ARIPIPRAZOLE ONCE-MONTHLY INJECTABLE SHOWS SUPERIOR EFFECTIVENESS TO PALIPERIDONE PALMITATE ONCE-MONTHLY INJECTABLE ON QUALITY OF LIFE SCALE IN PATIENTS WITH SCHIZOPHRENIA

- The head-to-head QUALIFY study compared the effectiveness of aripiprazole once-monthly to paliperidone palmitate once-monthly in adult patients with schizophrenia
- Patients treated with aripiprazole once-monthly demonstrated a statistically significant improvement on the primary endpoint, quality-of-life measures, compared to those treated with paliperidone palmitate
- Discontinuations due to adverse events occurred in 10.8% of patients in the aripiprazole once-monthly group compared to 18.4% of patients in the paliperidone once-monthly group

Princeton, N.J., U.S. and Valby, Denmark – November 3, 2014 – Otsuka America Pharmaceutical, Inc. (Otsuka) and H. Lundbeck A/S (Lundbeck), today announced results from the QUALIFY study, the first study of its kind comparing two atypical long-acting injectable anti-psychotic therapies in a close-to-real-life setting. The effectiveness of aripiprazole once-monthly (aripiprazole extended-release injectable suspension, for intramuscular use: Abilify Maintena®) and paliperidone palmitate (paliperidone palmitate extended-release injectable suspension, for intramuscular use) in adult patients with schizophrenia was measured by the Heinrichs-Carpenter Quality of Life Scale (QLS; primary endpoint). QLS is a clinician-rated scale designed to evaluate social functioning and behavior in patients with schizophrenia.

The QLS is one of the most commonly used quality-of-life scales in schizophrenia clinical trials. The four domains of the QLS evaluate the patient’s intrapsychic foundations (sense of purpose, motivation, emotional interaction, etc.); interpersonal relations (social activity, social network, etc.); instrumental role (work functioning, work satisfaction, etc.); and common objects and activities. Higher scores indicate better quality of life. Additional secondary assessments include the Clinical Global Impressions scales (CGI, which measures symptom severity and treatment response), and the Investigator’s Assessment Questionnaire (IAQ, designed to evaluate response to antipsychotics).

In a 28 week trial, patients treated with aripiprazole once-monthly demonstrated a statistically significant and superior improvement in the QLS total score compared to those treated with paliperidone palmitate.
The mean difference between treatments of the change from baseline to week 28 in QLS total score was 4.4 (p=0.031) with a respective change of 7.5 for the aripiprazole once-monthly group and 3.1 for the paliperidone palmitate group.iii

A difference between treatments was also confirmed by a change in the Clinical Global Impression-Severity Scale (CGI-S, used by clinicians to evaluate the overall severity of a patient’s illness; p=0.004). Both treatments were generally well-tolerated, however discontinuation rates due to adverse events were 10.8% (n=16/148) vs. 18.4% (n=27/147), for aripiprazole once-monthly group vs paliperidone once-monthly group, respectively.iii

About the QUALIFY studyiv

QUALIFY is a 28 week, randomized, open-label, rater-blinded, head-to-head comparison of intramuscular aripiprazole once-monthly (400 or 300 mg/month) and intramuscular paliperidone palmitate (50 to 150 mg/month (EU and Canada) or 78 to 234 mg/month (US). After a three-week oral conversion period when patients received either oral aripiprazole or oral paliperidone, the intramuscular formulations were administered according to approved local instructions (EU Summary of Product Characteristics or US Package Insert) during five weeks and continued for 20 weeks. The study design included that if non-inferiority was confirmed then superiority would be tested. The primary endpoint was the QLS total score change from baseline to week 28. The study included 295 patients in Europe and North America.

The study design was presented at the New Clinical Drug Evaluation Unit 53rd Annual Meeting in May 2013. Data from the QUALIFY study will be presented at upcoming medical congresses and in scientific publications.

About Abilify Maintena (aripiprazole once-monthly)

Abilify Maintena (aripiprazole once-monthly) is the first and only once-monthly injection of a dopamine D2 partial agonist. It is available in the U.S. for the treatment of schizophrenia and in a number of European countries for maintenance treatment of schizophrenia in adult patients stabilized with oral aripiprazole. In Canada it is available for the maintenance treatment of schizophrenia in stabilized adult patients and in Australia for maintenance of clinical improvement in the treatment of schizophrenia.

Abilify Maintena, an atypical antipsychotic, is an intramuscular depot formulation of aripiprazole. It is a sterile lyophilized powder that, when reconstituted with sterile water for injection, forms an injectable suspension that can be administered monthly. After an initial injection of Abilify Maintena along with an overlapping 14-day dosing of oral antipsychotic treatment, subsequent injections of Abilify Maintena
provide uninterrupted medication coverage for 30 days at a time. It provides a treatment option to address one of the most important considerations in the management of schizophrenia — reducing the risk of relapse, or the re-emergence of worsening of symptoms. Depot formulations of antipsychotic agents provide patients with concentrations of active drug that remain at a therapeutic range for an extended period of time.\(^v\)

**INDICATION AND IMPORTANT SAFETY INFORMATION** for **ABILIFY MAINTENA\(^\text{®}\)** (aripiprazole) for extended-release injectable suspension

Abilify Maintena is an atypical antipsychotic indicated for the treatment of schizophrenia.

- Efficacy was demonstrated in a placebo-controlled, randomized-withdrawal maintenance trial in patients with schizophrenia and additional support for efficacy was derived from oral aripiprazole trials.

**Increased Mortality in Elderly Patients with Dementia-Related Psychosis**

Elderly patients with dementia-related psychosis treated with antipsychotic drugs are at an increased risk (1.6 to 1.7 times) of death compared to placebo (4.5\% vs. 2.6\%, respectively). Analyses of 17 placebo-controlled trials (modal duration of 10 weeks), largely in patients taking atypical antipsychotic drugs, revealed a risk of death in drug-treated patients of between 1.6 to 1.7 times the risk of death in placebo-treated patients. Over the course of a typical 10-week controlled trial, the rate of death in drug treated patients was about 4.5\%, compared to a rate of about 2.6% in the placebo group. Although the causes of death were varied, most of the deaths appeared to be cardiovascular (e.g., heart failure, sudden death) or infectious (e.g., pneumonia) in nature.

**ABILIFY MAINTENA** (aripiprazole) is not approved for the treatment of patients with dementia-related psychosis.

**Contraindication:** Known hypersensitivity reaction to aripiprazole. Reactions have ranged from pruritus/urticaria to anaphylaxis.

**Cerebrovascular Adverse Events, Including Stroke:** Increased incidence of cerebrovascular adverse events (e.g., stroke, transient ischemic attack), including fatalities, have been reported in clinical trials of elderly patients with dementia-related psychosis treated with oral aripiprazole.

**Neuroleptic Malignant Syndrome (NMS):** A potentially fatal symptom complex sometimes referred to as NMS may occur with administration of antipsychotic drugs, including ABILIFY MAINTENA. Rare cases of NMS occurred during aripiprazole treatment. Signs and symptoms of NMS include hyperpyrexia,
muscle rigidity, altered mental status, and evidence of autonomic instability (e.g., irregular pulse or blood pressure, tachycardia, diaphoresis, and cardiac dysrhythmia). Additional signs may include elevated creatine phosphokinase, myoglobinuria (rhabdomyolysis), and acute renal failure. The management of NMS should include: 1) immediate discontinuation of antipsychotic drugs and other drugs not essential to concurrent therapy; 2) intensive symptomatic treatment and medical monitoring; and 3) treatment of any concomitant serious medical problems for which specific treatments are available.

**Tardive Dyskinesia (TD):** The risk of developing TD (a syndrome of abnormal, involuntary movements) and the potential for it to become irreversible are believed to increase as the duration of treatment and the total cumulative dose of antipsychotic increase. The syndrome can develop, although much less commonly, after relatively brief treatment periods at low doses. Prescribing should be consistent with the need to minimize TD. There is no known treatment for established TD, although the syndrome may remit, partially or completely, if antipsychotic treatment is withdrawn.

**Metabolic Changes:** Atypical antipsychotic drugs have been associated with metabolic changes that include:

- **Hyperglycemia/Diabetes Mellitus:** Hyperglycemia, in some cases extreme and associated with ketoacidosis, coma, or death, has been reported in patients treated with atypical antipsychotics including aripiprazole. Patients with diabetes should be regularly monitored for worsening of glucose control; those with risk factors for diabetes should undergo baseline and periodic fasting blood glucose testing. Any patient treated with atypical antipsychotics should be monitored for symptoms of hyperglycemia including polydipsia, polyuria, polyphagia, and weakness. Patients who develop symptoms of hyperglycemia should also undergo fasting blood glucose testing. In some cases, hyperglycemia has resolved when the atypical antipsychotic was discontinued; however, some patients required continuation of anti-diabetic treatment despite discontinuation of the suspect drug.

- **Dyslipidemia:** Undesirable alterations in lipids have been observed in patients treated with atypical antipsychotics. There were no significant differences between aripiprazole- and placebo-treated patients in the proportion with changes from normal to clinically significant levels for fasting/nonfasting total cholesterol, fasting triglycerides, fasting low-density lipoproteins (LDLs), and fasting/nonfasting high-density lipoproteins (HDLs).

- **Weight Gain:** Weight gain has been observed. Clinical monitoring of weight is recommended.
Orthostatic Hypotension: Aripiprazole may cause orthostatic hypotension. ABILIFY MAINTENA (aripiprazole) should be used with caution in patients with known cardiovascular disease, cerebrovascular disease, or conditions which would predispose them to hypotension.

Leukopenia, Neutropenia, and Agranulocytosis: Leukopenia, neutropenia, and agranulocytosis have been reported. Patients with a history of clinically significant low white blood cell (WBC) count or drug-induced leukopenia/neutropenia should have their complete blood count monitored frequently during the first few months of therapy while receiving ABILIFY MAINTENA. In such patients, consider discontinuation of ABILIFY MAINTENA at the first sign of a clinically significant decline in WBC count in the absence of other causative factors.

Seizures/Convulsions: ABILIFY MAINTENA should be used with caution in patients with a history of seizures or with conditions that lower the seizure threshold.

Potential for Cognitive and Motor Impairment: ABILIFY MAINTENA (aripiprazole) may impair judgment, thinking, or motor skills. Instruct patients to avoid operating hazardous machinery including automobiles until they are certain ABILIFY MAINTENA does not affect them adversely.

Body Temperature Regulation: Disruption of the body’s ability to reduce core body temperature has been attributed to antipsychotic agents. Advise patients regarding appropriate care in avoiding overheating and dehydration. Appropriate care is advised for patients who may exercise strenuously, may be exposed to extreme heat, receive concomitant medication with anticholinergic activity, or are subject to dehydration.

Dysphagia: Esophageal dysmotility and aspiration have been associated with ABILIFY MAINTENA; use caution in patients at risk for aspiration pneumonia.

Alcohol: Advise patients to avoid alcohol while taking ABILIFY MAINTENA.

Concomitant Medication: Dosage adjustments are recommended in patients who are CYP2D6 poor metabolizers and in patients taking concomitant CYP3A4 inhibitors or CYP2D6 inhibitors for greater than 14 days. If the CYP3A4 inhibitor or CYP2D6 inhibitor is withdrawn, the ABILIFY MAINTENA dosage may need to be increased. Avoid the concomitant use of CYP3A4 inducers with ABILIFY MAINTENA for greater than 14 days because the blood levels of aripiprazole are decreased and may be below the effective levels. Dosage adjustments are not recommended for patients with concomitant use of CYP3A4 inhibitors, CYP2D6 inhibitors or CYP3A4 inducers for less than 14 days.
Most commonly observed adverse reaction: The safety profile of ABILIFY MAINTENA is expected to be similar to that of oral aripiprazole. In patients who tolerated and responded to oral aripiprazole and single-blind ABILIFY MAINTENA and were then randomized to receive ABILIFY MAINTENA or placebo injections, the incidence of adverse reactions was similar between the two treatment groups. The adverse reaction ≥ 5% incidence and at least twice the rate of placebo for oral aripiprazole vs. placebo, respectively, was:

- Akathisia (8% vs. 4%) in adult patients with schizophrenia.

Injection Site Reactions: In the open-label, stabilization phase of a study with ABILIFY MAINTENA in patients with schizophrenia, the percent of patients reporting any injection site- related adverse reaction was 6.3% for ABILIFY MAINTENA-treated patients.

Dystonia is a class effect of antipsychotic drugs. Symptoms of dystonia may occur in susceptible individuals during the first days of treatment and at low doses.

Pregnancy/Nursing: Based on animal data, may cause fetal harm. ABILIFY MAINTENA (aripiprazole) should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Aripiprazole is excreted in human breast milk. A decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

Please see accompanying FULL PRESCRIBING INFORMATION, including Boxed WARNING, for ABILIFY MAINTENA.

About Schizophrenia

Schizophrenia is a disease characterized by a distortion in the process of thinking and of emotional responsiveness. It most commonly manifests as hallucinations, paranoid or bizarre delusions, or disorganized speech and thinking, and is accompanied by significant social or occupational dysfunction. Onset of symptoms typically occurs in young adulthood and the condition is chronic, often requiring lifelong treatment to mitigate symptoms. It has been estimated that schizophrenia affects approximately 1% of the adult population in the U.S., and approximately 24 million people worldwide. In the U.S., there are approximately 2.4 million adults with schizophrenia, prevalent equally in both genders. While there is no cure for the disease, symptoms and risk of relapse — the re-emergence or worsening of psychotic symptoms — can be managed in most patients with appropriate antipsychotic treatment.
About Otsuka America Pharmaceutical, Inc.

Otsuka America Pharmaceutical, Inc. (OAPI) is an innovative, fast-growing healthcare company that commercializes Otsuka-discovered and in-licensed products in the U.S., with a strong focus on neuroscience, oncology, cardio-renal and medical devices. For more information, visit http://www.otsuka-us.com.

OAPI is a subsidiary of Otsuka America, Inc. (OAI), a holding company established in the U.S. in 1989. OAI is wholly owned by Otsuka Pharmaceutical Co., Ltd, based in Japan. The Otsuka Group employs approximately 42,000 people globally and its products are available in more than 80 countries worldwide. Otsuka welcomes you to visit its global website at https://www.otsuka.co.jp/en/.

About H. Lundbeck A/S

H. Lundbeck A/S (LUN.CO, LUN DC, HLUYY) is a global pharmaceutical company specialized in brain diseases. For more than 50 years, we have been at the forefront of research within neuroscience. Our key areas of focus are alcohol dependence, Alzheimer’s disease, bipolar disorder, depression/anxiety, epilepsy, Huntington’s disease, Parkinson’s disease, schizophrenia, stroke and symptomatic neurogenic orthostatic hypotension (NOH).

An estimated 700 million people worldwide are living with brain disease and far too many suffer due to inadequate treatment, discrimination, a reduced number of working days, early retirement and other unnecessary consequences. Every day, we strive for improved treatment and a better life for people living with brain disease – we call this Progress in Mind.


Our approximately 6,000 employees in 57 countries are engaged in the entire value chain throughout research, development, production, marketing and sales. Our pipeline consists of several late-stage development programmes and our products are available in more 100 countries. We have research centres in China, Denmark and the US and production facilities in China, Denmark, France and Italy. Lundbeck generated revenue of approximately DKK15.3 billion in 2013 (EUR2.1 billion; USD2.7 billion).

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**Otsuka Pharmaceutical Contacts**

**Investors:**
Yoko Ishii
Otsuka Holdings Co., Ltd.
Ishiiyo@Otsuka.jp
+81 3 6361 7411

**Media:**
Rose Weldon
Otsuka America Pharmaceutical, Inc.
rose.weldon@otsuka-us.com
+1 609 524 6879

**Lundbeck Contacts**

**Investors:**
Palle Holm Olesen
Chief Specialist, Head of Investor Relations
palo@lundbeck.com
+45 36 43 24 26

**Media:**
Ashleigh Duchene
Lundbeck
aduc@lundbeck.com
+1 847 282 1164

Jens Høyer
Specialist, Investor Relations
JSHR@Lundbeck.com
+45 36 43 33 86
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iii. Data on File: 14724A – the QUALIFY study.


