 1 barrier to timely primary care were more likely to be an ED user than those who did not report such barriers (33.3% vs 20.2%) (P < .001). The bivariate analysis performed on specific barriers and ED use revealed that each of the 5 barriers was associated with a higher likelihood of ED visits (Table 3 and Figure). In a full multivariate model controlling for sociodemographic and health status variables, the odds ratios (ORs) of ED use were significantly different between people with and without barriers to getting timely medical care. All barriers except “not open when you could go” (OR, 1.24; 95% confidence interval).

Table 2. Emergency Department (ED) Use Among Population With Usual Source of Medical Care by Characteristics and Barriers to Care

<table>
<thead>
<tr>
<th>Characteristic or Care Barrier</th>
<th>Weighted Population, No. (%)</th>
<th>Non-ED Users</th>
<th>ED Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>All adults</td>
<td>130 128 265 (79.2)</td>
<td>34 168 828 (20.8)</td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-44</td>
<td>60 093 298 (78.6)</td>
<td>16 387 342 (22.4)</td>
<td></td>
</tr>
<tr>
<td>45-64</td>
<td>47 936 459 (81.8)</td>
<td>10 693 184 (18.2)</td>
<td></td>
</tr>
<tr>
<td>≥65</td>
<td>22 098 508 (75.7)</td>
<td>7 088 302 (24.3)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>59 839 502 (80.9)</td>
<td>14 113 572 (19.1)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70 288 763 (77.8)</td>
<td>20 055 256 (22.2)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>98 010 102 (80.0)</td>
<td>11 624 121 (20.0)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>12 560 178 (73.7)</td>
<td>2 182 933 (26.3)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>12 880 773 (78.4)</td>
<td>1 392 545 (21.6)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic other</td>
<td>6 677 212 (80.8)</td>
<td>1 589 552 (19.2)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;High school</td>
<td>19 404 623 (72.0)</td>
<td>7 558 335 (28.0)</td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td>34 381 684 (78.8)</td>
<td>9 273 595 (21.2)</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>76 341 958 (81.5)</td>
<td>17 336 898 (18.5)</td>
<td></td>
</tr>
<tr>
<td>Household income, $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 000</td>
<td>18 373 771 (69.6)</td>
<td>8 017 427 (30.4)</td>
<td></td>
</tr>
<tr>
<td>≥20 000</td>
<td>111 754 494 (81.0)</td>
<td>26 151 401 (19.0)</td>
<td></td>
</tr>
<tr>
<td>Insurance status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With insurance</td>
<td>119 647 940 (79.4)</td>
<td>31 117 892 (20.6)</td>
<td></td>
</tr>
<tr>
<td>No insurance</td>
<td>10 480 325 (77.5)</td>
<td>3 050 936 (22.5)</td>
<td></td>
</tr>
<tr>
<td>Health status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good-excellent</td>
<td>117 597 335 (82.1)</td>
<td>25 669 216 (17.9)</td>
<td></td>
</tr>
<tr>
<td>Fair-poor</td>
<td>12 530 930 (59.6)</td>
<td>8 499 612 (40.4)</td>
<td></td>
</tr>
<tr>
<td>Having at least 1 barrier to getting timely medical care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 296 488 (68.0)</td>
<td>5 326 671 (32.0)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>118 831 777 (80.5)</td>
<td>28 842 157 (19.5)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Subjects Visiting the Emergency Department (ED) vs Barriers to Getting Timely Medical Care Among Persons Reporting Usual Source of Primary Medical Care

<table>
<thead>
<tr>
<th>Barriers to Timely Medical Care</th>
<th>Non-ED Users, No.</th>
<th>ED Users, No.</th>
<th>Reported ED Use in the Past Year, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Couldn’t get through on phone”</td>
<td>2 433 923</td>
<td>1 418 355</td>
<td>36.8</td>
</tr>
<tr>
<td>No</td>
<td>127 694 342</td>
<td>32 750 473</td>
<td>20.4</td>
</tr>
<tr>
<td>“Couldn’t get an appointment soon enough”</td>
<td>5 708 575</td>
<td>2 904 440</td>
<td>33.7</td>
</tr>
<tr>
<td>No</td>
<td>124 419 690</td>
<td>31 264 388</td>
<td>20.1</td>
</tr>
<tr>
<td>“Waiting too long in doctor’s office”</td>
<td>5 190 667</td>
<td>2 464 077</td>
<td>32.2</td>
</tr>
<tr>
<td>No</td>
<td>124 937 598</td>
<td>31 704 751</td>
<td>20.2</td>
</tr>
<tr>
<td>“Not open when you could go”</td>
<td>3 345 193</td>
<td>1 658 444</td>
<td>33.1</td>
</tr>
<tr>
<td>No</td>
<td>126 783 072</td>
<td>32 510 384</td>
<td>20.4</td>
</tr>
<tr>
<td>“No transportation”</td>
<td>1 163 181</td>
<td>2 155 805</td>
<td>51.9</td>
</tr>
<tr>
<td>No</td>
<td>128 965 084</td>
<td>32 913 023</td>
<td>20.3</td>
</tr>
</tbody>
</table>

*From The 2005 National Health Interview Survey (NHIS).^

^Projected number of US civilians.
The 2005 NHIS data\textsuperscript{12} demonstrate that American adults still rely heavily on EDs for medical care. More than 1 in 5 adults in nearly every demographic subgroup in America had at least 1 ED visit each year. This is consistent with data from the 2005 National Hospital Ambulatory Medical Care Survey (NHAMCS),\textsuperscript{2} which tally 39.6 visits per 100 persons (each person may have had 1 or more visits).

A main finding of our study is that having a regular source of primary medical care may be necessary but not sufficient to lower the risk of ED use. Barriers to timely access appear also to be highly associated with the risk of using the ED in the past year. This relationship persists even after adjusting for socioeconomic and health-related factors.

Our findings suggest that patients are more likely to use the ED when there are barriers that keep them from getting timely medical care. Even though all subjects in our data set reported having a regular source for medical care when sick, various problems with accessing medical care such as long waiting times in the physician’s office, limited availability of appointments, or difficulty getting through to the physician on the telephone may still increase their tendency to use the ED. This result is consistent with the findings of previous studies that examined the links between specific aspects of primary care and ED use. For example, Bair et al\textsuperscript{13} demonstrated that patients with asthma who reported at least 1 problem accessing medical care were more likely to have made at least 1 asthma-related ED visit. Similarly, Fredrickson et al\textsuperscript{24} found that parents of patients with asthma who used the ED would have greatly preferred to use primary care but faced substantial barriers.

Some studies have shown that having a primary care physician as the usual source of care can decrease use of the ED,\textsuperscript{33} while other studies have shown that frequent users of the ED are also frequent users of other medical care, including primary care, in part owing to the severity of their illness or comorbidity.\textsuperscript{66,11} However, even when an intervention improves primary care follow-up for uninsured ED patients, the rate of ED visit use might not be reduced.\textsuperscript{18} Few of these studies have examined the difference between “potential access” and “effective access” to primary care, ie, the impact of primary care timely access barriers on ED use. Our findings from the 2005 NHIS\textsuperscript{12} may help explain the conflicting results of previous studies regarding the relationship between access to primary care and ED use.

The numbers of patients reporting various access barriers in NHIS\textsuperscript{12} also generally reinforce the conclusions of a Commonwealth Fund survey\textsuperscript{19} that compared adult health care experiences in 7 countries. In that study, 90% of US respondents reported having a usual source of medical care (80% said they had a specific physician). Nineteen percent reported difficulty contacting the physician by telephone, and less than half reported that they could get a same-day or next-day appointment when sick or needing care (49%). Two-thirds of US patients in the Commonwealth Fund Survey (67%) reported that it was somewhat or very difficult “to get care on nights, weekends and holidays without going to a hospital emergency room,”\textsuperscript{19(p.w723)} and 15% reported having gone to the ED “for a condition that could have been treated by a regular doctor if available."\textsuperscript{19(p.w723)} Minor differences in survey results may be due to the sampling frames and/or the difference in question formats. The NHIS questions allowed only dichotomous yes/no responses instead of interval ratings (not difficult, somewhat difficult, very diffic-

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
Characteristic & OR (95% CI) & \\
\hline
Age, y & & \\
18-44 & 1.16 (1.05-1.29) & \\
45-64 & 0.86 (0.77-0.95) & \\
\geq 65 & 1 [Reference] & \\
\hline
Sex & & \\
Male & 0.89 (0.82-0.96) & \\
Female & 1 [Reference] & \\
\hline
Race & & \\
Non-Hispanic white & 1 [Reference] & \\
Non-Hispanic black & 1.21 (1.08-1.36) & \\
Non-Hispanic other & 0.90 (0.73-1.11) & \\
Non-Hispanic white & 1 [Reference] & \\
\hline
Education & & \\
\leq High school & 1.25 (1.10-1.41) & \\
High school graduate & 1.10 (1.00-1.21) & \\
\geq High school & 1 [Reference] & \\
\hline
Household income, $ & & \\
<20 000 & 1.32 (1.21-1.45) & \\
\geq 20 000 & 1 [Reference] & \\
\hline
Insurance status & & \\
No insurance & 0.94 (0.82-1.07) & \\
Having insurance & 1 [Reference] & \\
\hline
Health status & & \\
Fair-poor & 2.75 (2.50-3.00) & \\
Good-excellent & 1 [Reference] & \\
\hline
Barriers to primary care access & & \\
“Couldn’t get through on phone” & & \\
Yes & 1.27 (1.02-1.59) & \\
No & 1 [Reference] & \\
“Couldn’t get appointment soon enough” & & \\
Yes & 1.45 (1.21-1.75) & \\
No & 1 [Reference] & \\
“Waiting too long in doctor’s office” & & \\
Yes & 1.20 (1.02-1.41) & \\
No & 1 [Reference] & \\
“Not open when you could go” & & \\
Yes & 1.24 (0.99-1.55) & \\
No & 1 [Reference] & \\
“No transportation” & & \\
Yes & 1.88 (1.50-2.35) & \\
No & 1 [Reference] & \\
\hline
\end{tabular}
\caption{Adjusted Odds Ratios (ORs) and 95% Confidence Intervals (CIs) Associated With Multivariate Logistic Regression Model of Predictors of Emergency Department (ED) Visits}
\end{table}

From The 2005 National Health Interview Survey (NHIS).\textsuperscript{12}
ficult, and others) to evaluate gradations of each access barrier.

Our analysis suggests that providing primary care access is necessary but not sufficient for reducing unnecessary visits to the ED. Availability and potential access are not the same as real-world, timely, and effective access to care. According to Starfield,20 good primary care is characterized by high levels of first-contact accessibility, patient-focused care over time, a comprehensive package of services, and coordination of services when services are required elsewhere. When any of these qualities are missing, patients may not be able to obtain timely medical care from their usual care source and may have to resort to the ED for those services.

Four of the 5 barriers examined in our study may be considered at least partially under the control or responsibility of the primary care clinician and his/her practice and/or health care organization. Only lack of transportation might be considered primarily a patient-level barrier. Answering the telephone on time, being available for appointments, and other important behavior might be amenable to various forms of practice reengineering or quality improvement. Open-access scheduling is an intervention that has been demonstrated to increase patient satisfaction and the perception of accessibility and improve practice efficiency and continuity of care.21-23 Further research is needed to measure the impact of open-access scheduling and other interventions designed to reduce real-time barriers specifically on rates of ED use.

One limitation of this study is that it relied on self-reported ED use rather than a direct measure of ED visits or claims. We also were able to assess ED use only in general rather than differentiating between emergency care– vs primary care–related ED use or between visits for ambulatory care sensitive conditions (ACSC) vs visits for non-ACSC conditions. Although many medical problems can be cared for in alternative settings, many ED visits result from true emergencies. Still, our ability to differentiate between what could and could not be cared for in a primary care setting is limited, especially in self-reported survey data.

Another limitation is that health status is a driver of ED use and might confound our results, given the limited information on specific medical conditions and severity of illness available in the NHIS.32 Although we controlled for self-reported health status, persons who are sicker or who have specific combinations of medical comorbidities might have a more frequent need for urgent care and thus more chances to encounter timeliness barriers to primary medical care, thus generating an ED visit. The “usual source of care when sick” variable is also an imperfect surrogate for whether or not patients had an ongoing, continuity-of-care relationship with a primary care medical practitioner.

In addition, as some studies have pointed out, the survey techniques of the NHIS32 may have missed vulnerable populations such as homeless subjects or undocumented immigrants.34 Therefore, the actual percentage of people who have a regular source of care may be lower than what we found in this study, and the number who experience barriers might be higher. Self-reports of having a usual source of medical care may also overstate respondents’ actual connection to a primary care medical home. However, the NHIS oversamples minority populations and includes significant numbers of individuals whose socioeconomic status is below poverty level. It is also the survey with a sampling frame explicitly designed to be generalizable to the entire US civilian, non-institutionalized population.

We conclude that timely access to primary care may be more relevant to ED use than is the simple ability to name a usual source of medical care. The present study identifies specific, potentially fixable barriers to primary care access such as inability to get through to the physician by telephone or to get a timely appointment for acute illness episodes. Timely access barriers to primary care may create excess ED visit risk for all adults and even greater risk for the uninsured and for those whose health status is poor.

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Correspondence: George Rust, MD, MPH, National Center for Primary Care, Morehouse School of Medicine, 720 Westview Dr, Atlanta, GA 30310 (GRust@msm.edu).
Author Contributions: Drs Rust and Ye had full access to all of the data in the study and take full responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Rust and Ye. Acquisition of data: Ye. Analysis and interpretation of data: Rust, Ye, Baltrus, Daniels, and Fryer. Drafting of the manuscript: Rust, Ye, Baltrus, Daniels, and Adesunloye. Critical revision of the manuscript for important intellectual content: Rust, Ye, Baltrus, Daniels, Adesunloye, and Fryer. Statistical analysis: Ye, Baltrus, and Fryer. Administrative, technical, and material support: Rust. Study supervision: Rust.
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