

**CENTER FOR DRUG EVALUATION AND
RESEARCH**

APPLICATION NUMBER:

21-284

APPROVED LABELING

[Attachment to FDA approval letter for NDA 21-284]

Ritalin® LA (methylphenidate hydrochloride) Extended-release capsules

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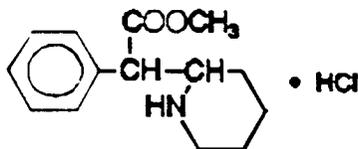
Rx only

DESCRIPTION

Methylphenidate hydrochloride is a central nervous system (CNS) stimulant.

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) is an extended-release formulation of methylphenidate with a bi-modal release profile. Ritalin®LA uses the proprietary SODAS™ (Spheroidal Oral Drug Absorption System) technology. Each bead-filled Ritalin LA capsule contains half the dose as immediate release beads and half as enteric-coated, delayed-release beads, thus providing an immediate release of methylphenidate and a second delayed release of methylphenidate. Ritalin LA 20, 30, and 40 mg capsules provide in a single dose the same amount of methylphenidate as dosages of 10, 15, or 20 mg of Ritalin tablets given b.i.d.

The active substance in Ritalin LA is methyl α -phenyl-2-piperidineacetate hydrochloride, and its structural formula is



Methylphenidate hydrochloride USP is a white, odorless, fine crystalline powder. Its solutions are acid to litmus. It is freely soluble in water and in methanol, soluble in alcohol, and slightly soluble in chloroform and in acetone. Its molecular weight is 269.77.

Inactive ingredients: ammonio methacrylate copolymer, black iron oxide (40 mg capsules only), gelatin, methacrylic acid copolymer, polyethylene glycol, red iron oxide (40 mg capsules only), sugar spheres, talc, titanium dioxide, triethyl citrate, and yellow iron oxide (30 and 40 mg capsules only).

CLINICAL PHARMACOLOGY

Pharmacodynamics

Methylphenidate hydrochloride, the active ingredient in Ritalin® LA (methylphenidate hydrochloride) extended-release capsules, is a central nervous system (CNS) stimulant. The mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is not known. Methylphenidate is thought to block the reuptake of norepinephrine and dopamine into the presynaptic neuron and increase the release of these monoamines into the extraneuronal space. Methylphenidate is a racemic mixture comprised of the *d*- and *l*-*threo* enantiomers. The *d*-*threo* enantiomer is more pharmacologically active than the *l*-*threo* enantiomer.

Pharmacokinetics

Absorption

Ritalin® LA produces a bi-modal plasma concentration-time profile (i.e., two distinct peaks approximately four hours apart) when orally administered to children diagnosed with ADHD and to healthy adults. The initial rate of absorption for Ritalin® LA is similar to that of Ritalin® tablets as shown by the similar rate parameters between the two formulations, i.e., initial lag time (T_{lag}), first peak concentration (C_{max1}), and time to the first peak (T_{max1}), which is reached in 1-3 hours. The mean time to the interpeak minimum (T_{minip}), and time to the second peak (T_{max2}) are also similar for Ritalin® LA given once daily and Ritalin® tablets given in two doses 4 hours apart [see Figure 1 and Table 1], although the ranges observed are greater for Ritalin® LA.

Ritalin® LA given once daily exhibits a lower second peak concentration (C_{max2}), higher interpeak minimum concentrations (C_{minip}), and less peak and trough fluctuations than Ritalin tablets given in two doses given 4 hours apart. This is due to an earlier onset and more prolonged absorption from the delayed release beads [see Figure 1 and Table 1].

The relative bioavailability of Ritalin LA given once daily is comparable to the same total dose of Ritalin® tablets given in two doses 4 hours apart in both children and in adults.

Figure 1. Mean plasma concentration time-profile of methylphenidate after a single dose of Ritalin LA 40 mg q.d. and Ritalin® 20 mg given in two doses four hours apart

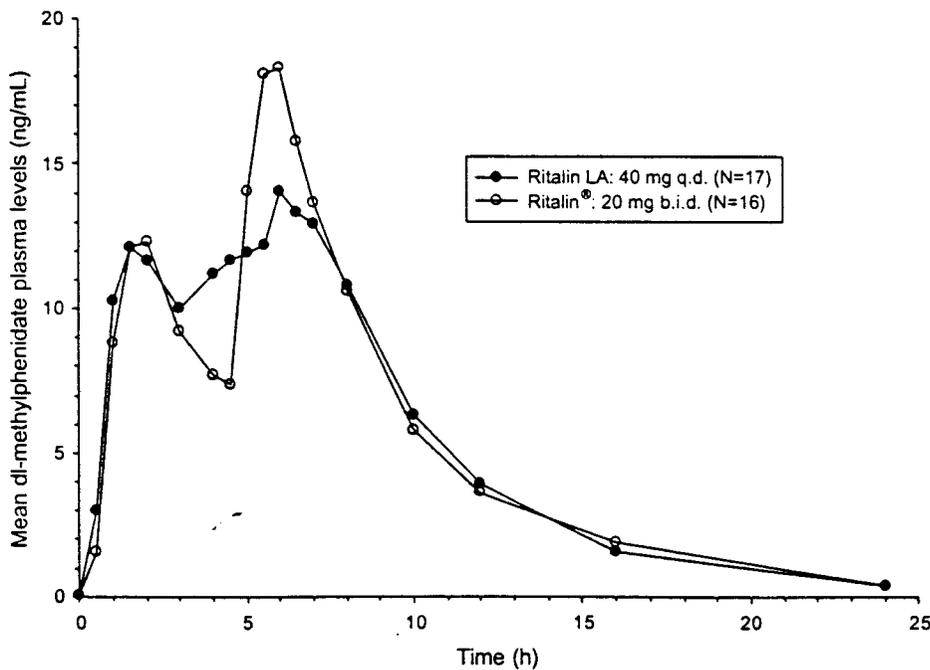


Table 1. Mean \pm SD and range of pharmacokinetic parameters of methylphenidate after a single dose of Ritalin LA and Ritalin® given in two doses 4 hours apart

Population	Children		Adult Males	
Formulation	Ritalin	Ritalin LA	Ritalin	Ritalin LA
Dose	10 mg & 10 mg	20 mg	10 mg & 10 mg	20 mg
N	21	18	9	8
Tlag (h)	0.24 \pm 0.44 0 - 1	0.28 \pm 0.46 0 - 1	1.0 \pm 0.5 0.7 - 1.3	0.7 \pm 0.2 0.3 - 1.0
Tmax1 (h)	1.8 \pm 0.6 1 - 3	2.0 \pm 0.8 1 - 3	1.9 \pm 0.4 1.3 - 2.7	2.0 \pm 0.9 1.3 - 4.0
Cmax1 (ng/mL)	10.2 \pm 4.2 4.2 - 20.2	10.3 \pm 5.1 5.5 - 26.6	4.3 \pm 2.3 1.8 - 7.5	5.3 \pm 0.9 3.8 - 6.9
Tminip (h)	4.0 \pm 0.2 4 - 5	4.5 \pm 1.2 2 - 6	3.8 \pm 0.4 3.3 - 4.3	3.6 \pm 0.6 2.7 - 4.3
Cminip (ng/mL)	5.8 \pm 2.7 3.1 - 14.4	6.1 \pm 4.1 2.9 - 21.0	1.2 \pm 1.4 0.0 - 3.7	3.0 \pm 0.8 1.7 - 4.0
Tmax2 (h)	5.6 \pm 0.7 5 - 8	6.6 \pm 1.5 5 - 11	5.9 \pm 0.5 5.0 - 6.5	5.5 \pm 0.8 4.3 - 6.5
Cmax2 (ng/mL)	15.3 \pm 7.0 6.2 - 32.8	10.2 \pm 5.9 4.5 - 31.1	5.3 \pm 1.4 3.6 - 7.2	6.2 \pm 1.6 3.9 - 8.3
AUC(0- ∞) (ng/mL x h-1)	102.4 \pm 54.6 40.5 - 261.6	86.6 \pm 64.0a 43.3 - 301.44	37.8 \pm 21.9 14.3 - 85.3	45.8 \pm 10.0 34.0 - 61.6
tt/2 (h)	2.5 \pm 0.8 1.8 - 5.3	2.4 \pm 0.7a 1.5 - 4.0	3.5 \pm 1.9 1.3 - 7.7	3.3 \pm 0.4 3.0 - 4.2

a n = 15

Dose Proportionality

After oral administration of Ritalin® LA 20 mg and 40 mg capsules to adults there is a slight upward trend in the methylphenidate area under the curve (AUC) and peak plasma concentrations (Cmax1 and Cmax2).

Distribution

Binding to plasma proteins is low (10-33%), and the apparent distribution volume at steady-state with intravenous administration has been reported to be approximately 6L/kg.

Metabolism

The absolute oral bioavailability of methylphenidate in children has been reported to be about 30% (range 10 - 52%), suggesting pronounced presystemic metabolism. Biotransformation of methylphenidate is rapid and extensive leading to the main, de-esterified metabolite α -phenyl-2-piperidine acetic-acid (ritalinic acid). Only

small amounts of hydroxylated metabolites (e.g. hydroxymethylphenidate and hydroxyritalinic acid) are detectable in plasma. Therapeutic activity is principally due to the parent compound.

Elimination

In studies with Ritalin® LA and Ritalin® tablets in adults, methylphenidate from Ritalin® tablets is eliminated from plasma with an average half-life of about 3.5 hours, (range 1.3 - 7.7 hours). In children the average half-life is about 2.5 hours, with a range of about 1.5 - 5.0 hours. The rapid half-life in both children and adults may result in unmeasurable concentrations between the morning and mid-day doses with Ritalin tablets. No accumulation of methylphenidate is expected following multiple once a day oral dosing with Ritalin LA. The half-life of ritalinic acid is about 3-4 hours.

After oral administration of an immediate release formulation of methylphenidate, 78-97% of the dose is excreted in the urine and 1-3% in the feces in the form of metabolites within 48-96 hours. Only small quantities (< 1%) of unchanged methylphenidate appear in the urine. Most of the dose is excreted in the urine as ritalinic acid (60-86%), the remainder being accounted for by minor metabolites.

Food Effects

Administration times relative to meals and meal composition may need to be individually titrated.

When Ritalin LA was administered with a high fat breakfast to adults, Ritalin LA had a longer lag time until absorption began and variable delays in the time until the first peak concentration, the time until the interpeak minimum, and the time until the second peak. The first peak concentration and the extent of absorption were unchanged after food relative to the fasting state, although the second peak was approximately 25% lower. The effect of a high fat lunch was not examined.

There were no differences in the pharmacokinetics of Ritalin LA when administered with applesauce, compared to administration in the fasting condition. There is no evidence of dose dumping in the presence or absence of food.

For patients unable to swallow the capsule, the contents may be sprinkled on applesauce and administered (see Dosage and Administration).

Special Populations

Age

The pharmacokinetics of Ritalin® LA was examined in 18 children with ADHD between 7 and 12 years of age. Fifteen of these children were between 10 and 12 years of age. The time until the between peak minimum, and the time until the second peak were delayed and more variable in children compared to adults. After a 20 mg dose of Ritalin® LA, concentrations in children were approximately twice the concentrations observed in 18 to 35 year old adults. This higher exposure is almost completely due to the smaller body size and total volume of distribution in children, as apparent clearance normalized to body weight is independent of age.

Gender

There were no apparent gender differences in the pharmacokinetics of methylphenidate between healthy male and female adults when administered Ritalin LA.

Renal Insufficiency

Ritalin LA has not been studied in renally-impaired patients. Renal insufficiency is expected to have minimal effect on the pharmacokinetics of methylphenidate since less than 1% of a radiolabeled dose is excreted in the urine as unchanged compound, and the major metabolite (ritalinic acid), has little or no pharmacologic activity.

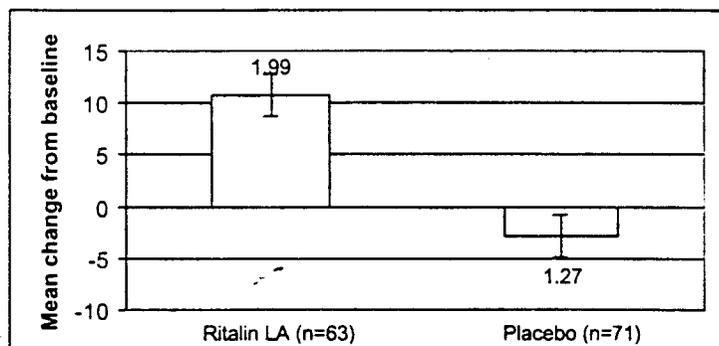
Hepatic Insufficiency

Ritalin LA has not been studied in patients with hepatic insufficiency. Hepatic insufficiency is expected to have minimal effect on the pharmacokinetics of methylphenidate since it is metabolized primarily to ritalinic acid by nonmicrosomal hydrolytic esterases that are widely distributed throughout the body.

Clinical Studies

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) was evaluated in a randomized, double-blind, placebo-controlled, parallel group clinical study in which 134 children, ages 6 to 12, with DSM-IV diagnoses of attention deficit hyperactivity disorder (ADHD) received a single morning dose of Ritalin LA in the range 10-40 mg/day, or placebo, for up to 2 weeks. The doses used were the optimal doses established in a previous individual dose titration phase. In that titration phase, 53 of 164 patients (32%) started on a daily dose of 10 mg and 111 of 164 patients (68%) started on a daily dose of 20 mg or higher. The patient's regular school teacher completed the Conners ADHD/DSM-IV Scale for Teachers (CADS-T) at baseline and the end of each week. The CADS-T assesses symptoms of hyperactivity and inattention. The change from baseline of the (CADS-T) scores during the last week of treatment was analyzed as the primary efficacy parameter. Patients treated with Ritalin LA showed a statistically significant improvement in symptom scores from baseline over patients who received placebo. (See Figure 1.) This demonstrates that a single morning dose of Ritalin LA exerts a treatment effect in ADHD.

Figure 1. CADS-T total subscale - Mean change from baseline*



*Error bars represent standard error of the mean

INDICATIONS AND USAGE

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) is indicated for the treatment of Attention-Deficit Hyperactivity Disorder (ADHD).

The efficacy of Ritalin® LA in the treatment of ADHD was established in one controlled trial of children aged 6 to 12 who met DSM-IV criteria for ADHD (see CLINICAL PHARMACOLOGY).

A diagnosis of Attention Deficit Hyperactivity Disorder (ADHD; DSM-IV) implies the presence of hyperactive-impulsive or inattentive symptoms that caused impairment and were present before age 7 years. The symptoms must cause clinically significant impairment, e.g., in social, academic, or occupational functioning, and be present in two or more settings, e.g., school (or work) and at home. The symptoms must not be better accounted for by another mental disorder. For the Inattentive Type, at least six of the following symptoms must have persisted for at least 6 months: lack of attention to details/careless mistakes; lack of sustained attention; poor listener; failure to follow through on tasks; poor organization; avoids tasks requiring sustained mental effort; loses things; easily distracted; forgetful. For the Hyperactive-Impulsive Type, at least six of the following symptoms must have persisted for at least 6 months: fidgeting/squirming; leaving seat; inappropriate running/climbing; difficulty with quiet activities; "on the go;" excessive talking; blurting answers; can't wait turn; intrusive. The Combined Types requires both inattentive and hyperactive-impulsive criteria to be met.

Special Diagnostic Considerations

Specific etiology of this syndrome is unknown, and there is no single diagnostic test. Adequate diagnosis requires the use not only of medical but of special psychological, educational, and social resources. Learning may or may not be impaired. The diagnosis must be based upon a complete history and evaluation of the child and not solely on the presence of the required number of DSM-IV characteristics.

Need for Comprehensive Treatment Program

Ritalin® LA is indicated as an integral part of a total treatment program for ADHD that may include other measures (psychological, educational, social) for patients with this syndrome. Drug treatment may not be indicated for all children with this syndrome. Stimulants are not intended for use in the child who exhibits symptoms secondary to environmental factors and/or other primary psychiatric disorders, including psychosis. Appropriate educational placement is essential and psychosocial intervention is often helpful. When remedial measures alone are insufficient, the decision to prescribe stimulant medication will depend upon the physician's assessment of the chronicity and severity of the child's symptoms.

Long-Term Use

The effectiveness of Ritalin® LA for long-term use, i.e., for more than 2 weeks, has not been systematically evaluated in controlled trials. Therefore, the physician who elects to use Ritalin® LA for extended periods should periodically re-evaluate the long-term usefulness of the drug for the individual patient (see DOSAGE and ADMINISTRATION).

CONTRAINDICATIONS

Agitation

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) is contraindicated in marked anxiety, tension, and agitation, since the drug may aggravate these symptoms.

Hypersensitivity to methylphenidate

Ritalin LA is contraindicated in patients known to be hypersensitive to methylphenidate or other components of the product.

Glaucoma

Ritalin LA is contraindicated in patients with glaucoma.

Tics

Ritalin LA is contraindicated in patients with motor tics or with a family history or diagnosis of Tourette's syndrome. See ADVERSE REACTIONS.

Monoamine Oxidase Inhibitors

Ritalin LA is contraindicated during treatment with monoamine oxidase inhibitors, and also within a minimum of 14 days following discontinuation of treatment with a monoamine oxidase inhibitor (hypertensive crises may result).

WARNINGS

Depression

Ritalin LA should not be used to treat severe depression.

Fatigue

Ritalin LA should not be used for the prevention or treatment of normal fatigue states.

Long-Term Suppression of Growth

Sufficient data on the safety of long-term use of methylphenidate in children are not yet available. Although a causal relationship has not been established, suppression of growth (i.e., weight gain, and/or height) has been reported with the long-term use of stimulants in children. Therefore, patients requiring long-term therapy should be carefully monitored. Patients who are not growing or gaining weight as expected should have their treatment interrupted. In the double blind placebo controlled study of Ritalin LA, the mean weight gain was greater for patients receiving placebo (+1.0 kg) than for patients receiving Ritalin LA (+0.1 kg).

Psychosis

Clinical experience suggests that in psychotic patients, administration of methylphenidate may exacerbate symptoms of behavior disturbance and thought disorder.

Seizures

There is some clinical evidence that methylphenidate may lower the convulsive threshold in patients with prior history of seizures, with prior EEG abnormalities in the absence of seizures, and, very rarely, in the absence of history of seizures and no prior EEG evidence of seizures. Safe concomitant use of anticonvulsants and methylphenidate has not been established. In the presence of seizures, Ritalin LA should be discontinued.

Hypertension and other Cardiovascular Conditions

Use cautiously in patients with hypertension. Blood pressure should be monitored at appropriate intervals in patients taking Ritalin LA, especially patients with hypertension. Studies of methylphenidate have shown modest increases of resting pulse and systolic and diastolic blood pressure. Therefore, caution is indicated in treating patients whose underlying medical conditions might be compromised by increases in blood pressure or heart rate, e.g., those with pre-existing hypertension, heart failure, recent myocardial infarction, or hyperthyroidism.

Visual Disturbance

Symptoms of visual disturbances have been encountered in rare cases. Difficulties with accommodation and blurring of vision have been reported with methylphenidate.

Use in Children Under Six Years of Age

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) should not be used in children under six years of age, since safety and efficacy in this age group have not been established.

Drug Dependence

Ritalin LA should be given cautiously to patients with a history of drug dependence or alcoholism. Chronic abusive use can lead to marked tolerance and psychological dependence with varying degrees of abnormal behavior. Frank psychotic episodes can occur, especially with parenteral abuse. Careful supervision is required during withdrawal from abusive use, since severe depression may occur. Withdrawal following chronic therapeutic use may unmask symptoms of the underlying disorder that may require follow-up.

PRECAUTIONS

Hematologic Monitoring

Periodic CBC, differential, and platelet counts are advised during prolonged therapy.

Information for Patients

Patient information is provided at the end of this insert. To assure safe and effective use of Ritalin® LA (methylphenidate hydrochloride extended-release capsules), the patient information should be discussed with patients.

Drug Interactions

Methylphenidate is metabolized primarily by de-esterification (nonmicrosomal hydrolytic esterases) to ritalinic acid and not through oxidative pathways.

The effects of gastrointestinal pH alterations on the absorption of methylphenidate from Ritalin LA have not been studied. Since the modified release characteristics of Ritalin LA are pH dependent, the co-administration of antacids or acid suppressants could alter the release of methylphenidate.

Methylphenidate may decrease the hypotensive effect of guanethidine. Because of possible effects on blood pressure, methylphenidate should be used cautiously with pressor agents.

Human pharmacologic studies have shown that methylphenidate may inhibit the metabolism of coumarin anticoagulants, anticonvulsants (e.g., phenobarbital, phenytoin, primidone), and tricyclic drugs (e.g., imipramine, clomipramine, desipramine). Downward dose adjustment of these drugs may be required when given concomitantly with methylphenidate. It may be necessary to adjust the dosage and monitor plasma drug concentrations (or, in the case of coumarin, coagulation times), when initiating or discontinuing concomitant methylphenidate.

Serious adverse events have been reported in concomitant use of methylphenidate with clonidine, although no causality for the combination has been established. The safety of using methylphenidate in combination with clonidine or other centrally acting alpha-2-agonists has not been systematically evaluated.

Carcinogenesis/Mutagenesis/Impairment of Fertility

In a lifetime carcinogenicity study carried out in B6C3F1 mice, methylphenidate caused an increase in hepatocellular adenomas and, in males only, an increase in hepatoblastomas, at a daily dose of approximately 60 mg/kg/day. This dose is approximately 30 times and 4 times the maximum recommended human dose on a mg/kg and mg/m² basis, respectively. Hepatoblastoma is a relatively rare rodent malignant tumor type. There was no increase in total malignant hepatic tumors. The mouse strain used is sensitive to the development of hepatic tumors, and the significance of these results to humans is unknown.

Methylphenidate did not cause any increases in tumors in a lifetime carcinogenicity study carried out in F344 rats; the highest dose used was approximately 45 mg/kg/day, which is approximately 22 times and 5 times the maximum recommended human dose on a mg/kg and mg/m² basis, respectively.

In a 24-week carcinogenicity study in the transgenic mouse strain p53+/-, which is sensitive to genotoxic carcinogens, there was no evidence of carcinogenicity. Male and female mice were fed diets containing the same concentration of methylphenidate as in the lifetime carcinogenicity study; the high-dose groups were exposed to 60 to 74 mg/kg/day of methylphenidate.

Methylphenidate was not mutagenic in the in vitro Ames reverse mutation assay or in the in vitro mouse lymphoma cell forward mutation assay. Sister chromatid exchanges and chromosome aberrations were increased, indicative of a weak clastogenic response, in an in vitro assay in cultured Chinese Hamster Ovary (CHO) cells. Methylphenidate was negative in vivo in males and females in the mouse bone marrow micronucleus assay.

Methylphenidate did not impair fertility in male or female mice that were fed diets containing the drug in an 18-week Continuous Breeding study. The study was conducted at doses up to 160 mg/kg/day, approximately 80-fold and 8-fold the highest recommended dose on a mg/kg and mg/m² basis, respectively.

Pregnancy Category C

In studies conducted in rats and rabbits, methylphenidate was administered orally at doses of up to 75 and

200 mg/kg/day, respectively, during the period of organogenesis. Teratogenic effects (increased incidence of fetal spina bifida) were observed in rabbits at the highest dose, which is approximately 40 times the maximum recommended human dose (MRHD) on a mg/m² basis. The no effect level for embryo-fetal development in rabbits was 60 mg/kg/day (11 times the MRHD on a mg/m² basis). There was no evidence of specific teratogenic activity in rats, although increased incidences of fetal skeletal variations were seen at the highest dose level (7 times the MRHD on a mg/m² basis), which was also maternally toxic. The no effect level for embryo-fetal development in rats was 25 mg/kg/day (2 times the MRHD on a mg/m² basis). When methylphenidate was administered to rats throughout pregnancy and lactation at doses of up to 45 mg/kg/day, offspring body weight gain was decreased at the highest dose (4 times the MRHD on a mg/m² basis), but no other effects on postnatal development were observed. The no effect level for pre- and postnatal development in rats was 15 mg/kg/day (equal to the MRHD on a mg/m² basis).

Adequate and well-controlled studies in pregnant women have not been conducted. Ritalin® LA should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers

It is not known whether methylphenidate is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised if Ritalin® LA is administered to a nursing woman.

Pediatric Use

Long-term effects of methylphenidate in children have not been well established. Ritalin LA should not be used in children under six years of age (see Warnings).

In a study conducted in young rats, methylphenidate was administered orally at doses of up to 100 mg/kg/day for 9 weeks, starting early in the postnatal period (Postnatal Day 7) and continuing through sexual maturity (Postnatal Week 10). When these animals were tested as adults (Postnatal Weeks 13 -14), decreased spontaneous locomotor activity was observed in males and females previously treated with 50 mg/kg/day (approximately 6 times the maximum recommended human dose [MRHD] on a mg/m² basis) or greater, and a deficit in the acquisition of a specific learning task was seen in females exposed to the highest dose (12 times the MRHD on a mg/m² basis). The no effect level for juvenile neurobehavioral development in rats was 5 mg/kg/day (half the MRHD on a mg/m² basis). The clinical significance of the long-term behavioral effects observed in rats is unknown.

ADVERSE REACTIONS

The clinical program for Ritalin® LA (methylphenidate hydrochloride extended-release capsules) consisted of six studies: two controlled clinical studies conducted in children with ADHD aged 6-12 years and four clinical pharmacology studies conducted in healthy adult volunteers. These studies included a total of 256 subjects; 195 children with ADHD and 61 healthy adult volunteers. The subjects received Ritalin LA in doses of 10- 40 mg per day. Safety of Ritalin LA was assessed by evaluating frequency and nature of adverse events, routine laboratory tests, vital signs, and body weight.

Adverse events during exposure were obtained primarily by general inquiry and recorded by clinical investigators using terminology of their own choosing. Consequently, it is not possible to provide a meaningful estimate of the proportion of individuals experiencing adverse events without first grouping similar types of events into a smaller number of standardized event categories. In the tables and listings that follow, MEDRA terminology has been used to classify reported adverse events. The stated frequencies of adverse events represent the proportion of individuals who experienced, at least once, a treatment-emergent adverse event of the type listed. An event was considered treatment emergent if it occurred for the first time or worsened while receiving therapy following baseline evaluation.

Adverse Events in a Double-blind, Placebo-Controlled Clinical Trial with Ritalin LA

Treatment-Emergent Adverse Events

A placebo-controlled, double-blind, parallel-group study was conducted to evaluate the efficacy and safety of Ritalin LA in children with ADHD aged 6-12 years. All subjects received Ritalin LA for up to 4 weeks, and had their dose optimally adjusted prior to entering the double-blind phase of the trial. In the two-week double-blind treatment phase of this study, patients received either placebo or Ritalin LA at their individually-titrated dose (range 10-40 mg).

The prescriber should be aware that these figures cannot be used to predict the incidence of adverse events in the course of usual medical practice where patient characteristics and other factors differ from those which prevailed in the clinical trials. Similarly, the cited frequencies cannot be compared with figures obtained from other clinical investigations involving different treatments, uses, and investigators. The cited figures, however, do provide the prescribing physician with some basis for estimating the relative contribution of drug and non-drug factors to the adverse event incidence rate in the population studied.

Adverse events with an incidence > 5% during the initial four-week single-blind Ritalin LA titration period of this study were headache, insomnia, upper abdominal pain, appetite decreased, and anorexia.

Treatment-emergent adverse events with an incidence > 2% among Ritalin LA-treated subjects, during the two-week double-blind phase of the clinical study, were as follows:

Preferred term	Ritalin LA	Placebo
	N=65	N=71
	n (%)	n (%)
Anorexia	2 (3.1)	0 (0.0)
Insomnia	2 (3.1)	0 (0.0)

Adverse Events Associated with Discontinuation of Treatment

In the two-week double-blind treatment phase of a placebo-controlled parallel-group study in children with ADHD, only one Ritalin LA-treated subject (1/65, 1.5%) discontinued due to an adverse event (depression).

In the single-blind titration period of this study, subjects received Ritalin LA for up to 4 weeks. During this period a total of six subjects (6/161, 3.7%) discontinued due to adverse events. The adverse events leading to discontinuation were anger (in 2 patients), hypomania, anxiety, depressed mood, fatigue, migraine and lethargy.

Adverse Events with Other Methylphenidate HCl Dosage Forms

Nervousness and insomnia are the most common adverse reactions reported with other methylphenidate products. In children, loss of appetite, abdominal pain, weight loss during prolonged therapy, insomnia, and tachycardia may occur more frequently; however, any of the other adverse reactions listed below may also occur.

Other reactions include:

Cardiac: angina, arrhythmia, palpitations, pulse increased or decreased, tachycardia

Gastrointestinal: abdominal pain, nausea

Immune: hypersensitivity reactions including skin rash, urticaria, fever, arthralgia, exfoliative dermatitis, erythema multiforme with histopathological findings of necrotizing vasculitis, and thrombocytopenic purpura.

Metabolism/Nutrition: anorexia, weight loss during prolonged therapy

Nervous System: dizziness, drowsiness, dyskinesia, headache, rare reports of Tourette's syndrome, toxic psychosis

Vascular: blood pressure increased or decreased, cerebral arteritis and/or occlusion

Although a definite causal relationship has not been established, the following have been reported in patients taking methylphenidate:

Blood/lymphatic: leukopenia and/or anemia

Hepato-biliary: abnormal liver function, ranging from transaminase elevation to hepatic coma

Psychiatric: transient depressed mood

Skin/subcutaneous: scalp hair loss

Very rare reports of neuroleptic malignant syndrome (NMS) have been received, and, in most of these, patients were concurrently receiving therapies associated with NMS. In a single report, a ten-year-old boy who had been taking methylphenidate for approximately 18 months experienced an NMS-like event within 45 minutes of ingesting his first dose of venlafaxine. It is uncertain whether this case represented a drug-drug interaction, a response to either drug alone, or some other cause.

DRUG ABUSE AND DEPENDENCE

Ritalin® LA (methylphenidate hydrochloride extended-release capsules), like other products containing methylphenidate, is a Schedule II controlled substance. (See Warnings for boxed warning containing drug abuse and dependence information.)

OVERDOSAGE

Signs and Symptoms

Signs and symptoms of acute overdosage, resulting principally from overstimulation of the central nervous system and from excessive sympathomimetic effects, may include the following: vomiting, agitation, tremors, hyperreflexia, muscle twitching, convulsions (may be followed by coma), euphoria, confusion, hallucinations, delirium, sweating, flushing, headache, hyperpyrexia, tachycardia, palpitations, cardiac arrhythmias, hypertension, mydriasis, and dryness of mucous membranes.

Poison Control Center

Consult with a Certified Poison Control Center regarding treatment for up-to-date guidance and advice.

Recommended Treatment

As with the management of all overdosage, the possibility of multiple drug ingestion should be considered.

When treating overdose, practitioners should bear in mind that there is a prolonged release of methylphenidate from Ritalin® LA (methylphenidate hydrochloride extended-release capsules).

Treatment consists of appropriate supportive measures. The patient must be protected against self-injury and against external stimuli that would aggravate overstimulation already present. Gastric contents may be evacuated by gastric lavage as indicated. Before performing gastric lavage, control agitation and seizures if present and protect the airway. Other measures to detoxify the gut include administration of activated charcoal and a cathartic. Intensive care must be provided to maintain adequate circulation and respiratory exchange; external cooling procedures may be required for hyperpyrexia.

Efficacy of peritoneal dialysis or extracorporeal hemodialysis for methylphenidate overdosage has not been established; also, dialysis is considered unlikely to be of benefit due to the large volume of distribution of methylphenidate.

DOSAGE AND ADMINISTRATION

Administration of Dose

Ritalin® LA (methylphenidate hydrochloride extended-release capsules) is for oral administration once daily in the morning. Ritalin LA may be swallowed as whole capsules or alternatively may be administered by sprinkling the capsule contents on a small amount of applesauce (see specific instructions below). Ritalin LA and/or their contents should not be crushed, chewed, or divided.

The capsules may be carefully opened and the beads sprinkled over a spoonful of applesauce. The applesauce should not be warm because it could affect the modified release properties of this formulation. The mixture of drug and applesauce should be consumed immediately in its entirety. The drug and applesauce mixture should be not stored for future use.

Dosing Recommendations

Dosage should be individualized according to the needs and responses of the patients.

Initial Treatment: The recommended starting dose of Ritalin LA is 20 mg once daily. Dosage may be adjusted in weekly 10 mg increments to a maximum of 60 mg/day taken once daily in the morning, depending on tolerability and degree of efficacy observed. Daily dosage above 60 mg is not recommended. When in the judgement of the clinician a lower initial dose is appropriate, patients may begin treatment with an immediate-release methylphenidate product at a lower dose. After titration to 10 mg b.i.d., these patients may be switched to Ritalin LA according to the guidelines in the table below. Further titration, if necessary, may proceed as above.

Patients Currently Receiving Methylphenidate:

The recommended dose of Ritalin LA for patients currently taking methylphenidate b.i.d or sustained release (SR) is provided below.

Previous methylphenidate dose	Recommended Ritalin® LA dose
10 mg methylphenidate b.i.d or 20 mg methylphenidate-SR	20 mg qd
15 mg methylphenidate b.i.d	30 mg qd
20 mg methylphenidate b.i.d or 40 mg of methylphenidate-SR	40 mg qd
30 mg methylphenidate b.i.d. or 60 mg methylphenidate-SR	60 mg qd

For other methylphenidate regimens, clinical judgment should be used when selecting the starting dose. Ritalin LA dosage may be adjusted at weekly intervals in 10 mg increments.

Daily dosage above 60 mg is not recommended.

Maintenance/Extended Treatment

There is no body of evidence available from controlled trials to indicate how long the patient with ADHD should be treated with Ritalin LA. It is generally agreed, however, that pharmacological treatment of ADHD may be needed for extended periods. Nevertheless, the physician who elects to use Ritalin LA for extended periods in patients with ADHD should periodically re-evaluate the long-term usefulness of the drug for the individual patient with trials off medication to assess the patient's functioning without pharmacotherapy. Improvement may be sustained when the drug is either temporarily or permanently discontinued.

Dose Reduction and Discontinuation

If paradoxical aggravation of symptoms or other adverse events occur, the dosage should be reduced, or, if necessary, the drug should be discontinued. If improvement is not observed after appropriate dosage adjustment over a one-month period, the drug should be discontinued.

HOW SUPPLIED

Ritalin® LA capsules 20 mg: white (imprinted NVR R20)
Bottles of 100.....NDC 0078-0370-05
Ritalin LA capsules 30 mg : yellow (imprinted NVR R30)
Bottles of 100.....NDC 0078-0371-05
Ritalin LA capsules 40 mg: light brown (imprinted NVR R40)
Bottles of 100.....NDC 0078-0372-05

Store at 25°C (77°F), excursions permitted 15-30°C (59-86°F) [See USP controlled temperature]

Dispense in tight container (USP).

RITALIN (R) LA is a trademark of Novartis AG.

SODAS™ is a trademark of Elan Corporation, plc.

This product is covered by US patents including US 5,837,284 and 6,228,398.

REFERENCE

American Psychiatric Association. Diagnosis and Statistical Manual of Mental disorders. 4th edition. Washington DC: American Psychiatric Association 1994

Manufactured for :

Novartis Pharmaceuticals Corp.
East Hanover, New Jersey 07936
By ELAN HOLDINGS INC.
Pharmaceutical Division
Gainesville, GA 30504

INFORMATION ABOUT RITALIN® LA FOR PATIENTS OR THEIR PARENTS OR CAREGIVERS

Once Daily

Ritalin®LA

(methylphenidate HCl) extended-release capsules

This information for patients or their parents or caregivers is about RITALIN LA. Please read this before you start taking RITALIN LA. Also, read the information you get each time you renew your prescription, in case anything has changed. Remember, this information does not take the place of your doctor's instructions. If you have any questions about this information or about RITALIN LA, talk to your doctor or pharmacist.

What is RITALIN LA ?

RITALIN LA is a once-a-day treatment for Attention Deficit Hyperactivity Disorder, or ADHD. RITALIN LA contains the drug methylphenidate (Ritalin®), a central nervous system stimulant that has been used to treat ADHD for more than 30 years. Ritalin is available in several forms including Ritalin LA, an extended-release form of methylphenidate hydrochloride available as 20, 30 and 40 mg extended-release capsules. RITALIN LA is taken by mouth, once each day in the morning, before breakfast.

What is Attention Deficit Hyperactivity Disorder?

ADHD has three main types of symptoms: inattention, hyperactivity, and impulsiveness. Symptoms of inattention include not paying attention, making careless mistakes, not listening, not finishing tasks, not following directions, and being easily distracted. Symptoms of hyperactivity and impulsiveness include fidgeting, talking excessively, running around at inappropriate times, and interrupting others. Some patients have more symptoms of hyperactivity and impulsiveness while others have more symptoms of inattentiveness. Some patients have all three types of symptoms.

Many people have symptoms like these from time to time, but patients with ADHD have these symptoms more than others their age. Symptoms must be present for at least 6 months to be certain of the diagnosis.

How does RITALIN LA work?

When you take a Ritalin LA capsule, half of the beads provide an immediate dose of methylphenidate and the other half provide a delayed second release of the drug to continue to help lessen the symptoms of ADHD during the day. Methylphenidate, the active ingredient in RITALIN LA, helps increase attention and decrease impulsiveness and hyperactivity in patients with ADHD.

Before Ritalin LA Treatment

It is very important that ADHD be accurately diagnosed and that the need for medication be carefully assessed.

It is important to remember that Ritalin is only part of the overall management of ADHD. Parents, teachers, physicians and other professionals are part of a team that must work together.

Before Ritalin treatment, your doctor should be made aware of any current or past physical or mental problems.

Tell your doctor if there is a history of drug or alcohol abuse, depression, psychosis, epilepsy or seizure disorders, high blood pressure, glaucoma, facial tics (involuntary movements), or a family history of Tourette's syndrome.

Both your doctor and your pharmacist should also be informed of all medicines that you are taking, even if these drugs are not taken on a regular basis and are available without prescription. Your doctor will decide whether you can take Ritalin with other medicines. Methylphenidate is known to interact with a number of other drugs. These include medicines to treat depression, such as monoamine oxidase inhibitors; to control seizures; and to thin blood. Sometimes these interactions may require a change in dosage, or occasionally stopping one of the drugs involved.

Tell your doctor if you are pregnant or nursing a baby.

Who should NOT take RITALIN LA ?

You should NOT take RITALIN LA if:

- You have significant anxiety, tension, or agitation since RITALIN LA may make these conditions worse.
- You are allergic to methylphenidate or any of the other ingredients in RITALIN LA.
- You have glaucoma, an eye disease.
- You have tics or Tourette's Syndrome, or a family history of Tourette's Syndrome.
- You are taking a monoamine oxidase inhibitor, a type of drug, or have discontinued a monoamine oxidase inhibitor in the last 14 days.

Talk to your doctor if you believe any of these conditions apply to you.

How should I take RITALIN LA ?

Take RITALIN LA once each day in the morning.

Take the dose prescribed by your doctor. Your doctor may adjust the amount of drug you take until it is right for you. From time to time, your doctor may interrupt your treatment to check your symptoms while you are not taking the drug.

Ritalin LA capsules may be taken at the same time as food or without food, although food may delay the absorption of Ritalin LA. The Ritalin LA capsule may be swallowed as whole capsules or the capsule may be opened and sprinkled on a small amount of applesauce. The capsule should not be crushed or chewed or its contents divided.

To sprinkle the contents of the capsule, open the capsule carefully and sprinkle the beads over a spoonful of applesauce. The applesauce should not be warm because it could affect the modified release properties of this formulation. The mixture of drug and applesauce should be consumed immediately in its entirety. The drug and

applesauce mixture should not be stored for future use.

If you also take antacids or drugs that suppress stomach acids, you should discuss with your physician or pharmacist how to take these drugs with Ritalin LA.

What are the possible side effects of RITALIN LA ?

The most common side effects of RITALIN LA are:

- nervousness
- stomach pain
- sleeplessness
- decreased appetite.

Other side effects seen with methylphenidate, the active ingredient in RITALIN LA, include nausea, vomiting, dizziness, tics, allergic reactions, increased blood pressure and psychosis (abnormal thinking or hallucinations).

Dependence: Abuse of methylphenidate can lead to dependence. Tell your doctor if you have ever abused or been dependent on alcohol or drugs, or if you are now abusing or dependent on alcohol or drugs.

Blurred Vision: Tell your doctor if you have blurred vision when taking RITALIN LA. This could be a sign of a serious problem.

Slower Growth: Slower growth (weight gain and/or height) has been reported with long-term use of methylphenidate in children. Your doctor will be carefully watching your height and weight. If you are not growing or gaining weight as your doctor expects, your doctor may stop your RITALIN LA treatment.

This is not a complete list of possible side effects. Ask your doctor about other side effects. If you develop any side effect, talk to your doctor.

What must I discuss with my doctor before taking RITALIN LA ?

Talk to your doctor *before* taking RITALIN LA if you:

- Are being treated for depression or have symptoms of depression such as feelings of sadness, worthlessness, and hopelessness.
- Have motion tics (hard-to-control, repeated twitching of any parts of your body) or verbal tics (hard-to-control repeating of sounds or words).
- Have someone in your family with motion tics, verbal tics, or Tourette's Syndrome.
- Have abnormal thoughts or visions, hear abnormal sounds, or have been diagnosed with psychosis.
- Have had seizures (convulsions, epilepsy) or abnormal EEGs (electroencephalograms).
- Have high blood pressure.
- Have an abnormal heart rate or rhythm.

Tell your doctor *immediately* if you develop any of the above conditions or symptoms while taking RITALIN LA.

Can I take RITALIN LA with other medicines?

Tell your doctor about *all* medicines that you are taking or intend to take. Your doctor should decide whether you can take RITALIN LA with other medicines. These include:

- Other medicines that a doctor has prescribed.
- All medicines that you buy yourself without a prescription.
- Any herbal remedies that you may be taking.

Monoamine Oxidase (MAO) Inhibitors: You should not take RITALIN LA with (MAO) inhibitors or within 14 days of stopping a MAO inhibitor.

Starting a New Medicine: While on RITALIN LA, do not start taking a new medicine or herbal remedy before checking with your doctor.

Other Medicines You May Be Taking: RITALIN LA may change the way your body reacts to certain medicines. These include medicines used to treat depression, prevent seizures, or prevent blood clots (commonly called “blood thinners”). Your doctor may need to change your dose of these medicines if you are taking them with RITALIN LA.

Other Important Safety Information:

Pregnancy and Nursing: *Before* taking RITALIN LA, tell your doctor if you are pregnant or plan on becoming pregnant. If you take methylphenidate, it may be in your breast milk. Tell your doctor if you are nursing a baby.

Overdose: Call your doctor *immediately* if you take more than the amount of RITALIN LA prescribed by your doctor.

What else should I know about RITALIN LA ?

RITALIN LA has not been studied in children under 6 years of age.

RITALIN LA may be a part of your overall treatment for ADHD. Your doctor may also recommend that you have counseling or other therapy.

As with all medicines, never share RITALIN LA with anyone else and take only the number of RITALIN LA Capsules prescribed by your doctor.

RITALIN LA should be stored in a safe place at room temperature (between 59°-86°F). Do not store this medicine in hot, damp, or humid places. Keep the container of Ritalin LA in a safe place, away from high-traffic areas where other people could have accidental or unauthorized access to the medication. Keep track of the number of capsules so that you will know if any are missing. Someone who has easy access to Ritalin may be able to give the capsules to others or misuse the medication.

Keep out of the reach of children.

This leaflet summarizes the most important information about Ritalin LA . If you would like more information, talk with your doctor. You can ask your pharmacist or doctor for information about Ritalin LA that is written for health professionals. You can also call 1- 1-888 NOWNOVA (1-888-669-6682).

Manufactured for :
Novartis Pharmaceuticals Corp.
East Hanover, New Jersey 07936
By ELAN HOLDINGS INC.
Pharmaceutical Division
Gainesville, GA 30504

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/s/

Russell Katz
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the approval package consisted of draft labeling