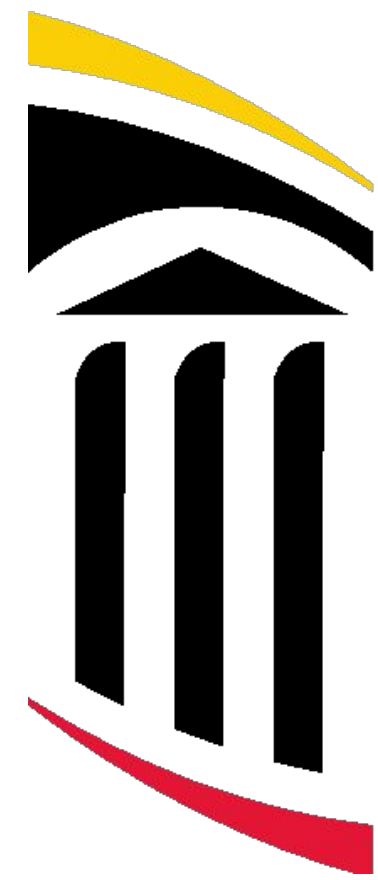


Pharmacist-Led Education and Training of Health Care Practitioners to Administer Long-Acting Injectable Medications

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Background

- Long-acting injectable antipsychotics (LAIAs) prolong time to hospitalization, improve adherence, and are cost-effective
- Fourteen unique LAIAs are available in the United States
- LAIAs vary in active ingredients, administration routes, preparation, and storage requirements
- There remains a gap in education regarding their preparation and administration

Description of Innovative Practice

A team of pharmacists from the University of Maryland designed a hands-on learning lab to educate healthcare practitioners on administration techniques and common errors such as improper mixing, incorrect site administration, and inappropriate medication selection. This learning lab is offered at conferences, academic institutions, and in clinical practice settings.

Learning Lab Curriculum

- Overview of available LAIA options
- Education on administering injections at ventrogluteal, dorsogluteal, deltoid, and subcutaneous sites
- Discussion on how pharmacokinetics vary between injection sites
- Practical tips on how to overcome common challenges and engage patients in conversations about their options
- Mannequin-based simulations to identify injection sites and practice medication preparation and administration

Learning Lab Set Up



Educational Tools

Long Acting Injectables (LAIAs)

First Generation LAIs	Second Generation LAIs
Fluphenazine decanoate (Prolixin Dec [®]) Haloperidol decanoate (Haldol Dec [®])	Arripiprazole mono-hydrochloride (Abilify Materna [®]) Aripiprazole lauroxil (Aristada [®]) Paliperidone palmitate (Invega Sustenna [®]) Risperidone (Invega [®])

All drugs can be given using 2-lick technique. All drugs are NOTAMINOGLUCOSIDES except for UZEVY[®] which is SUBCUTANEOUS. All syringes should be PRIMED before administering except for UZEVY[®]. READ the ADMINISTRATION GUIDE prior to giving the drug. Check previous administration site to ensure area is ROTATED.

Invega Sustenna[®]

Key Points:

- Weight determines needle size. If the patient is obese, use the longer needle.
- Shake with VIGOR for AT LEAST 30 seconds.
- First 2 loading doses, must be given in DELTOID. All other maintenance doses can be gluteal or deltoid.
- Administer the injection within 5 minutes of shaking. If more than 5 minutes has passed, shake again for 15 seconds.
- Inject the vial contents intramuscularly slowly, deep into the selected deltoid or gluteal muscle of the patient.

Weight	Deltoid	Gluteal
<90 kg	Deltoid: 1.5 inch, 22 gauge needle	Deltoid: 1.5 inch, 22 gauge needle
≥90 kg	Deltoid: 1.5 inch, 22 gauge needle	Deltoid: 1.5 inch, 22 gauge needle

Clinical Pearls:

- Oral overlap is not recommended. The second LAI/IM dose can be given within 3 to 11-day window after the first injection. Patients may be given the injection up to 7 days before or after the monthly time point.

Aristada[®]

Key Points:

- Dose determines location of administration. All doses can be given in the gluteus. ONLY 441 mg and 675 mg can be given in the deltoid.
- Weight determines needle size. See chart below. If the patient is obese, use the longer needle.
- Tap the syringe at least 10 times to dislodge any material which may have settled.
- Shake the syringe vigorously for at least 30 seconds. If the syringe is not used within 15 minutes, shake again for 30 seconds.

Injection Site	Needle Length
Deltoid	1.5 inch or 20 gauge, 1.5 inch
Gluteal	1.5 inch or 20 gauge, 2 inch
Gluteal	1.5 inch or 20 gauge, 2 inch
Gluteal	1.5 inch or 20 gauge, 2 inch
Gluteal	1.5 inch or 20 gauge, 2 inch
Gluteal	1.5 inch or 20 gauge, 2 inch

Clinical Pearls:

- Oral overlap is recommended for 3 weeks, unless using Invega[®]. In the event of oral dosing, an Aristada[®] injection should not be given earlier than 14 days after the previous injection.

Ability, Materna[®]

Key Points:

- Weight determines needle size. If the patient is obese, use the longer needle.
- Rotate plunger not completely until the red stop rotating to release diluent.
- Vertically shake the syringe vigorously for 20 seconds until drug is uniformly milky-white.
- Twist and pull off Over-cap and Tip cap.
- This formulation should be utilized within 30 minutes of reconstitution.

Clinical Pearls:

- Ability Materna[®] doses should be administered not earlier than 25 days after the last injection.

Timing is Key!

VIGOROUSLY shake for:

Medication	20 sec	30 sec
Monthly Paliperidone	20 sec	30 sec
Monthly Paliperidone Palmitate	20 sec	30 sec

Speed of Injection

Medication	Slowly	Rapidly
Haloperidol Decanoate	X	
Fluphenazine Decanoate	X	
Aripiprazole Mono-hydroxide		X
Aripiprazole Lauroxil		X
Paliperidone Palmitate	X	
Monthly GEM & GEM		X

* Less pain, recommended at 30 sec/lick.

Impact on Patient Care and Institutions

- A total of eight programs have been completed providing education to the following health care practitioners:
 - Registered nurses (RNs)
 - Nurse practitioners (NPs)
 - Physician assistants (PAs)
 - Doctors of osteopathic medicine (DOs)
 - Medical doctors (MDs)
 - Doctors of pharmacy (PharmDs)
 - Students from the above disciplines
- Practitioners report learning valuable new skills and insights during these sessions

Conclusions

- This hands-on, comprehensive training model is, to our knowledge, the first to combine preparation and administration education with practical, real-world scenarios
- As the use of LAIs expands, this model has the flexibility to adapt and evolve, ensuring it remains a critical resource for healthcare providers

Future Directions

- Extend the program beyond psychiatry, given the broad applicability of the techniques taught in these training sessions across multiple classes of medications
- Expand to incorporate a broader range of mannequin types, representing diverse body habitus—including both larger and smaller physiques
- Establish additional resources to support the accurate preparation of LAI products