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# Does the Proportion of Same-Day and 24-Hour Appointments Impact Patient Satisfaction?

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**Authors**

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# Does the Proportion of Same-Day and 24-Hour Appointments Impact Patient Satisfaction?

Jason P. Richter, PhD; Lynn Downs, PhD; Brad Beauvais, PhD; Peter V. Huynh, MSA; Jessica E. Hamilton, BSBA; Forest Kim, PhD; Fred Weigel, PhD

**Background:** The relationship between open access and patient satisfaction is mixed. Our study is the first to assess the relationship between open access appointment scheduling and patient satisfaction in the Military Health System (MHS). It is also unique in that we examine both same-day and 24-hour access through a relationship with satisfaction. **Methods:** We conducted a panel time-series analysis with general estimating equations on the Army population of outpatient facilities (N = 32), with 32 364 957 total observations. Our primary independent variables were the proportion of a facility's appointments within 24 hours and same day from July 2013 to May 2015. **Results:** We identified that a higher proportion of same-day appointments is associated with increased patient satisfaction with the ability to see their provider when needed. We did not find the same result when examining access within 24 hours. **Conclusions:** Open access appointment scheduling appears to have a greater impact on patient satisfaction with timeliness of care if that appointment is made the same day the patient presents to the facility. Facilities should consider opening more of their schedule to accommodate same-day appointments. This can result in less costly primary care instead of emergency department usage.

**Key words:** access to care, military health, patient satisfaction, quality

## PATIENT SATISFACTION

Patient satisfaction, under the umbrella of the broader patient experience, has grown in prominence in recent years with its incorporation into the Centers for Medicare & Medicaid Services value-based purchasing model. This model is composed of the following domains for 2017: 25% outcome measures, 25% patient experience of care, 25% efficiency, 20% safety, and 5% process of care measures.<sup>1</sup> The percentage of diagnosis-related group payments tied to performance on those domains is 2%. Patient satisfaction also affects health care utilization rates, clinical outcomes, continuity of care, patient retention, and malpractice lawsuits.<sup>2</sup>

Access to care, quality of care, and interpersonal interaction with staff account for the majority of variance in overall patient satisfaction.<sup>3,4</sup> Other literature indicates that a host of variables may influence patient satisfaction. Age,<sup>5</sup> gender,<sup>6</sup> and self-perceived health status<sup>7,8</sup> influence satisfaction at the individual level. At

the facility level, patient satisfaction is known to differ on the basis of facility size,<sup>9</sup> location, and the presence or absence of a medical ICU.<sup>10</sup>

## ACCESS TO CARE

In addition to patient satisfaction, access to care is a foundational tenet of health care quality and value. Access to care has been associated with increased health statuses, positive health outcomes, and decreased health disparities.<sup>11</sup> Access to care has become increasingly important as more emphasis is put upon prevention and wellness initiatives.<sup>12</sup> Studies have shown that increased access to care not only improves health outcomes but also promotes operational efficiencies in the treatment setting, decreases time in between appointments, and improves continuity of care.<sup>13</sup> In addition, better access to care has been linked to fewer nonemergent urgent care and emergency department visits.<sup>14-16</sup>

Open access—a scheduling process in which a percentage of daily appointments are set aside for use with same-day or 24-hour appointments—is an alternative to traditional appointment scheduling methods. In support of improving access to care, open access appointment scheduling has progressively been implemented to varying degrees in private and government organizations. While most studies show strong negative associations of open access with patient wait times, no-shows and emergency department and urgent care utilization, studies that explore the relationship between open access and patient satisfaction yield mixed results.<sup>17,18</sup> Despite the fact that many outpatient clinics are interested in or experimenting with open access scheduling, there are very few published studies that assess the relationship between open

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access scheduling and patient satisfaction. A systematic literature review found neutral to small positive improvements in patient satisfaction across 6 studies.<sup>17</sup> Studies identified in that review examined overall patient satisfaction and did not examine patient satisfaction with the time to see their provider and did not control for perceived health status. Another study of military beneficiaries found that patient perceptions of the number of days between the appointment and the day the provider was seen was a contributor to overall satisfaction.<sup>19</sup> Existing studies are limited by small sample sizes and lack of controls, such as perceived health status, known to influence patient satisfaction.

## THE MILITARY HEALTH SYSTEM

The Military Health System (MHS) is one of the largest health care systems in the United States, with total annual expenditures of more than \$50 billion. The MHS provides care directly to its beneficiaries through military treatment facilities (MTFs) and augments any additional care that cannot be delivered by an MTF through care purchased from civilian providers. The MHS has nearly 10 million eligible beneficiaries and has more than 20 000 inpatient admissions, 1.9 million outpatient visits, 2.54 million prescriptions, and 177 000 emergency department visits in an average week.<sup>20</sup> The Army has the largest share of beneficiaries in the MHS at 3.9 million.

Traditionally, a structured approach to appointment scheduling has been used in the MHS, wherein appointments for wellness, specialty, and routine care are booked with a provider at some point in the future, typically 7 to 28 days.<sup>21</sup> In 2008, MHS leadership released guidance to MTFs to offer some open access scheduling, to improve access to care, and to assist in improving patient satisfaction with access to care to greater than 90% (MHS, 2008).<sup>21</sup>

## PURPOSE

The results of the influence of open access on patient satisfaction remain unclear. Studies we found in the civilian health care system have shown mixed results, although those studies did not control for perceived health status, a predictor of overall satisfaction. The relationship between open access appointment scheduling and patient satisfaction has not been studied in the MHS, and we did not find other studies that controlled for health status or studied an entire population of beneficiaries when examining this relationship. Also, we did not find studies that studied open access as both access within 24 hours and access in the same day. Thus, the purpose of our study was to assess the relationship between open access appointment scheduling and patient satisfaction in outpatient facilities. We also sought to determine whether having an appointment the same day or within 24 hours impacts patient satisfaction to different degrees.

We framed our 2 primary research questions as follows: (1) what is the impact of same-day outpatient

access on patient satisfaction and (2) what is the impact of outpatient access within 24 hours on patient satisfaction?

## METHODS

### Intervention

To accommodate same-day scheduling of appointments, schedules were actively managed by a practice manager. Each primary care clinic was instructed to book 2 additional appointments per day beyond capacity to account for patient no-shows. Clinics also had the ability to set the ratio of same day or future appointments available on the schedule.

### Data collection

Two sources provided the data required for this study. Encounter data were extracted from the MHS Management Analysis and Reporting Tool (M2). M2 is a powerful ad hoc query tool used to manage and oversee health care operations worldwide. Patient satisfaction scores were drawn from the Army Provider Level Satisfaction Survey (APLSS). The APLSS is a comprehensive outpatient provider-level satisfaction tool with a similar design to that of the Hospital Consumer Assessment of Healthcare Providers and Systems. The APLSS program randomly selects patients within 24 hours after an encounter with a health care provider and generates a mailed survey (Figure 1).<sup>22</sup>

The unit of analysis is at the parent military treatment facility (parent MTF). In the civilian health care system, this is similar to a national health care system that has local or regional groups of facilities. This study included the entire Army parent MTF population of 32, of which there are 107 individual MTFs.<sup>23</sup> We included data from all encounters between July 2013 and May 2015. The final study data set included a total of 32 364 957 encounters and satisfaction surveys. We aggregated data to the parent MTF by month.

### Variables

Table 1 provides the list of variables used in the final analysis: independent variables, dependent variables, and control variables. All variables are aggregated at the parent MTF level.

Our study uses 2 primary dependent variables, *see provider when needed* and *overall satisfaction*. “See provider when needed” relates to the APLSS question that asks patients to score, “In general, I am able to see provider(s) when needed.” Overall satisfaction is from the APLSS survey question that asks, “Overall, how satisfied are you with your health care?” The values for each of those questions are calculated as a percentage of patients who scored the question as “Agree” or “Strongly Agree.”

We use 2 primary independent variables: *same-day appts* and *24-hour appts*. We calculated same-day appts as a percentage of each parent MTF’s appointments made within the same day the patient requested the appointment. The 24-hour appts variable is the percentage of appointments that occur within



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 SURVEY PROGRAM OFFICE  
 DECISION SUPPORT CENTER (DASG-PAE-DSC)  
 7700 ARLINGTON BLVD STE 5140  
 FALLS CHURCH, VA 22042-5140



### Army Patient Satisfaction Survey

We need your help. We are trying to improve the quality of care we give our Soldiers and their families.



Our records show that you got care from the provider named below.  
 <PROVIDER RANK><PROVIDER>  
 Is that right?

- Yes  → Please continue with the survey.  
 No  → Please go to Question 24.

Please use pen or dark pencil to mark an "X" in the answer box.  
 EXAMPLES: Correct  Incorrect

Thinking specifically about your visit with <PROVIDER RANK><PROVIDER> on <DATE> at <FACILITY>, please mark an "X" in the box for the answer that is closest to your opinion.

**Did this provider...**

	No	Yes, somewhat	Yes, definitely											
1. show respect for what you had to say?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											
2. spend enough time with you?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											
3. answer all your questions to your satisfaction?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>											
4. Overall, how satisfied do you feel about your visit with <PROVIDER RANK><PROVIDER>?	<table border="0" style="width: 100%;"> <thead> <tr> <th>Completely Dissatisfied</th> <th>Dissatisfied</th> <th>Neither Satisfied nor Dissatisfied</th> <th>Satisfied</th> <th>Completely Satisfied</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>				Completely Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Completely Satisfied	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Completely Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Completely Satisfied										
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
5. Do you have any comments about your visit with <PROVIDER RANK><PROVIDER> that we can share with the Army Medical Command?	<hr/>													

**Did the nurses...**

	No	Yes, somewhat	Yes, definitely													
6. treat you with courtesy and respect?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
7. listen carefully to you?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
8. Overall, how satisfied do you feel about the nurses you saw during your visit?	<table border="0" style="width: 100%;"> <thead> <tr> <th>Completely Dissatisfied</th> <th>Dissatisfied</th> <th>Neither Satisfied nor Dissatisfied</th> <th>Satisfied</th> <th>Completely Satisfied</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </tbody> </table>				Completely Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Completely Satisfied	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Completely Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Completely Satisfied												
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>												
9. Did clerks and receptionists at this provider's office treat you with courtesy and respect?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
10. Were clerks and receptionists at this provider's office as helpful as you thought they should be?.....	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
11. Did you have to wait to see a nurse or provider after you checked in?	<table border="0" style="width: 100%;"> <tbody> <tr> <td>No, I was seen immediately.....</td> <td><input checked="" type="checkbox"/></td> <td colspan="2">Please go to Question 13.</td> </tr> <tr> <td>No, I was seen by my appointment time.....</td> <td><input checked="" type="checkbox"/></td> <td colspan="2">Please go to Question 13.</td> </tr> <tr> <td>Yes, I had to wait.....</td> <td><input checked="" type="checkbox"/></td> <td colspan="2"></td> </tr> </tbody> </table>				No, I was seen immediately.....	<input checked="" type="checkbox"/>	Please go to Question 13.		No, I was seen by my appointment time.....	<input checked="" type="checkbox"/>	Please go to Question 13.		Yes, I had to wait.....	<input checked="" type="checkbox"/>		
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Yes, I had to wait.....	<input checked="" type="checkbox"/>															

Please turn over and continue on the back page.

<CD> <LITHO NUM>

Figure 1. APLSS Adult Questionnaire (continues).

24 hours of when the patient made the request for the appointment.

The control variables account for differences in patient and delivery system characteristics. Three variables, *perception of health*, *mean age*, and *percent male*, accounted for patient characteristics, and one variable, *total encounters*, accounted for delivery sys-

tem size. We used perceived health status as a control variable because other studies have shown it to be a significant contributor to patient satisfaction.<sup>7,19,24</sup> Perception of health is from the question, "In general, how would you rate your overall health?" We calculated the perception of health variable as a percentage of patients who scored "Good," "Very Good," or

12. After you checked in for your appointment were you kept informed about how long you would need to wait for your appointment to start?.....  No  Yes

Please rate the following aspects of your care and service on <DATE> or mark "no experience":

13. The overall phone service you received in scheduling the appointment for this visit.....  No Experience  Poor  Fair  Good  Very Good  Excellent

14. The amount of time from when you made the appointment until your actual visit...  No Experience  Poor  Fair  Good  Very Good  Excellent

If you also went to the Pharmacy, Radiology, or had laboratory work done in conjunction with your visit on <DATE>, please rate your experience with this service or mark "no experience":

15. Pharmacy.....  No Experience  Poor  Fair  Good  Very Good  Excellent

16. Radiology.....  No Experience  Poor  Fair  Good  Very Good  Excellent

17. Laboratory.....  No Experience  Poor  Fair  Good  Very Good  Excellent

18. Everything considered, how satisfied were you with <FACILITY> during this visit?  
 Completely Dissatisfied  Dissatisfied  Neither Satisfied nor Dissatisfied  Satisfied  Completely Satisfied

19. Would you recommend <FACILITY> to your family and friends?  
 Definitely No  Probably No  Probably Yes  Definitely Yes

20. Do you have any comments about your visit to <FACILITY> that we can share with the Army Medical Command?  
 \_\_\_\_\_  
 \_\_\_\_\_

How much do you disagree or agree with the following statements:

21. In general, I am able to see my provider(s) when needed.....  Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

22. I feel confident that I have the knowledge to make healthy choices and informed medical decisions.....  Strongly Disagree  Disagree  Neither Agree nor Disagree  Agree  Strongly Agree

23. Did anyone in this provider's office talk with you about specific goals for your health?.....  No  Yes

24. Which of the following best describes your familiarity with the provider you saw on <DATE>?  
 I did not have an appointment on <DATE>.....   
 I did have an appointment but I do not recognize the name <PROVIDER RANK>-<PROVIDER>.....   
 This provider is my Primary Care Manager (PCM) whom I see for most routine care.....   
 This provider is not my PCM, but I had met or heard of him/her before this visit.....   
 This provider is not my PCM, I had a referral to this provider.....   
 This provider is not my PCM, and I had never met or heard of him/her before this visit.....

25. Overall, how satisfied are you with your healthcare?  
 Completely Dissatisfied  Dissatisfied  Neither Satisfied nor Dissatisfied  Satisfied  Completely Satisfied

26. In general, how would you rate your overall health?.....  Poor  Fair  Good  Very Good  Excellent

27. In general, how would you rate your overall mental or emotional health?.....  Poor  Fair  Good  Very Good  Excellent

**Thank you very much for your opinions. Please return this survey today in the self-addressed envelope.  
 ATTN: AMEDD SURVEY CENTER, P.O. Box 5720, Hopkins, MN 55343**

Data Recognition Corp. 14745-54321

Figure 1. (Continued).

“Excellent” to question 26 of the survey. Previous studies of satisfaction included age, gender, and facility size, and thus we included these variables in our study as control variables.<sup>5,6,25</sup>

**Analysis**

We conducted a panel time-series analysis with general estimating equations (GEEs) to account for the

multiple observations per sample.<sup>26</sup> GEE is an appropriate method for longitudinal data analysis and to assess the effects on the covariate average of a continuous dependent variable in a population.<sup>27</sup> Hubbard et al<sup>28</sup> found that GEE provides a more useful approximation of population averages than mixed models because mixed models may be based on unverifiable assumptions on the data-generating distribution,

**Table 1. Variable Table**

Measurement	Variable Name	Use in Analysis	Type of Data	Measurement Units	Data Source
Access	Same-day	IV	Continuous	% of same-day appts	M2
Access	24-h	IV	Continuous	% of 24-hour appts	M2
Satisfaction	See provider when needed	DV	Continuous	% of patients who agree or strongly agree with satisfaction to see provider when needed	APLSS
Satisfaction	Overall satisfaction	DV	Continuous	% of patients who are satisfied or completely satisfied with health care received	APLSS
Patient health	Perception of health	Control	Continuous	% of patients who rate very good or excellent in perception of overall health	APLSS
Age	Age	Control	Continuous	Average age	M2
Gender	Male	Control	Continuous	% of male patients	M2
Size	Encounters	Control	Continuous	Total encounters	M2

Abbreviations: APLSS, Army Provider Level Satisfaction Survey; DV, dependent variable; IV, independent variable; M2, Military Health System Management Analysis and Reporting Tool.

which can lead to biased inference and misleading estimates.

We analyzed 2 separate GEE models for each of the 2 dependent variables and labeled them models 1 to 4. For each of the 2 dependent variables, we included the same control variables, but used only a single independent variable of interest, percent of same-day appointments, or percent of 24-hour appointments. We conducted the analysis, using IBM SPSS Statistics for Windows, Version 22 (Armonk, New York).

**RESULTS**

Table 2 provides the detailed descriptive statistics for each of the variables in our study of 32 facilities. Same-day appointments range from 0 to 1.63% (*M* = 0.26; *SD* = 0.14), while 24-hour appointments range from 4.98% to 33.91% (*M* = 16.07; *SD* = 5.56). Same-day appointment is the percentage of each parent MTF’s appointments made within the same day the patient requested the appointment, while 24-hour appointment reflects the percentage of appointments that occur within 24 hours of when the patient made the request for the appointment. “See provider when needed” ranges from 49.11% to 97.33% (*M* = 83.30;

**Table 2. Descriptive Statistics<sup>a</sup>**

Variable	<i>M</i>	<i>SD</i>	Min	Max
Same-day	0.26	0.14	0.00	1.63
24-h	16.07	5.56	4.98	33.91
See provider when needed	83.30	5.73	49.11	97.73
Overall satisfaction	91.63	3.84	64.23	98.41
Perception of health	63.93	6.84	29.09	85.54
Age	28.87	3.81	23.27	37.58
Male	56.31	4.62	48.58	68.51
Encounters	44045.00	30988.93	1637.00	133154.00

<sup>a</sup>*N* = 32 parent military facilities.

**Table 3. GEE Multiple Regression on See Provider When Needed<sup>a</sup>**

	<i>β</i>	<i>SE</i>	<i>P</i>	<i>β</i>	<i>SE</i>	<i>P</i>
Independent variables						
Same-day appts	1.81	0.80	.023			
24-hour appts				0.02	0.08	.779
Controls						
Perception of health	0.16	0.03	<.001	0.16	0.03	<.001
Encounters	0.00	0.00	.063	0.00	0.00	.104
Male	0.08	0.11	.474	0.09	0.11	.452
Age	0.35	0.17	.036	0.38	0.17	.030

Abbreviation: GEE, Generalized Estimating Equation.

<sup>a</sup>We ran 2 separate models: one with same-day appts and the other with 24 hours. *N* = 32 parent military treatment facilities.

*SD* = 5.73), while overall satisfaction ranges from 64.23% to 98.41% (*M* = 91.63; *SD* = 3.84). These numbers reveal the percentage of patients who agreed or strongly agreed with questions related to the ability to see the provider when needed, and overall satisfaction.

In Table 3 we show a significant association with the percentage of same-day appointments on the ability to see provider when needed (*β* = 1.81; *P* = .023), although we did not find the same relationship for 24-hour appointments (*β* = 0.02; *P* = .779). The same-day appointments coefficient can be interpreted as follows: for a 1% increase in the percentage of appointments that are same day, the patient satisfaction with ability to see provider when needed increases 1.81%. Two of the control variables, perception of health and age, also show significance with satisfaction with the ability to see the provider when needed.

We did not find significant associations of the access to care variables on overall satisfaction (see Table 4). The same-day appointments (*β* = 0.04; *P* = .955) and 24-hour appointments variables (*β* = 0.04; *P* = .398) did

**Table 4. GEE Multiple Regression on Overall Satisfaction<sup>a</sup>**

	$\beta$	SE	P	$\beta$	SE	P
Independent variables						
Same-day appts	0.04	0.65	.955			
24-hour appts				0.04	0.05	.398
Controls						
Perception of health	0.07	0.03	.049	0.07	0.03	.040
Encounters	0.00	0.00	.039	0.00	0.00	.141
Male	-0.12	0.06	.043	-0.09	0.07	.201
Age	0.20	0.06	<.001	0.23	0.07	.001

Abbreviation: GEE, Generalized Estimating Equation.

<sup>a</sup>We ran 2 separate models: one with same-day appts and the other with 24 hours. N = 32 parent military treatment facilities.

not have a significant relationship with overall satisfaction. Two of the control variables, perception of health and age, show significance with overall satisfaction.

**DISCUSSION**

We found a positive association between the percentage of same-day appointments and patient satisfaction with the ability to see their provider when needed, even after controlling for other factors found in previous literature to impact patient satisfaction. The relationship with 24-hour appointments and patient satisfaction with the ability to see the provider when needed was not significant, nor was the relationship between open access and overall patient satisfaction.

Our findings suggest the importance of having same-day appointment availability to satisfy patient perceptions of timely care. However, increases to the availability of 24-hour appointments may not yield the same benefits to satisfaction as increases to the availability of same-day appointments. This finding is consistent with a study on the Veterans Health Administration that found that longer waits were associated with satisfaction with treatment access.<sup>29</sup> This reflects that when a patient is ill or needs treatment the patient does not want to wait for that care because of the unknown or concern caused by that health issue.<sup>17</sup>

Receiving timely care is an important factor in preventing illnesses, reinjuries, and degrading conditions. If people are not satisfied with their access to care, they may not schedule necessary appointments or may seek out urgent care or emergency department care, at a much higher expense and reduced continuity of care. Studies suggest that patients who are less satisfied with ability to see their primary care provider are more likely to use urgent care and emergency facilities, and conversely, patients who are more satisfied are less likely to utilize costlier urgent care or emergency facilities.<sup>30,31</sup> Access to care is a predictor of emergency department utilization.<sup>32</sup> When a patient can obtain an appointment within 1 day, it predicts fewer nonemer-

gent emergency department visits.<sup>16</sup> Because patients are more satisfied with the time to see the provider and are less likely to utilize urgent and emergency department care, appointment scheduling efforts should target improvement in same-day access. Improved access to care has the potential to decrease non-emergent emergency department utilization, thus minimizing unnecessary costs. Patients who are dissatisfied with their regular source of care or who cannot be seen in a timely manner may switch providers.

We add to existing literature on the relationship between open access and patient satisfaction, by controlling for perceived health status and through the examination of a large patient population that had not previously been studied. Our findings on the relationship between open access and overall satisfaction are consistent with other studies of the civilian health care sector that found neutral to small positive improvement from the implementation of open access appointment scheduling.<sup>17</sup> The speed to which patients see their providers does not appear to have a strong impact on satisfaction with overall health care. Therefore, hospitals that wish to improve upon that measure of satisfaction should consider other operational strategies.

**LIMITATIONS**

Although our analysis is thorough, it is not without limitations. For example, our data source is composed of only Army facilities; thus, our results may not generalize well to the civilian sector. However, we believe the volume of our data—the entire population of Army facilities, which provide service to 3.9 million beneficiaries—is a substantial strength that aids in generalizability of our results.<sup>23</sup> We also were unable to test for causality, although our study incorporated a repeated-measures design.

**Directions for future research**

Future studies should evaluate whether patient satisfaction with the ability to see the provider when needed impacts emergency department and urgent care utilization. We also suggest that future studies should consider pre- and poststudy data for facilities that decide to implement open access appointment scheduling, to assess causality. It would be interesting to see if our results hold true in organizations with high proportions of same-day appointments. Effective August 2016, the APLSS survey has been replaced by the Joint Outpatient Experience Survey. A future study should also expand to include the Air Force and Navy components of the MHS. The Joint Outpatient Experience Survey can be used for that purpose since it is the same survey instrument across the Army, Air Force, and Navy.

**CONCLUSION**

Medical facilities, particularly those in the Army, should strive toward increasing the amount of same-day access. Although further research is warranted, there appears to be a distinction between the benefit of



same-day access and 24-hour access on satisfaction. When access to an appointment is available within 1 day, it significantly predicts fewer nonurgent emergency department visits, minimizing unnecessary health care system expenditures.<sup>16</sup> When patients are not satisfied with their regular sources of care, they are more likely to visit the emergency department for nonurgent conditions. This finding, coupled with ours, highlights the importance of patients getting seen when they desire. In addition, increased same-day access has the potential to improve population health because patients are more likely to seek care when they need it.

## REFERENCES

- Medicare CF, Services M. A step-by-step guide to calculating the patient experience of care domain score in the hospital Value-Based Purchasing FY 2012 Actual percentage payment summary report. [http://www.hcahpsonline.org/Files/Hospital%20VBP%20Domain%20Score%20Calculation%20Step-by-Step%20Guide\\_V2.pdf](http://www.hcahpsonline.org/Files/Hospital%20VBP%20Domain%20Score%20Calculation%20Step-by-Step%20Guide_V2.pdf). Published 2014. Accessed December 21, 2016.
- Fenton JJ, Jerant AF, Bertakis KD, Franks P. The cost of satisfaction: a national study of patient satisfaction, health care utilization, expenditures, and mortality. *Arch Intern Med*. 2012;172(5):405-411.
- Joon Choi B, Sik Kim H. The impact of outcome quality, interaction quality, and peer-to-peer quality on customer satisfaction with a hospital service. *Manag Serv Q Int J*. 2013;23(3):188-204.
- Ross CK, Steward CA, Sinacore JM. The importance of patient preferences in the measurement of health care satisfaction. *Med Care*. 1993;1138-1149.
- Voutilainen A, Kvist T, Sherwood PR, Vehviläinen-Julkunen K. A new look at patient satisfaction: learning from self-organizing maps. *Nurs Res*. 2014;63(5):333-345.
- Woods S, Heidari Z. The influence of gender on patient satisfaction. *J Gen Specific Med*. 2002;6(4):30-35.
- Xiao H, Barber JP. The effect of perceived health status on patient satisfaction. *Value Health*. 2008;11(4):719-725.
- Skelton JA, Irby MB, Geiger AM. A systematic review of satisfaction and pediatric obesity treatment: new avenues for addressing attrition. *J Healthc Qual*. 2014;36(4):5-22.
- Ford EW, Huerta TR, Diana ML, Kazley AS, Menachemi N. Patient satisfaction scores and their relationship to hospital website quality measures. *Health Mark Q*. 2013;30(4):334-348.
- Jha AK, Orav EJ, Zheng J, Epstein AM. Patients' perception of hospital care in the United States. *N Engl J Med*. 2008;359(18):1921-1931.
- Millman M. *Access to Health Care in America*. Washington, DC: National Academies Press; 1993.
- Sommers BD, Baicker K, Epstein AM. Mortality and access to care among adults after state Medicaid expansions. *N Engl J Med*. 2012;367(11):1025-1034.
- Parente DH, Pinto MB, Barber JC. A pre-post comparison of service operational efficiency and patient satisfaction under open access scheduling. *Health Care Manag Rev*. 2005;30(3):220-228.
- Murray M, Tantau C. Redefining open access to primary care. *Manag Care Q*. 1999;7(3):45-55.
- Scott DR, Batal HA, Majeres S, Adams JC, Dale R, Mehler PS. Access and care issues in urban urgent care clinic patients. *BMC Health Serv Res*. 2009;9(1):1.
- Yoon J, Cordasco KM, Chow A, Rubenstein LV. The relationship between same-day access and continuity in primary care and emergency department visits. *PLoS One*. 2015;10(9):e0135274.
- Rose KD, Ross JS, Horwitz LI. Advanced access scheduling outcomes: a systematic review. *Arch Intern Med*. 2011;171(13):1150-1159.
- Cherniack EP, Sandals L, Gillespie D, Maymi E, Aguilar E. The use of open-access scheduling for the elderly. *J Healthc Q*. 2007;29(6):45-48.
- Barido GT, Campbell-Gauthier GD, Mang-Lawson AM, Mangelsdorff AD, Finstuen K. Patient satisfaction in military medicine: model refinement and assessment of continuity of care effects. *Military Med*. 2008;173(7):641-646.
- Defense Health Agency. *Final report to the Secretary of Defense: Military health system review*. <http://www.health.mil/Military-Health-Topics/Access-Cost-Quality-and-Safety/MHS-Review>. 2014. Accessed March 1, 2016.
- Military Health System. Military health system's guide to access success. <http://www.health.mil/Reference-Center/Publications/2008/12/15/Military-Health-Systems-Guide-to-Access-Success>. Published 2008. Accessed March 1, 2016.
- Gates TM. *Quantitative Analysis of Contributing Factors Affecting Patient Satisfaction in Family Medicine Service Clinics at Brooke Army Medical Center*. Fort Belvoir, VA: Defense Technical Information Center; 2008.
- Military Health System. Military Health System Review - Final Report. <http://www.health.mil/Reference-Center/Reports/2014/08/29/File-2-MHS-Review-Report-Introduction-and-Overview>. Published 2014. Accessed March 1, 2016.
- O'Malley AS. After-hours access to primary care practices linked with lower emergency department use and less unmet medical need. *Health Aff*. 2012;32(1). doi:10.1377/hlthaff.2012.0494.
- Weisman CS, Rich DE, Rogers J, Crawford KG, Grayson CE, Henderson JT. Gender and patient satisfaction with primary care: tuning in to women in quality measurement. *J Women's Health Gen Based Med*. 2000;9(6):657-665.
- Zeger SL, Liang KY. Longitudinal data analysis for discrete and continuous outcomes. *Biometrics*. 1986:121-130.
- Gardiner JC, Luo Z, Roman LA. Fixed effects, random effects and GEE: what are the differences? *Stat Med*. 2009;28(2):221-239.
- Hubbard AE, Ahern J, Fleischer NL, et al. To GEE or not to GEE: comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. *Epidemiology*. 2010;21(4):467-474.
- Prentice JC, Davies ML, Pizer SD. Which outpatient wait-time measures are related to patient satisfaction? *Am J Med Qual*. 2014;29(3):227-235.
- Uscher-Pines L, Pines J, Kellermann A, Gillen E, Mehrotra A. Deciding to visit the emergency department for non-urgent conditions: a systematic review of the literature. *Am J Manag Care*. 2013;19(1):47-59.
- Werner RM, Canamucio A, Marcus SC, Terwiesch C. Primary care access and emergency room use among older veterans. *J Gen Intern Med*. 2014;29(2):689-694.
- Shaw EK, Howard J, Clark EC, Etz RS, Arya R, Tallia AF. Decision-making processes of patients who use the emergency department for primary care needs. *J Health Care Poor Underserved*. 2013;24(3):1288-1305.