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Abstract:	<p>Objective</p> <p>Investigate the impact of increased access to new and refilled prescriptions via an automated pickup kiosk (Asteres ScriptCenter) on prescription abandonment rates, patient experience, and pharmacist consultations.</p> <p>Design</p> <p>Non-randomized, observational study using retrospective, de-identified data from the filling pharmacy and the kiosk over a 35-month study period.</p> <p>Setting and Participants</p> <p>Hospital employees opting to utilize a kiosk located in the lobby with 24/7 access for pickups and a telephone pharmacist consultation service compared to employees using the regular counter at the filling pharmacy.</p> <p>Outcome Measures</p>

	<p>Return to Stock (RTS) rate to assess prescription abandonment, time to prescription pickup, consultation duration, kiosk user assessment, pharmacist assessment of counseling ability.</p> <p>Results</p> <p>Approximately 9% of employees (440) enrolled to use the kiosk, with 5,062 kiosk pickups recorded for new prescriptions (29%), refill prescriptions (33%), and OTCs (38%). Mean kiosk RTS ($4.3\% \pm 3.2$) was lower than at the regular counter ($5.6\% \pm 0.8$), $p=0.04$, while mean time to pickup was about one day greater at the kiosk vs. the regular counter (2.8 ± 0.4 vs. 1.8 ± 0.2, $p < 0.001$). The average kiosk consultation was approximately one minute shorter (2.0 ± 1.4) vs. the regular counter (3.4 ± 1.9, $p<0.001$) and fewer kiosk patients (15.7%) had additional questions at the end of a consultation session vs. regular counter patients (38.8%, $p<0.001$). The majority of kiosk users agreed their prescription questions were answered and kiosk convenience was an important reason for using the filling pharmacy. Almost all (>90%) pharmacists indicated they were able to effectively counsel patients at the kiosk and regular counter.</p> <p>Conclusion</p> <p>The kiosk, located in a workplace setting with 24/7 access, was a convenient, contactless pickup extension of the filling pharmacy with a lower prescription abandonment rate and similar pickup and consultation characteristics as at the regular pharmacy counter.</p>
Suggested Reviewers:	
Opposed Reviewers:	
Additional Information:	
Question	Response



Pamela Heaton, PhD, BSP Pharm, MS
Editor-in-Chief
Journal of the American Pharmacists Association

August 8, 2020

Dear Dr. Heaton:

I would like to submit an article entitled "Impact of a contactless prescription pickup kiosk on prescription abandonment, patient experience, and pharmacist consultations" for publication consideration in the Journal of the American Pharmacists Association.

This study is a timely contribution to the pharmacy literature given our current pandemic and need for contactless prescription pickup alternatives. The purpose of this study was to investigate the impact of increased access to new and refilled prescriptions via an automated pickup kiosk (Asteres ScriptCenter) on prescription abandonment rates, patient experience, and pharmacist consultations.

The study was approved by the University of California San Diego (UCSD) and the Sharp Healthcare Human Research Protection Programs prior to its implementation.

My co-authors and I are hopeful that the Journal and its reviewers will find this study suitable for publication.

Best Regards,

A handwritten signature in blue ink that reads "Jan D. Hirsch".

Jan D. Hirsch, BSP Pharm, PhD, FNAP
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4 **Impact of a contactless prescription pickup kiosk on prescription abandonment, patient**
5 **experience, and pharmacist consultations**
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25 study.
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20 **Declaration of Interest:** S. Lake was employed by Asteres Inc., as Director of Regulatory Affairs
21 at the time of data collection.
22

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24 commercial, or not-for-profit sectors
25
26

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6 **Abstract**
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8 **Objective:** Investigate the impact of increased access to new and refilled prescriptions via an
9 automated pickup kiosk (Asteres ScriptCenter) on prescription abandonment rates, patient
10 experience, and pharmacist consultations.
11

12
13 **Design:** Non-randomized, observational study using retrospective, de-identified data from the
14 filling pharmacy and the kiosk over a 35-month study period.
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16
17 **Setting and Participants:** Hospital employees opting to utilize a kiosk located in the lobby with
18 24/7 access for pickups and a telephone pharmacist consultation service compared to
19 employees using the regular counter at the filling pharmacy.
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21
22 **Outcome Measures:** Return to Stock (RTS) rate to assess prescription abandonment, time to
23 prescription pickup, consultation duration, kiosk user assessment, pharmacist assessment of
24 counseling ability.
25

26
27 **Results:** Approximately 9% of employees (440) enrolled to use the kiosk, with 5,062 kiosk
28 pickups recorded for new prescriptions (29%), refill prescriptions (33%), and OTCs (38%). Mean
29 kiosk RTS ($4.3\% \pm 3.2$) was lower than at the regular counter ($5.6\% \pm 0.8$), $p=0.04$, while mean
30 time to pickup was about one day greater at the kiosk vs. the regular counter (2.8 ± 0.4 vs. $1.8 \pm$
31 0.2 , $p < 0.001$). The average kiosk consultation was approximately one minute shorter ($2.0 \pm$
32 1.4) vs. the regular counter (3.4 ± 1.9 , $p < 0.001$) and fewer kiosk patients (15.7%) had additional
33 questions at the end of a consultation session vs. regular counter patients (38.8%, $p < 0.001$).
34 The majority of kiosk users agreed their prescription questions were answered and kiosk
35 convenience was an important reason for using the filling pharmacy. Almost all (>90%)
36 pharmacists indicated they were able to effectively counsel patients at the kiosk and regular
37 counter.
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39
40 **Conclusion:** The kiosk, located in a workplace setting with 24/7 access, was a convenient,
41 contactless pickup extension of the filling pharmacy with a lower prescription abandonment
42 rate and similar pickup and consultation characteristics as at the regular pharmacy counter.
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49 **Key Points**
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52 Background (what is known on the topic and other relevant background).

- 53
54 • Prescription abandonment, when a prescription is filled but the patient does not pickup,
55 contributes to primary medication nonadherence and is important to a pharmacy from a
56 business and patient outcome perspective.
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58 • Abandonment rates differ by prescription type and are a particular problem for brand name
59 medications, with an abandonment rate almost three times higher (21.3%) than for generics
60 (8.1%).³
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- An automated pickup kiosk that patients can use to pick up their prescriptions that have already been ordered, filled, and verified by a pharmacist in an outpatient pharmacy is a possible solution to improving prescription abandonment rates.

Findings (what manuscript findings add to the knowledge about topic).

- A lower prescription abandonment rate and similar pickup characteristics were observed for patients using an automated prescription pickup kiosk compared to patients using the regular pharmacy counter.
- Pharmacists agreed their ability to counsel kiosk patients was similar to regular counter patients.
- Patients were satisfied with pharmacist access and kiosk operations.

Background

Poor medication adherence is known to be associated with increased hospitalization, worse health outcomes, and increased health care costs. The World Health Organization (WHO) included this statement as a key take-home point in its report on adherence to long-term therapies: “Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments”.¹

Medication nonadherence is divided into two subtypes: primary and secondary nonadherence.² Many studies examine secondary medication nonadherence which occurs when an original prescription is filled and picked up by the patient, but it is not taken or refilled as directed after pickup. Although less studied, the elements of primary medication nonadherence are equally important. Primary medication nonadherence (PMN) is when a new medication is prescribed for a patient but the patient does not obtain the medication. This includes prescriptions that never reach the pharmacy, and those that do but are never filled or never picked up (i.e. abandoned). Abandonment rates differ by prescription type and are a particular problem for brand name medications, with an abandonment rate almost three times higher (21.3%) than for generics (8.1%).³ Prescription abandonment, filled but never picked up, is important to a pharmacy from a business and patient outcome perspective. From a business view, abandoned prescriptions result in the need to return medications to stock which has an associated labor cost and can cause overstocking which means wasted dollars on the pharmacy shelf. From a patient outcome perspective, abandoned prescriptions can be an indicator of patient non-adherence problems, and can influence pharmacy Star Ratings.⁴ Although there are many reasons why patients do not pick up their prescriptions, technology to improve convenience of prescription pickup could help reduce prescription abandonment rates. In addition, a technology that allows contactless pickup has taken on added significance in the COVID-19 pandemic that has not only highlighted community pharmacists as front-line providers but heightened the need for contactless means of prescription delivery.

Automated prescription dispensing or delivery devices, sometimes thought of as “prescription kiosks or lockers”, offer a contactless prescription pickup option and may help decrease PMN by increasing the ease of the patient’s first step toward adherence; picking up their medications. Automated prescription kiosks for both dispensing and pickup were launched in the early 2000’s as a way for patients to safely and conveniently obtain their prescriptions. Two main types of technology used today are:

1. Automated dispensing kiosks, primarily used in urgent care centers and clinics, allow patients to receive commonly prescribed medications dispensed directly to them after visiting with a health care professional.
2. Automated pickup kiosks, the subject of this study, are used for patients to pick up their prescriptions that have already been ordered, filled, and verified by a pharmacist in the dispensing pharmacy.

Both types of automated prescription kiosks are designed to be used with appropriate patient counseling as required by local laws and regulations. Although these automated devices may be helpful there is very little evidence available to assess the impact of these kiosks on prescription abandonment rates and pharmacist-patient consultations.⁵

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6 The impetus for this study was directly related to this lack of evidence. Sharp Rees Stealy (SRS)
7 Pharmacy in San Diego, CA submitted a request to the California Board of Pharmacy to install
8 one type of automated kiosk, an automated prescription pickup kiosk (Asteres ScriptCenter), in
9 the Sharp Memorial Hospital (SMH) lobby located 0.2 miles from the SRS pharmacy. A SMH
10 employee interest survey fielded by SRS had revealed 70.4% of respondents agreed they would
11 benefit from being able to pick up their prescription at SMH and 68.5% agreed that they would
12 be more likely to pick up their medications if they had easier access to retrieving their
13 medications. However, at the time of the Sharp request, the California Board of Pharmacy
14 Code of Regulations, Title 16, Division 17, Section 1713(d), regarding delivery of prescriptions
15 allowed the kiosk to deliver only previously dispensed (refill) prescription medications and the
16 kiosk had to be located adjacent to the secure pharmacy area.⁶ In an effort to investigate the
17 impact of delivering both new and refill prescriptions at a non-adjacent location the Board of
18 Pharmacy issued a waiver to Sharp to operate the kiosk with the stipulation that a study would
19 be conducted concurrently.
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26 The purpose of this study was to investigate the impact of increased access to new and refilled
27 prescriptions via the automated pickup kiosk (Asteres ScriptCenter) on prescription
28 abandonment rates, patient experience, and pharmacist consultations. SRS expected that
29 patients would be more likely to pick up their prescriptions due to the convenience of the
30 onsite kiosk while having a similar relationship with their pharmacist as they would at the
31 regular counter.
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36 **Objectives**

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39 The primary objective of this study was to compare the prescription abandonment rate
40 between patients using a kiosk vs. patients using a regular pharmacy counter in a hospital
41 employee population. Secondary objectives were to compare time to prescription pickup, and
42 number of questions asked after pharmacist consultation between the two delivery modes,
43 regular counter and kiosk. Patient experience with the kiosk and pharmacist-rated ability to
44 effectively counsel kiosk patients were also assessed.
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48 **Methods**

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51 This study was a non-randomized, observational study that utilized retrospective, de-identified
52 data gathered from both the filling pharmacy (SRS) and the kiosk. The study period included a
53 6-month regular counter, pre-kiosk installation, period (9/1/15-2/28/16) and a 35-month period
54 (3/1/16-1/31/19) in which the kiosk and regular counter operations occurred in parallel.
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57 SMH employees were sent an email giving them the option to pick up their (and their
58 dependents') new or refilled prescriptions, as well as over-the-counter (OTC) medications,
59 either via the ScriptCenter automated prescription pickup kiosk located in the SMH lobby or at
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4 the regular pharmacy counter in the SRS outpatient pharmacy located two-tenths of a mile
5 away. ScriptCenter is equipped with various security features to prevent the diversion and
6 unauthorized access to the kiosk. The automated prescription pickup kiosk weighs more than
7 1,300 lbs, is bolted the floor, interfaces with the pharmacy management system for real-time
8 prescription tracking, uses security codes and biometric technology for both patient and
9 pharmacy access, and captures a photo and signature of every patient picking up their
10 prescription. Normal operating hours at the regular pharmacy counter were 8:30am to
11 5:30pm, Monday through Friday. The kiosk was accessible 24 hours per day, 7 days a week. All
12 prescriptions were filled and verified at the SRS pharmacy during regular business hours, with
13 kiosk prescriptions delivered to the kiosk daily. OTC products were restocked in the kiosk as
14 needed and included products related to allergy, digestion, pain, cough, cold, and vitamins.
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20 New prescriptions in the kiosk required mandatory consultation with the pharmacist (as
21 required for any new prescription in California), and pharmacists used their professional
22 judgment to determine whether a refilled prescription required consultation. Patients
23 requiring consultation were notified (text or email) of need for consultation prior to being able
24 to pick up their prescription. Patients then could call back from their personal phone or from
25 the phone adjacent to the kiosk. Patients had the ability to call at any time that was convenient
26 for them and did not need to be at the kiosk at the time of phone consultations. After required
27 consultations were conducted the pharmacist electronically released the prescription in the
28 kiosk for pickup. For additional questions, the SRS pharmacy service phone number was
29 provided on the kiosk for patients and calls were answered by the SRS pharmacy during
30 business hours and by an on-call SRS pharmacist after hours. Patients paid for their
31 medications at the kiosk using a credit or debit card.
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37 While pharmacist counseling for new prescriptions occurred as part of the normal operating
38 procedures of SRS pharmacy (as required by law), documentation of the counseling sessions
39 was not as detailed as needed for this study. A counseling documentation log was developed
40 for pharmacists to document each counseling session for a patient with a new prescription
41 during pre-specified data collection periods. Each counseling session may have included
42 multiple prescriptions (new and/or refill). Counseling sessions were documented for the kiosk
43 for 15 months (3/1/16-12/31/16 and 10/1/17-2/28/2018). Since the volume of new
44 prescriptions at the regular counter was much larger than at the kiosk, a sampling plan was
45 used to collect data for a similar number of new prescription sessions as had been documented
46 at the kiosk during the study time period. Regular counter consultation data were collected
47 during five, one-week periods (in May, June, December of 2016 and November, December
48 2017). Collecting data for an entire week for all new prescription counseling sessions was
49 expected to reduce bias that may occur if specific times or day or days had been selected. As
50 at the regular counter, kiosk prescriptions were defined as "new" if either transferred into the
51 SRS pharmacy, renewed to a new prescription number, had not been previously taken by the
52 patient, or included a change in dosage form, strength, or directions for use.
53 A designation of "truly new" to the patient excluded prescriptions renewed to a new
54 prescription number (without changes) only occurred for the subset of documented
55 consultation sessions from 10/1/2017 through 2/28/2018 after an inquiry from the Board of
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4 Pharmacy highlighted the value of making this distinction for analyses. Pharmacists counseled if
5 a medication was either transferred into the SRS pharmacy, had not been previously taken by
6 the patient, or included a change in dosage form, strength, or directions for use as required by
7 law, or as needed per pharmacist’s clinical judgement.
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10 Return to Stock (RTS) rate was used to assess prescription abandonment with a lower RTS rate
11 indicating more patients had picked up their prescriptions. RTS and time to prescription pickup
12 were calculated as part of SRS pharmacy’s normal operating procedures. RTS rate was a
13 summary measure, based on new and refill prescriptions, calculated on a monthly basis over
14 the study period as monthly number of prescriptions returned to stock after a 14 day period
15 divided by number of prescriptions filled over the month period. Time to prescription pickup
16 was a summary measure, including new and refill prescriptions, calculated on a monthly basis
17 over the study period as the interval between when the pharmacist verified the prescription
18 and when the patient picked up the prescription. Consultation variables collected included
19 duration of counseling session, if patients had more questions at end of consultation and
20 number of questions, and pharmacist-rated ability to effectively counsel kiosk patients was
21 assessed via questionnaire completed by the pharmacist after each session. RTS, time to
22 prescription pickup, and consultation variables were compared between groups over the study
23 period. For all comparisons, the regular counter group included Sharp employees and
24 dependents only in order to more closely match patients using the kiosk in the SMH location.
25 Patient experience with the kiosk was rated by kiosk users via a voluntary, four-question survey
26 at the completion of the patient’s second kiosk session as part of the normal operating
27 procedures of the kiosk. If a patient skipped a question the remaining questions were not
28 presented to the patient. No patient identifiers were recorded for any data collected.
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36 To achieve 95% power using the primary outcome of RTS, a sample size of 820 pickup events
37 was required for both the regular counter group and the kiosk group. Pearson’s chi-squared
38 test was used to compare categorical variables and two-sample t-tests were used to compare
39 continuous variables between groups. This study was approved by the UCSD and Sharp
40 Healthcare Human Research Protection Programs.
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45 **Results**

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48 Sharp Memorial Hospital employed 4,820 people during the study period; 54% working day
49 shift and remaining 46% working evening or variable shift. Approximately 9% of employees
50 (440), enrolled to use the kiosk. Over the 35-month study period there were 5,062 kiosk
51 pickups fairly evenly split among new prescription (29%), refill prescription (33%), and OTC
52 (38%) pickups. The majority (approximately 70%) of prescription (new and refill) pickups at the
53 kiosk were during regular pharmacy hours, while OTC pickups were more evenly split between
54 regular pharmacy hours (55%) and after hours (45%). Of patients answering kiosk survey
55 questions (n=158), the majority believed questions regarding their prescriptions had been
56 answered, they knew where to call if they had more questions, and that the convenience of
57 after-hours pickup at the kiosk was an important reason to use the SRS pharmacy. (Table 1)
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4 Anecdotally there were no complaints received by the filling pharmacy nor the California Board
5 of Pharmacy regarding the kiosk operation, nor reports of patients receiving the wrong
6 prescription.
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10 The mean RTS at the kiosk ($4.3\% \pm 3.2$) was lower than at the regular counter ($5.6\% \pm 0.8$)
11 during the study period ($p=0.04$) and similar to the 6-month regular counter, pre-kiosk
12 installation, period ($5.2\% \pm 1.2$, $p = 0.53$, data not shown). (Table 2) Mean time from
13 prescription verification to pick up was about one day greater at the kiosk compared to the
14 regular counter (2.8 ± 0.4 vs. 1.8 ± 0.2 respectively, $p < 0.001$).
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17 Based on data from the 15-month consultation data collection period, the average consultation
18 was approximately one minute shorter at the kiosk (2.0 ± 1.4) vs. the regular counter (3.4 ± 1.9 ,
19 $p<0.001$). (Table 3). Fewer patients using the kiosk had additional questions at the end of a
20 consultation session (15.7%) compared to those using the regular counter for pickup (38.8%,
21 $p<0.001$), although for patients with questions the mean number was approximately one for
22 each group ($p=0.67$). When the limited subset of patients with a truly new prescription were
23 considered (kiosk $n=46$, regular counter $n=104$), a shorter consultation duration (kiosk 2.6 ± 1.4 ,
24 regular counter 3.3 ± 1.6) and fewer patients with a question at the end of consultation (kiosk
25 7% vs regular counter 46%) were similarly observed. More than 90% of pharmacists' ratings of
26 their ability to counsel patients were a 3 or 4 (4=Fully Able) at both the regular counter and the
27 kiosk for the three elements assessed (build a therapeutic relationship, establish a management
28 plan, negotiate safety netting strategies). (Table 4)
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34 35 **Discussion**

36 In this hospital employee population, prescription abandonment rate was lower for patients
37 using an automated kiosk for prescription pickup than that observed for patients using the
38 regular counter in the associated filling retail pharmacy 0.2 miles away from the hospital. Time
39 from prescription verification to pickup was about one day longer, and the average prescription
40 consultation time was about one minute shorter for the kiosk vs. regular counter patients.
41 Fewer kiosk patients had questions for the pharmacist at the end of their consultation session,
42 though the average number of questions was only one for those asking questions at the kiosk
43 and regular counter. When the subset of truly new prescriptions was considered the one
44 minute duration difference and proportion of patients with questions was similar. Hospital
45 employees electing to use the kiosk agreed any questions they had regarding their prescription
46 were answered and the convenience of being able to pick up prescriptions at the hospital
47 located kiosk was an important reason they used the filling pharmacy. Similarly, almost all
48 pharmacists indicated they were able to effectively counsel patients at the kiosk and regular
49 counter.
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56 The expectation of SRS Pharmacy that patients would be more likely to pick up their
57 prescriptions due to the convenience of the onsite kiosk while having a similar relationship with
58 their pharmacist was supported by study results. The difference of about a 1 percentage point
59 difference in RTS rate, though small, has operational significance in that returning a prescription
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4 to stock requires employee time to physically return medications to stock while retaining
5 proper labeling (e.g. NDC code, expiration date) as well as reversal of third party payer claims.
6 The SRS pharmacy estimated the cost of a RTS prescription to be \$30 through its Six Sigma
7 efforts to increase efficiency and identify waste reduction strategies. Considering 40,000
8 prescriptions filled per year at SRS Pharmacy, reducing RTS by one percentage point yields
9 \$12,000 in annual savings. From a patient outcome view the one percentage point
10 improvement would mean the patient population would take the first essential step toward
11 adherence, picking up their medications, 400 more times each year. Prescription pickup
12 characteristics and pharmacist assessment of counseling sessions were similar between pickup
13 options, and kiosk users were satisfied with their access to pharmacist counseling. After
14 presenting study results to the California Board of Pharmacy, the Board decided to move
15 forward and sponsor SB1447. The subsequent law was enacted in July, 2019 to allow for
16 automated pickup systems such as the ScriptCenter to be placed anywhere within pharmacies,
17 hospitals, correctional facilities, clinics, and medical offices throughout California to deliver new
18 and refill prescriptions to patients 24/7.
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25 From a wider perspective, consumers want convenience and automation to provide a self-
26 service option is increasingly expected.⁷ Self-service options in pharmacy are a growing trend in
27 both healthcare and retail settings. Improving employee and patient satisfaction (e.g. by
28 offering 24/7 access to prescriptions) and significantly reducing pharmacy lines would be
29 important goals for a hospital system. In commercial retail settings, pharmacies are adding a
30 higher level of convenience and frictionless checkout options to their shopping experiences.
31 Community pharmacy is directly impacted by this trend as evidenced by the rise in mail order
32 prescription delivery and the increased utilization of automated prescription dispensing and
33 pickup solutions. While dispensing solutions take the actual filling of the prescription out of the
34 pharmacists' hands, automated pickup solutions allow for the normal processing of a
35 prescription and provide a secure, regulatory compliant extension for will-call pharmacy pickup;
36 allowing pharmacists to spend more time working at the top end of their license on more
37 clinically relevant tasks, and providing a method for remote pickup of prescriptions that could
38 be useful in remote areas or for areas closer to patient work-places.
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44 The use of an automated prescription pickup kiosk offers an advantage of contactless
45 prescription pickup, the importance of which could not have been imagined prior to the COVID-
46 19 pandemic. As the shutdown of states progressed community pharmacists became known
47 and highlighted as front-line responders providing essential healthcare services. In addition to
48 assuring patients received their medications via extra measures such as emergency refills and
49 home delivery, pharmacists also provided an array of direct patient care services. As patients
50 avoided emergency departments, clinics and doctors' offices, pharmacists increased their
51 delivery of medication therapy management services to help patients manage their chronic
52 medications. Pharmacists are now adding ordering and administering COVID testing to their
53 role that already included providing immunizations; which will be needed when a vaccine for
54 COVID-19 is available. Having a contactless automated prescription pickup kiosk can help
55 pharmacies expand their geographic radius for remote pickup of prescriptions at the same time
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4 freeing up pharmacists and other pharmacy-based staff to provide a growing array of direct
5 patient care services while reducing patron density in pharmacies.
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8 This observational study, with limited sample size, was conducted in a single site with
9 employees of one health system. Patients were not randomized to use the kiosk vs. the
10 counter, rather were allowed to opt-in to kiosk usage as would occur in real world settings.
11 There was limited marketing of the kiosk via email to employees which could have implications
12 for the types of patients opting to use the kiosk; possibly those with greater usage of email
13 within their job activities. Future studies should look at a wider patient population, as there
14 may be some inherent bias in utilizing only hospital employees. For example, it may have been
15 easier to convey information to hospital employees about the kiosk, or prescriptions than it
16 would be to employees in another non-hospital setting. Demographic data were not collected
17 in this study, however future studies may want to examine differences among age groups
18 opting to utilize the kiosk. Notably, during this study period, the kiosk did not utilize a video
19 function on the kiosk that is now the standard with this manufacturer (Asteres) thus
20 assessment of this enhancement should be conducted. Although kiosk users and pharmacists
21 had positive assessments of the kiosk as a prescription delivery method, the cost-benefit
22 analysis for the institution remains to be conducted, and would likely vary among various
23 populations.
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29 30 31 **Conclusion**

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34 The automated prescription pickup kiosk, ScriptCenter, located in a workplace setting with 24/7
35 access, was a convenient, contactless pickup option, with a lower prescription abandonment
36 rate than the comparator regular counter pickup option. Kiosk users were satisfied with their
37 access to pharmacist counseling, and pharmacists rated counseling sessions similarly between
38 the kiosk and regular counter.
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44 **Appendix**

45 Questionnaire for pharmacist assessment of phone patient consultation
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Patient has: (write in number) ____ New Rxs ____ Refill Rxs	Introduction (Build a Relationship)	Action (Incorporate Patient's Understanding)	Closing (Safety Net Strategy)
Call day & time:	1. Introduce self Yes or No 2. Explain role of pharmacist Yes or No	1. What med is for: Yes or No 2. How to take med: Yes or No • Time of day Yes or No • Length of therapy Yes or No • Missed dose Yes or No	1. What to do if patient had difficulties following the plan: Yes or No 2. Future appointment or contact provided: Yes or No 3. Opportunity to ask additional questions: Yes or No
Call duration:	3. Confirm patient ID Yes or No 4. Discuss consult purpose: Yes or No • Structure Yes or No • Desired length Yes or No	3. What to expect: Yes or No • Efficacy Yes or No • DDI Yes or No • S/E Yes or No	PHARMACIST ASK PATIENT Do you have any more questions about your medication(s) I haven't answered yet? (check No/Yes and write in number) ____ No ____ Yes Write in Number of Questions _____
Consult: (check one) ____ Counter for regular patient ____ Phone for regular patient ____ Phone for kiosk patient	5. Has the patient previously talked with a pharmacist about this/these medication(s)? Yes or No	4. Invite patient to teach back: Yes or No • Patient understands Yes or No • Questions answered Yes or No, N/A	What questions did the patient have?
Consult initiated by: (circle one) Pharmacist Patient	6. Invite patient to discuss: Yes or No • Medication concerns Yes or No • Health related concerns Yes or No	5. Lifestyle and prevention: Yes or No, N/A • Additional information Yes or No, N/A • Referral Yes or No, N/A	
Pharmacist-Assessment	Ability to <i>build therapeutic relationship</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	Ability to <i>establish a management plan</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	Ability to <i>negotiate "safety netting" strategies</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4
Comments			
Patient has: (write in number) ____ New Rxs ____ Refill Rxs	Introduction (Build a Relationship)	Action (Incorporate Patient's Understanding)	Closing (Safety Net Strategy)
Call day & time:	1. Introduce self Yes or No 2. Explain role of pharmacist Yes or No	1. What med is for: Yes or No 2. How to take med: Yes or No • Time of day Yes or No • Length of therapy Yes or No • Missed dose Yes or No	1. What to do if patient had difficulties following the plan: Yes or No 2. Future appointment or contact provided: Yes or No 3. Opportunity to ask additional questions: Yes or No
Call duration:	3. Confirm patient ID Yes or No 4. Discuss consult purpose: Yes or No • Structure Yes or No • Desired length Yes or No	3. What to expect: Yes or No • Efficacy Yes or No • DDI Yes or No • S/E Yes or No	PHARMACIST ASK PATIENT Do you have any more questions about your medication(s) I haven't answered yet? (check No/Yes and write in number) ____ No ____ Yes Write in Number of Questions _____
Consult: (circle one) Counter Phone	5. Has the patient previously talked with a pharmacist about this/these medication(s)? Yes or No	4. Invite patient to teach back: Yes or No • Patient understands Yes or No • Questions answered Yes or No	
Initiated by: (circle one) Pharmacist Patient	6. Invite patient to discuss: Yes or No • Medication concerns Yes or No • Health related concerns Yes or No	5. Lifestyle and prevention: Yes or No, N/A • Additional information Yes or No, N/A • Referral Yes or No, N/A	What questions did the patient have?
Rx Pickup: (circle one) Counter Kiosk			
Pharmacist-Assessment	Ability to <i>build therapeutic relationship</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	Ability to <i>establish a management plan</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4	Ability to <i>negotiate "safety netting" strategies</i> with patient: N/A Not Able Partially Able Fully Able 0 1 2 3 4
Comments			

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Table 1: Patient experience with kiosk

n=158	Yes	No
Do you feel your questions were answered regarding the prescriptions you picked up today? (n=91; 12 skipped question, 55 had no questions)	88 (96.7%)	3 (3.3%)
Is the convenience of after-hours prescription pickup an important reason to use this pharmacy? (n=128; 30 skipped question)	105 (82.0%)	23 (18.0%)
Is the kiosk a main reason for you to use this pharmacy? (n=111; 47 skipped)	106 (95.5%)	5 (4.5%)
If you have questions for a pharmacist regarding the prescriptions you picked up today, do you know where to call? (n=109; 49 skipped)	78 (72.0%)	31 (28.0%)

Table 2: Return to stock rates and time from verify to pickup at regular counter vs kiosk

	Regular Counter ^a	Kiosk
Return to Stock rate		
Total Rx Filled	104,702	3,260
Total Rx Picked Up	98,799	3,119
Total Rx RTS	5,903	141
RTS (%) (Mean ± SD) ^b	5.6 ± 0.8	4.3 ± 3.2 ^c
Time from verify to pick up		
Days (Mean ± SD) ^b	1.8 ± 0.2	2.8 ± 0.4 ^d
Hours (Mean ± SD) ^b	43.4 ± 5.1	66.1 ± 10.3
Range	4 sec to 30.2 days	7 min to 28.9 days
Abbreviation used: Rx = prescription RTS = Return to Stock ^a Regular Counter = Employees and dependents only to mirror group using kiosk ^b Monthly mean over study period ^c p<0.05 kiosk vs. regular counter ^d p<0.001 kiosk vs. regular counter		

Table 3: Patient consultations at regular counter vs kiosk^a

	Regular Counter ^b	Kiosk
Number of consultation logs	255	223
Duration (minutes) of consultation (Mean \pm SD)	3.4 \pm 1.9	2.0 \pm 1.4 ^{c,d}
Patients with questions at end of counseling session n (%)	99 (38.8%)	35 (15.7%) ^d
Number of questions for patients with more questions ^e (Mean \pm SD)	1.2 \pm 0.7	1.1 \pm 0.6
^a Documented counseling sessions: Kiosk 15 months (3/1/16-12/31/16 and 10/1/17-2/28/2018), regular counter five one-week periods (in May, June, December of 2016 and November, December 2017) ^b Regular Counter = Employees and dependents only to mirror group using kiosk ^c Missing data = 37 Counter and 9 at Kiosk: Pharmacist did not record. ^d p<0.001 kiosk vs. regular counter ^e p=0.67 kiosk vs. regular counter		

Table 4: Pharmacist-rated ability to effectively counsel at regular counter vs kiosk^a

	Fully Able 4	3	Partially Able 2	1	Not Able 0
Ability to build a therapeutic relationship with patient					
Regular Counter ^b n=246 N/A=9	147 (59.8%) ^c	94 (38.2%)	4 (1.6%)	1 (0.4%)	0 (0.0%)
Kiosk n=143 N/A=57	95 (66.4%)	42 (29.4%)	5 (3.5%)	0 (0.0%)	1 (0.7%)
Ability to establish a management plan with patient					
Regular Counter n=220 N/A=30	128 (58.2%)	90 (40.9%)	2 (0.9%)	0 (0.0%)	0 (0.0%)
Kiosk N=92 N/A=88	58 (63.0%)	28 (30.4%)	3 (3.3%)	1 (1.1%)	2 (2.2%)
Ability to negotiate 'safety netting' strategies with patient					
Regular Counter n=204 N/A=36	119 (58.3%)	83 (40.7%)	2 (1.0%)	0 (0.0%)	0 (0.0%)
Kiosk N=109 N/A=87	66 (60.6%)	36 (33.0%)	3 (2.8%)	2 (1.8%)	2 (1.8%)
N/A: Not applicable to the counseling session per pharmacist					
^a Documented counseling sessions: Kiosk 15 months (3/1/16-12/31/16 and 10/1/17-2/28/2018), regular counter five one-week periods (in May, June, December of 2016 and November, December 2017)					
^b Regular Counter = Employees and dependents only to mirror group using kiosk					
^c Percentage of total not including N/A					