

TABLE 1.

Z-score	FG-LAI	ALAI
GLOBAL B.A.C. S	-3.10 ( $\pm$ 0.91)	-2.37 ( $\pm$ 1.08)*
V.M.	-3.19 ( $\pm$ 0.58)	-2.21 ( $\pm$ 0.76)*
W.M.	-2.76 ( $\pm$ 1.13)	-1.45 ( $\pm$ 1.02)**
M.S.	-0.27 ( $\pm$ 0.75)	0.07 ( $\pm$ 0.70)
V.F.	-1.97 ( $\pm$ 0.54)	-1.28 ( $\pm$ 0.48)**
A.	-3.12 ( $\pm$ 3.18)	-2.65 ( $\pm$ 2.77)
E.F.	-2.67 ( $\pm$ 1.26)	-1.55 ( $\pm$ 1.64)*

\*p < 0.05; \*\*p < 0.01

speed was barely affected. In contrast, verbal memory was most impaired, whereas motor speed was the least impaired cognitive domain in the group receiving FG-LAI. Patients with schizophrenia taking ALAI showed a better cognitive function in all domains (except for motor speed and attention) than patients receiving FG-LAI. Summarized results in Table 1.

**CONCLUSIONS:** In our study, patients with schizophrenia receiving Aripiprazole long-acting injectable have better cognitive function than patients receiving first-generation long-acting antipsychotics.

## 69 Mnemonics versus Cramming. Learning Can Be Effective, Efficient and Fun. A Systematic Review Studying Memorization Techniques in Education

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**ABSTRACT:** The Problem: While learning is at the core of any education (e.g., primary or high school, college, or continuing medical education, to name a few), evidence-based methods of effective memorization are lacking from most forms of education. If attempts are made to teach memorization techniques, they are often without a sound scientific backing. The classical form of memorization (popularly known as “cramming”, or “rote learning”) is tedious, time consuming, and - we know from personal experience - can be so boring that students avoid memorizing at all. A “new” technique of memorization, which is usually referred to as “mnemonics” or “memory techniques” (first reported as being used by the Greeks and the Romans to learn speeches by heart) has received rave reviews from enthusiastic users. A quick

search of the scientific databases shows the technique has been studied quite extensively in a number of areas, including education, the medical world, and in the field of learning disabilities, but as far as we know no systematic reviews have assessed the effectivity of using the mnemonics technique versus classical memorization in education.

**STUDY OBJECTIVE:** We hypothesize that memorization using mnemonics is a more effective strategy than classical memorization (cramming). To study this hypothesis we have performed a systematic review as described below. In this poster we will describe our study and show preliminary findings.

**METHOD:** Design: We have performed a systematic review using the Rapid Evidence Assessment procedure described by the Center for Evidence Based Management.

Setting and participants: Studies included limited to those that tested the use of mnemonics in education (primary school, high school, university).

Interventions and main outcome measure of the primary studies: We included studies that compared memorization using mnemonics with “regular” memorization (cramming).

**RESULTS:** Using 4 databases (Academic Search Premier, PubMed, ERIC and PsycInfo) we found 803 articles. After one round of filtering 589 articles were excluded from the study. The major reasons for exclusion were: learning disabilities, non-educational setting, and no study. In this poster we present the results of the first 10 papers that were included after the second, more stringent, round of filtering. In all 10 papers the mnemonics group performed significantly better on at least a number of the memorization tasks, but in no instance worse than the control group. In some cases where the control groups performed worse, the results were not significant.

**CONCLUSIONS:** This poster describes the analysis of the first 10 papers of our full set of mnemonics studies. They all show a significant advantage of using mnemonics in memorization. If these results are confirmed in our full systematic review, we expect this to have a significant impact on the way “learning how to learn” is taught.

## 74 Alpha Lipoic Acid Responsive Hypergeusia

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**ABSTRACT:** Introduction: Improvement in hypergeusia in response to alpha lipoic acid treatment has not heretofore been described. Such a case is presented.

**METHODS:** Case Study: A 64 year old right handed nasute female noted the sudden onset of salty hypergeusia, about 200% saltier than foods should be. Concurrently she experienced a constant phantogeusia of salt involving the front half of her tongue, lips, and inside her mouth. She denied any smell problems, cacogeusia, or palinogeusia. This persisted for five months until treatment with 1800 mg/day of alpha lipoic acid, whereupon, over a one month duration, the salty hypergeusia gradually resolved. Suppression of the salty hypergeusia continued until she developed an upper respiratory infection, whereupon, despite the continuation of alpha lipoic acid, the salty hypergeusia returned to 250% of normal. During the cold, her ability to taste dropped down from 100% to 80%, and ability to smell dropped from 100% to 50% and upon resolution of the cold, the senses returned to normal and the salty hypergeusia remitted.

**RESULTS:** Abnormalities in Neurologic Examination: Reflexes: 3+ bilateral quadriceps femoris and pendular. Chemosensory testing: Olfaction: Alcohol Sniff Test: 12 (hyposmia), Phenylethyl Alcohol Threshold: greater than -2 (anosmia). Suprathreshold Amyl Acetate Odor Intensity Testing: parallel pattern (normosmia). Pocket Smell Test: 4(normosmia). Retronasal Olfactory Testing: Retronasal Smell Index: 8(normosmia). Gustatory testing: Propylthiouracil Disc Taste Test: 5(normogeusia). Taste Super threshold Testing: normogeusia to sodium chloride, sucrose, and phenylthiocarbamol: hypogeusia(10–30%) to urea; ageusia(0%) to hydrochloric acid. Taste Quadrant Testing: taste weakness to sodium chloride for the entire mouth.

**DISCUSSION:** The alpha lipoic acid may have acted to improve smell and associated enhanced retro nasal smell, inhibiting savory gustatory discharge, and thus, effectively reducing salt perception. Such a mechanism would also explain the recurrence of hypergeusia with the upper respiratory infection; the infection presumably transiently reducing the olfactory ability, overcoming any olfactory enhancing effects of alpha lipoic acid. On the other hand, this agent could have acted to improve smell as well as taste. With such enhanced chemosensory capacity, the normal olfactory and gustatory components of food would have inhibited competing pathologically discharging gustatory receptors for salt, reducing dysgeusia and hypergeusia. Moreover, the alpha lipoic acid may have acted to focus the patient's

attention on the gustatory stimulation which may have caused her to perceive not just the predominant salt sensation but enhanced perception of the other gustatory sensations which acted to competitively inhibit the perception of salt. Further investigation of alpha lipoic acid in the management of dysgeusia and hypergeusia is warranted.

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### Formulation Properties of Long-acting Injectable Antipsychotics and the Impact on Administration: Focus on Aripiprazole Lauroxil

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**ABSTRACT:** Clinicians using long-acting injectable (LAI) antipsychotics may assume that there is uniformity in the injection technique for all LAIs. However, because LAIs have significant differences in their formulation, each requires a specific administration procedure. Here, we focus on how the formulation properties of the atypical LAI aripiprazole lauroxil impact its administration.

The history of LAI formulations is presented as a background to recent advances in formulation technology. A shared challenge for new LAIs is to adapt the formulation of insoluble drugs to aqueous-based suspensions.

The early LAIs kept the drug product dissolved as oil-based solutions, which were stable and did not require mixing prior to injection. However, oil-based solutions tend to be viscous and cause injection-site reactions (ISRs).

New LAI formulations tend to be aqueous-based suspensions and need to be resuspended or reconstituted before injection. Beyond this common element, formulation properties lead to differences in administration for each of the available LAIs.

We reviewed the formulations of LAIs indicated for the treatment of schizophrenia and how they impact instructions for use, with a focus on aripiprazole lauroxil.

Aripiprazole monohydrate and olanzapine pamoate are lyophilized powders that require reconstitution before administration and should be injected slowly. Risperidone is formulated as microspheres in powder form that require reconstitution before injection, although the injection speed is not specified. Paliperidone palmitate is a ready-to-use aqueous suspension of crystalline particles and should be injected slowly. Aripiprazole lauroxil is an aqueous-based, ready-to-use suspension of crystalline particles. Unlike other LAIs, the formulation of