

that stavudine is transferred to the fetus through the placenta. The concentration in fetal tissue was approximately one-half the concentration in maternal plasma. Animal reproduction studies are not always predictive of human response.

There are no adequate and well-controlled studies of stavudine in pregnant women. Stavudine should be used during pregnancy only if the potential benefit justifies the potential risk.

Fatal lactic acidosis has been reported in pregnant women who received the combination of stavudine and didanosine with other antiretroviral agents. It is unclear if pregnancy augments the risk of lactic acidosis/hepatic steatosis syndrome reported in nonpregnant individuals receiving nucleoside analogues (see **WARNINGS: Lactic Acidosis/Severe Hepatomegaly with Steatosis/Hepatic Failure**). The combination of stavudine and didanosine should be used with caution during pregnancy and is recommended only if the potential benefit clearly outweighs the potential risk. Healthcare providers caring for HIV-infected pregnant women receiving stavudine should be alert for early diagnosis of lactic acidosis/hepatic steatosis syndrome.

Antiretroviral Pregnancy Registry: To monitor maternal-fetal outcomes of pregnant women exposed to stavudine and other antiretroviral agents, an Antiretroviral Pregnancy Registry has been established. Physicians are encouraged to register patients by calling 1-800-258-4263.

Nursing Mothers: The Centers for Disease Control and Prevention recommend that HIV-infected mothers not breast-feed their infants to avoid risking postnatal transmission of HIV. Studies in lactating rats demonstrated that stavudine is excreted in milk. Although it is not known whether stavudine is excreted in human milk, there exists the potential for adverse effects from stavudine in nursing infants. Because of both the potential for HIV transmission and the potential for serious adverse reactions in nursing infants, **mothers should be instructed not to breast-feed if they are receiving ZERIT (stavudine).**

Pediatric Use: Use of stavudine in pediatric patients is supported by evidence from adequate and well-controlled studies of stavudine in adults with additional pharmacokinetic and safety data in pediatric patients.

Adverse events that were reported to occur in 105 pediatric patients receiving ZERIT 2 mg/kg/day for a median of 6.4 months in study ACTG 240 were generally similar to those reported in adults.

Stavudine pharmacokinetics have been evaluated in 25 HIV-infected pediatric patients ranging in age from 5 weeks to 15 years and in weight from 2 to 43 kg after I.V. or oral administration of single doses and twice-daily regimens (see **CLINICAL PHARMACOLOGY**, Table 1).

Geriatric Use: Clinical studies of ZERIT did not include sufficient numbers of patients aged 65 years and over to determine whether they respond differently than younger patients. Greater sensitivity of some older individuals to the effects of ZERIT cannot be ruled out.

In a monotherapy Expanded Access Program for patients with advanced HIV infection, peripheral neuropathy or peripheral neuropathic symptoms were observed in 15 of 40 (38%) elderly patients receiving 40 mg twice daily and 8 of 51 (16%) elderly patients receiving 20 mg twice daily. Of the approximately 12,000 patients enrolled in the Expanded Access Program, peripheral neuropathy or peripheral neuropathic symptoms developed in 30% of patients receiving 40 mg twice daily and 25% of patients receiving 20 mg twice daily. Elderly patients should be closely monitored for signs and symptoms of peripheral neuropathy.

ZERIT is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, it may be useful to monitor renal function. Dose adjustment is recommended for patients with renal impairment (see **DOSAGE AND ADMINISTRATION: Dosage Adjustment**).

ADVERSE REACTIONS

Adults: Fatal lactic acidosis has occurred in patients treated with ZERIT in combination with other antiretroviral agents. Patients with suspected lactic acidosis should immediately suspend therapy with ZERIT. Permanent discontinuation of ZERIT should be considered for patients with confirmed lactic acidosis.

ZERIT therapy has rarely been associated with motor weakness, occurring predominantly in the setting of lactic acidosis. If motor weakness develops, ZERIT should be discontinued.

ZERIT therapy has also been associated with peripheral sensory neuropathy, which can be severe, is dose related, and occurs more frequently in patients being treated with neurotoxic drug therapy, including didanosine, in patients with advanced HIV infection, or in patients who have previously experienced peripheral neuropathy.

Patients should be monitored for the development of neuropathy, which is usually manifested by numbness, tingling, or pain in the feet or hands. Stavudine-related peripheral neuropathy may resolve if therapy is withdrawn promptly. In some cases, symptoms may worsen temporarily following discontinuation of therapy. If symptoms resolve completely, patients may tolerate resumption of treatment at one-half the dose (see **DOSAGE AND ADMINISTRATION**). If neuropathy recurs after resumption, permanent discontinuation of ZERIT should be considered.

When ZERIT is used in combination with other agents with similar toxicities, the incidence of adverse events may be higher than when ZERIT is used alone. Pancreatitis, peripheral neuropathy, and liver function abnormalities occur more frequently in patients treated with the combination of ZERIT and didanosine, with or without hydroxyurea. Fatal pancreatitis and hepatotoxicity may occur more frequently in patients treated with ZERIT in combination with didanosine and hydroxyurea (see **WARNINGS and PRECAUTIONS**).

Selected clinical adverse events that occurred in adult patients receiving ZERIT in a controlled monotherapy study (Study AI455-019) are provided in Table 3.

Adverse Events	Percent (%)	
	ZERIT (40 mg twice daily) (n=412)	zidovudine (200 mg 3 times daily) (n=402)
Headache	54	49
Diarrhea	50	44
Peripheral Neurologic Symptoms/Neuropathy	52	39
Rash	40	35
Nausea and Vomiting	39	44

^a Median duration of stavudine therapy = 79 weeks; median duration of zidovudine therapy = 53 weeks.

Pancreatitis was observed in 3 of the 412 adult patients who received ZERIT in a controlled monotherapy study.

Selected clinical adverse events that occurred in antiretroviral naive adult patients receiving ZERIT from two controlled combination studies are provided in Table 4.

Adverse Events	Percent (%)			
	START 1		START 2	
	ZERIT+ lamivudine+ indinavir (n=100) ^b	zidovudine+ lamivudine+ indinavir (n=102)	ZERIT+ didanosine+ indinavir (n=102) ^b	zidovudine+ lamivudine+ indinavir (n=103)
Nausea	43	63	53	67
Diarrhea	34	16	45	39
Headache	25	26	46	37
Rash	18	13	30	18
Vomiting	18	33	30	35
Peripheral Neurologic Symptoms/Neuropathy	8	7	21	10

^a START 2 compared two triple-combination regimens in 205 treatment-naive patients. Patients received either ZERIT (stavudine) (40 mg twice daily) plus didanosine plus indinavir or zidovudine plus lamivudine plus indinavir.
^b Duration of stavudine therapy = 48 weeks.

Pancreatitis resulting in death was observed in patients treated with ZERIT plus didanosine, with or without hydroxyurea, in controlled clinical studies and in postmarketing reports.

Selected laboratory abnormalities reported in a controlled monotherapy study (Study AI455-019) are provided in Table 5.

Parameter	Percent (%)	
	ZERIT (40 mg twice daily) (n=402)	zidovudine (200 mg 3 times daily) (n=402)
AST (SGOT) (>5.0 x ULN)	11	10
ALT (SGPT) (>5.0 x ULN)	13	11
Amylase (≥1.4 x ULN)	14	13

^a Data presented for patients for whom laboratory evaluations were performed.
^b Median duration of stavudine therapy = 79 weeks; median duration of zidovudine therapy = 53 weeks.
ULN = upper limit of normal.

Selected laboratory abnormalities reported in two controlled combination studies are provided in Table 6 and Table 7.

Parameter	Percent (%)			
	START 1		START 2	
	ZERIT+ lamivudine+ indinavir (n=100)	zidovudine+ lamivudine+ indinavir (n=102)	ZERIT+ didanosine+ indinavir (n=102)	zidovudine+ lamivudine+ indinavir (n=103)
Bilirubin (>2.6 x ULN)	7	6	16	8
SGOT (AST) (>5 x ULN)	5	2	7	7
SGPT (ALT) (>5 x ULN)	6	2	8	5
GGT (>5 x ULN)	2	2	5	2
Lipase (>2 x ULN)	6	3	5	5
Amylase (>2 x ULN)	4	<1	8	2

ULN = upper limit of normal.

Parameter	Percent (%)			
	START 1		START 2	
	ZERIT+ lamivudine+ indinavir (n=100)	zidovudine+ lamivudine+ indinavir (n=102)	ZERIT+ didanosine+ indinavir (n=102)	zidovudine+ lamivudine+ indinavir (n=103)
Total Bilirubin	65	60	68	55
SGOT (AST)	42	20	53	20
SGPT (ALT)	40	20	50	18
GGT	15	8	28	12
Lipase	27	12	26	19
Amylase	21	19	31	17

Observed During Clinical Practice: The following events have been identified during post-approval use of ZERIT. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be made. These events have been chosen for inclusion due to their seriousness, frequency of reporting, causal connection to ZERIT, or a combination of these factors.

Body as a Whole- abdominal pain, allergic reaction, chills/fever, and redistribution/accumulation of body fat (see **PRECAUTIONS: Fat Redistribution**).

Digestive Disorders- anorexia.

Exocrine Gland Disorders- pancreatitis [including fatal cases (see **WARNINGS**)].

Hematologic Disorders- anemia, leukopenia, and thrombocytopenia.

Liver- lactic acidosis and hepatic steatosis (see **WARNINGS**), hepatitis and liver failure.

Musculoskeletal- myalgia.

Nervous System- insomnia, severe motor weakness (most often reported in the setting of lactic acidosis, see **WARNINGS**).

Pediatric Patients: Adverse reactions and serious laboratory abnormalities in pediatric patients were similar in type and frequency to those seen in adult patients.

OVERDOSAGE

Experience with adults treated with 12 to 24 times the recommended daily dosage revealed no acute toxicity. Complications of chronic overdosage include peripheral neuropathy and hepatic toxicity. Stavudine can be removed by hemodialysis; the mean ± SD hemodialysis clearance of stavudine is 120 ± 18 mL/min. Whether stavudine is eliminated by peritoneal dialysis has not been studied.

DOSAGE AND ADMINISTRATION

The interval between doses of ZERIT (stavudine) should be 12 hours. ZERIT may be taken without regard to meals.

Adults: The recommended dose based on body weight is as follows:
40 mg twice daily for patients ≥60 kg.
30 mg twice daily for patients <60 kg.

Pediatrics: The recommended dose for pediatric patients weighing less than 30 kg is 1 mg/kg/dose, given every 12 hours. Pediatric patients weighing 30 kg or greater should receive the recommended adult dosage.

Dosage Adjustment: Patients should be monitored for the development of peripheral neuropathy, which is usually manifested by numbness, tingling, or pain in the feet or hands. These symptoms may be difficult to detect in young children (see **WARNINGS**). If these symptoms develop during treatment, stavudine therapy should be interrupted. Symptoms may resolve if therapy is withdrawn promptly. In some cases, symptoms may worsen temporarily following discontinuation of therapy. If symptoms resolve completely, patients may tolerate resumption of treatment at one-half the recommended dose:
20 mg twice daily for patients ≥60 kg.
15 mg twice daily for patients <60 kg.

If peripheral neuropathy recurs after resumption of ZERIT, permanent discontinuation should be considered.

Renal Impairment- ZERIT may be administered to adult patients with impaired renal function with adjustment in dose as shown in Table 8.

Creatinine Clearance (mL/min)	Recommended ZERIT Dose by Patient Weight	
	≥60 kg	<60 kg
>50	40 mg every 12 hours	30 mg every 12 hours
26-50	20 mg every 12 hours	15 mg every 12 hours
10-25	20 mg every 24 hours	15 mg every 24 hours

Since urinary excretion is also a major route of elimination of stavudine in pediatric patients, the clearance of stavudine may be altered in children with renal impairment. Although there are insufficient data to recommend a specific dose adjustment of ZERIT in this patient population, a reduction in the dose and/or an increase in the interval between doses should be considered.

Hemodialysis Patients- The recommended dose is 20 mg every 24 hours (≥60 kg) or 15 mg every 24 hours (<60 kg), administered after the completion of hemodialysis and at the same time of day on non-dialysis days.

Method of Preparation: ZERIT (stavudine) for Oral Solution

Prior to dispensing, the pharmacist must constitute the dry powder with purified water to a concentration of 1 mg stavudine per mL of solution, as follows:

- Add 202 mL of purified water to the container.
- Shake container vigorously until the powder dissolves completely. Constitution in this way produces 200 mL (deliverable volume) of 1 mg/mL stavudine solution. The solution may appear slightly hazy.
- Dispense solution in original container with measuring cup provided. Instruct patient to shake the container vigorously prior to measuring each dose and to store the tightly closed container in a refrigerator, 36° to 46°F (2° to 8°C). Discard any unused portion after 30 days.

HOW SUPPLIED

ZERIT® (stavudine) Capsules are available in the following strengths and configurations of plastic bottles with child-resistant closures:

Product Strength	Capsule Shell Color	Markings on Capsule (in Black Ink)	Capsules per Bottle	NDC No.
15 mg	Light yellow & dark red	BMS 1964	15	60 0003-1964-01
20 mg	Light brown	BMS 1965	20	60 0003-1965-01
30 mg	Light orange & dark orange	BMS 1966	30	60 0003-1966-01
40 mg	Dark orange	BMS 1967	40	60 0003-1967-01

ZERIT® (stavudine) for Oral Solution is a dye-free, fruit-flavored powder that provides 1 mg of stavudine per mL of solution upon constitution with water. Directions for solution preparation are included on the product label and in the **DOSAGE AND ADMINISTRATION** section of this insert. ZERIT for Oral Solution (NDC No. 0003-1968-01) is available in child-resistant containers that provide 200 mL of solution after constitution with water.

US Patent No.: 4,978,655

Storage: ZERIT Capsules should be stored in tightly closed containers at controlled room temperature, 59° to 86°F (15° to 30°C).

ZERIT for Oral Solution should be protected from excessive moisture and stored in tightly closed containers at controlled room temperature, 59° to 86°F (15° to 30°C). After constitution, store tightly closed containers of ZERIT for Oral Solution in a refrigerator, 36° to 46°F (2° to 8°C). Discard any unused portion after 30 days.

BMS Virology™
Bristol-Myers Squibb Company
Princeton, NJ 08543
U.S.A.

PATIENT INFORMATION

Rx ONLY

ZERIT®

(generic name = **stavudine**, also known as **d4T**)

ZERIT® (stavudine) Capsules

ZERIT® (stavudine) for Oral Solution

What is ZERIT?

ZERIT (pronounced ZER it) is a prescription medicine used in combination with other drugs to treat adults and children who are infected with HIV (the human immunodeficiency virus), the virus that causes AIDS. ZERIT belongs to a class of drugs called nucleoside analogues. By reducing the growth of HIV, ZERIT helps your body maintain its supply of CD4 cells, which are important for fighting HIV and other infections.

ZERIT will not cure your HIV infection. At present there is no cure for HIV infection. Even while taking ZERIT, you may continue to have HIV-related illnesses, including infections caused by other disease-producing organisms. Continue to see your doctor regularly and report any medical problems that occur.

ZERIT does not prevent a patient infected with HIV from passing the virus to other people. To protect others, you must continue to practice safe sex and take precautions to prevent others from coming in contact with your blood and other body fluids.

There is limited information on the long-term use of ZERIT.

Who should not take ZERIT?

Do not take ZERIT if you are allergic to any of its ingredients, including its active ingredient, stavudine, and the inactive ingredients. (See **Inactive Ingredients** at the end of this leaflet.) Tell your doctor if you think you have had an allergic reaction to any of these ingredients.

How should I take ZERIT? How should I store it?

Your doctor will determine your dose (the amount in each capsule or spoonful) based on your body weight, kidney and liver function, and any side effects that you may have had with other medicines. Take ZERIT exactly as instructed. Try not to miss a dose, and if you do, take it as soon as possible. If it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. ZERIT may be taken with food or on an empty stomach.

- **Capsules:** ZERIT capsules are usually taken twice a day (every 12 hours). Store ZERIT capsules in a tightly closed container at room temperature away from heat and out of the reach of children and pets. Do NOT store this medicine in a damp place such as a bathroom medicine cabinet or near the kitchen sink.

- **Oral solution (for children):** ZERIT for Oral Solution is taken twice a day (every 12 hours). If your child will be taking ZERIT, the doctor should give you written instructions on how to give this medicine. Before measuring each dose, shake the bottle well. Store ZERIT for Oral Solution in a tightly closed container in a refrigerator and throw away any unused portion after 30 days.

If you have a kidney problem: If your kidneys are not working properly, your doctor may monitor your kidney function while you take ZERIT. Also, your dosage of ZERIT may be adjusted.

What should I do if someone takes an overdose of ZERIT?

If you suspect that someone has taken an overdose of ZERIT, get medical help right away. Contact their doctor or a poison control center.

What should I avoid while taking ZERIT?

Other medicines. Other medicines, including those you can buy without a prescription, may interfere with the actions of ZERIT. You should not use ZERIT in combination with zidovudine (AZT). **Do not take any medicine, vitamin, supplement, or other health preparation without first checking with your doctor.** (Taking ZERIT with other drugs that also may cause peripheral neuropathy may increase your risk of getting this serious side effect.)

Pregnancy: It is not known if ZERIT can harm a human fetus. Also, pregnant women have experienced serious side effects when taking ZERIT in combination with didanosine and other HIV medicines. ZERIT should be used during pregnancy only after discussion with your doctor. **Tell your doctor if you become pregnant or plan to become pregnant while taking ZERIT.**

Nursing: Because studies have shown ZERIT is in the breast milk of animals receiving the drug, it may be present in human breast milk. The Centers for Disease Control and Prevention (CDC) recommends that HIV-infected mothers **not** breast-feed to reduce the risk of passing HIV infection to their babies and the potential for serious adverse reactions in nursing infants. Therefore, do not nurse a baby while taking ZERIT.

What are the possible side effects of ZERIT?

Serious side effects of ZERIT may include:

- **Lactic acidosis**, severe increase of lactic acid in the blood, **severe liver enlargement**, including inflammation (pain and swelling) of the liver, and **liver failure**, which can cause death.
- **Peripheral neuropathy**, a nerve disorder of the hands and feet.

People who take ZERIT along with other medicines that may cause similar side effects may have a higher chance of developing these side effects than if they took ZERIT alone. For example, if you use ZERIT in combination with other drugs (including didanosine, with or without hydroxyurea) that may be associated with liver enlargement, peripheral neuropathy, or pancreatitis, you may be at increased risk for these side effects. Children experience side effects that are similar to those experienced by adults.

Lactic acidosis and severe liver enlargement: Lactic acidosis and severe liver enlargement, including deaths, have been reported among patients taking ZERIT (including pregnant women). **Symptoms of lactic acidosis may include:**

- **nausea, vomiting, or unusual or unexpected stomach discomfort;**
- **feeling very weak and tired;**
- **shortness of breath;**
- **weakness in arms and legs.**

If you notice these symptoms or if your medical condition has suddenly changed, stop taking ZERIT and call your doctor right away. Lactic acidosis is a medical emergency that must be treated in a hospital. Women, overweight patients, and those who have had lengthy treatment with nucleoside medicines are more likely to develop lactic acidosis. Your doctor should check your liver function periodically while you are taking ZERIT, especially if you have a history of heavy alcohol use or a liver problem. The combination of ZERIT, didanosine, and hydroxyurea may increase your risk for liver damage, which may be fatal. Your doctor should closely monitor your liver function if you are taking this combination.

Peripheral neuropathy: This nerve disorder is rare, but may be serious. **Tell your doctor right away if you or a child taking ZERIT (stavudine) has continuing numbness, tingling, burning, or pain in the feet and/or hands.** A child may not recognize these symptoms or know to tell you that his or her feet or hands are numb, burning, tingling, or painful. Ask your child's doctor for instructions on how to find out if your child develops peripheral neuropathy.

Let your doctor know if you or a child taking ZERIT has ever had peripheral neuropathy, because this condition occurs more often in patients who have had it previously. Peripheral neuropathy is also more likely to occur in patients taking drugs that affect the nerves and in patients with advanced HIV disease, but it can occur at any disease stage. If you develop peripheral neuropathy, your doctor may tell you to stop taking ZERIT. In some cases the symptoms worsen for a short time before getting better. Once symptoms of peripheral neuropathy go away completely, ZERIT may be started again at a lower dose.

Pancreatitis: Pancreatitis is a dangerous inflammation of the pancreas. It may cause death. **Tell your doctor right away if you develop stomach pain, nausea, or vomiting. These can be signs of pancreatitis.** Let your doctor know if you have ever had pancreatitis, regularly drink alcoholic beverages, or have gallstones. Pancreatitis occurs more often in patients with these conditions. It is also more likely in people with advanced HIV disease, but can occur at any disease stage. The combination of ZERIT and didanosine, with or without hydroxyurea, may increase your risk for pancreatitis.

Other side effects: In addition to peripheral neuropathy, the most frequent side effects observed in studies of adults taking the recommended dose of ZERIT were headache, diarrhea, rash, and nausea and vomiting. Other side effects may include abdominal pain, muscle pain, insomnia, loss of appetite, chills or fever, allergic reactions, and blood disorders.

Changes in body fat have been seen in some patients taking antiretroviral therapy. These changes may include increased amount of fat in the upper back and neck ("buffalo hump"), breast, and around the trunk. Loss of fat from the legs, arms, and face may also happen. The cause and long-term health effects of these conditions are not known at this time.

What else should I know about ZERIT?

If you have diabetes mellitus: ZERIT for Oral Solution contains 50 mg of sucrose (sugar) per mL.

Inactive Ingredients:

ZERIT Capsules: microcrystalline cellulose, sodium starch glycolate, lactose (milk sugar), and magnesium stearate in a hard gelatin shell.

ZERIT for Oral Solution: methylparaben, propylparaben, sodium carboxymethylcellulose, sucrose (table sugar), and flavoring agents.

This medicine was prescribed for your particular condition. Do not use ZERIT for another condition or give it to others. Keep ZERIT and all other medicines out of the reach of children. Throw away ZERIT when it is outdated or no longer needed by flushing it down the toilet or pouring it down the sink.

This summary does not include everything there is to know about ZERIT. Medicines are sometimes prescribed for purposes other than those listed in a Patient Information Leaflet. If you have questions or concerns, or want more information about ZERIT, your physician and pharmacist have the complete prescribing information upon which this leaflet was based. You may want to read it and discuss it with your doctor or other healthcare professional. Remember, no written summary can replace careful discussion with your doctor.


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