

Introducing S.C.O.P.E.TM (Schizophrenia Clinical Outcome Scenarios and Patient–Provider Engagement), an Interactive Digital Platform to Educate Healthcare Professionals on Schizophrenia Care

Christoph U Correll^{1-4,*}, Jose M Rubio^{1-3,*}, Leslie Citrome^{5,*}, Marko A Mychaskiw⁶, Stephen Thompson⁶, Kelli R Franzenburg⁷, Mark Suett⁸, Sameer Kotak⁹, John M Kane^{1-3,*}

¹Department of Psychiatry, The Zucker Hillside Hospital, Northwell Health, Glen Oaks, NY, USA; ²Department of Psychiatry, Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY, USA; ³Institute of Behavioral Science, Feinstein Institutes for Medical Research, Manhasset, NY, USA; ⁴Department of Child and Adolescent Psychiatry, Charité – Universitätsmedizin Berlin, Berlin, Germany; ⁵Department of Psychiatry and Behavioral Sciences, New York Medical College, Valhalla, NY, USA; ⁶Global Health Economics and Outcomes Research, Teva Branded Pharmaceutical Products R&D, Inc., West Chester, PA, USA; ⁷Global Medical Affairs, Teva Branded Pharmaceutical Products R&D, Inc., West Chester, PA, USA; ⁸Global Medical Affairs, Teva UK Limited, Harlow, United Kingdom; ⁹Yorker Health Corp., Glen Rock, NJ, USA

*These authors contributed equally to this work

Correspondence: Christoph U Correll, Email ccorrell@northwell.edu

Abstract: Despite evidence of benefits beyond those of oral antipsychotics, long-acting injectable antipsychotics (LAIs) are underused in schizophrenia treatment. Underuse may be partially a result of misconceptions held by some healthcare professionals (HCPs) pertaining to LAIs. A panel of four experts convened between January 2022 and May 2022 to identify these misconceptions, and example cases or scenarios were created to illustrate common clinical situations relevant to these beliefs. Ultimately, an online platform and heuristic tool, Schizophrenia Clinical Outcome Scenarios and Patient-Provider Engagement (S.C.O.P.E.TM), was developed to help prescribing clinicians and other HCPs better understand common clinical dilemmas, as well as the place for LAIs in schizophrenia treatment. Three main misconceptions related to the use of LAIs to treat schizophrenia were identified and included “physicians/providers know when patients are nonadherent”, “patients do not accept/want LAI treatment”, and “LAIs are only appropriate for patients who have demonstrated nonadherence”. All misconceptions are refuted by current evidence and were used to develop clinical scenarios with questions to consider when patients present to various sites of care for treatment. These cases are presented on the S.C.O.P.E. educational platform. The platform also includes videos designed to help non-prescribing HCPs and mental health professionals address patient/caregiver concerns and to communicate LAI benefits. In addition, S.C.O.P.E. provides a section with information about each LAI that is currently FDA approved in the United States for the treatment of schizophrenia, to help familiarize HCPs with characteristics of LAIs. S.C.O.P.E. is an educational tool designed for HCPs to help improve their understanding of how to manage common clinical dilemmas in the treatment of people with schizophrenia, to clarify the role of LAIs in medication management, and to increase understanding of the characteristics of available LAIs. S.C.O.P.E. also aims to improve care in schizophrenia by facilitating increased awareness to patients and caregivers.

Plain Language Summary: Schizophrenia is a serious, lifelong mental health disorder that affects about 2.8 million adults in the United States and many more worldwide. Symptoms can include hallucinations (ie, hearing “voices”), delusions (ie, convinced something is true when it is not), poor attention, lack of motivation and interest, and cognitive problems. Schizophrenia can have considerable impact on people with the disorder as well as their families, friends, and communities. There are several treatment options available for healthcare professionals (HCPs), patients, and caregivers to consider, with antipsychotic medicines being the cornerstone

of the treatment for schizophrenia. Long-acting injectable antipsychotics (LAIs) have shown benefits over antipsychotics taken orally (by mouth), but are underused, and this is likely due to some common misconceptions.

Four experts in schizophrenia treatment met repeatedly online to identify some of these misconceptions and created a tool to help HCPs learn about misconceptions, using example cases of patients with schizophrenia who have different types of clinical situations and concerns. On the Schizophrenia Clinical Outcome Scenarios and Patient-Provider Engagement (S.C.O.P.E.TM) interactive digital platform, HCPs can choose in which type of case they are interested in and see details of the case, information they should obtain about the case, and appropriate considerations for LAI use. The tool also provides videos about communicating with patients and their families about LAIs, and information about the different LAIs currently available.

The goal of providing this tool to HCPs is to improve understanding of how to treat patients with schizophrenia and the role that LAIs can play.

Keywords: long-acting injectable antipsychotic, schizophrenia, treatment, education, patient outcomes

Introduction

Schizophrenia is a chronic mental health disorder that is estimated to affect 2.8 million adults in the United States (US) and more than 21 million people worldwide.¹ The broad range of symptoms associated with the disorder include positive symptoms (eg, hallucinations, delusions), negative symptoms (eg, amotivation, anhedonia, asociality), and cognitive impairment (eg, poor attention, memory problems); these symptoms can interfere with education, work, interpersonal relationships, and self-care.²

Following treatment of acute episodes of psychosis, maintenance therapy with antipsychotics has been shown to significantly reduce the likelihood of relapse.^{3–5} However, nonadherence or poor adherence to oral antipsychotics has been consistently reported, accounting for the most common and most impactful risk factor for relapse and hospitalization in schizophrenia.⁶ Studies have found that the use of long-acting injectable antipsychotics (LAIs) helps to control positive symptoms and decreases the risk of the patient experiencing hospitalization, relapse, or premature death.^{7–12} Evidence from a small number of studies and a meta-analysis suggest LAIs may also improve adherence.^{7,8,10} However, this evidence is limited and lacks direct assessments of adherence. LAIs may be preferred by patients, if appropriately given the choice of receiving them.^{13,14} In addition, a survey of caregivers of patients with schizophrenia in the United States found that those caring for patients receiving LAI antipsychotic treatments generally had fewer barriers (eg, less strain on their emotional health, less inability to have a satisfying personal life) than those caring for patients not receiving such treatments.¹⁵

Although both clinical data and published treatment guidelines have supported the utility of LAIs in schizophrenia management, LAIs remain underused.^{13,14,16–20} Commercial claims and survey data suggest that many fewer patients receive LAIs than oral antipsychotics, and that treatment with LAIs is reserved for later in the disease course, more severe disease, and/or patients who have clearly demonstrated adherence problems.^{21–23} US-based claims data showed only ≈5% of patients with newly-diagnosed schizophrenia received treatment with an LAI, and more than half (118 of 202 [58%]) of patients received ≥2 different oral antipsychotics before initiating an LAI.^{13,22} This delayed use is common, despite the evidence that earlier use of LAIs in the treatment algorithm has been shown to positively affect outcomes in people with schizophrenia.^{24–28}

The specific reasons for the underuse of LAIs are unclear. Challenges in treating patients with schizophrenia, such as multiple comorbidities, substance abuse, lack of patient illness insight, or response to oral antipsychotics for which an equivalent LAI formulation is not available, may complicate optimal patient management and cause uncertainty regarding use of LAIs.^{1,14} Furthermore, mental health professionals may hold misconceptions regarding LAIs and their role in the treatment of patients with schizophrenia.^{14,29,30}

Educational initiatives targeting the most common dilemmas or issues faced by healthcare professionals (HCPs) could potentially alleviate knowledge gaps and clarify the role that LAIs could play in treating patients with schizophrenia. To address unmet educational needs regarding the potential benefits of LAIs for patients and caregivers, a panel of experts identified misconceptions surrounding their use and provided both expert opinions based on their clinical experience and

supportive evidence to help dispel these misinformed beliefs. This process informed the development of a case-based learning tool to help clinicians better understand how to manage common clinical dilemmas and where to place LAIs in the treatment regimen of people with schizophrenia.

Methods

During multiple online meetings held between January 2022 and May 2022, a panel of four experts collated common myths and misconceptions on the use of LAIs in the treatment of schizophrenia based on their clinical experience and knowledge of the relevant medical literature. Taking the identified misconceptions into consideration, the panel then identified key clinical dilemmas (scenarios) in the treatment management of people with schizophrenia in which LAI treatment could be useful based on empirical evidence, often in contrast to common misconceptions. The experts developed a heuristic tool of considerations that both prescribing and non-prescribing HCPs may use when facing these dilemmas in the emergency department (ED), inpatient units, and outpatient clinics. Patient scenarios were based on real-life situations consistently seen in the clinical setting by the expert panel. Evidence supporting the use of LAIs in these scenarios is presented as found in the medical literature, based on research reports and reviews published by the expert panel, and others as cited in this paper.

The Schizophrenia Clinical Outcome Scenarios and Patient-Provider Engagement tool (S.C.O.P.E.TM; <https://www.scopeengage.com/>) is an interactive digital platform that is designed to educate HCPs on schizophrenia treatment. S.C.O.P.E. does not replace clinical judgment, guidelines, or continuing medical education and is not a platform for recording patient-level data, nor is it intended for payer negotiations or access-related questions by HCPs and non-prescribing mental health professionals. No data are captured from users. S.C.O.P.E. allows exploration of the potential usefulness of LAIs across clinical scenarios and settings. Upon entering the S.C.O.P.E. website, an introductory page reviews the purpose of the platform and provides videos of the expert panel discussing its use. The platform consists of three parts:

- **Clinical Dilemmas:** The key clinical dilemmas (scenarios) identified by the panel are compiled in the S.C.O.P.E. interactive resource. These include scenarios observed in the ED, inpatient units, and outpatient clinics or office settings. The potential usefulness of LAIs in these cases is also explored.
- **Clinical Education Videos:** Select clinical dilemmas were further illustrated with clinical education videos, which provided directional information aimed to address patients' concerns and help HCPs, including non-prescribing mental health professionals, answer any questions related to LAIs.
- **Selected LAIs:** Characteristics are provided for each available LAI currently approved by the Food and Drug Administration for the treatment of schizophrenia in the US, based on prescribing information for each product (current as of May 2024).^{31–45}

Results

Identification of Myths and Misconceptions

The expert panel identified the three main and most common myths or misconceptions relating to the use of LAIs to treat people with schizophrenia that are refuted by current evidence (Table 1).^{6,8,18,19,23,30,46–49}

Myth #1: Physicians/Providers Know When Patients Are Nonadherent

Many clinicians are confident in their ability to assess adherence in their patients. However, several lines of evidence have demonstrated that clinicians are generally inaccurate when determining the medication adherence status of their patients.^{50,51} Studies using the Medication Event Monitoring SystemTM (a cap that fits on standard medicine bottles and records the time and date each time the bottle is opened and closed) have found nonadherence rates with oral antipsychotics of 42% to 57% in patients with schizophrenia or schizoaffective disorder, while prescribers, caregivers, and patients estimated nonadherence rates of 0% to 7%.^{52–54} Likewise, a comparison of clinician assessment versus antipsychotic plasma levels found that nearly 20% (10 of 53) of patients thought to be adherent had undetectable plasma drug levels.⁵⁵ Conversely, some patients thought to be nonadherent had detectable plasma drug levels.⁵⁵

The assumption that a patient is adherent to medication can lead to their misclassification as treatment-resistant. One study of 36 patients who were clinically identified as having treatment-resistant schizophrenia found almost half of these

Table 1 Myths and Misconceptions Surrounding the Use of Long-Acting Injectable Antipsychotics for Treatment of Schizophrenia

Myth and Misconception	“Physicians/Providers Know When Patients Are Nonadherent”	“Patients Do Not Accept/Want LAI Treatment”	“LAIs Are Only Appropriate for Patients That Have Demonstrated Nonadherence”
Evidence	<ul style="list-style-type: none">• Adherence is a challenge for clinicians, especially when managing patients with chronic disorders³²• The most common methods to monitor adherence in day-to-day practice are often inaccurate, and quantitative assays are not commonly used⁷	<ul style="list-style-type: none">• Physicians may overestimate patients’ fears of LAIs and therefore refrain from presenting LAIs as a treatment option^{22,30}• Data have shown that most patients are open to LAI treatment³¹	<ul style="list-style-type: none">• LAIs have improved survival time to first hospitalization and reduced the rate of relapse in early-phase schizophrenia^{9,24}• Expert consensus and recent guidelines support wider use of LAIs^{16,17,29}

Abbreviation: LAI, long-acting injectable antipsychotic.

patients (n=16) showed evidence of poor adherence based on undetectable or subtherapeutic drug concentrations.⁵⁰ Hence, these patients may have been “pseudo-resistant”, or failing to show clinical benefits of treatment due to lack of adherence rather than lack of response to the medication.⁵¹ This misclassification is highly consequential, as it could involve recommending clozapine, a drug with severe and potentially lethal side effects and strict monitoring requirements,⁵⁶ to patients who could respond to other antipsychotics not associated with such risks or monitoring. To rule out pseudo-resistance due to inadequate treatment adherence, one set of guidelines on treatment-resistant schizophrenia proposes an optimal definition of treatment resistance that includes ≥ 1 failed trial with an LAI given for ≥ 6 weeks after it has achieved steady-state (generally, ≥ 4 months from commencing treatment).⁵¹

Myth #2: Patients Do Not Accept/Want LAI Treatment

While many clinicians believe LAIs are underused, they also report that only a minority of their patients would be open to accepting LAI use.⁵⁷ This is an incorrect assumption in the opinion of the experts and based on the available literature. Perceived barriers to LAI treatment acceptance by patients include negative attitudes, stigma and loss of autonomy/control related to LAIs, and fear of needles.^{14,57} However, a cross-sectional study using semi-structured interviews to assess patient and HCP perceptions of LAIs (164 patients, 63 physicians/nurses) found that clinicians overestimated patient fears of pain, embarrassment, reduced autonomy, feelings of being controlled, and stigma.²⁹ A cluster-randomized clinical trial found that when clinical trial site staff were educated on the benefits of LAIs and trained in communication strategies and how to overcome logistical barriers, there was a strong acceptance by patients of possible LAI use (86%).^{30,48} Furthermore, US-based commercial claims databases showed that once initiated on an LAI, 86% of patients stayed on that LAI until successful implementation (defined as treatment for ≥ 90 consecutive days with ≤ 7 day gaps).²² These data support that while LAIs may be underused, assumptions regarding patient concerns or willingness to use them may not be accurate, and education on overcoming barriers can help clinicians to successfully implement the use of LAIs.

Myth #3: LAIs are Only Appropriate for Patients Who Have Demonstrated Nonadherence

LAIs are often thought of as a last resort treatment option to manage nonadherence in chronically ill individuals. However, when used proactively in early-phase schizophrenia, LAIs can prolong time to first hospitalization and reduce the rate of relapse. In a cluster-randomized trial including 489 patients, the mean time to first hospitalization was significantly longer for early-phase illness patients treated with an LAI versus those who received the clinician’s choice of medication.²⁴ In another study of 83 patients, early-phase schizophrenia patients were randomly assigned to a once-every-2-weeks dosage of the LAI formulation of risperidone or once-daily oral risperidone found that treatment with the LAI formulation was associated with significantly fewer relapses and longer mean time to relapse.⁸ Conversely, the randomized, open-label EULAST trial found no substantial advantage of LAIs versus oral antipsychotics when comparing time to all-cause discontinuation in patients with early-phase schizophrenia.⁵⁸ However, several notable limitations of the study require consideration.⁵⁹ First, patients were directly randomized to an LAI or an oral formulation of aripiprazole or paliperidone, which is not consistent with clinical practice, where patients who respond to and tolerate a particular oral antipsychotic are usually either continued on the same oral medication or switched to the LAI formulation. This design feature biased the results toward all-cause treatment failure in the oral and the LAI arms, which is also reflected by

relatively high overall discontinuation rates of 64% on LAIs and 71% on oral antipsychotics at 19 months. Second, upfront randomization to one of four treatment arms does not consider the importance of patient preference in the treatment of schizophrenia.^{59–61} Finally, the primary outcome of “all-cause discontinuation” included patients who continued their assigned treatment but who may have received doses outside of the approved dose range and/or an added second antipsychotic, which is not uncommon in clinical care, including in patients receiving LAIs.⁶² Together, these points diminish the desired “pragmatic” nature of the EULAST study.

In a nationwide cohort involving 2588 patients hospitalized for the first time with schizophrenia, LAIs were associated with a significantly lower risk of rehospitalization than oral formulations of the same antipsychotics (adjusted hazard ratio, 0.36; 95% CI: 0.17–0.75; $P=0.007$).⁷ Additionally, in a US database study, the preventive use of LAIs before a first ED visit, first hospitalization, or signs of nonadherence had the best outcome for patients with schizophrenia and was incrementally superior compared with waiting for hospitalizations and/or signs of nonadherence.²⁶

Expert consensus supports the use of LAIs regardless of adherence status in patients with poor insight into illness and need for treatment, those who are experiencing homelessness or have unstable housing situations, those with substance use disorders, those with prominent psychotic symptoms or cognitive impairment, those who are aged 18 to 25 years, and those with a history of multiple hospitalizations for psychotic relapses, violence to others, or a suicide attempt.⁴⁶ Moreover, American Psychiatric Association guidelines recommend that patients receive treatment with an LAI if they prefer such treatment.¹⁹ Notably, even in patients with first episode schizophrenia, the Florida Best Practice Guidelines recommend initial treatment with monotherapy with a second-generation antipsychotic other than clozapine, followed by the same antipsychotic given either orally or as an LAI (ie, without waiting for signs of nonadherence or relapse).¹⁸ Given this discordance between recommendations and real-world usage, education is needed around recommendations for wider use of LAIs, and not as a “last resort treatment.”

The S.C.O.P.E.™ Platform Clinical Dilemmas

Considering the three myths regarding LAI use identified above, 11 specific scenarios were developed with questions to consider when patients present to various sites of care for treatment. The clinical dilemmas presented on S.C.O.P.E. can be filtered based on clinical setting, current treatment, patient status, and clinical concerns (Figure 1). This approach allows users a “hands-on” interactive experience, and reference citations throughout the tool linking the scenario to available supporting evidence facilitate self-directed learning.

In the Clinical Dilemmas module, one ED scenario, five inpatient scenarios, and five outpatient scenarios are available, each describing patients with various treatment histories (eg, untreated or unknown, oral antipsychotic, LAI), clinical statuses (eg, stable, residual symptoms, acute symptoms in first episode or relapse), and clinical concerns (eg, nonadherence, substance use). Each scenario includes a detailed description and a specific set of questions and supporting information to aid in the learning process. An “items to consider” checklist includes tests and assessments of the patient that may be needed. Each chosen scenario concludes with an exploration of the role of LAIs; an “LAI considerations” section highlights how LAIs may be useful in the scenario.

The tool also provides a set of queries/questions to consider when patients present to the ED and a framework to inform clinical dilemmas and scenarios observed in inpatient care and outpatient clinics. The checklist includes questions such as, “Were the ED notes reviewed/available?” and buttons for “Yes”, “No”, and “N/A”. Only one option can be chosen for each question. For example, the ED scenario involves an acutely psychotic patient with a history of oral antipsychotic treatment who reports stopping her medication the previous month (Figure 2). After a checklist regarding the review of existing hospital records and patient history, another checklist on adherence assessment includes information on the reliability of various methods, such as self-report and plasma level, based on available evidence.^{6,52,55} A reminder is included to assess factors that may affect adherence, such as substance use and social determinants.^{19,63,64} Finally, as mentioned above, an LAI considerations section is provided, including patient education on risk of relapse following the discontinuation of maintenance treatment and the advantages of LAIs for maintenance treatment, documentation of the discussion on LAIs for handoff/follow-up, and guidance on considering restarting on an oral antipsychotic that has an LAI formulation to allow for an easy transition.^{7,10,15,19,24,48}

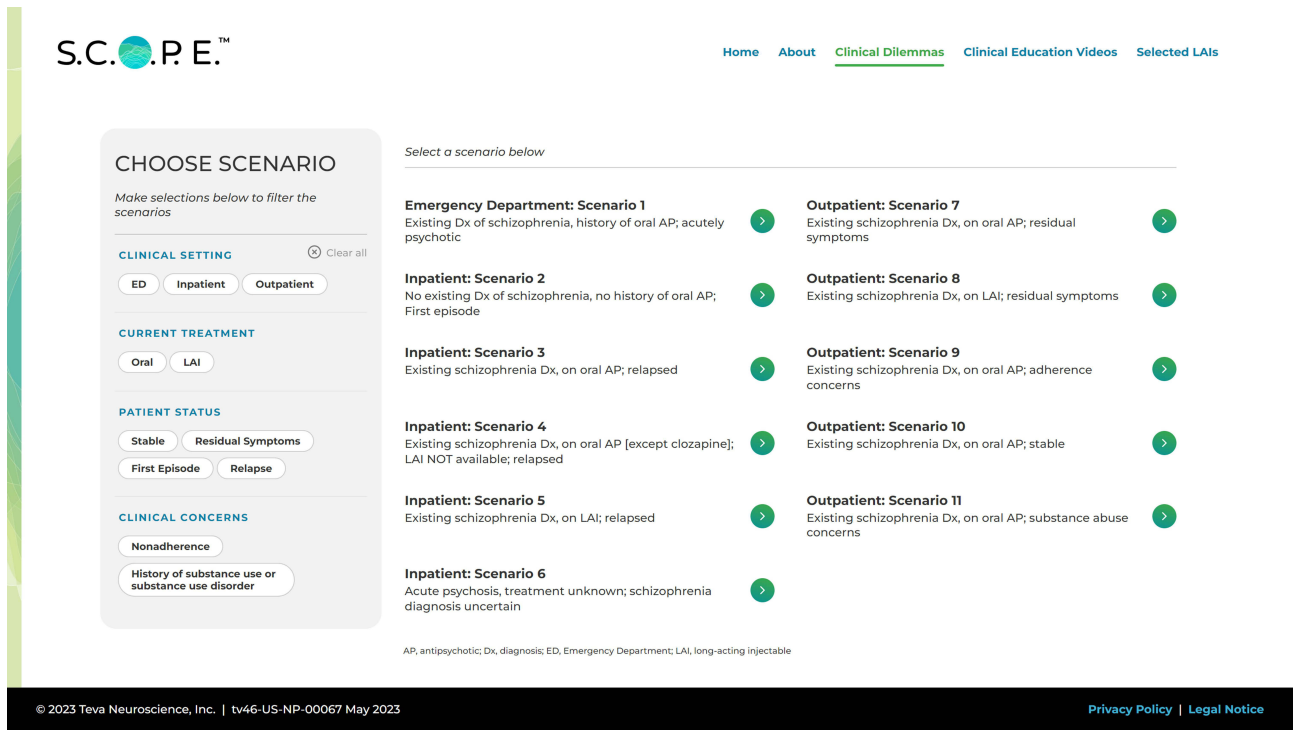


Figure 1 Clinical dilemmas on the S.C.O.P.E. platform.
Abbreviations: S.C.O.P.E, Schizophrenia Clinical Outcome Scenarios and Patient–Provider Engagement.

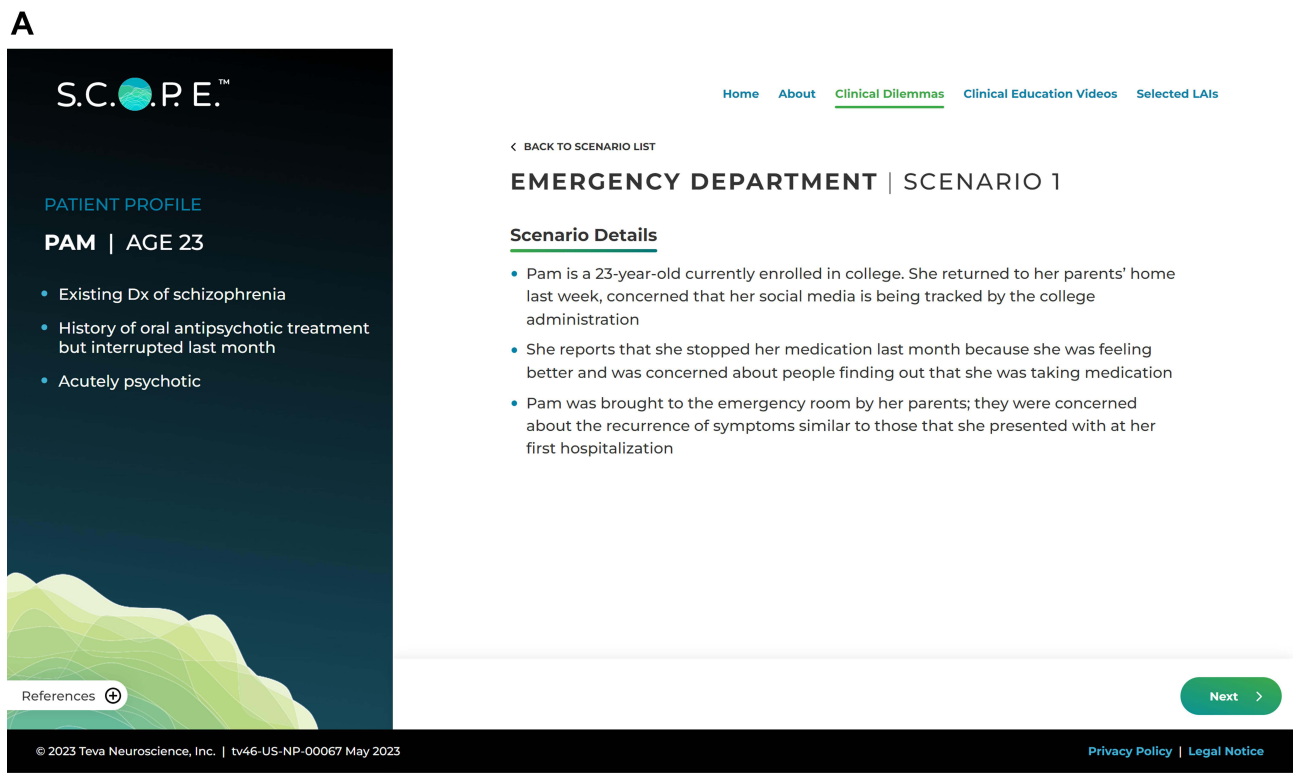


Figure 2 Continued.

B

S.C.O.P.E.TM

PATIENT PROFILE

PAM | AGE 23

Existing Dx of schizophrenia

History of oral antipsychotic treatment but interrupted last month

Acutely psychotic

References

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EMERGENCY DEPARTMENT | SCENARIO 1

1 OF 4

Is there an existing hospital record?

YNNA

Have you assessed the following patient history:

Existing diagnosis?

YNNA

Currently on medication?

YNNA

Existing comorbidities (psychiatric and somatic)?

YNNA

Danger to self or others?

YNNA

Unable to care for oneself?

YNNA

2 OF 4

Have you spoken with the patient/family and assessed the following:

Patient history?

YNNA

Existing diagnosis?

YNNA

Was there a diagnostic change?

YNNA

Psychiatric and physical comorbidities?

YNNA

Reasons leading up to ED visit?

YNNA

Currently on antipsychotics? Other medications?

YNNA

3 OF 4

Have you assessed adherence?

YN

If yes, select methodology used:

Patient Self-report

Family Report

Pharmacy Claims

Pill Count

Physician Assessment

AP Plasma Level

Other

4 OF 4

Have you assessed the following:

Substance use and substance use disorder?

YNNA

Patient's social determinants (ie, family, employment)

YNNA

Where the patient goes if they do not get admitted?

YNNA

Next

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Figure 2 Continued.

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EMERGENCY DEPARTMENT | SCENARIO 1

LAI Considerations

- Provide psychoeducation to patient and family on:
 - The high risk of relapse following the discontinuation of maintenance treatment with antipsychotics^{3,12,13}
 - The advantages of LAIs for the maintenance phase of treatment (ie, less frequent dosing compared to daily orals, allows prescribers to easily identify when treatment is discontinued without consulting so psychoeducation can be provided, lower risk of rehospitalization compared to orals)^{12,14,15}
- In handoff to next level of care (ie, inpatient or outpatient) document discussion on LAIs with patient and family, so this can be followed up on
- If an antipsychotic is restarted in the ED, consider an oral second-generation antipsychotic that has an LAI formulation to allow for an easy transition at a later time point¹⁶

Additional Considerations for LAIs ➔

Next: Inpatient Scenario 2
No existing Dx of schizophrenia, no history of oral AP; First episode ➔

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Figure 2 Example emergency department S.C.O.P.E. scenario: acute episode following treatment discontinuation. (A) Scenario, (B) Assessments, (C) Considerations. **Abbreviations:** AP, antipsychotic; Dx, diagnosis; LAI, long-acting injectable antipsychotic; S.C.O.P.E., Schizophrenia Clinical Outcome Scenarios and Patient–Provider Engagement.

In one of the inpatient scenarios, a patient with no previous diagnosis of schizophrenia presents with his first episode (Supplemental Figure 1). Again, an “items to consider” checklist covers routine assessments and patient history. The LAI considerations section then discusses points relating to patients with first-episode schizophrenia, such as increased risk for nonadherence, importance of communicating the benefits of LAIs for relapse prevention, and possible adverse consequences of repeated relapses.^{7,24,48,65–68}

In an outpatient scenario, a patient currently on an oral antipsychotic reports substance use (Supplemental Figure 2). The “items to consider” checklist on adherence assessment is again suggested, as well as evaluations of adverse events and substance use.^{51,64,69} The LAI considerations section suggests discussing an LAI formulation to help ensure continuity and mitigate psychotogenic effects of substances of abuse.^{7,68,70,71}

Clinical Education Videos

S.C.O.P.E. also includes clinical education videos designed to help prepare non-prescribing HCPs and mental health professionals (eg, social workers, case managers) to address any concerns patients and their families may have and to communicate the potential benefits of LAI treatment. The videos contain useful information that can help to address concerns of patients (ie, clients) and answer questions related to LAIs. Featuring computer-generated actors, each video presents an example case from a patient’s or caregiver’s perspective and shows considerations for using LAIs from the point of view of a case manager or social worker (Figure 3 and Supplemental Figures 3 and 4).

The clinical education videos provide real-world narratives of the rationale and consequences of nonadherence to antipsychotic treatments and include testimonials from patients, families, case managers, and social workers. In one video, a patient named Pam who had an acute episode following a discontinuation from her oral antipsychotic treatment describes the events surrounding the episode.

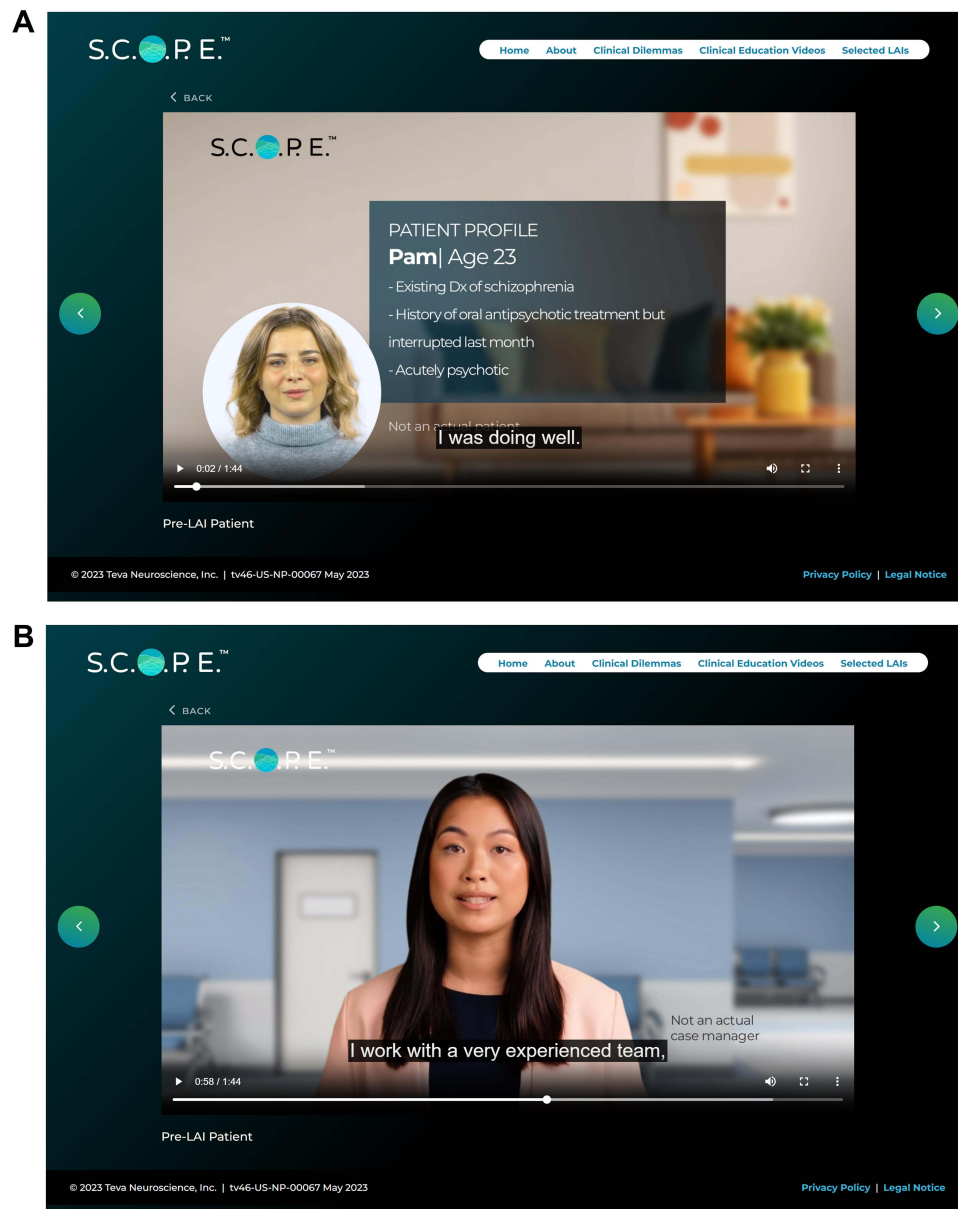


Figure 3 Example S.C.O.P.E. clinical education video - acute episode following oral treatment discontinuation, (A) patient and (B) case manager. **Abbreviations:** Dx, diagnosis; S.C.O.P.E, Schizophrenia Clinical Outcome Scenarios and Patient–Provider Engagement.

Pam also describes a discussion with her case manager regarding the use of LAIs:

Fiona, told me about getting my meds with a shot and about how the medicine will stay in my body longer and help reduce the chance of me getting sick again; but, to be honest, I don't like the idea of shots or needles at all really. They're painful and I just don't want to do it, but I know I need to do something, so we'll see how things go.

The case manager acknowledges the patient's apprehensions and mentions,

She actually told me her uncle has diabetes and takes a shot every day, so I think deep down she understands that this isn't so bad. Also, I thought it was important to relay the other potential benefits from long acting treatment. You get a lot of confidence when you know no one is checking to see if you've taken your medication (Figure 3).

In another video, a parent of Pam also describes the acute episode and states,

And that’s the first time we learned about long-acting treatment. It would be life-changing to not worry about her taking her meds so much.

A social worker who works on Pam’s case states,

So, when I first heard about long-acting injectables, I was very skeptical...Over time though, a lot of my beliefs have changed. I think long-acting injectable treatment offers the patients and families I see more autonomy. That autonomy comes from being well and having freedom from some of that worry ([Supplemental Figure 3](#)).

Selected LAIs

S.C.O.P.E. compiles data from prescribing information from each current US Food and Drug Administration-approved LAI to help acquaint HCPs with the different characteristics or features of LAIs available in the United States for the treatment of people with schizophrenia (current as of May 2024).^{31–45} S.C.O.P.E. offers a selector that filters LAIs by approved indication(s), initiation regimen, reconstitution requirements, dosing strengths and frequency, injection volumes and routes, and supply and storage information based on approved product labels ([Table 2](#), [Figure 4](#)). Differences in amenities of care (eg, how and where the injection is given, the volume injected, injection frequency, reconstitution requirements [if any], need

Table 2 LAI Filter Properties and Selection Options

Filter Property	Selection Options
Disease states	<ul style="list-style-type: none">• Schizophrenia• Schizoaffective disorder• Bipolar I disorder
Initiation regimen	<ul style="list-style-type: none">• Initiation regimen required• Oral supplementation required• Not required
Reconstitution	<ul style="list-style-type: none">• Required• Not required
Dosing strengths	<ul style="list-style-type: none">• 1• 2–3• 4–5• 6+
Dosing frequency	<ul style="list-style-type: none">• Every 2 weeks• Once monthly• Every 2 months• Every 6 weeks• Every 3 months• Every 6 months
Injection volumes	<ul style="list-style-type: none">• ≤0.25 mL• 0.5 mL to 1 mL• 1.5 mL to 2 mL• >2 mL
Injection route	<ul style="list-style-type: none">• IM (deltoid)• IM (gluteal)• SC (subcutaneous)

(Continued)

Table 2 (Continued).

Filter Property	Selection Options
How supplied	<ul style="list-style-type: none"> • Powder for reconstitution + diluent • Aqueous suspension • Oil-based suspension • Prefilled syringe(s) kit • Single- or multi-dose vial(s) • Ampule
Storage	<ul style="list-style-type: none"> • Requires refrigeration • No refrigeration required • Protect from light • Store horizontally

Abbreviations: LAI, long-acting injectable antipsychotic; IM, intramuscular; SC, subcutaneous.

for refrigeration) play an important role in formulation selection, given the limited array of molecules available.⁷² The LAI selector does not provide LAI safety and efficacy data; thus, HCPs are directed to visit individual product websites for this information or consult product information leaflets and/or labels. As noted above, this tool is not intended for use as a substitute for clinical judgment as to the appropriateness of any product for individual patients, but rather to allow HCPs to filter LAI products based solely on characteristics other than safety and efficacy.

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Selected LAIs

Filter Properties	Select a medication below
Make selections below to filter the LAIs. <input type="button" value="Clear all"/>	
Disease States <input type="button" value="v"/>	<div> Abilify Maintena® (aripiprazole) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Invega Trinza® (paliperidone palmitate) extended-release injectable suspension <input type="button" value="v"/> </div>
Initiation Regimen <input type="button" value="v"/>	<div> Aristada Initio® (aripiprazole lauroxil) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Perseris® (risperidone) extended-release injectable suspension <input type="button" value="v"/> </div>
Reconstitution <input type="button" value="v"/>	<div> Aristada® (aripiprazole lauroxil) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Risperdal Consta® (risperidone) long-acting injection <input type="button" value="v"/> </div>
Dosing Strengths <input type="button" value="v"/>	
Dosing Frequency <input type="button" value="v"/>	<div> Fluphenazine Decanoate (fluphenazine) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Rykindo® (risperidone) extended-release injectable suspension <input type="button" value="v"/> </div>
Injection Volumes <input type="button" value="v"/>	<div> Haloperidol Decanoate (haloperidol) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Uzedo™ (risperidone) extended-release injectable suspension <input type="button" value="v"/> </div>
Injection Route <input type="button" value="v"/>	<div> Invega Hafyera® (paliperidone palmitate) extended-release injectable suspension <input type="button" value="v"/> </div> <div> Zyprexa Relprevv® (olanzapine) extended-release injectable suspension <input type="button" value="v"/> </div>
How Supplied <input type="button" value="v"/>	
Storage <input type="button" value="v"/>	<div> Invega Sustenna® (paliperidone palmitate) extended-release injectable suspension <input type="button" value="v"/> </div> <div> NEW Information coming soon: Abilify Asimtufii® (aripiprazole) extended-release injectable suspension <input type="button" value="v"/> </div>

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Figure 4 Selected LAIs and filter properties.

Abbreviations: LAI, long-acting injectable antipsychotic; S.C.O.P.E., Schizophrenia Clinical Outcome Scenarios and Patient–Provider Engagement.

Discussion

Nonadherence to medications for any chronic illnesses is problematic, and schizophrenia is no exception.^{73,74} Clinicians often overestimate antipsychotic medication adherence and underestimate nonadherence.^{6,50} Clinicians may also overestimate patient fears regarding LAI antipsychotics, and underestimate patients' willingness to try an LAI treatment.^{14,29}

LAI have been shown to prolong time to hospitalization and reduce relapse rates,¹⁰ including in early-phase schizophrenia,^{7,8,24} supporting their use beyond demonstrated or emerging nonadherence. However, data suggest that LAIs continue to be reserved for later in the course of disease, particularly after demonstrating nonadherence.^{21,22} To counteract this delay or underuse, education is needed to dispel false ideas and clarify the potential role of LAIs in order for clinicians to make, together with their patients, appropriate, evidence-based decisions regarding treatment.^{30,74,75}

Clinical cases are widely used in medical education and may be associated with deeper learning (ie, the enhanced ability to apply lessons to practice).⁷⁶ Similarly, a heuristic approach enables clinicians to discover or learn for themselves. Therefore, the S.C.O.P.E. interactive digital platform was developed as a freely available resource providing evidence-based educational materials for clinicians, non-prescribing HCPs, and mental health professionals involved in the continuum of care for patients with schizophrenia. A variety of common clinical scenarios, along with checklists and questions, serve as heuristic learning tools for shared decision-making, monitoring of adverse effects, and other aspects of care. Along with standard psychiatric evaluations in inpatient and outpatient settings, S.C.O.P.E. can be used to assist clinicians to better understand how to manage common clinical dilemmas and explore the potential of LAIs in the treatment algorithm.²⁰ The hope is that educating on the appropriate use of LAIs will provide important benefits to patients, their caregivers, clinicians, and society at large, including reduced relapses, decreased hospitalizations, reduced family and caregiver burden, and improvements in health economics outcomes.

Conclusions

S.C.O.P.E. is an educational tool for HCPs to improve their understanding of how to manage common clinical dilemmas when treating patients with schizophrenia. S.C.O.P.E. aims to clarify the potential role of LAIs in the treatment of people with schizophrenia, as well as enable clinicians to understand the characteristics of the currently available LAIs. The S.C.O.P.E. framework includes considerations for shared decision-making, monitoring of adverse effects, and the use of alternative antipsychotic formulations when needed, including the use of LAIs, with the goals of improving care and outcomes for patients with schizophrenia.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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