REVIEW ON: ATORVASTATIN AND ITS MARKETED PRODUCT

Mr. Vaibhav Arjun Ubale, Miss. Sharavani Bappasaheb Chaudhar, Miss. Sakshi Bhivsen Shinde, Mr. Pratik Santosh Dhotre, Mr. Uday Bhagwan Jogpete, Mr. Gomed Mukund Jagtap
Gajanan Maharaj College Of Pharmacy, Chh. Sambhajinagar
ubale9991@gmail.com
Prof. Tooba khan (M Pharm), Gajanan Maharaj College Of Pharmacy, Chh. Sambhajinagar.
Dr. Kavita Kulkarni (Phd.Mpharm), Department Of Quality Assurance, Gajanan Maharaj College Of Pharmacy,Chh. Sambhajinagar.

Abstract
The development of pharmaceutical drugs in dosage form faces a major challenge due to poor bioavailability. Atorvastatin (AST) is one such drug that faces poor bioavailability because of its poor solubility. The objective of this article is to review the literature published in selected search engines about the enhancement of solubility and bioavailability of AST. The literature search was conducted in four databases: ScienceDirect, PubMed, Google Scholar, and BASE engine. Seventy-one articles related to atorvastatin formulations were selected, and 26 articles related to bioavailability enhancement were discussed. Additionally, various methods for the estimation of AST alone and in formulations were compiled. The results of the research indicate that bioavailability could be improved by several methods, including solid-dispersion co-crystallization, microspheres, solid lipid nanoparticles, co-solvency, nanosuspension, and self-nano emulsifying drug delivery system (SNEEDS). Moreover, simple UV and HPLC methods could be used for the estimation of AST alone.[1].

Keyword: *atorvastatin, hyperlipidaemia, hyper cholesterol*

Introduction:

Brand Names: Aravalli, Cadets, Lipitor, Leprose

Generic Name: Atorvastatin

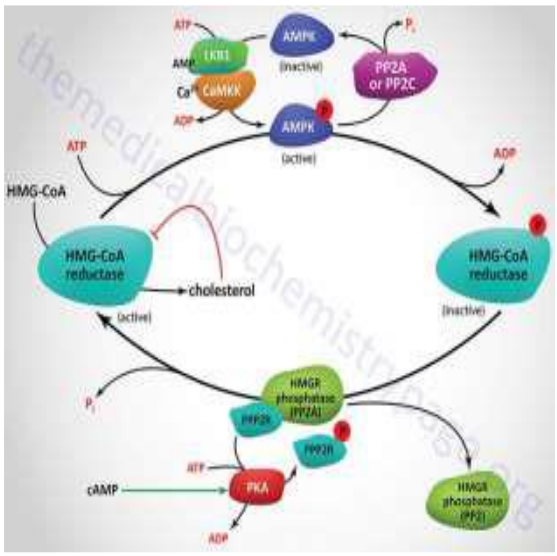
Chemical Formula: $C_{33}H_{35}FN_2O_5$

Synonyms:

- atorvastatin.
- atorvastatin calcium.
- atorvastatin calcium anhydrous.
- atorvastatin calcium hydrate.
- atorvastatin calcium trihydrate.
- atorvastatin, calcium salt.

Atorvastatin calcium is an anti-hyperlipidaemic agent belong to class to statins. Liver is the main site of action of Atorvastatin. It acts by inhibiting HMG-COA reductase inhibitor, the enzyme involved in the conversion of HMG-COA to mevalonate in the cholesterol biosynthesis [2]. Atorvastatin oral tablet is a prescription drug available as the brand-name Lipitor and also in a generic form. Generic drugs are typically less expensive than the brand-name version and may not be available in all strengths or forms. Atorvastatin, a type of medication known as a "statin," works by lowering the liver's production of cholesterol. It can help increase "good" cholesterol (HDL) levels while lowering "bad" cholesterol and fats (including LDL and triglycerides) in the blood. This can reduce the risk of cardiovascular issues. In addition to maintaining a healthy diet, other lifestyle changes can enhance the effectiveness of this medication. It's important to consult your physician for further details. Hyperlipidaemias is a disorder of lipid metabolism characterized by elevated plasma concentrations of various lipid and lipoprotein fractions, which can contribute

to heart disease. It is defined by increased levels of serum triglycerides (TG), very low-density lipoproteins (VLDL), low-density lipoproteins (LDL), and high-density lipoproteins (HDL), which can lead to issues such as atherosclerosis, heart attack, coronary artery syndrome, stroke, myocardial infarction, and pancreatitis. This condition can be treated with antihyperlipidemic drugs.



Atorvastatin calcium is a commonly used medication for treating hyperlipidaemias. It works by inhibiting the enzyme 3-hydroxy-3methyl-glutaryl coenzyme A (HMG-CoA) reductase, which is responsible for converting HMG-CoA to mevalonate. Atorvastatin calcium is classified as a BCS Class II drug with low aqueous solubility and high permeability.[7] Its oral bioavailability is quite low, at only 14%, due to its low aqueous solubility and high hepatic first-pass metabolism. Efforts are being made to improve the dissolution rate and oral bioavailability of atorvastatin calcium.[24]. Atorvastatin calcium is marketed in the form of tablets. The typical dose is 10–80 mg/day and is rapidly absorbed after oral administration. It is used for prophylaxis of cardiovascular events [3]. Atorvastatin is a statin derivative, mainly used to lower blood cholesterol, and for prevention related to cardiovascular disease, which is the major causes of mortalities worldwide [4]. The therapeutic efficacy of a drug depends on rate and extent of drug absorption from the site of administration to the systemic circulation.[6].

Drug Substance

The active substance is atorvastatin calcium (as trihydrate), an established active substance described in the European Pharmacopoeia (Pear.). The active substance is a white to off-white crystalline powder, which is very slightly soluble in water, slightly soluble in ethanol and freely soluble in methanol. Polymorphic form I is used. Four different manufacturers are used for the production of the active substance. For all manufacturers, the CEP procedure is used for the active substance. Under the official Certification Procedures of the EDQM of the Council of Europe, manufacturers or suppliers of substances for pharmaceutical use can apply for a certificate of suitability concerning the control of the chemical purity and microbiological quality of their substance according to the corresponding specific monograph, or the evaluation of reduction of Transmissible Spongiform Encephalopathy (TSE) risk, according to the general monograph, or both. This procedure is meant to ensure that the quality of substances is guaranteed and that these substances comply with the Pear [9].

Natural and synthetic statins

Statins are divided into two groups based on the generation: natural and synthetic products. They are also categorized as natural (lovastatin), semi-synthetic (simvastatin and pravastatin), and synthetic compounds (fluvastatin, atorvastatin,

cerivastatin, rosuvastatin, and pinta statin). In nature, statins are fungal metabolites. They are produced by fermentation of the fungus to compounds with methyl groups at different positions in ring structure of the molecule and compounds with chemical differences in their side chains [7].

Biological products are drugs made of ingredients or materials used to influence or investigate physiological systems or pathological conditions. They are used to establish diagnoses, prevent, heal, recover, and improve health, as well as for contraception in humans [11]. The term "patent medicines" or "innovator drugs" refers to newly discovered drugs that are based on research and have a patent period which varies depending on the type of drug. According to Law No. 14 of 2001, the validity period of patents in Indonesia is 20 years. During these 20 years, the pharmaceutical company has exclusive rights in Indonesia to produce the specified drug. Other companies are not allowed to produce and market similar drugs, unless they have a special agreement with the patent owner. An example of a drug whose patent period expired in 2011 is Atorvastatin.[15]. "We can expect to see many new branded or generic names emerging because atorvastatin is one of the statin drugs available in the market. These are medications that have expired patent rights and are produced and marketed under a different name. This happens when the original patent for a drug expires. Atorvastatin is a type of statin used to lower blood cholesterol levels and to prevent cardiovascular disease, which is a major cause of death worldwide."[16,17].

Pharmacokinetics

Taken orally, atorvastatin is rapidly absorbed, with peak plasma levels occurring within 2.5 hours. Atorvastatin's absorption is dose-dependent and non-linear. Because of extensive first-pass metabolism, atorvastatin's bioavailability is only around 12% and is seldom affected by food. About 70% of the circulating HMG-CoA reductase inhibitory activity is a result of its widespread metabolism by cytochrome P4503A4 to active metabolites. About 98% of it is linked to proteins in the blood. Atorvastatin and its metabolites are mostly excreted in the bile after undergoing hepatic and/or extrahepatic metabolism; however there does not seem to be any enterohepatic recirculation of the drug. While the elimination half-life in plasma is only around 14 hours on average, the half-life of the HMG-CoA reductase inhibitory action is more like 24 hours due to the presence of active metabolites [5].

Pharmacodynamics:

Atorvastatin is a medication taken by mouth that reversibly inhibits HMG-CoA reductase, an enzyme involved in cholesterol production. It helps lower total cholesterol, low-density lipoprotein-cholesterol (LDL-C), apolipoprotein B (apo B), non-high-density lipoprotein-cholesterol (non-HDL-C), and triglyceride (TG) levels while increasing high-density

lipoprotein-cholesterol (HDL-C) levels. High LDL-C, low HDL-C, and high TG levels in the blood are linked to an increased risk of atherosclerosis and cardiovascular disease. The ratio of total cholesterol to HDL-C is a strong predictor of coronary artery disease, with higher ratios indicating a greater risk of disease. Higher levels of HDL-C are associated with a lower cardiovascular risk. By reducing LDL-C and TG levels and increasing HDL-C levels, atorvastatin helps lower the risk of cardiovascular illness and death [25,26,27,28]. Elevated levels of cholesterol, especially high levels of low-density lipoprotein (LDL), are a significant risk factor for developing cardiovascular disease (CVD). Clinical studies have demonstrated that atorvastatin can reduce LDL-C and total cholesterol levels by 36-53% [40]. In individuals with lipoproteinemia, atorvastatin decreased the levels of intermediate-density lipoprotein cholesterol.[30]. It has also been suggested that atorvastatin can limit the extent of angiogenesis, which can be useful in the treatment of chronic subdural hematoma.[31]

Dissolution study

The dissolution profiles of Atorvastatin calcium tablets were evaluated in 900 mL of phosphate buffer pH 6.8 using US Pharmacopoeia dissolution apparatus II (Electro-Lab, TDT-08 L dissolution tester USP). The temperature and degree of agitation were set at 37 ± 0.5°C and 50 revolutions per minute respectively. Sample (5.0 ml) was withdrawn from the dissolution apparatus at predetermined time intervals 5, 10, 15, 30, 45 and 60 min. 5 ml of fresh medium already equilibrated to 37°C was replaced into dissolution medium after each sampling in order to maintain sink condition. Six tablets per brand were used for the study. The collected samples were filtered with syringe filter 0.45 am to remove any insoluble excipients. The filtered samples were analysed by the HPLC as stated earlier. The concentration and the percentage release in each time interval was determined using the equation of the line of the calibration plot obtained from the reference standard [8].

Myopathy/Rhabdomyolysis:

Atorvastatin, like other HMG-CoA reductase inhibitors, is linked to a risk of drug-induced myopathy, which is characterized by muscle pain, tenderness, or weakness along with elevated levels of creatine kinase (CK). Myopathy can often lead to rhabdomyolysis, with or without acute renal failure due to myoglobinuria. The risk of statin-induced myopathy is related to the dosage, and the symptoms typically improve when the drug is discontinued. Observational studies suggest that 10-15% of people taking statins may experience muscle aches at some point during treatment.[19]

Liver Dysfunction:

Statins, along with certain other therapies for lowering lipid levels, have been linked to liver function abnormalities. In clinical trials, 0.7% of patients who were given atorvastatin experienced persistent elevations (> 3 times the upper limit of normal [ULN]) in serum transaminases on two or more occasions. This effect seems to be related to the dosage of the medication. [23,24]

Endocrine Effects:

Statins have been linked to an increased risk of higher serum HbA1c and glucose levels. A laboratory study showed that atorvastatin had a dose-dependent toxic effect on human pancreatic islet β cells.

Additionally, insulin secretion rates decreased compared to the control group.

HMG-CoA reductase inhibitors interfere with cholesterol synthesis and may theoretically affect the production of adrenal and/or gonadal steroids. Clinical studies with atorvastatin and other HMG-CoA reductase inhibitors have suggested that these agents do not impact plasma cortisol concentrations, basal plasma testosterone concentration, or adrenal reserve. However, the effect of statins on male fertility has not been fully investigated. The effects of statins on the pituitary-gonadal axis in premenopausal women are unknown.[23]

Cardiovascular:

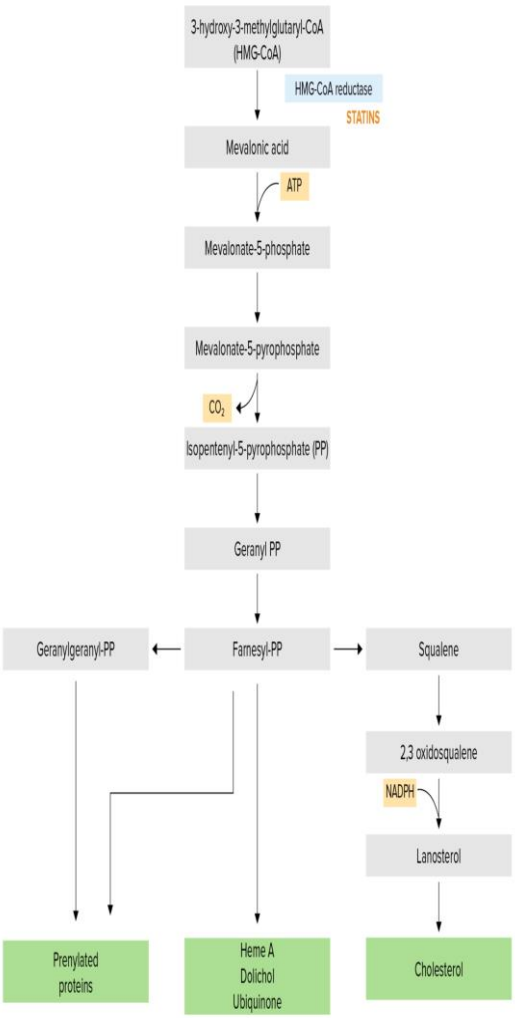
Patients treated with atorvastatin and other statins have been found to have significantly lower levels of circulating ubiquinone. The potential long-term effects of this statin-induced ubiquinone deficiency have not been established clinically. Studies have suggested that reduced levels of ubiquinone in the heart may result in impaired cardiac function in patients with borderline congestive heart failure [23]

Lipoprotein A:

In certain patients, the positive impact of decreased total cholesterol and LDL-C levels may be somewhat offset by the simultaneous increase in Lap (a) lipoprotein concentrations. Current knowledge indicates that high Lap(a) levels are increasingly recognized as a risk factor for coronary heart disease. Additionally, recent studies have shown that statins affect Lap (a) levels differently in patients with dyslipidaemia based on their apo(a) phenotype; specifically, statins exclusively increase Lap(a) levels in patients with the low molecular weight apo(a) phenotype.[22].

Mechanism of action:

Atorvastatin is a type of statin medication that works by inhibiting the enzyme HMG-CoA reductase, which is involved in the production of cholesterol in the body. It primarily acts in the liver and helps increase the liver's uptake of LDL cholesterol. Atorvastatin also reduces VLDL-C, serum triglycerides, and IDL, while increasing HDL-C. Additionally, it has been shown to have beneficial effects on blood vessels, independent of its cholesterol-lowering effects. These effects include improving endothelial function, stabilizing atherosclerotic plaques, reducing oxidative stress and inflammation, and inhibiting the formation of blood clots. Studies have also found that statins like atorvastatin can bind to β2 integrin function-associated antigen-1 (LFA-1), which is involved in the activation and movement of certain white blood cells.[21].



Why it's used:

Atorvastatin is prescribed to improve cholesterol levels in individuals with various types of cholesterol issues. It is also used to reduce the risk of heart attack and stroke. Atorvastatin is typically taken in conjunction with dietary changes, weight loss, and exercise. The medication works by preventing the buildup of cholesterol in the arteries, which can otherwise lead to blockages and restrict blood flow to the heart and brain. In some cases, Atorvastatin may be used in combination with other medications such as bile acid resins and other cholesterol-lowering drugs.

How it works:

Atorvastatin belongs to a class of drugs known as HMG-CoA reductase inhibitors, or statins. A drug class is a group of medications that work in a similar way and are often used to treat similar conditions. Atorvastatin works by reducing your low-density lipoprotein (LDL) or "bad" cholesterol and increasing your high-density lipoprotein (HDL) or "good" cholesterol. It enhances your body's ability to eliminate LDL cholesterol through your liver

Atorvastatin side effects:

Atorvastatin oral tablet doesn't cause drowsiness, but it can cause other side effects.

More common side effects

Some of the more common side effects that can occur with the use of atorvastatin oral tablets include:

- cold symptoms such as runny nose, sneezing, and coughing
- gas
- joint pain
- forgetfulness
- urinary tract infection

If these effects are mild, they may go away within a few days or a couple of weeks. If they're more severe or don't go away, talk to your doctor or pharmacist.

Serious side effects

Call your doctor right away if you have serious side effects. Call 911 if your symptoms feel life-threatening or if you think you're having a medical emergency. Serious side effects and their symptoms can include following:

- Muscle problems. Symptoms can include:
  - unexplained muscle weakness, tenderness, or pain
  - tiredness
- Liver problems. Symptoms can include:

- tiredness or weakness
- loss of appetite
- upper stomach pain
- dark urine
- yellowing of your skin or the whites of your eyes

- Allergic reaction.

Disclaimer: "Our aim is to offer you the most relevant and up-to-date information. However, since drugs can affect each person differently, we cannot ensure that this information covers all potential side effects. This information should not be used as a replacement for medical advice. Always consult a healthcare provider who is familiar with your medical history to discuss potential side effects."

Atorvastatin may interact with other medications:

Remember that atorvastatin oral tablet may interact with other medications, vitamins, or herbs you're taking. An interaction can change the way a drug works, which can be harmful or prevent the drug from working well.

To avoid interactions, your doctor should carefully manage all of your medications. Be sure to inform your doctor about all medications, vitamins, or herbs you are taking. If you want to know how this drug might interact with something else, you're taking, talk to your doctor or pharmacist. Below are examples of drugs that can cause interactions with atorvastatin.

Antibiotics

Taking atorvastatin with certain antibiotics increases your risk for muscle problems. Examples of these drugs include:

- clarithromycin
- erythromycin

Fungal drugs

Please remember that taking atorvastatin with certain drugs used to treat fungal infections may cause atorvastatin to build up in your body. This can increase your risk for muscle breakdown. If you need to take these drugs together, your doctor may decrease your dosage of atorvastatin. Examples of these drugs include:

- itraconazole
- ketoconazole

Cholesterol-lowering drugs

Taking atorvastatin with other cholesterol-lowering drugs increases the risk of muscle problems. Your doctor may adjust your dosage or advise against taking them together. Examples of these drugs include:

- gemfibrozil
- medications that contain fibrate
- niacin

Revamping:

Taking revamping with atorvastatin may reduce the effectiveness of atorvastatin

HIV drugs

When atorvastatin is taken with certain drugs used to treat HIV, it may lead to an accumulation of atorvastatin in your body, increasing the risk of muscle breakdown. If you need to take these drugs together, your doctor may lower your atorvastatin dosage. Examples of these drugs include protease inhibitors such as:

- darunavir
- lopinavir
- ritonavir
- saquinavir
- tipranavir

Digoxin

Taking digoxin with atorvastatin can increase the level of digoxin in your blood to dangerous levels. If you need to take these drugs together, your doctor will monitor the levels and adjust your medication doses if needed.

Oral birth control pills

Taking atorvastatin with oral birth control pills may increase the levels of oral contraceptive hormones in your blood.

Colchicine

Taking colchicine with atorvastatin raises your risk for muscle breakdown.

Cyclosporine

Taking cyclosporin with atorvastatin raises your risk for muscle breakdown. Your doctor should avoid this combination.

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Atorvastatin warnings

This drug comes with several warnings.

Allergy warning

Atorvastatin can cause a severe allergic reaction. Symptoms can include:

- swelling of your face, lips, tongue, or throat
- trouble breathing
- trouble swallowing

Call 911 or go to the nearest emergency room if you develop these symptoms. **Don't take this drug again if you've ever had an allergic reaction to it.** Taking it again could be fatal (cause death).

Food interactions warning

Remember not to consume large amounts of grapefruit juice while taking atorvastatin. Grapefruit juice can cause atorvastatin to accumulate in your bloodstream, increasing the risk of muscle breakdown. Consult your doctor to find out how much grapefruit juice is safe for you.

Alcohol interaction warning

The use of alcoholic beverages increases the risk of liver disease when taking atorvastatin. Please consult your doctor if you consume more than two alcoholic drinks daily.

Warnings for people with certain health conditions

For people with kidney problems: Having kidney problems increases the risk of muscle breakdown while taking atorvastatin. Your doctor may closely monitor you for muscle problems.

For people with liver disease: Do not take this medication if you have liver disease, as it can elevate your liver test results, indicating potential liver damage. If you have liver issues, consult your doctor to ensure that this medication is safe for you.

For people with diabetes: Atorvastatin can raise your blood sugar levels. If this happens, your doctor may adjust your diabetes medications, and you may need to monitor your blood sugar levels more frequently while taking this medication.

Warnings for other groups

For pregnant women: Atorvastatin should not be used during pregnancy as its safety in pregnant women is unknown, and there's no apparent benefit of this drug during pregnancy.

Call your doctor right away if you become pregnant while taking this drug.

For women who are breastfeeding Atorvastatin should not be used while breastfeeding. Consult your doctor for alternative medications.

For seniors: People aged 65 and above at higher risk of muscle breakdown (rhabdomyolysis) when taking atorvastatin.

For children: Atorvastatin should not be used in children younger than 10 years, as it has not been studied for this age group. However, it has been shown to be safe and effective in children aged 10–17 years.

How to take atorvastatin

This dosage information is for atorvastatin oral tablets. It may not include all possible dosages and drug forms. Dosage, drug form, and frequency depend on individual factors. your age

- the condition being treated
- how severe your condition is
- other medical conditions you have
- how you react to the first dose

Forms and strengths

Generic: Atorvastatin

- **Form:** oral tablet
- **Strengths:** 10 mg, 20 mg, 40 mg, and 80 mg

Brand: Lipitor

- **Form:** oral tablet
- **Strengths:** 10 mg, 20 mg, 40 mg, and 80 mg

Dosage for prevention of heart disease

Adult dosage (ages 18–64 years)

- **Typical starting dosage:** 10–20 mg taken once per day.
- **Typical maintenance dosage:** 10–80 mg taken once per day.

Child dosage (ages 0–17 years)

Atorvastatin hasn't been approved for use in children younger than 18 years for the prevent heart disease.

Senior dosage (ages 65 years and older)

As people age, their kidneys may not function as effectively as before. This can lead to slower processing of medications in the body, causing a higher concentration of drugs to remain in the system for longer periods. Consequently, this raises the likelihood of experiencing adverse effects. Your doctor might initiate treatment with a lower dosage or adjust the medication schedule to prevent excessive accumulation of the drug in your body.

Dosage for dyslipidaemia (cholesterol problems)

Adult dosage (ages 18–64 years)

- **Typical starting dosage:** 10–20 mg taken once per day.
- **Typical maintenance dosage:** 10–80 mg taken once per day.
- **Note:** When treating homozygous familial hypercholesterolemia, the dosage is 10–80 mg taken once per day.

Child dosage (ages 10–17 years)

In children, atorvastatin is only used to treat heterozygous familial hypercholesterolemia.

- **Typical starting dosage:** 10 mg once per day.
- **Maximum dosage:** 20 mg once per day.

Child dosage (ages 0–9 years)

Atorvastatin hasn't been studied in children younger than 10 years of age for this purpose. It shouldn't be used in this age range for this purpose.

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Atorvastatin oral tablet is used for long-term treatment. It comes with risks if you don't take it as prescribed.

If you stop taking the drug or don't take it at all: Atorvastatin can further improve your cholesterol levels, reducing the risk of heart attack or stroke.

If you miss doses or don't take the drug on schedule: Your medication may not work as well or may stop working completely. For this drug to work well, a certain amount needs to be in your body at all times.

- **If you take too much:** You may have dangerous levels of the drug in your body, which could lead to the following symptoms:
- diarrhoea
- gas
- heartburn
- joint pain
- forgetfulness
- confusion
- unexplained muscle weakness, tenderness, or pain
- loss of appetite
- upper stomach pain
- dark-colour urine
- yellowing of your skin or the whites of your eyes

If you believe you have taken an excessive amount of this medication, contacted your doctor or sought advice from the American Association of Poison Control Canter at 1-800-222-1222 or by using their online tool. However, if your symptoms are severe, call 911 or go to the nearest emergency room immediately.

What to do if you miss a dose: "Take your dose as soon as you remember. However, if you recall it just a few hours before your next scheduled dose, take only one dose. Do not attempt to take two doses at once to make up for the missed dose, as this could lead to dangerous side effects."

How to tell if the drug is working: You will not feel atorvastatin working. Your doctor will monitor your cholesterol levels to assess its effectiveness and may adjust your dosage accordingly.

Important considerations for taking atorvastatin

Keep these considerations in mind if your doctor prescribes atorvastatin oral tablet for you.

General

- Don't cut or crush the tablet.

Storage

- Store atorvastatin at room temperature between 68°F (20°C) and 77°F (25°C). Keep it away from high temperatures.
- Don't store this medication in moist or damp areas, such as bathrooms.

Refills

A prescription for this medication is refillable. You should not need a new prescription for this medication to be refilled. Your doctor will write the number of refills authorized on your prescription.

Travel

When traveling with your medication:

- Always carry your medication with you. When flying, never put it into a checked bag. Keep it in your carry-on bag.
- Don't worry about airport X-ray machines. They can't hurt your medication.
- You may need to show airport staff the pharmacy label for your medication. Always carry the original prescription label container with you.
- Don't put this medication in your car's glove compartment or leave it in the car. Be sure to avoid doing this when the weather is very hot or very cold.

Clinical monitoring

While you're being treated with atorvastatin, your doctor will monitor your

cholesterol levels and liver function using blood tests.

Your diet

Your doctor may have you follow a low-fat, low-cholesterol diet while you take this drug.

Are there any alternatives?

There are alternative medications to treat your condition. Some may be more suitable for you than others. Discuss with your doctor about other medication options that may be effective for you.

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Atorvastatin coupons and savings

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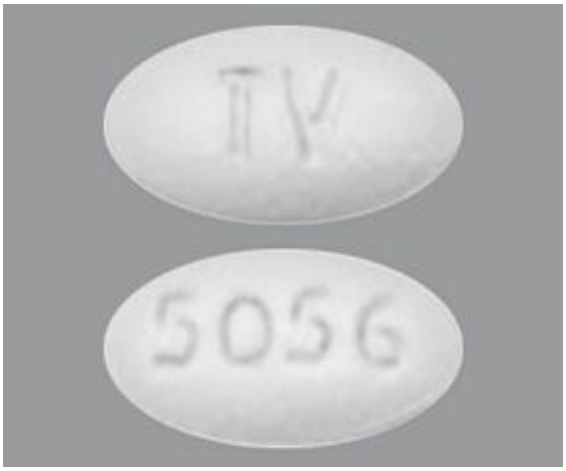
Atorvastatin, oral tablet Images



Brand Name Prescription Products

Show 5102550100 entries

Name	Dosage	Strength	Route	Labeller
Torvald	Suspension	20 mg/5mL	Oral	Camp Pharma, Inc.
Atorvastatin	Tablet	80 mg	Oral	Actavis Pharma Company
Atorvastatin	Tablet	40 mg	Oral	TEVA Canada Limited
Atorvastatin	Tablet	20 mg	Oral	Sanis Health Inc
Atorvastatin	Tablet	80 mg	Oral	Angina Pharma Inc.

Dosage Forms

Show 102550100 entries

Form	Route	Strength
Tablet	Oral	20 mg
Tablet	Oral	40 mg
Tablet	Oral	80 mg
Tablet	Oral	10.000 mg
Tablet, coated	Oral	

Form	Route	Strength
Tablet, film coated	Oral	
Capsule		
Tablet, film coated	Oral	30 MG
Tablet, film coated	Oral	60 MG
Tablet, coated	Oral	21.65 mg

Mixture Products

Show 5102550100 entries

Name	Ingredients	Dosage	Route	Labeller
Amlodipine and Atorvastatin	Atorvastatin calcium trihydrate (10 mg/1) + amlodipine besylate (5 mg/1)	Tablet, film coated	Oral	Bryant ranch prepack
Amlodipine and atorvastatin	Atorvastatin calcium trihydrate (40 mg/1) + amlodipine besylate (2.5 mg/1)	Tablet, film coated	Oral	Mylan Pharmaceuticals Inc.
Amlodipine and atorvastatin	Atorvastatin calcium trihydrate (10 mg/1) + amlodipine besylate (5 mg/1)	Tablet, film coated	Oral	Zydus Lifesciences Limited
Amlodipine and Atorvastatin	Atorvastatin calcium trihydrate (10 mg/1) + amlodipine besylate (5 mg/1)	Tablet, coated	Oral	Prescod Laboratories
Amlodipine and Atorvastatin	Atorvastatin calcium trihydrate (20 mg/1) + amlodipine besylate (10 mg/1)	Tablet, film coated	Oral	Aponte Corp.

CONCLUSION

In individuals with hypercholesterolemia, atorvastatin is more effective in lowering total cholesterol, low-density lipoprotein cholesterol, and triglycerides compared to other HMG-CoA reductase inhibitors. However, post-marketing monitoring is necessary to determine whether this newly introduced medication is more effective than the statins currently used for treating hyperlipidaemia.

Reference:

*[1] Nagesh C1**, Veda Murthy Joshi1, Abhishek S, Rajeshwari A.G.Department of Pharmaceutics, Sri Adichunchanagiri College of Pharmacy, Adichunchnagiri University, B G. Nagara -571448, Karnataka, India.*

[2] A. Navya Krishna, Y. Deepthi, S. Aruna, T E G K Murthy Department of Pharmaceutics, Bipetal College of Pharmacy, Bipetal, Guntur (Dt), A.P.-522101 India*

[3] A nab Carolina KogAwA Unit Esta dual Paulist - UNESP, School of Pharmaceutical Sciences of Prerequire, Department of Pharmaceutics, Prerequire, São Paulo, Brazil

[4] BPOM. Regulation of the Head of the Republic of Indonesia Drug and Food Supervisory Agency About Mandatory Equivalence Tests. Jakarta: Badan Peng was Obat dan Makana, 2011.

[5] Sahnaj Husain, Dr Jitendra Kumar Malik, Surendra Singh Parihar, Rohit Singh, Gajendra Singh Institute of Pharmacy, PK University, Thanda - 473665, Madhya Pradesh, India*

[6] Md. Abir Khan1, Abu Asad Chowdhury2, Nur Jamarat Lubna1 1Laboratory of Pharmaceutics, Department of Pharmacy, Prime Asia University, Banani, Dhaka 1213, Bangladesh*

[7] Siren, H M M 2017, ' Atorvastatin and Related Compounds: Review on Analyses of Pharmaceutical, Blood and Environmental Samples ', Journal of Biomedical Research and Practice, vol. 1, no. 1, 100003, pp. 1-31. <

[8] International Journal of Pharmacy and Pharmacology ISSN: 2326-7267 Vol. 3 (10), pp. 001-007, October, 2012.

[9] Atorvastatin CF 10 mg, 20 mg, 30 mg, 40 mg, 60 mg and 80 mg, film-coated tablets (atorvastatin calcium trihydrate) NL/H/3345/001-006/DC

[10] Diamond DM, Biman BT, Mason P. Statin therapy is not warranted for a person with high LDL-cholesterol on a low-carbohydrate diet. Current Opinion in Endocrinology & Diabetes and Obesity.2022 Oct 1;29(5):497-511.

[11] Hetal T, Binds P, Sneha T. A REVIEW ON TECHNIQUES FOR ORAL BIOAVAILABILITY ENHANCEMENT OF DRUGS. 4(3), 2010, 201-209.

[12] Pirani SE, Annisa A, Darma GCE. Dissolution enhancement of AST calcium by self-nanoemulsifying drug delivery system using Cremophor RH 40 and Transductal P as surfactants. Drug Invent Today. 10, 2018, 3768–72.

[13] Number P, Information P, Specification T, Information S, Information T. Product Information Product Information. (14998), 1920, 1919–20.

[14] BPOM. Regulation of the Head of the Republic of Indonesia Drug and Food Supervisory Agency About Mandatory Equivalence Tests. Jakarta: Badan Peng was Obat dan Makana, 2011.

[15] Moon, J. Switching Statins. sol: BMJ, 2006

[16] Alghamdi, E.S. Protective Effect of Quinoa (Chenopodium Quinoa Willd.) Seeds Against Hypercholesterolemia in Male Rats. Pharmacophore, 2018; 9(6): 11-21.

[17] Ghorbani, A., Shirzad pour, E., Kifissia, M. R, S., Seined, Y., Amraei, M. Anti-Atherosclerotic Effects of the Hydroalcoholic Extract of Crocus sativus L. (saffron) Petals on Hypercholesterolemic Rats. International Journal of Pharmaceutical and Phytopharmacological Research, 2018; 8(6): 99-104

[18] Qiu S, Zhuo W, Sun C, Su Z, Yan A, Shen L: Effects of atorvastatin on chronic subdural hematoma: A systematic review. Medicine (Baltimore). 2017 Jun;96(26): e7290. Doi: 10.1097/MD.0000000000007290. article

[19] Mohaddessin MH: Clinical pharmacology of 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors. Life Sci. 1999;65(13):1329-37. Doi: 10.1016/s0024-3205(99)00199-x.

[20] Liao JK, Laughs U: Pleiotropic effects of statins. Annu Rev Pharmocol Texico. 2005; 45:89-118. Doi: 10.1146/annurev.pharmtox.45.120403.095748. article

[21] Weitz-Schmidt G, Welzenbach K, Brinkmann V, Kamata T, Kallen J, Bruns C, Cottons S, Takada Y, Hommel U: Statins selectively inhibit leukocyte function antigen-1 by binding to a novel regulatory integrin site. Nat Med. 2001 Jun;7(6):687-92. Doi: 10.1038/89058.artical

[22] Yahya R, Berk K, Verhoeven A, Bos S, van der Zee L, Touw J, Erhart G, Kronenberg F, Timman R, Sibron's E, Roeters van Lenel J, Mulder M: Statin treatment increases lipoprotein(a) levels in subjects with low molecular weight apolipoprotein(a) phenotype. Atherosclerosis. 2019 Jul 3. pie: S0021-9150(19)31392-9. Doi: 10.1016/j.atherosclerosis.2019.07.001. article

[23] Health Canada Monograph – Atorvastatin. File

[24] FDA Label – Atorvastatin. file

[25] Anderson TJ, Gregoire J, Pearson GJ, Barry AR, Couture P, Dawes M, Francis GA, Genest J Jr, Grover S, Gupta M, Hegele RA, Lau DC, Leiter LA, Lonn E, Mancini GB, McPherson R, Ngui D, Poirier P, Sieve piper JL, Stone JA, Athanasius's G, Ward R: 2016 Canadian Cardiovascular Society Guidelines for the Management of Dyslipidaemia for the Prevention of Cardiovascular Disease in the Adult. Can J Cardio. 2016 Nov;32(11):1263-1282. Doi: 10.1016/j.cjca.2016.07.510. Pub 2016 Jul 25. article

[26] Grundy SM, Stone NJ: 2018 American Heart Association/American College of Cardiology Mult society Guideline on the Management of Blood Cholesterol: Primary Prevention. JAMA car diol. 2019 Apr 10. pie: 2730287. Doi: 10.1001/jamacardio.2019.0777. article

[27] Henwood JM, Heel RC: Lovastatin. A preliminary review of its pharmacodynamic properties and therapeutic use in hyperlipidaemia. Drugs. 1988 Oct;36(4):429-54. Doi: 10.2165/00003495-198836040-00003. article

[28] Bradford RH, Shear CL, Chromes AN, Dujons CA, Franklin FA, Grillo RB, Higgins J, Langendorfer A, Nash DT, Pool JL, et al.: Expanded Clinical Evaluation of Lovastatin (EXCEL) study results: two-year efficacy and safety follow-up. Am J car diol. 1994 Oct 1;74(7):667-73. Doi: 10.1016/0002-9149(94)90307-7. article

[29] Qiu S, Zhuo W, Sun C, Su Z, Yan A, Shen L: Effects of atorvastatin on chronic subdural hematoma: A systematic review. Medicine (Baltimore). 2017 Jun;96(26): e7290. Doi: 10.1097/MD.0000000000007290. article

[30] McIver LA, Siddique MS: Atorvastatin. article

[31] Ye YC, Zhao XL, Zhang SY: Use of atorvastatin in lipid disorders and cardiovascular disease in Chinese patients. Chin Med J (Engl). 2015 Jan 20;128(2):259-66. Doi: 10.4103/0366-6999.149226. article