

Attitudes and perceptions about the use of long-acting injectable antipsychotics among behavioral health practitioners

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Abstract

Introduction: Long-acting injectable antipsychotics (LAI-As) are important tools for the treatment of schizophrenia, yet they appear to be underutilized. This study will assess practitioner perceptions of LAI-As to elucidate reasons for underuse and uncover new avenues to increase appropriate use.

Methods: An anonymous electronic survey was developed and actively distributed to behavioral health care practitioners (MD, DO, PA, NP, PharmD, RN, LCSW). Independent *t* testing and linear regression analysis was used to assess for interactions between survey responses and individual factors.

Results: A total of 146 survey responses were collected from September 3, 2020 to March 17, 2021. On average, participants thought that LAI-As were slightly underutilized in practice. The mean estimated patient acceptance rate for LAI-A therapy was 38.6% ± 29.5% (range = 0%-100%). Participants who were <40 years of age and those with a psychiatric pharmacist at their practice site had significantly higher estimated acceptance rates. The highest-rated barriers to LAI-A use were related to negative patient attitudes, lack of patient education, and access issues (eg, transportation, cost). Respondent characteristics including age, gender identity, geographic location, practice setting, and the presence of a psychiatric pharmacist significantly influenced the perceived impact of these barriers.

Discussion: Behavioral health practitioners generally believed that LAI-As were underused, and only one-third of their patients would be accepting of the therapy. Several barriers were perceived as frequently impacting LAI-A use, but these were reduced by the presence of a psychiatric pharmacist. Understanding practitioner perceptions can assist with increasing the use of LAI-As.

Keywords: long-acting injectable, depot, antipsychotic, practitioner, perceptions

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Introduction

Schizophrenia affects an estimated 20 million individuals worldwide¹ and is associated with significant disability and excess mortality.² Treatment with antipsychotic medications can reduce hospitalization and death in this population, especially following the first psychotic episode.³⁻⁵ Unfortunately, many patients discontinue antipsychotic therapy within months of prescription, placing them at an increased risk of relapse.⁶ Long-acting injectable antipsychotic (LAI-A) formulations (also called depot) are at least as effective as oral formulations and have shown advantages in psychotic symptom control.⁷ LAI-As may increase treatment adher-

ence compared to oral agents^{8,9} and improve clinical outcomes such as hospitalizations, relapses, and mortality.¹⁰⁻¹³ A randomized clinical trial¹⁴ conducted from 2014 to 2019 confirmed that time to first hospitalization was significantly reduced in patients with early-phase schizophrenia prescribed aripiprazole LAI compared to usual treatment. Perceptions appear to reflect these favorable findings, with caregivers for patients with schizophrenia in the United States reporting a decrease in hospitalization for relapse in 63% of those on an LAI-A compared to 35% of those taking oral therapy.¹⁵

Despite mounting evidence supporting their use early and often in the treatment of schizophrenia, LAI-As are commonly reserved for use in later or more severe disease, or in response to medication nonadherence.¹⁶ The most recent American Psychiatric Association guidelines for the treatment of patients with schizophrenia suggest that patients receive an LAI-A according to their preference or if they have previously demonstrated nonadherence to therapy.¹⁷ In 2019 it was estimated that about 10% of patients with schizophrenia in the United States were taking LAI-As.¹⁸ Behavioral health professionals appear to be aware of these use patterns. In a survey¹⁹ of pharmacists practicing in the psychiatric setting in 2018, 41% believed LAI-As were underutilized. Another recent study²⁰ found that 59% of Indian psychiatrists reported underuse of these agents, with most common reasons being cost (55.45%), lack of patient interest (42.9%), lack of regular availability (41.3%), and patient hesitancy (41.2%). Several barriers to LAI-A use have previously been described,²¹⁻²³ including knowledge or education deficits (by both patients and clinicians), negative attitudes or beliefs, and lack of access due to cost and logistical factors.

Practitioners may misjudge how accepting their patients are of LAI-A therapy, which presents a perceived barrier to use. A systematic review²⁴ of studies from 1966 to 1999 measuring satisfaction with depot antipsychotics found generally positive attitudes by patients and nurses toward the medications. This was validated in more recent surveys of patients prescribed LAI-As performed in the United Kingdom²⁵ and South Africa.²⁶ Stable outpatients with schizophrenia who were switched from second-generation oral to LAI-A therapy reported subjective improvements in well-being and quality of life, along with reduced perceived disability.²⁷ Unfortunately, practitioners may not be aware of these positive perceptions. A survey²⁸ of nurses and physicians caring for patients with schizophrenia or schizoaffective disorder found that the clinicians overestimated patients' fears toward LAI-As. In another study²⁹ it was determined that psychiatrists did not discuss LAI-As with 50% of patients taking oral antipsychotic therapy for whom a therapy change was indicated.

The present study sought to add to the knowledge base regarding practitioner perceptions of patient acceptance, utilization patterns, and barriers to the use of LAI-As. The primary objective of this study was to determine mental health practitioners' estimated patient acceptance of LAI-As, frequency of barriers to LAI-A use, and utilization at their practice site, in their profession, and in their personal practice. Secondary objectives were to test the impact of mental health practitioners' age, gender identity, geographical location, role on the behavioral health team, years of experience in behavioral health care, practice setting, and presence of a psychiatric pharmacist (ie, clinical pharmacist with a specialization in psychiatry) at their practice site on responses tested in the primary objective. A better understanding of the perceived and actual use of these medications can inform practitioners' approach to expanding access and improving patient outcomes.

Methods

An electronic survey assessing behavioral health practitioners' perceptions of LAI-A utilization rates, patient acceptance, and barriers to use was developed using Qualtrics software. Survey questions collected demographic information (age group, gender identity, primary practice location/setting, and role on the behavioral health care team), asked practitioners to estimate the percentage of their patients they believe to be willing to use LAI-As, and used Likert scales to assess their perceptions about utilization in their practice site, profession, and personal practice (where 1 = *significantly underutilized* and 5 = *significantly overutilized*) and the impact of various barriers to LAI-A use (where 1 = *never presents a barrier* and 5 = *always presents a barrier*). See the Appendix for the full survey.

A link to the survey was distributed via email at 2 main inpatient behavioral health facilities (one located in the southeastern United States and one located in the midwestern United States) between September 3, 2020 and March 17, 2021. A reminder email was sent 1 month after the initial survey invitation. The practitioners solicited were physicians (MD, DO), advanced-practice providers (PA, NP), and allied health care team members (RN, LCSW, PharmD). Pharmacists included in this survey may or may not have had prescribing authority, depending on state regulations and individual practice models. The survey link was also distributed via a 1-time post to a message board on a national psychiatric pharmacist organization website.

The survey included a consent statement that must be accepted before advancing to the questions. Participation was completely voluntary, and responses were kept confidential. This study was approved by IRBs at both hospital sites and the affiliated university (Cone Health,

Community Health Network, and High Point University) in March 2020, prior to survey distribution.

Data were deidentified and analyzed using descriptive statistics. Subgroup analysis was performed to assess the impact of survey participant characteristics on their responses using independent *t* testing with equal variances not assumed and multivariate linear regression testing. Statistical analysis was performed using IBM SPSS (version 26).

Results

A total of 1085 individuals were contacted to complete the survey, and there were 146 survey attempts during the distribution period, yielding a response rate of 13.5%. An attempt was considered any survey where at least 1 question was answered. All survey attempts were included in the analysis. Age groups were broadly represented in the study population, with approximately half (47.9%) between the ages of 30 and 50. Respondents were mostly female (61.3%) and had a mean of 12.7 ± 9.8 years of experience in behavioral health (range = 1-40), with nearly half (47.9%) being new practitioners with <10 years of experience. The majority practiced within the United States, representing 26 different states, while 2 practiced abroad. See the Table for complete demographic information.

Over half of the respondents' practice sites were in the midwestern United States (57.0%), and most (77.9%) reported having a psychiatric pharmacist at their practice site. A variety of roles were represented in the study population, with the most common being registered nurse (47.8%), psychiatrist (16.3%), case manager (16.3%), and pharmacist (13.0%). Half of respondents practiced strictly in the inpatient setting, while 30.9% were outpatient, and the remaining 19.1% reported having responsibilities in both settings.

Participants estimated that a mean of $38.6\% \pm 29.5\%$ (range = 0%-100%) of their patients would be willing to take an LAI-A. Gender identity and practice setting did not significantly influence these estimations, though age <40 years ($46.1\% \pm 27.9\%$ vs $33.0\% \pm 29.1\%$, $P = .030$) and the presence of a psychiatric pharmacist at the practice site ($42.3\% \pm 29.8\%$ vs $27.1\% \pm 22.8\%$, $P = .018$) were associated with greater estimated patient acceptance rates. The majority of participants believed that LAI-As were *neither overutilized or underutilized or somewhat underutilized* at their practice site (79/104, 76.0%), in their profession (74/105, 70.5%), and in their personal practice (89/103, 86.4%; Figure 1).

Barriers to LAI-A use were rated in terms of frequency, with the most common being negative attitudes by the patient,

TABLE: Survey respondent demographics

Characteristic	Frequency, n (%)
Age group, y (n = 94)	
18-24	1 (1.1)
25-29	14 (14.9)
30-39	26 (27.7)
40-49	19 (20.2)
50-59	18 (19.1)
60 and above	16 (17.0)
Gender identity (n = 93)	
Male	35 (37.6)
Female	57 (61.3)
Transgender	0 (0.0)
Do not identify as male or female	1 (1.1)
Practice location (n = 93)	
Northeast US	9 (9.7)
Southeast US	19 (20.4)
Southwest US	2 (2.2)
West US	8 (8.6)
Midwest US	53 (57.0)
Outside US	2 (2.2)
Practice setting (n = 94)	
Strictly inpatient	47 (50.0)
Mixed inpatient and outpatient	18 (19.1)
Strictly outpatient	29 (30.9)
Practice role (n = 92)	
Psychiatrist	15 (16.3)
Physician assistant	0 (0.0)
Nurse practitioner	2 (2.2)
Registered nurse	44 (47.8)
Pharmacist	12 (13.0)
Social worker	4 (4.3)
Case manager	15 (16.3)
Years in practice (n = 94)	
<10	45 (47.9)
10-20	26 (27.7)
>20	23 (24.5)

fear of needles, lack of patient education, lack of transportation, and financial issues (*copay too expensive or not covered by insurance*; Figure 2). Having a psychiatric pharmacist at the practice site was associated with significantly lower perceived impact of fear of needles (3.9 ± 0.8 vs 4.3 ± 0.8 , $P = .040$) and lack of patient education (3.8 ± 0.9 vs 4.3 ± 0.6 , $P = .011$) as barriers to LAI-A use. Males viewed lack of transportation as less of a barrier than females (3.7 ± 0.9 vs 4.1 ± 0.9 , $P = .042$), while those in the midwestern United States perceived negative attitudes by prescribers as less of a barrier than those in the southeastern United States (2.8 ± 0.8 vs 3.6 ± 1.1 , $P = .007$).

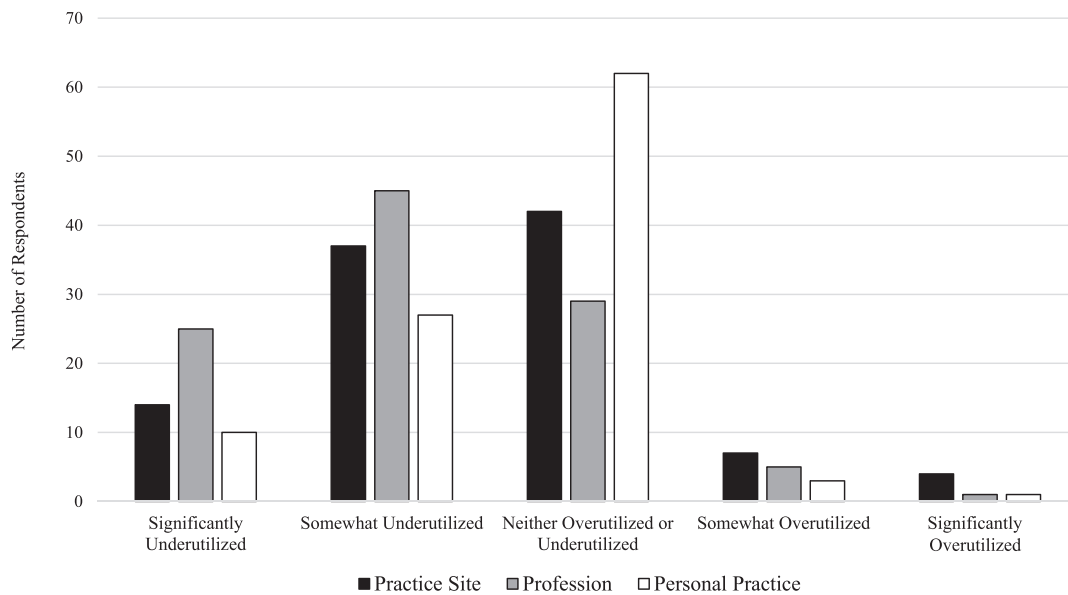


FIGURE 1: Perception of long-acting injectable antipsychotic utilization rates by survey respondents; bars = frequency of each response

Age significantly impacted the perception of several barriers, with those ≥ 40 years old viewing negative attitudes by the prescriber (3.3 ± 1.0 vs 2.8 ± 0.7 , $P = .004$), negative attitudes by the public (3.3 ± 0.9 vs 2.8 ± 0.8 , $P = .041$), and lack of patient education (4.1 ± 0.8 vs 3.6 ± 0.9 , $P = .009$) as greater barriers to LAI-A use than those < 40 years old. Those that practiced strictly in the inpatient setting believed lack of patient education to be less of a

barrier than those who practiced in the outpatient setting (3.7 ± 0.9 vs 4.1 ± 0.9 , $P = .023$). None of the subgroups tested significantly differed in terms of perceived practice, professional, or personal utilization of LAI-As.

Linear regression testing revealed that participant age (adjusted $R^2 = 0.107$, standardized $\beta = -0.400$, $P = .007$) and role on the behavioral health care team (adjusted

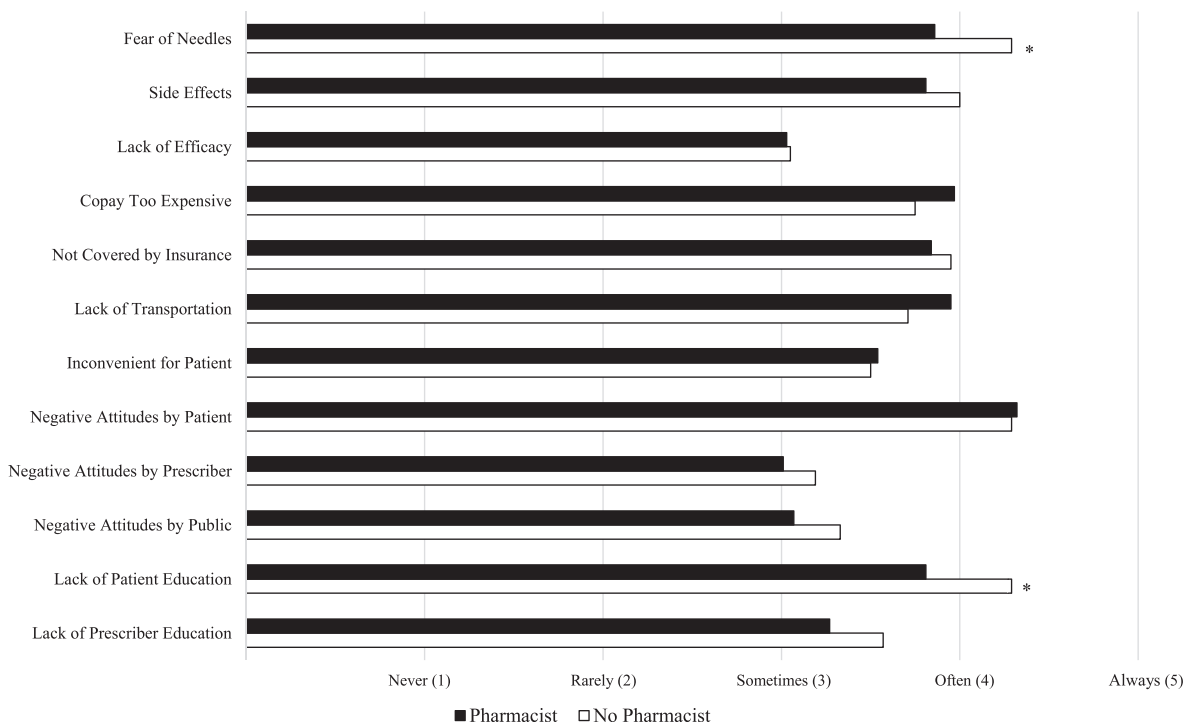


FIGURE 2: Ratings of long-acting injectable antipsychotic utilization barriers by survey respondents; * = statistically significant difference ($P < .05$); bars = mean responses (where 1 = never presents a barrier and 5 = always presents a barrier)

$R^2=0.107$, standardized $\beta=0.303$, $P=.014$) were statistically significant predictors of *lack of transportation* as a perceived barrier to LAI-A use. Geographic location was a significant predictor of the frequency of financial barriers *copay too expensive* (adjusted $R^2=0.085$, standardized $\beta=0.317$, $P=.007$) and *not covered by insurance* (adjusted $R^2=0.085$, standardized $\beta=0.304$, $P=.009$) being perceived by participants. Estimations of patients willing to take an LAI-A and utilization rates in practice site, profession, and personal practice were not significantly predicted by prespecified participant characteristics using regression modeling.

Discussion

The sample of behavioral health practitioners participating in this survey study was fairly diverse in terms of age, years of experience in the field, and practice setting. Overall, respondents believed that LAI-As were utilized at an appropriate rate or slightly underutilized in their practice experience, and they estimated that the majority of their patients would not be accepting of an LAI-A. Behavioral health care practitioners aged <40 years and those with a psychiatric pharmacist at their practice site perceived significantly higher patient acceptance rates. The barriers to LAI-A use that were experienced most frequently were negative attitudes by the patient, fear of needles, lack of patient education, lack of transportation, and financial issues. Age and the presence of a psychiatric pharmacist, as well as gender identity, geographical region, and practice setting, all significantly impacted the perceived importance for different barriers.

Given that the first LAI-As were developed in the late 1960s,³⁰ more seasoned behavioral health care practitioners may have entered practice when these agents were still relatively novel and less data existed supporting their safety and efficacy. Conversely, practitioners under the age of 40 were likely exposed to LAI-As during their training as a more established, evidence-based treatment option. As a result, younger practitioners may have more optimistic views on LAI-As, estimating that more of their patients would be accepting of treatment and perceiving less of a barrier to use from factors such as negative attitudes and lack of patient education. Previous studies suggest that psychiatrists with fewer years of experience are more likely to prescribe newer second-generation LAI-As,³¹ supporting differences in use patterns based on age.

In this investigation, knowledge about LAI-As emerged as an important theme in the perceived barriers to use. A study³² of European physicians published in 2020 found that those who reported stress when prescribing LAI-As were more likely to prefer oral agents. The authors suggest that this discomfort may arise from a lack of knowledge

about the medications. A review article²² from 2016 describes limited knowledge and experience with LAI-As among psychiatrists and hesitancy regarding controversial studies about the medications. This will likely become less of an issue over time as the use of these agents becomes increasingly widespread and more evidence is added to the scientific knowledgebase surrounding their safety and efficacy.

Subgroup analysis revealed that the presence of a psychiatric pharmacist at the practice site significantly increased respondents' estimations of the percentage of patients who would be accepting of an LAI-A. The expanding role of clinical pharmacy specialists in psychiatry and recent legislation in many parts of the United States allowing them to administer LAI-As may assist in reducing access barriers to treatments.³³ Surveys of primary care practitioners with an integrated psychiatric pharmacist at their practice indicate that they frequently utilize the services offered and feel more comfortable with prescribing psychotropics.³⁴ Nonspecialty pharmacists can play an important role in the delivery of mental health care as well. Patient satisfaction surveys indicate favorable attitudes toward pharmacist-administered LAI-As in the community setting, particularly because of increased convenience,³⁵ which suggests that this delivery mechanism may further reduce barriers to the use of the medications.

Patient education represents an additional route to increasing knowledge about LAI-As and can have a substantial impact on treatment acceptance. Prior to receiving information about the medication, only 5% of psychiatric outpatients preferred LAI-A versus oral antipsychotic therapy, while 24.9% reported considering LAI-A therapy following education.³⁶ Access to information may also offer insight into the finding of the present study that practitioners practicing strictly in the inpatient setting perceived lack of patient education as less of a barrier to LAI-A use. Many behavioral health hospitals, especially those with psychiatric pharmacists on staff, operate patient medication education programs, either in the large group setting or via one-on-one consultation. This affords more opportunities for practitioners to ensure that patient knowledge about LAI-As is sufficient prior to discharge.

Prescribers can attempt to overcome barriers to LAI-A use by offering the option to all of their eligible patients (including those newly diagnosed with schizophrenia), providing education on the benefits and risks associated with treatment, and correcting any misperceptions that the patient may have about the medication.³⁷ This requires patients and other care team members to receive accurate information about LAI-As,³⁸ which is not always the case. A study²⁹ from 2013 found that antipsychotic treatment decisions were made without patient or caregiver input in 67% of psychiatrist-patient conversations. Patients should

be involved in a shared decision-making process with the practitioner regarding medication prescribing, which builds trust and can increase the likelihood of treatment success.²²

Those prescribed an LAI-A who also preferred this formulation had greater positive attitudes toward the medication,²⁶ underscoring the importance of securing patient buy-in. The American Psychiatric Association advocates discussing potential benefits and risks of antipsychotic medication with patients in order to establish a therapeutic alliance.¹⁷ Strengthening the patient-practitioner relationship can improve insight and adherence to LAI-A treatment through activities such as goal setting.³⁹ Importantly, involvement in the shared decision-making process can lessen patient perceptions of being coerced into LAI-A therapy.⁴⁰ Negative attitudes at the initiation of LAI-A treatment predict discontinuation⁴¹ and should be addressed by practitioners in an effort to increase the likelihood of success. One strategy to increase acceptance is offering LAI-A therapy early, especially during hospitalization.²³

This study was limited by a low response rate, which may have been improved by the use of additional survey reminders or other strategies to boost participation. Another limitation was the potentially biased sample overrepresented by registered nurses and those practicing at the main study sites in Indiana and North Carolina. It is unclear how participants' roles on the behavioral health care team may have influenced their perceptions on LAI-A acceptance, utilization, and barriers, but their geographical location appears to have significantly influenced responses, as those in the midwestern United States (which represented more than half of the total survey participants) perceived negative attitudes by prescriber as less of a barrier than those in the southeastern United States. This finding does not appear to be driven by age, but rather indicates regional differences in practice patterns that may result from the existence of psychiatry training programs, varying availability of LAI-A agents, and/or exposure to pharmaceutical industry representatives. Finally, wording of the survey question asking participants to estimate the percentage of their patients that are willing to use a LAI-A should have specified *eligible* patients. This may have led to some respondents misinterpreting the question and underestimating the percentage if they were estimating out of *all* patients.

Investigating practitioner perceptions on LAI-As can assist in the development of strategies to overcome barriers to the use of these medications in the treatment of schizophrenia. The present study adds evidence of the impact of variables previously described (practitioner age and patient/practitioner knowledge) as well as those not yet described (presence of a psychiatric pharmacist and geographic location) on the perceived utilization of LAI-As. It is also unique in its multisite design that included representation

from the full complement of behavioral health care team members. Future research could further explore the influence of various factors with a more targeted survey or a comparative study assessing actual prescribing patterns.

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References

1. James SL, Abate D, Abate KH, Abay SM, Abbafati C, Abbasi N, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet*. 2018;392(10159):1789–858. DOI: [10.1016/S0140-6736\(18\)32279-7](https://doi.org/10.1016/S0140-6736(18)32279-7). PubMed PMID: [30496104](https://pubmed.ncbi.nlm.nih.gov/30496104/).
2. Laursen TM, Nordentoft M, Mortensen PB. Excess early mortality in schizophrenia. *Annu Rev Clin Psychol*. 2014;10:425–48. DOI: [10.1146/annurev-clinpsy-032813-153657](https://doi.org/10.1146/annurev-clinpsy-032813-153657). PubMed PMID: [24313570](https://pubmed.ncbi.nlm.nih.gov/24313570/).
3. Leucht S, Tardy M, Komossa K, Heres S, Kissling W, Salanti G, et al. Antipsychotic drugs versus placebo for relapse prevention in schizophrenia: a systematic review and meta-analysis. *Lancet*. 2012;379(9831):2063–71. DOI: [10.1016/S0140-6736\(12\)60239-6](https://doi.org/10.1016/S0140-6736(12)60239-6). PubMed PMID: [22560607](https://pubmed.ncbi.nlm.nih.gov/22560607/).
4. Taipale H, Mehtälä J, Tanskanen A, Tiihonen J. Comparative effectiveness of antipsychotic drugs for rehospitalization in schizophrenia—a nationwide study with 20-year follow-up. *Schizophr Bull*. 2018;44(6):1381–7. DOI: [10.1093/schbul/sbx176](https://doi.org/10.1093/schbul/sbx176). PubMed PMID: [29272458](https://pubmed.ncbi.nlm.nih.gov/29272458/).
5. Tiihonen J, Tanskanen A, Taipale H. 20-year nationwide follow-up study on discontinuation of antipsychotic treatment in first-episode schizophrenia. *Am J Psychiatry*. 2018;175(8):765–73. DOI: [10.1176/appi.ajp.2018.17091001](https://doi.org/10.1176/appi.ajp.2018.17091001). PubMed PMID: [29621900](https://pubmed.ncbi.nlm.nih.gov/29621900/).
6. Miller BJ. A review of second-generation antipsychotic discontinuation in first-episode psychosis. *J Psychiatr Pract*. 2008;14(5):289–300. DOI: [10.1097/01.pra.0000336756.65308.83](https://doi.org/10.1097/01.pra.0000336756.65308.83). PubMed PMID: [18832960](https://pubmed.ncbi.nlm.nih.gov/18832960/).
7. Buckley PF, Schooler NR, Goff DC, Hsiao J, Kopelowicz A, Lauriello J, et al. Comparison of SGA oral medications and a long-acting injectable SGA: the PROACTIVE study. *Schizophr Bull*. 2015;41(2):449–59. DOI: [10.1093/schbul/sbu067](https://doi.org/10.1093/schbul/sbu067). PubMed PMID: [24870446](https://pubmed.ncbi.nlm.nih.gov/24870446/); PubMed Central PMCID: [PMC4332934](https://pubmed.ncbi.nlm.nih.gov/PMC4332934/).
8. Marcus SC, Zummo J, Pettit AR, Stoddard J, Doshi JA. Antipsychotic adherence and rehospitalization in schizophrenia patients receiving oral versus long-acting injectable antipsychotics following hospital discharge. *J Manag Care Spec Pharm*. 2015; 21(9):754–68. DOI: [10.18553/jmcp.2015.21.9.754](https://doi.org/10.18553/jmcp.2015.21.9.754). PubMed PMID: [26308223](https://pubmed.ncbi.nlm.nih.gov/26308223/).
9. Titus-Lay EN, Ansara ED, Isaacs AN, Ott CA. Evaluation of adherence and persistence with oral versus long-acting injectable antipsychotics in patients with early psychosis. *Ment Health Clin* [Internet]. 2018;8(2):56–62. DOI: [10.9740/mhc.2018.03.056](https://doi.org/10.9740/mhc.2018.03.056). PubMed PMID: [29955546](https://pubmed.ncbi.nlm.nih.gov/29955546/); PubMed Central PMCID: [PMC6007741](https://pubmed.ncbi.nlm.nih.gov/PMC6007741/).
10. Tiihonen J, Mittendorfer-Rutz E, Majak M, Mehtälä J, Hoti F, Jedenius E, et al. Real-world effectiveness of antipsychotic treatments in a nationwide cohort of 29 823 patients with schizophrenia. *JAMA Psychiatry*. 2017;74(7):686–93. DOI: [10.1001/jamapsychiatry.2017.1322](https://doi.org/10.1001/jamapsychiatry.2017.1322). PubMed PMID: [28593216](https://pubmed.ncbi.nlm.nih.gov/28593216/); PubMed Central PMCID: [PMC5710250](https://pubmed.ncbi.nlm.nih.gov/PMC5710250/).

11. Kishimoto T, Hagi K, Nitta M, Leucht S, Olfson M, Kane JM, et al. Effectiveness of long-acting injectable vs oral antipsychotics in patients with schizophrenia: a meta-analysis of prospective and retrospective cohort studies. *Schizophr Bull.* 2018;44(3):603-19. DOI: [10.1093/schbul/sbx090](https://doi.org/10.1093/schbul/sbx090). PubMed PMID: [29868849](https://pubmed.ncbi.nlm.nih.gov/29868849/); PubMed Central PMCID: [PMC5890463](https://pubmed.ncbi.nlm.nih.gov/PMC5890463/).
12. Kim HO, Seo GH, Lee BC. Real-world effectiveness of long-acting injections for reducing recurrent hospitalizations in patients with schizophrenia. *Ann Gen Psychiatry.* 2020;19:1. DOI: [10.1186/s12991-019-0254-2](https://doi.org/10.1186/s12991-019-0254-2). PubMed PMID: [31956334](https://pubmed.ncbi.nlm.nih.gov/31956334/); PubMed Central PMCID: [PMC6958777](https://pubmed.ncbi.nlm.nih.gov/PMC6958777/).
13. Kishimoto T, Hagi K, Kurokawa S, Kane JM, Correll CU. Long-acting injectable versus oral antipsychotics for the maintenance treatment of schizophrenia: a systematic review and comparative meta-analysis of randomised, cohort, and pre-post studies. *Lancet Psychiatry.* 2021;8(5):387-404. DOI: [10.1016/S2215-0366\(21\)00039-0](https://doi.org/10.1016/S2215-0366(21)00039-0). PubMed PMID: [33862018](https://pubmed.ncbi.nlm.nih.gov/33862018/).
14. Kane JM, Schooler NR, Marcy P, Correll CU, Achtyes ED, Gibbons RD, et al. Effect of long-acting injectable antipsychotics vs usual care on time to first hospitalization in early-phase schizophrenia: a randomized clinical trial. *JAMA Psychiatry.* 2020;77(12):1217-24. DOI: [10.1001/jamapsychiatry.2020.2076](https://doi.org/10.1001/jamapsychiatry.2020.2076). PubMed PMID: [32667636](https://pubmed.ncbi.nlm.nih.gov/32667636/).
15. Chen M, Shepherd J, Bailey H, Wright J, Fitzgerald HM. Analysis of treatment goals for patients with schizophrenia: US survey of psychiatrists, patients with SCZ and caregivers [abstract]. *CNS Spectr.* 2021;26(2):158. DOI: [10.1017/s1092852920002539](https://doi.org/10.1017/s1092852920002539).
16. Fitzgerald HM, Shepherd J, Bailey H, Berry M, Wright J, Chen M. Characterization and treatment goals of patients on long-acting injectable vs oral antipsychotics: results from a patient/caregiver/psychiatrist survey [abstract]. *CNS Spectr.* 2021;26(2):154. DOI: [10.1017/s109285292000245x](https://doi.org/10.1017/s109285292000245x).
17. Keepers GA, Fochtmann LI, Anzia JM, Benjamin S, Lyness JM, Mojtabai R, et al. The American Psychiatric Association practice guidelines for the treatment of patients with schizophrenia. *Am J Psychiatry.* 2020;177(9):868-72. DOI: [10.1176/appi.ajp.2020.177901](https://doi.org/10.1176/appi.ajp.2020.177901). PubMed PMID: [32867516](https://pubmed.ncbi.nlm.nih.gov/32867516/).
18. Canady VA. Long-acting injectables good option for schizophrenia patients. *Ment Health Wkly.* 2019;29(15):6-7. DOI: [10.1002/mhw.31861](https://doi.org/10.1002/mhw.31861).
19. Cusimano J, VandenBerg A. Long-acting injectable antipsychotics and their use in court-ordered treatment: a cross-sectional survey of psychiatric pharmacists' perceptions. *Ment Health Clin [Internet].* 2020;10(1):18-24. DOI: [10.9740/mhc.2020.01.018](https://doi.org/10.9740/mhc.2020.01.018). PubMed PMID: [31942274](https://pubmed.ncbi.nlm.nih.gov/31942274/); PubMed Central PMCID: [PMC6956974](https://pubmed.ncbi.nlm.nih.gov/PMC6956974/).
20. Grover S, Sahoo S, Mehra A. Perceptions of psychiatrists toward the use of long-acting injectable antipsychotics: an online survey study from India. *J Clin Psychopharmacol.* 2019;39(6):611-9. DOI: [10.1097/JCP.0000000000001109](https://doi.org/10.1097/JCP.0000000000001109). PubMed PMID: [31688382](https://pubmed.ncbi.nlm.nih.gov/31688382/).
21. Blixen C, Lema I, Mbwambo J, Kaaya S, Levin JB, Sajatovic M. Community perceptions of barriers to management of chronic psychotic disorders and knowledge and attitudes about long-acting injectable antipsychotic medication: qualitative study in Dar es Salaam, Tanzania. *BJPsych Open.* 2020;6(2):e27. DOI: [10.1192/bjo.2020.4](https://doi.org/10.1192/bjo.2020.4). PubMed PMID: [32157988](https://pubmed.ncbi.nlm.nih.gov/32157988/).
22. Parellada E, Bioque M. Barriers to the use of long-acting injectable antipsychotics in the management of schizophrenia. *CNS Drugs.* 2016;30(8):689-701. DOI: [10.1007/s40263-016-0350-7](https://doi.org/10.1007/s40263-016-0350-7). PubMed PMID: [27255405](https://pubmed.ncbi.nlm.nih.gov/27255405/).
23. Lindenmayer J-P, Glick ID, Talreja H, Underriner M. Persistent barriers to the use of long-acting injectable antipsychotics for the treatment of schizophrenia. *J Clin Psychopharmacol.* 2020;40(4):346-9. DOI: [10.1097/JCP.0000000000001225](https://doi.org/10.1097/JCP.0000000000001225). PubMed PMID: [32639287](https://pubmed.ncbi.nlm.nih.gov/32639287/).
24. Walburn J, Gray R, Gournay K, Quraishi S, David AS. Systematic review of patient and nurse attitudes to depot antipsychotic medication. *Br J Psychiatry.* 2001;179(4):300-7. DOI: [10.1192/bjp.179.4.300](https://doi.org/10.1192/bjp.179.4.300). PubMed PMID: [11581109](https://pubmed.ncbi.nlm.nih.gov/11581109/).
25. Mace S, Chak O, Punny S, Sedough-Abbasian D, Vegad C, Taylor DM. Positive views on antipsychotic long-acting injections: results of a survey of community patients prescribed antipsychotics. *Ther Adv Psychopharmacol.* 2019;9:2045125319860977. DOI: [10.1177/2045125319860977](https://doi.org/10.1177/2045125319860977). PubMed PMID: [31321027](https://pubmed.ncbi.nlm.nih.gov/31321027/).
26. Roopun KR, Tomita A, Paruk S. Attitude and preferences towards oral and long-acting injectable antipsychotics in patients with psychosis in KwaZulu-Natal, South Africa. *S Afr J Psychiatr.* 2020;26:1509. DOI: [10.4102/sajpsychiatry.v26i0.1509](https://doi.org/10.4102/sajpsychiatry.v26i0.1509). PubMed PMID: [32832130](https://pubmed.ncbi.nlm.nih.gov/32832130/).
27. Pietrini F, Tatini L, Santarelli G, Brugnolo D, Squillace M, Bozza B, et al. Self- and caregiver-perceived disability, subjective well-being, quality of life and psychopathology improvement in long-acting antipsychotic treatments: a 2-year follow-up study. *Int J Psychiatry Clin Pract.* 2021;25(3):307-15. DOI: [10.1080/13651501.2021.1912358](https://doi.org/10.1080/13651501.2021.1912358). PubMed PMID: [34057873](https://pubmed.ncbi.nlm.nih.gov/34057873/).
28. Cahling L, Berntsson A, Bröms G, Öhrmalm L. Perceptions and knowledge of antipsychotics among mental health professionals and patients. *BJPsych Bull.* 2017;41(5):254-9. DOI: [10.1192/pb.bp.116.055483](https://doi.org/10.1192/pb.bp.116.055483). PubMed PMID: [29018549](https://pubmed.ncbi.nlm.nih.gov/29018549/); PubMed Central PMCID: [PMC5623883](https://pubmed.ncbi.nlm.nih.gov/PMC5623883/).
29. Potkin S, Bera R, Zubek D, Lau G. Patient and prescriber perspectives on long-acting injectable (LAI) antipsychotics and analysis of in-office discussion regarding LAI treatment for schizophrenia. *BMC Psychiatry.* 2013;13:261. DOI: [10.1186/1471-244X-13-261](https://doi.org/10.1186/1471-244X-13-261). PubMed PMID: [24131801](https://pubmed.ncbi.nlm.nih.gov/24131801/).
30. Crocq M-A. [A history of antipsychotic long-acting injections in the treatment of schizophrenia]. *Encephale.* 2015;41(1):84-92. French. DOI: [10.1016/j.encep.2014.12.002](https://doi.org/10.1016/j.encep.2014.12.002). PubMed PMID: [25598520](https://pubmed.ncbi.nlm.nih.gov/25598520/).
31. Kenicer D, Ellahi R, Davies P, Walker A, Cheyne A. Factors important to psychiatrists when prescribing depot antipsychotics. *Prog Neurol Psychiatry.* 2016;20(3):16-20. DOI: [10.1002/pnp.428](https://doi.org/10.1002/pnp.428).
32. Patel MX, Bent-Ennakhl N, Sapin C, di Nicola S, Loze J-Y, Nylander A-G, et al. Attitudes of European physicians towards the use of long-acting injectable antipsychotics. *BMC Psychiatry.* 2020;20(1):123. DOI: [10.1186/s12888-020-02530-2](https://doi.org/10.1186/s12888-020-02530-2). PubMed PMID: [32169077](https://pubmed.ncbi.nlm.nih.gov/32169077/); PubMed Central PMCID: [PMC7071632](https://pubmed.ncbi.nlm.nih.gov/PMC7071632/).
33. Goldstone LW, Dipaula BA, Werremeyer A, Botts S, Hepburn B, Liu HY, et al. The role of board-certified psychiatric pharmacists in expanding access to care and improving patient outcomes. *Psychiatr Serv.* 2021;72(7):794-801. DOI: [10.1176/appi.ps.202000066](https://doi.org/10.1176/appi.ps.202000066). PubMed PMID: [33940946](https://pubmed.ncbi.nlm.nih.gov/33940946/).
34. Chavez B, Kosirog E. Impact on an integrated psychiatric pharmacy service in a primary care clinic. *Ment Health Clin [Internet].* 2019;9(4):269-74. DOI: [10.9740/mhc.2019.07.269](https://doi.org/10.9740/mhc.2019.07.269). PubMed PMID: [31293846](https://pubmed.ncbi.nlm.nih.gov/31293846/); PubMed Central PMCID: [PMC6607947](https://pubmed.ncbi.nlm.nih.gov/PMC6607947/).
35. Mooney EV, Hamper JG, Willis RT, Farinha TL, Ricchetti CA. Evaluating patient satisfaction with pharmacist-administered long-acting injectable antipsychotics in the community pharmacy. *J Am Pharm Assoc (2003).* 2018;58(4S):S24-S29.e2. DOI: [10.1016/j.japh.2018.04.035](https://doi.org/10.1016/j.japh.2018.04.035). PubMed PMID: [30006184](https://pubmed.ncbi.nlm.nih.gov/30006184/).
36. Grover S, Sahoo S, Bn S, Malhotra N, Dua D, Avasthi A. Attitude and perceptions of patients towards long acting depot injections (LAIs). *Asian J Psychiatr.* 2019;44:200-8. DOI: [10.1016/j.ajp.2019.07.052](https://doi.org/10.1016/j.ajp.2019.07.052). PubMed PMID: [31419737](https://pubmed.ncbi.nlm.nih.gov/31419737/).
37. Taylor DM, Velaga S, Werneke U. Reducing the stigma of long acting injectable antipsychotics - current concepts and future developments. *Nord J Psychiatry.* 2018;72(sup1):S36-9. DOI: [10.1080/08039488.2018.1525638](https://doi.org/10.1080/08039488.2018.1525638). PubMed PMID: [30688170](https://pubmed.ncbi.nlm.nih.gov/30688170/).
38. Robinson DG, Subramaniam A, Fearis PJ, Shi R, Walsh M, Hanna LA, et al. Focused ethnographic examination of barriers to use of long-acting injectable antipsychotics. *Psychiatr Serv.* 2020;71(4):337-42. DOI: [10.1176/appi.ps.201900236](https://doi.org/10.1176/appi.ps.201900236). PubMed PMID: [31847736](https://pubmed.ncbi.nlm.nih.gov/31847736/).

39. Fehér L, Kalisova L, Dubinská S, Hermán L, Susac J, Risler M, et al. [Become the expert and embrace a positive attitude: communication strategies for discussing long-acting injectable antipsychotic treatment with patients living with schizophrenia]. *Psychiatr Hung*. 2020;35(2):211-22. Hungarian. PubMed PMID: [32191223](#).
40. Fiorillo A, Barlati S, Bellomo A, Corrivetti G, Nicolò G, Sampogna G, et al. The role of shared decision-making in improving adherence to pharmacological treatments in patients with schizophrenia: a clinical review. *Ann Gen Psychiatry*. 2020;19:43. DOI: [10.1186/s12991-020-00293-4](#). PubMed PMID: [32774442](#).
41. Tatini L, D'Anna G, Pietrini F, Calligaris E, Ballerini A, Ricca V. Predictors of long-acting injectable antipsychotic treatment discontinuation in outpatients with schizophrenia: relevance of the Drug Attitude Inventory-10. *Int Clin Psychopharmacol*. 2021; 36(4):181-7. DOI: [10.1097/YIC.0000000000000359](#). PubMed PMID: [33902086](#).

APPENDIX: Long-acting injectable antipsychotics (LAI-As) clinician survey

- Q1.** Approximately what percentage of your patients are **willing** to use a LAI-A?
- Q2.** Thinking about your **practice site**, which of the following best characterized the utilization of LAI-As?
- Significantly underutilized
 - Somewhat underutilized
 - Neither overutilized or underutilized
 - Somewhat overutilized
 - Significantly overutilized
- Q3.** Thinking about your **profession**, which of the following best characterized the utilization of LAI-As?
- Significantly underutilized
 - Somewhat underutilized
 - Neither overutilized or underutilized
 - Somewhat overutilized
 - Significantly overutilized
- Q4.** Thinking about your **personal practice**, which of the following best characterized your utilization of LAI-As?
- Significantly underutilized
 - Somewhat underutilized
 - Neither overutilized or underutilized
 - Somewhat overutilized
 - Significantly overutilized

(See end of Appendix for Q5 Table.)

- Q6.** Do you have a clinical pharmacy specialist in behavioral health at your primary practice site?
- Yes
 - No
- Q7.** Which of the following best describes your age?
- 18-24
 - 25-29
 - 30-39
 - 40-49
 - 50-59
 - 60 and above
- Q8.** What is your gender identity?
- Male
 - Female
 - Transgender
 - Do not identify as male, female, or transgender
- Q9.** Which state is your primary practice site?
- _____

Q10. Which best describes your role on the behavioral health team?

- Psychiatrist
- Physician assistant
- Nurse practitioner
- Nurse
- Pharmacist
- Social worker
- Case manager

Q11. How many years have you practiced in behavioral health?

Q12. How would you describe your practice setting?

- Strictly inpatient
- Mixed inpatient and outpatient
- Strictly outpatient

Q5 (*moved to the end for the purposes of this article*). In your experience, how often do each of the following factors present a **barrier** to the utilization of LAI-As?

	Never	Rarely	Sometimes	Often	Always
Fear of needles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Side effects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of efficacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Copay too expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not covered by insurance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inconvenient for patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative attitudes by patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative attitudes by prescriber	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative attitudes by the public	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of patient education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of prescriber education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>