VIDEX- didanosine powder, for solution
Bristol-Myers Squibb Company

HIGHLIGHTS OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use VIDEX safely and effectively. See full prescribing information for VIDEX.

VIDEX (didanosine, USP) pediatric powder for oral solution
Initial U.S. Approval: 1991

WARNING: PANCREATITIS, LACTIC ACIDOSIS and HEPATOMEGALY with STEATOSIS

See full prescribing information for complete boxed warning.

- **Fatal and nonfatal pancreatitis. VIDEX should be suspended in patients with suspected pancreatitis and discontinued in patients with confirmed pancreatitis. (5.1)**
- **Lactic acidosis and severe hepatomegaly with steatosis, including fatal cases. Fatal lactic acidosis has been reported in pregnant women who received the combination of didanosine and stavudine. (5.2)**

RECENT MAJOR CHANGES

Dosage and Administration
Instructions for Reconstitution (2.4) 8/2014

INDICATIONS AND USAGE

VIDEX (didanosine, USP) is a nucleoside reverse transcriptase inhibitor for use in combination with other antiretroviral agents for the treatment of human immunodeficiency virus (HIV)-1 infection. (1)

DOSAGE AND ADMINISTRATION

- Adult patients: Administered on an empty stomach at least 30 minutes before or 2 hours after eating. Dosing is based on body weight. (2.1)

	at least 60 kg	**less than 60 kg**
Preferred dosing	200 mg twice daily	125 mg twice daily
Dosing for patients whose management requires once-daily frequency	400 mg once daily	250 mg once daily

- Pediatric patients (2 weeks old to 18 years old): Administered on an empty stomach at least 30 minutes before or 2 hours after eating.
  - Between 2 weeks and 8 months old, dosing is 100 mg per m^2 twice daily.
  - For those greater than 8 months old, dosing is 120 mg per m^2 twice daily but not to exceed the adult dosing recommendation. (2.1)
- Renal impairment: Dose reduction is recommended. (2.2)
- Coadministration with tenofovir: Dose reduction is recommended. Patients should be monitored closely for didanosine-associated adverse reactions. (2.3, 7.1)

DOSAGE FORMS AND STRENGTHS

- 4-ounce glass bottle containing 2 g of VIDEX (3)
- 8-ounce glass bottle containing 4 g of VIDEX (3)

CONTRAINDICATIONS

Coadministration with allopurinol or ribavirin is contraindicated. (4)

WARNINGS AND PRECAUTIONS

- Pancreatitis: Suspension or discontinuation of didanosine may be necessary. (5.1)

- Lactic acidosis and severe hepatomegaly with steatosis: Suspend didanosine in patients who develop clinical symptoms or signs with or without laboratory findings. (5.2)
- Hepatic toxicity: Interruption or discontinuation of didanosine must be considered upon worsening of liver disease. (5.3)
- Non-cirrhotic portal hypertension: Discontinue didanosine in patients with evidence of non-cirrhotic portal hypertension. (5.4)
- Patients may develop peripheral neuropathy (5.5), retinal changes and optic neuritis (5.6), immune reconstitution syndrome (5.7), and redistribution/accumulation of body fat (5.8).

ADVERSE REACTIONS

- In adults, the most common adverse reactions (greater than 10%, all grades) are diarrhea, peripheral neurologic symptoms/neuropathy, abdominal pain, nausea, headache, rash, and vomiting. (6.1)
- Adverse reactions in pediatric patients were consistent with those in adults. (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Bristol-Myers Squibb at 1-800-721-5072 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

Coadministration of VIDEX can alter the concentration of other drugs and other drugs may alter the concentration of didanosine. The potential drug-drug interactions must be considered prior to and during therapy. (4, 7, 12.3)

USE IN SPECIFIC POPULATIONS

Pregnancy: Fatal lactic acidosis has been reported in pregnant women who received both didanosine and stavudine with other agents. This combination should be used with caution during pregnancy and only if the potential benefit clearly outweighs the potential risk. (5.2, 8.1)

See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

Revised: 8/2015

FULL PRESCRIBING INFORMATION: CONTENTS*

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FULL PRESCRIBING INFORMATION

WARNING: PANCREATITIS, LACTIC ACIDOSIS and HEPATOMEGALY with STEATOSIS

Fatal and nonfatal pancreatitis has occurred during therapy with VIDEX used alone or in combination regimens in both treatment-naive and treatment-experienced patients, regardless of degree of immunosuppression. VIDEX should be suspended in patients with suspected pancreatitis and discontinued in patients with confirmed pancreatitis [*see Warnings and Precautions (5.1)*].

Lactic acidosis and severe hepatomegaly with steatosis, including fatal cases, have been reported with the use of nucleoside analogues alone or in combination, including didanosine and other antiretrovirals. Fatal lactic acidosis has been reported in pregnant women who received the combination of didanosine and stavudine with other antiretroviral agents. The combination of didanosine and stavudine should be used with caution during pregnancy and is recommended only if the potential benefit clearly outweighs the potential risk [*see Warnings and Precautions (5.2)*].

1 INDICATIONS AND USAGE

VIDEX® (didanosine, USP), also known as ddI, in combination with other antiretroviral agents is indicated for the treatment of human immunodeficiency virus (HIV)-1 infection [*see Clinical Studies (14)*].

2 DOSAGE AND ADMINISTRATION

VIDEX should be administered on an empty stomach, at least 30 minutes before or 2 hours after eating.

2.1 Recommended Dosage (Adult and Pediatric Patients)

The preferred dosing frequency of VIDEX is twice daily because there is more evidence to support the effectiveness of this dosing regimen. Once-daily dosing should be considered only for patients whose management requires once-daily dosing of VIDEX [*see Clinical Studies (14)*]. The recommended adult total daily dose is based on body weight (kg) (see Table 1).

Table 1: Recommended Dosage (Adult)

	at least 60 kg	**less than 60 kg**
Preferred dosing	200 mg twice daily	125 mg twice daily
Dosing for patients whose management requires once-daily frequency	400 mg once daily	250 mg once daily

Pediatric Patients (2 weeks old to 18 years old): The recommended dose of VIDEX (didanosine) in pediatric patients between 2 weeks old and 8 months old is 100 mg per m^2 twice daily, and the recommended VIDEX dose for pediatric patients greater than 8 months old is 120 mg per m^2 twice daily but not to exceed the adult dosing recommendation.

Dosing recommendations in patients less than 2 weeks of age cannot be made because the pharmacokinetics of didanosine in these children are too variable to determine an appropriate dose. There are no data on once-daily dosing of VIDEX in pediatric patients.

2.2 Renal Impairment

Adult Patients

In adult patients with impaired renal function, the dose of VIDEX should be adjusted to compensate for the slower rate of elimination. The recommended doses and dosing intervals of VIDEX in adult patients with renal insufficiency are presented in Table 2.

Table 2: Recommended Dosage in Patients with Renal Impairment

Creatinine Clearance (mL/min)	**Recommended VIDEX Dose by Patient Weight**	
	at least 60 kg	**less than 60 kg**
at least 60	200 mg twice daily[a]	125 mg twice daily[a]
30-59	200 mg once daily or 100 mg twice daily	150 mg once daily or 75 mg twice daily
10-29	150 mg once daily	100 mg once daily
less than 10	100 mg once daily	75 mg once daily

[a] 400 mg once daily (at least 60 kg) or 250 mg once daily (less than 60 kg) for patients whose management requires once-daily frequency of administration.

Pediatric Patients

Urinary excretion is also a major route of elimination of didanosine in pediatric patients, therefore the clearance of didanosine may be altered in pediatric patients with renal impairment. Although there are insufficient data to recommend a specific dose adjustment of VIDEX in this patient population, a reduction in the dose should be considered (see Table 2).

Patients Requiring Continuous Ambulatory Peritoneal Dialysis (CAPD) or Hemodialysis

For patients requiring CAPD or hemodialysis, follow dosing recommendations for patients with creatinine clearance of less than 10 mL per min, shown in Table 2. It is not necessary to administer a supplemental dose of VIDEX following hemodialysis.

2.3 Dosage Adjustment

Concomitant Therapy with Tenofovir Disoproxil Fumarate

In patients who are also taking tenofovir disoproxil fumarate, a dose reduction of VIDEX to 250 mg (adults weighing at least 60 kg with creatinine clearance of at least 60 mL per min) or 200 mg (adults weighing less than 60 kg with creatinine clearance of at least 60 mL per min) once daily is recommended. VIDEX and tenofovir disoproxil fumarate may be taken together in the fasted state. Alternatively, if tenofovir disoproxil fumarate is taken with food, VIDEX should be taken on an empty stomach (at least 30 minutes before food or 2 hours after food). The appropriate dose of VIDEX coadministered with tenofovir disoproxil fumarate in patients with creatinine clearance of less than 60 mL per min has not been established. ([*See Drug Interactions (7)* and *Clinical Pharmacology (12.3)*]; see the complete prescribing information for VIDEX EC (enteric-coated formulation of didanosine) for results of drug interaction studies of tenofovir disoproxil fumarate with reduced doses of the enteric-coated formulation of didanosine.)

Hepatic Impairment

No dose adjustment is required in patients with hepatic impairment [*see Warnings and Precautions (5.3)* and *Clinical Pharmacology (12.3)*].

2.4 Instructions for Reconstitution

Prior to dispensing, the pharmacist must reconstitute dry powder with Purified Water, USP, to an initial concentration of 20 mg per mL and immediately mix the resulting solution with antacid to a final concentration of 10 mg per mL as follows:

20 mg per mL Initial Solution

Reconstitute the product to 20 mg per mL by adding 100 mL or 200 mL of Purified Water, USP, to the 2 g or 4 g of VIDEX powder, respectively, in the product bottle.

10 mg per mL Final Admixture

1. Immediately mix one part of the 20 mg per mL initial solution with one part of any commercially available antacid that contains as active ingredients aluminum hydroxide (400 mg per 5 mL), magnesium hydroxide (400 mg per 5 mL), and simethicone (40 mg per 5 mL) for a final dispensing concentration of 10 mg VIDEX per mL. For patient home use, the admixture should be dispensed in appropriately sized, flint-glass or plastic (HDPE, PET, or PETG) bottles with child-resistant closures.
2. Instruct the patient to shake the admixture thoroughly prior to use and to store the tightly closed container in the refrigerator.

The bottles of powder should be stored at 59° F to 86° F (15° C to 30° C). The VIDEX admixture may be stored up to 30 days in a refrigerator, 36° F to 46° F (2° C to 8° C). Discard any unused portion after 30 days.

3 DOSAGE FORMS AND STRENGTHS

VIDEX (didanosine, USP) Pediatric Powder for Oral Solution is supplied in 4- and 8-ounce glass bottles containing 2 g or 4 g of VIDEX, respectively.

4 CONTRAINDICATIONS

These recommendations are based on either drug interaction studies or observed clinical toxicities.

Allopurinol: Coadministration of didanosine and allopurinol is contraindicated because systemic exposures of didanosine are increased, which may increase didanosine-associated toxicity [*see Clinical Pharmacology (12.3)*].

Ribavirin: Coadministration of didanosine and ribavirin is contraindicated because exposures of the active metabolite of didanosine (dideoxyadenosine 5′-triphosphate) are increased. Fatal hepatic failure, as well as peripheral neuropathy, pancreatitis, and symptomatic hyperlactatemia/lactic acidosis have been reported in patients receiving both didanosine and ribavirin.

5 WARNINGS AND PRECAUTIONS

5.1 Pancreatitis

Fatal and nonfatal pancreatitis has occurred during therapy with VIDEX used alone or in combination regimens in both treatment-naive and treatment-experienced patients, regardless of degree of immunosuppression. VIDEX should be suspended in patients with signs or symptoms of pancreatitis and discontinued in patients with confirmed pancreatitis. Patients treated with VIDEX in combination with stavudine may be at increased risk for pancreatitis.

When treatment with life-sustaining drugs known to cause pancreatic toxicity is required, suspension of VIDEX (didanosine) therapy is recommended. In patients with risk factors for pancreatitis, VIDEX should be used with extreme caution and only if clearly indicated. Patients with advanced HIV-1 infection, especially the elderly, are at increased risk of pancreatitis and should be followed closely. Patients with renal impairment may be at greater risk for pancreatitis if treated without dose adjustment. The frequency of pancreatitis is dose related. [*See Adverse Reactions (6).*]

5.2 Lactic Acidosis/Severe Hepatomegaly with Steatosis

Lactic acidosis and severe hepatomegaly with steatosis, including fatal cases, have been reported with the use of nucleoside analogues alone or in combination, including didanosine and other antiretrovirals. A majority of these cases have been in women. Obesity and prolonged nucleoside exposure may be risk factors. Fatal lactic acidosis has been reported in pregnant women who received the combination of didanosine and stavudine with other antiretroviral agents. The combination of didanosine and stavudine should be used with caution during pregnancy and is recommended only if the potential benefit clearly outweighs the potential risk [*see Use in Specific Populations (8.1)*]. Particular caution should be exercised when administering VIDEX to any patient with known risk factors for liver disease; however, cases have also been reported in patients with no known risk factors. Treatment with VIDEX should be suspended in any patient who develops clinical signs or symptoms with or without laboratory findings consistent with symptomatic hyperlactatemia, lactic acidosis, or pronounced hepatotoxicity (which may include hepatomegaly and steatosis even in the absence of marked transaminase elevations).

5.3 Hepatic Toxicity

The safety and efficacy of VIDEX have not been established in HIV-infected patients with significant underlying liver disease. During combination antiretroviral therapy, patients with preexisting liver dysfunction, including chronic active hepatitis, have an increased frequency of liver function abnormalities, including severe and potentially fatal hepatic adverse events, and should be monitored according to standard practice. If there is evidence of worsening liver disease in such patients, interruption or discontinuation of treatment must be considered.

Hepatotoxicity and hepatic failure resulting in death were reported during postmarketing surveillance in HIV-infected patients treated with hydroxyurea and other antiretroviral agents. Fatal hepatic events were reported most often in patients treated with the combination of hydroxyurea, didanosine, and stavudine. This combination should be avoided. [*See Adverse Reactions (6).*]

5.4 Non-cirrhotic Portal Hypertension

Postmarketing cases of non-cirrhotic portal hypertension have been reported, including cases leading to liver transplantation or death. Cases of didanosine-associated non-cirrhotic portal hypertension were confirmed by liver biopsy in patients with no evidence of viral hepatitis. Onset of signs and symptoms ranged from months to years after start of didanosine therapy. Common presenting features included elevated liver enzymes, esophageal varices, hematemesis, ascites, and splenomegaly.

Patients receiving VIDEX should be monitored for early signs of portal hypertension (eg, thrombocytopenia and splenomegaly) during routine medical visits. Appropriate laboratory testing including liver enzymes, serum bilirubin, albumin, complete blood count, and international normalized ratio (INR) and ultrasonography should be considered. VIDEX should be discontinued in patients with evidence of non-cirrhotic portal hypertension.

5.5 Peripheral Neuropathy

Peripheral neuropathy, manifested by numbness, tingling, or pain in the hands or feet, has been reported in patients receiving VIDEX therapy. Peripheral neuropathy has occurred more frequently in patients with advanced HIV disease, in patients with a history of neuropathy, or in patients being treated with neurotoxic drug therapy, including stavudine. Discontinuation of VIDEX should be considered in patients who develop peripheral neuropathy. [*See Adverse Reactions (6).*]

5.6 Retinal Changes and Optic Neuritis

Retinal changes and optic neuritis have been reported in adult and pediatric patients. Periodic retinal examinations should be considered for patients receiving VIDEX [*see Adverse Reactions (6)*].

5.7 Immune Reconstitution Syndrome

Immune reconstitution syndrome has been reported in patients treated with combination antiretroviral therapy, including VIDEX. During the initial phase of combination antiretroviral treatment, patients whose immune system responds may develop an inflammatory response to indolent or residual opportunistic infections (such as *Mycobacterium avium* infection, cytomegalovirus, *Pneumocystis jiroveci* pneumonia [PCP], or tuberculosis), which may necessitate further evaluation and treatment.

Autoimmune disorders (such as Graves' disease, polymyositis, and Guillain-Barré syndrome) have also been reported to occur in the setting of immune reconstitution; however, the time to onset is more variable, and can occur many months after initiation of treatment.

5.8 Fat Redistribution

Redistribution/accumulation of body fat including central obesity, dorsocervical fat enlargement (buffalo hump), peripheral wasting, facial wasting, breast enlargement, and "cushingoid appearance" have been observed in patients receiving antiretroviral therapy. The mechanism and long-term consequences of these events are currently unknown. A causal relationship has not been established.

6 ADVERSE REACTIONS

The following serious adverse reactions are described below and elsewhere in the labeling:

- Pancreatitis [*see Boxed Warning, Warnings and Precautions (5.1)*]
- Lactic acidosis/severe hepatomegaly with steatosis [*see Boxed Warning, Warnings and Precautions (5.2)*]
- Hepatic toxicity [*see Warnings and Precautions (5.3)*]
- Non-cirrhotic portal hypertension [*see Warnings and Precautions (5.4)*]
- Peripheral neuropathy [*see Warnings and Precautions (5.5)*]

- Retinal changes and optic neuritis [*see Warnings and Precautions (5.6)*]

6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

Adults

Selected clinical adverse reactions that occurred in adult patients in clinical studies with VIDEX are provided in Tables 3 and 4.

Table 3: Selected Clinical Adverse Reactions from Monotherapy Studies

	Percent of Patients*			
	ACTG 116A		**ACTG 116B/117**	
Adverse Reactions	**VIDEX n=197**	**zidovudine n=212**	**VIDEX n=298**	**zidovudine n=304**
Diarrhea	19	15	28	21
Peripheral Neurologic Symptoms/Neuropathy	17	14	20	12
Abdominal Pain	13	8	7	8
Rash/Pruritus	7	8	9	5
Pancreatitis	7	3	6	2

* The incidences reported included all severity grades and all reactions regardless of causality.

Table 4: Selected Clinical Adverse Reactions from Combination Studies

	Percent of Patients[a,c]			
	AI454-148[b]		**START 2[b]**	
Adverse Reactions	**VIDEX + stavudine + nelfinavir n=482**	**zidovudine + lamivudine + nelfinavir n=248**	**VIDEX + stavudine + indinavir n=102**	**zidovudine + lamivudine + indinavir n=103**
Diarrhea	70	60	45	39
Nausea	28	40	53	67
Peripheral Neurologic Symptoms/Neuropathy	26	6	21	10
Headache	21	30	46	37
Rash	13	16	30	18
Vomiting	12	14	30	35
Pancreatitis (see below)	1	*	less than 1	*

[a] Percentages based on treated subjects.
[b] Median duration of treatment 48 weeks.
[c] The incidences reported included all severity grades and all reactions regardless of causality.
* This event was not observed in this study arm.

Pancreatitis resulting in death was observed in one patient who received VIDEX (didanosine) plus stavudine plus nelfinavir in Study Al454-148 and in one patient who received VIDEX plus stavudine

plus indinavir in the START 2 study. In addition, pancreatitis resulting in death was observed in 2 of 68 patients who received VIDEX plus stavudine plus indinavir plus hydroxyurea in an ACTG clinical trial [*see Warnings and Precautions (5)*].

The frequency of pancreatitis is dose related. In phase 3 studies, incidence ranged from 1% to 10% with doses higher than are currently recommended and from 1% to 7% with recommended dose.

Selected laboratory abnormalities in clinical studies with VIDEX are shown in Tables 5-7.

Table 5: Selected Laboratory Abnormalities from Monotherapy Studies

	Percent of Patients			
	ACTG 116A		**ACTG 116B/117**	
Parameter	**VIDEX n=197**	**zidovudine n=212**	**VIDEX n=298**	**zidovudine n=304**
SGOT (AST) (greater than 5 x ULN)	9	4	7	6
SGPT (ALT) (greater than 5 x ULN)	9	6	6	6
Alkaline phosphatase (greater than 5 x ULN)	4	1	1	1
Amylase (at least 1.4 x ULN)	17	12	15	5
Uric acid (greater than 12 mg/dL)	3	1	2	1

ULN = upper limit of normal.

Table 6: Selected Laboratory Abnormalities from Combination Studies (Grades 3-4)

	Percent of Patients[a]			
	AI454-148[b]		**START 2[b]**	
Parameter	**VIDEX + stavudine + nelfinavir n=482**	**zidovudine + lamivudine + nelfinavir n=248**	**VIDEX + stavudine + indinavir n=102**	**zidovudine + lamivudine + indinavir n=103**
Bilirubin (greater than 2.6 x ULN)	less than 1	less than 1	16	8
SGOT (AST) (greater than 5 x ULN)	3	2	7	7
SGPT (ALT) (greater than 5 x ULN)	3	3	8	5
GGT (greater than 5 x ULN)	NC	NC	5	2
Lipase (greater than 2 x ULN)	7	2	5	5
Amylase (greater than 2 x ULN)	NC	NC	8	2

ULN = upper limit of normal.
NC = Not Collected.
[a] Percentages based on treated subjects.
[b] Median duration of treatment 48 weeks.

Table 7: Selected Laboratory Abnormalities from Combination Studies (All Grades)

	Percent of Patients[a]			
	AI454-148[b]		**START 2[b]**	
	VIDEX + stavudine + nelfinavir	**zidovudine + lamivudine + nelfinavir**	**VIDEX + stavudine + indinavir**	**zidovudine + lamivudine + indinavir**

Parameter	n=482	n=248	n=102	n=103
Bilirubin	7	3	68	55
SGOT (AST)	42	23	53	20
SGPT (ALT)	37	24	50	18
GGT	NC	NC	28	12
Lipase	17	11	26	19
Amylase	NC	NC	31	17

NC = Not Collected.
[a] Percentages based on treated subjects.
[b] Median duration of treatment 48 weeks.

Pediatric Patients

In clinical trials, 743 pediatric patients between 2 weeks and 18 years of age have been treated with didanosine. Adverse reactions and laboratory abnormalities reported to occur in these patients were generally consistent with the safety profile of didanosine in adults.

In pediatric phase 1 studies, pancreatitis occurred in 2 of 60 (3%) patients treated at entry doses below 300 mg per m^2 per day and in 5 of 38 (13%) patients treated at higher doses. In study ACTG 152, pancreatitis occurred in none of the 281 pediatric patients who received didanosine 120 mg per m^2 every 12 hours and in less than 1% of the 274 pediatric patients who received didanosine 90 mg per m^2 every 12 hours in combination with zidovudine [*see Clinical Studies (14)*].

Retinal changes and optic neuritis have been reported in pediatric patients.

6.2 Postmarketing Experience

The following adverse reactions have been identified during postapproval use of didanosine. Because they are reported voluntarily from a population of unknown size, it is not always possible to reliably estimate their frequency. These reactions have been chosen for inclusion due to their seriousness, frequency of reporting, causal connection to VIDEX, or a combination of these factors.

Blood and Lymphatic System Disorders – anemia, leukopenia, and thrombocytopenia.

Body as a Whole – alopecia, anaphylactoid reaction, asthenia, chills/fever, pain, and redistribution/accumulation of body fat [*see Warnings and Precautions (5.8)*].

Digestive Disorders – anorexia, dyspepsia, and flatulence.

Exocrine Gland Disorders – pancreatitis (including fatal cases) [*see Boxed Warning, Warnings and Precautions (5.1)*], sialadenitis, parotid gland enlargement, dry mouth, and dry eyes.

Hepatobiliary Disorders – symptomatic hyperlactatemia/lactic acidosis and hepatic steatosis [*see Boxed Warning, Warnings and Precautions (5.2)*]; non-cirrhotic portal hypertension [*see Warnings and Precautions (5.4)*]; hepatitis and liver failure.

Metabolic Disorders – diabetes mellitus, hypoglycemia, and hyperglycemia.

Musculoskeletal Disorders – myalgia (with or without increases in creatine kinase), rhabdomyolysis including acute renal failure and hemodialysis, arthralgia, and myopathy.

Ophthalmologic Disorders – retinal depigmentation and optic neuritis [*see Warnings and Precautions (5.6)*].

Use with Stavudine- and Hydroxyurea-Based Regimens

When didanosine is used in combination with other agents with similar toxicities, the incidence of these toxicities may be higher than when didanosine is used alone. Thus, patients treated with VIDEX in combination with stavudine, with or without hydroxyurea, may be at increased risk for pancreatitis and hepatotoxicity, which may be fatal, and severe peripheral neuropathy [*see Warnings and Precautions (5)*]. The combination of VIDEX and hydroxyurea, with or without stavudine, should be avoided.

7 DRUG INTERACTIONS

7.1 Established Drug Interactions

Clinical recommendations based on the results of drug interaction studies are listed in Table 8. Pharmacokinetic results of drug interaction studies are shown in Tables 12 and 13 [*see Contraindications (4), Clinical Pharmacology (12.3)*].

Table 8: Established Drug Interactions with VIDEX

Drug	Effect	Clinical Comment
ciprofloxacin	↓ ciprofloxacin concentration	Administer VIDEX at least 2 hours after or 6 hours before ciprofloxacin.
delavirdine	↓ delavirdine concentration	Administer VIDEX 1 hour after delavirdine.
ganciclovir	↑ didanosine concentration	If there is no suitable alternative to ganciclovir, then use in combination with VIDEX with caution. Monitor for didanosine-associated toxicity.
indinavir	↓ indinavir concentration	Administer VIDEX 1 hour after indinavir.
methadone	↓ didanosine concentration	Do not coadminister methadone with VIDEX pediatric powder due to significant decreases in didanosine concentrations. If coadministration of methadone and didanosine is necessary, the recommended formulation of didanosine is VIDEX EC. Patients should be closely monitored for adequate clinical response when VIDEX EC is coadministered with methadone, including monitoring for changes in HIV RNA viral load.
nelfinavir	No interaction 1 hour after didanosine	Administer nelfinavir 1 hour after VIDEX.
tenofovir disoproxil fumarate	↑ didanosine concentration	A dose reduction of VIDEX to the following dosage once daily is recommended.[a] • 250 mg (adults weighing at least 60 kg with creatinine clearance of at least 60 mL/min) • 200 mg (adults weighing less than 60 kg with creatinine clearance of at least 60 mL/min) VIDEX and tenofovir disoproxil fumarate may be taken together in the fasted state. If tenofovir disoproxil fumarate is taken with food, VIDEX should be taken on an empty stomach (at least 30 minutes before food or 2 hours after food). Patients should be monitored for didanosine-associated toxicities and clinical response.

↑ Indicates increase.
↓ Indicates decrease.
[a] The dosing recommendation for coadministration of VIDEX EC and tenofovir disoproxil fumarate with respect to meal consumption differs from that of VIDEX. See the complete prescribing information for VIDEX EC.

Exposure to didanosine is increased when coadministered with tenofovir disoproxil fumarate [*see*

Clinical Pharmacology (12.3)]. Increased exposure may cause or worsen didanosine-related clinical toxicities, including pancreatitis, symptomatic hyperlactatemia/lactic acidosis, and peripheral neuropathy. Coadministration of tenofovir disoproxil fumarate with VIDEX should be undertaken with caution, and patients should be monitored closely for didanosine-related toxicities and clinical response. VIDEX should be suspended if signs or symptoms of pancreatitis, symptomatic hyperlactatemia, or lactic acidosis develop [*see Dosage and Administration (2.3), Warnings and Precautions (5)*]. Suppression of CD4 cell counts has been observed in patients receiving tenofovir disoproxil fumarate with didanosine at a dose of 400 mg daily.

7.2 Predicted Drug Interactions

Predicted drug interactions with VIDEX are listed in Table 9.

Table 9: Predicted Drug Interactions with VIDEX

Drug or Drug Class	Effect	Clinical Comment
Drugs that may cause pancreatic toxicity	↑ risk of pancreatitis	Use only with extreme caution[a]
Neurotoxic drugs	↑ risk of neuropathy	Use with caution[b]
Antacids containing magnesium or aluminum	↑ side effects associated with antacid components	Use caution with VIDEX Pediatric Powder for Oral Solution
Azole antifungals	↓ ketoconazole or itraconazole concentration	Administer drugs such as ketoconazole or itraconazole at least 2 hours before VIDEX.
Quinolone antibiotics (see also ciprofloxacin in Table 8)	↓ quinolone concentration	Consult package insert of the quinolone.
Tetracycline antibiotics	↓ antibiotic concentration	Consult package insert of the tetracycline.

↑ Indicates increase.
↓ Indicates decrease.
[a] Only if other drugs are not available and if clearly indicated. If treatment with life-sustaining drugs that cause pancreatic toxicity is required, suspension of VIDEX is recommended [*see Warnings and Precautions (5.1)*].
[b] [*See Warnings and Precautions (5.6).*]

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Pregnancy Category B

Reproduction studies have been performed in rats and rabbits at doses up to 12 and 14.2 times the estimated human exposure (based upon plasma levels), respectively, and have revealed no evidence of impaired fertility or harm to the fetus due to didanosine. At approximately 12 times the estimated human exposure, didanosine was slightly toxic to female rats and their pups during mid and late lactation. These rats showed reduced food intake and body weight gains but the physical and functional development of the offspring was not impaired and there were no major changes in the F2 generation. A study in rats showed that didanosine and/or its metabolites are transferred to the fetus through the placenta. Animal reproduction studies are not always predictive of human response.

There are no adequate and well-controlled studies of didanosine in pregnant women. Didanosine 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 didanosine and stavudine 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 and Precautions (5.2)*]. The combination of didanosine and stavudine 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 didanosine 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 didanosine and other antiretroviral agents, an Antiretroviral Pregnancy Registry has been established. Physicians are encouraged to register patients by calling 1-800-258-4263.

8.3 Nursing Mothers

The Centers for Disease Control and Prevention recommend that HIV-infected mothers not breastfeed their infants to avoid risking postnatal transmission of HIV. A study in rats showed that following oral administration, didanosine and/or its metabolites were excreted into the milk of lactating rats. It is not known if didanosine is excreted in human milk. Because of both the potential for HIV transmission and the potential for serious adverse reactions in nursing infants, mothers should be instructed not to breastfeed if they are receiving didanosine.

8.4 Pediatric Use

Use of didanosine in pediatric patients from 2 weeks of age through adolescence is supported by evidence from adequate and well-controlled studies of VIDEX in adult and pediatric patients [*see Dosage and Administration (2), Adverse Reactions (6.1), Clinical Pharmacology (12.3), Clinical Studies (14)*].

8.5 Geriatric Use

In an Expanded Access Program for patients with advanced HIV infection, patients aged 65 years and older had a higher frequency of pancreatitis (10%) than younger patients (5%) [*see Warnings and Precautions (5.1)*]. Clinical studies of didanosine did not include sufficient numbers of subjects aged 65 years and over to determine whether they respond differently than younger subjects. Didanosine 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, care should be taken in dose selection. In addition, renal function should be monitored and dosage adjustments should be made accordingly [*see Dosage and Administration (2.2)*].

8.6 Renal Impairment

Patients with renal impairment (creatinine clearance of less than 60 mL per min) may be at greater risk of toxicity from didanosine due to decreased drug clearance [*see Clinical Pharmacology (12.3)*]. A dose reduction is recommended for these patients [*see Dosage and Administration (2)*].

10 OVERDOSAGE

There is no known antidote for VIDEX (didanosine) overdosage. In phase 1 studies, in which VIDEX was initially administered at doses ten times the currently recommended dose, toxicities included: pancreatitis, peripheral neuropathy, diarrhea, hyperuricemia, and hepatic dysfunction. Didanosine is not dialyzable by peritoneal dialysis, although there is some clearance by hemodialysis [*see Clinical Pharmacology (12.3)*].

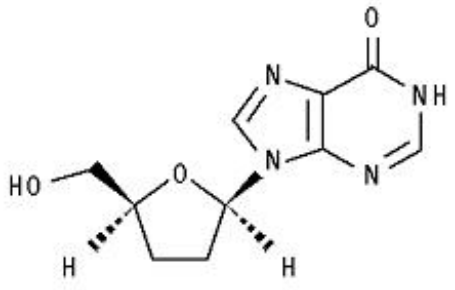
11 DESCRIPTION

VIDEX® is a brand name for didanosine, USP, a synthetic purine nucleoside analogue active against

HIV-1.

Didanosine is available as VIDEX, a Pediatric Powder for Oral Solution [*see How Supplied/Storage and Handling (16)*] and as VIDEX® EC Delayed-Release Capsules, containing enteric-coated beadlets [consult prescribing information for VIDEX EC (didanosine)].

The chemical name for didanosine is 2′,3′-dideoxyinosine. The structural formula is:



Didanosine is a white crystalline powder with the molecular formula $C_{10}H_{12}N_4O_3$ and a molecular weight of 236.2. The aqueous solubility of didanosine at 25° C and pH of approximately 6 is 27.3 mg per mL. Didanosine is unstable in acidic solutions. For example, at pH less than 3 and 37° C, 10% of didanosine decomposes to hypoxanthine in less than 2 minutes.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

Didanosine is an antiviral agent [*see Microbiology (12.4)*].

12.3 Pharmacokinetics

The pharmacokinetic parameters of didanosine are summarized in Table 10. Didanosine is rapidly absorbed, with peak plasma concentrations generally observed from 0.25 to 1.50 hours following oral dosing. Increases in plasma didanosine concentrations were dose proportional over the range of 50 to 400 mg. Steady-state pharmacokinetic parameters did not differ significantly from values obtained after a single dose. Binding of didanosine to plasma proteins *in vitro* was low (less than 5%). Based on data from *in vitro* and animal studies, it is presumed that the metabolism of didanosine in man occurs by the same pathways responsible for the elimination of endogenous purines.

Table 10: Mean ± SD Pharmacokinetic Parameters for Didanosine in Adult and Pediatric Patients

			Pediatric Patients[b]			
Parameter	**Adult Patients[a]**	**n**	**8 months to 19 years**	**n**	**2 weeks to 4 months**	**n**
Oral bioavailability (%)	42 ± 12	6	25 ± 20	46	ND	
Apparent volume of distribution[c] (L/m^2)	43.70 ± 8.90	6	28 ± 15	49	ND	
CSF-plasma ratio[d]	21 ± 0.03%[e]	5	46% (range 12-85%)	7	ND	
Systemic clearance[c] ($mL/min/m^2$)	526 ± 64.7	6	516 ± 184	49	ND	
Renal clearance[f] ($mL/min/m^2$)	223 ± 85.0	6	240 ± 90	15	ND	
Apparent oral clearance[g] ($mL/min/m^2$)	1252 ± 154	6	2064 ± 736	48	1353 ± 759	41

Elimination half-life[f] (h)	1.5 ± 0.4	6	0.8 ± 0.3	60	1.2 ± 0.3	21
Urinary recovery of didanosine[f] (%)	18 ± 8	6	18 ± 10	15	ND	

CSF = cerebrospinal fluid, ND = not determined.
[a] Parameter units for adults were converted to the same units in pediatric patients to facilitate comparisons among populations: mean adult body weight = 70 kg and mean adult body surface area = 1.73 m^2.
[b] In 1-day old infants (n=10), the mean ± SD apparent oral clearance was 1523 ± 1176 mL/min/m^2 and half-life was 2.0 ± 0.7 h.
[c] Following IV administration.
[d] Following IV administration in adults and IV or oral administration in pediatric patients.
[e] Mean ± SE.
[f] Following oral administration.
[g] Apparent oral clearance estimate was determined as the ratio of the mean systemic clearance and the mean oral bioavailability estimate.

Effect of Food

Didanosine peak plasma concentrations (C_{max}) and area under the plasma concentration time curve (AUC) were decreased by approximately 55% when VIDEX tablets were administered up to 2 hours after a meal. Administration of VIDEX tablets up to 30 minutes before a meal did not result in any significant changes in bioavailability [*see Dosage and Administration (2)*]. VIDEX should be taken on an empty stomach.

Special Populations

Renal Insufficiency: Data from two studies in adults indicated that the apparent oral clearance of didanosine decreased and the terminal elimination half-life increased as creatinine clearance decreased (see Table 11). Following oral administration, didanosine was not detectable in peritoneal dialysate fluid (n=6); recovery in hemodialysate (n=5) ranged from 0.6% to 7.4% of the dose over a 3-4 hour dialysis period. The absolute bioavailability of didanosine was not affected in patients requiring dialysis. [*See Dosage and Administration (2.2).*]

Table 11: Mean ± SD Pharmacokinetic Parameters for Didanosine Following a Single Oral Dose

	Creatinine Clearance (mL/min)				
Parameter	**at least 90 n=12**	**60-90 n=6**	**30-59 n=6**	**10-29 n=3**	**Dialysis Patients n=11**
CL_{cr} (mL/min)	112 ± 22	68 ± 8	46 ± 8	13 ± 5	ND
CL/F (mL/min)	2164 ± 638	1566 ± 833	1023 ± 378	628 ± 104	543 ± 174
CL_R (mL/min)	458 ± 164	247 ± 153	100 ± 44	20 ± 8	less than 10
$T_{½}$ (h)	1.42 ± 0.33	1.59 ± 0.13	1.75 ± 0.43	2.0 ± 0.3	4.1 ± 1.2

ND = not determined due to anuria.
CL_{cr} = creatinine clearance.
CL/F = apparent oral clearance.
CL_R = renal clearance.

Hepatic Impairment: The pharmacokinetics of didanosine have been studied in 12 non-HIV-infected subjects with moderate (n=8) to severe (n=4) hepatic impairment (Child-Pugh Class B or C). Mean AUC and C_{max} values following a single 400 mg dose of didanosine were approximately 13% and 19% higher, respectively, in patients with hepatic impairment compared to matched healthy subjects. No dose adjustment is needed, because a similar range and distribution of AUC and C_{max} values was observed

for subjects with hepatic impairment and matched healthy controls. [*See Dosage and Administration (2.3)*.]

Pediatric Patients: The pharmacokinetics of didanosine have been evaluated in HIV-exposed and HIV-infected pediatric patients from birth to adulthood. Overall, the pharmacokinetics of didanosine in pediatric patients are similar to those of didanosine in adults. Didanosine plasma concentrations appear to increase in proportion to oral doses ranging from 25 to 120 mg per m^2 in pediatric patients less than 5 months old and from 80 to 180 mg per m^2 in children above 8 months old. For information on controlled clinical studies in pediatric patients, *see Clinical Studies (14.2)* and *Use in Specific Populations (8.4)*.

Geriatric Patients: Didanosine pharmacokinetics have not been studied in patients over 65 years of age [*see Use in Specific Populations (8.5)*].

Gender: The effects of gender on didanosine pharmacokinetics have not been studied.

Drug Interactions

Tables 12 and 13 summarize the effects on AUC and C_{max}, with a 95% confidence interval (CI) when available, following coadministration of VIDEX (didanosine) with a variety of drugs. Drug-drug interactions for VIDEX buffered tablets are applicable to the VIDEX pediatric powder formulation and are noted in Tables 12 and 13. For clinical recommendations based on drug interaction studies for drugs in bold font, see *Dosage and Administration (2.3 for Concomitant Therapy with Tenofovir Disoproxil Fumarate), Contraindications (4),* and *Drug Interactions (7.1 and 7.2).*

Table 12: Results of Drug Interaction Studies with VIDEX: Effects of Coadministered Drug on Didanosine Plasma AUC and C_{max} Values

			% Change of Didanosine Pharmacokinetic Parameters[a]	
Drug	**Didanosine Dosage**	**n**	**AUC of Didanosine (95% CI)**	**C_{max} of Didanosine (95% CI)**
allopurinol,				
renally impaired, 300 mg/day	200 mg single dose	2	↑ 312%	↑ 232%
healthy volunteer, 300 mg/day for 7 days	400 mg single dose	14	↑ 113%	↑ 69%
ciprofloxacin, 750 mg every 12 hours for 3 days, 2 hours before didanosine	200 mg every 12 hours for 3 days	8[b]	↓ 16%	↓ 28%
ganciclovir, 1000 mg every 8 hours, 2 hours after didanosine	200 mg every 12 hours	12	↑ 111%	NA
indinavir, 800 mg single dose, simultaneous	200 mg single dose	16	↔	↔
1 hour before didanosine	200 mg single dose	16	↓ 17% (-27, -7%)[c]	↓ 13% (-28, 5%)[c]
ketoconazole, 200 mg/day for 4 days, 2 hours before didanosine	375 mg every 12 hours for 4 days	12[b]	↔	↓ 12%
methadone, chronic maintenance dose[f]	200 mg single dose	16[d]	↓ 57%	↓ 66%
			↓ 29%	↓ 41%

	400 mg single dose	15, 16[e]	↓ 29% (-40, -16%)[c]	↓ 41% (-54, -26%)[c]
tenofovir,[g,h] 300 mg once daily, 1 hour after didanosine	250[i] mg or 400 mg once daily for 7 days	14	↑ 44% (31, 59%)[c]	↑ 28% (11, 48%)[c]
loperamide, 4 mg every 6 hours for 1 day	300 mg single dose	12[b]	↔	↓ 23%
metoclopramide, 10 mg single dose	300 mg single dose	12[b]	↔	↑ 13%
ranitidine, 150 mg single dose, 2 hours before didanosine	375 mg single dose	12[b]	↑ 14%	↑ 13%
rifabutin, 300 or 600 mg/day for 12 days	167 mg or 250 mg every 12 hours for 12 days	11	↑ 13% (-1, 27%)	↑ 17% (-4, 38%)
ritonavir, 600 mg every 12 hours for 4 days	200 mg every 12 hours for 4 days	12	↓ 13% (0, 23%)	↓ 16% (5, 26%)
stavudine, 40 mg every 12 hours for 4 days	100 mg every 12 hours for 4 days	10	↔	↔
sulfamethoxazole, 1000 mg single dose	200 mg single dose	8[b]	↔	↔
trimethoprim, 200 mg single dose	200 mg single dose	8[b]	↔	↑ 17% (-23, 77%)
zidovudine, 200 mg every 8 hours for 3 days	200 mg every 12 hours for 3 days	6[b]	↔	↔

↑ Indicates increase.
↓ Indicates decrease.
↔ Indicates no change, or mean increase or decrease of less than 10%.
[a] The 95% confidence intervals for the percent change in the pharmacokinetic parameter are displayed.
[b] HIV-infected patients.
[c] 90% CI.
[d] Comparisons are made to a parallel control group not receiving methadone (n=10).
[e] Comparisons are made to historical controls (n=68, pooled from 3 studies) conducted in healthy subjects. The number of subjects evaluated for AUC and C_{max} is 15 and 16, respectively.
[f] For results of drug interaction studies between the enteric-coated formulation of didanosine (VIDEX EC) and methadone, see the complete prescribing information for VIDEX EC.
[g] Tenofovir disoproxil fumarate.
[h] For results of drug interaction studies between the enteric-coated formulation of didanosine (VIDEX EC) and tenofovir disoproxil fumarate, see the complete prescribing information for VIDEX EC.
[i] Patients less than 60 kg with creatinine clearance of at least 60 mL/min.
NA = Not available.

Table 13: Results of Drug Interaction Studies with VIDEX: Effects of Didanosine on Coadministered Drug Plasma AUC and C_{max} Values

			% Change of Coadministered Drug Pharmacokinetic Parameters[a]	
Drug	**Didanosine Dosage**	**n**	**AUC of Coadministered Drug (95% CI)**	**C_{max} of Coadministered Drug (95% CI)**
ciprofloxacin, 750 mg				

every 12 hours for 3 days, 2 hours before didanosine	200 mg every 12 hours for 3 days	8[b]	↓ 26%	↓ 16%
750 mg single dose	buffered placebo tablet	12	↓ 98%	↓ 93%
delavirdine, 400 mg single dose simultaneous	125 mg or 200 mg every 12 hours	12[b]	↓ 32%	↓ 53%
1 hour before didanosine	125 mg or 200 mg every 12 hours	12[b]	↑ 20%	↑ 18%
ganciclovir, 1000 mg every 8 hours, 2 hours after didanosine	200 mg every 12 hours	12[b]	↓ 21%	NA
indinavir, 800 mg single dose simultaneous	200 mg single dose	16	↓ 84%	↓ 82%
1 hour before didanosine	200 mg single dose	16	↓ 11%	↓ 4%
ketoconazole, 200 mg/day for 4 days, 2 hours before didanosine	375 mg every 12 hours for 4 days	12[b]	↓ 14%	↓ 20%
nelfinavir, 750 mg single dose, 1 hour after didanosine	200 mg single dose	10[b]	↑ 12%	↔
dapsone, 100 mg single dose	200 mg every 12 hours for 14 days	6[b]	↔	↔
ranitidine, 150 mg single dose, 2 hours before didanosine	375 mg single dose	12[b]	↓ 16%	↔
ritonavir, 600 mg every 12 hours for 4 days	200 mg every 12 hours for 4 days	12	↔	↔
stavudine, 40 mg every 12 hours for 4 days	100 mg every 12 hours for 4 days	10[b]	↔	↑ 17%
sulfamethoxazole, 1000 mg single dose	200 mg single dose	8[b]	↓ 11% (-17, -4%)	↓ 12% (-28, 8%)
tenofovir,[c] 300 mg once daily1 hour after didanosine	250[d] mg or 400 mg once daily for 7 days	14	↔	↔
trimethoprim, 200 mg single dose	200 mg single dose	8[b]	↑ 10% (-9, 34%)	↓ 22% (-59, 49%)
zidovudine, 200 mg every 8 hours for 3 days	200 mg every 12 hours for 3 days	6[b]	↓ 10% (-27, 11%)	↓ 16.5% (-53, 47%)

↑ Indicates increase.
↓ Indicates decrease.
↔ Indicates no change, or mean increase or decrease of less than 10%.
[a] The 95% confidence intervals for the percent change in the pharmacokinetic parameter are displayed.
[b] HIV-infected patients.
[c] Tenofovir disoproxil fumarate.
[d] Patients less than 60 kg with creatinine clearance of at least 60 mL/min.
NA = Not available.

12.4 Microbiology

Mechanism of Action

Didanosine is a synthetic nucleoside analogue of the naturally occurring nucleoside deoxyadenosine in which the 3′-hydroxyl group is replaced by hydrogen. Intracellularly, didanosine is converted by cellular enzymes to the active metabolite, dideoxyadenosine 5′-triphosphate. Dideoxyadenosine 5′-triphosphate inhibits the activity of HIV-1 reverse transcriptase both by competing with the natural substrate, deoxyadenosine 5′-triphosphate, and by its incorporation into viral DNA causing termination of viral DNA chain elongation.

Antiviral Activity in Cell Culture

The anti-HIV-1 activity of didanosine was evaluated in a variety of HIV-1 infected lymphoblastic cell lines and monocyte/macrophage cell cultures. The concentration of drug necessary to inhibit viral replication by 50% (EC_{50}) ranged from 2.5 to 10 µM (1 µM = 0.24 µg/mL) in lymphoblastic cell lines and 0.01 to 0.1 µM in monocyte/macrophage cell cultures.

Resistance

HIV-1 isolates with reduced sensitivity to didanosine have been selected in cell culture and were also obtained from patients treated with didanosine. Genetic analysis of isolates from didanosine-treated patients showed mutations in the reverse transcriptase gene that resulted in the amino acid substitutions K65R, L74V, and M184V. The L74V substitution was most frequently observed in clinical isolates. Phenotypic analysis of HIV-1 isolates from 60 patients (some with prior zidovudine treatment) receiving 6 to 24 months of didanosine monotherapy showed that isolates from 10 of 60 patients exhibited an average of a 10-fold decrease in susceptibility to didanosine in cell culture compared to baseline isolates. Clinical isolates that exhibited a decrease in didanosine susceptibility harbored one or more didanosine resistance-associated substitutions.

Cross-resistance

HIV-1 isolates from 2 of 39 patients receiving combination therapy for up to 2 years with didanosine and zidovudine exhibited decreased susceptibility to didanosine, lamivudine, stavudine, zalcitabine, and zidovudine in cell culture. These isolates harbored five substitutions (A62V, V75I, F77L, F116Y, and Q151M) in the reverse transcriptase gene. In data from clinical studies, the presence of thymidine analogue mutations (M41L, D67N, L210W, T215Y, K219Q) has been shown to decrease the response to didanosine.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Lifetime carcinogenicity studies were conducted in mice and rats for 22 and 24 months, respectively. In the mouse study, initial doses of 120, 800, and 1200 mg per kg per day for each sex were lowered after 8 months to 120, 210, and 210 mg per kg per day for females and 120, 300, and 600 mg per kg per day for males. The two higher doses exceeded the maximally tolerated dose in females and the high dose exceeded the maximally tolerated dose in males. The low dose in females represented 0.68-fold maximum human exposure and the intermediate dose in males represented 1.7-fold maximum human exposure based on relative AUC comparisons. In the rat study, initial doses were 100, 250, and 1000 mg per kg per day, and the high dose was lowered to 500 mg per kg per day after 18 months. The upper dose in male and female rats represented 3-fold maximum human exposure.

Didanosine induced no significant increase in neoplastic lesions in mice or rats at maximally tolerated doses.

Didanosine was positive in the following genetic toxicology assays: 1) the *Escherichia coli* tester strain WP2 uvrA bacterial mutagenicity assay; 2) the L5178Y/TK+/- mouse lymphoma mammalian cell gene mutation assay; 3) the *in vitro* chromosomal aberrations assay in cultured human peripheral lymphocytes; 4) the *in vitro* chromosomal aberrations assay in Chinese Hamster Lung cells; and 5) the BALB/c 3T3 *in*

vitro transformation assay. No evidence of mutagenicity was observed in an Ames *Salmonella* bacterial mutagenicity assay or in rat and mouse *in vivo* micronucleus assays.

13.2 Animal Toxicology and/or Pharmacology

Evidence of a dose-limiting skeletal muscle toxicity has been observed in mice and rats (but not in dogs) following long-term (greater than 90 days) dosing with didanosine at doses that were approximately 1.2 to 12 times the estimated human exposure. The relationship of this finding to the potential of VIDEX (didanosine) to cause myopathy in humans is unclear. However, human myopathy has been associated with administration of VIDEX and other nucleoside analogues.

14 CLINICAL STUDIES

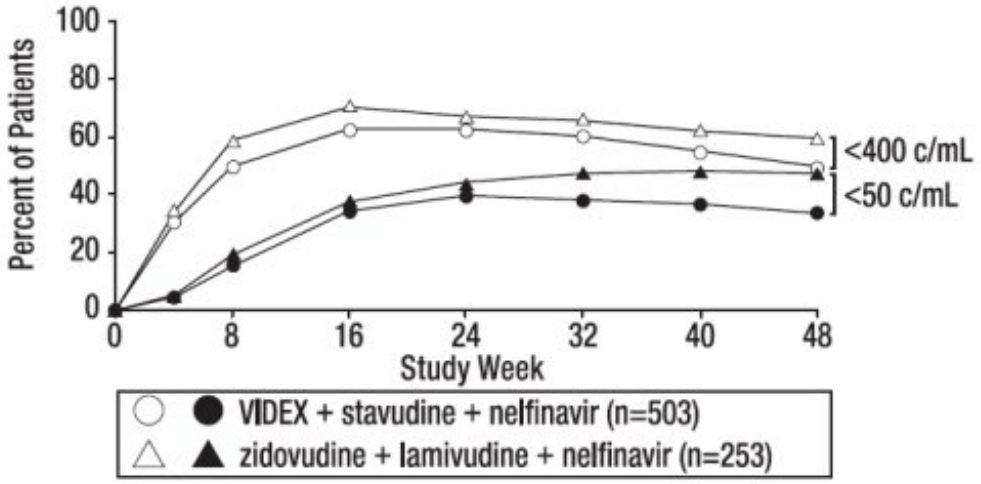
14.1 Adult Patients

Combination Therapy

START 2 was a multicenter, randomized, open-label study comparing VIDEX (200 mg twice daily)/stavudine/indinavir to zidovudine/lamivudine/indinavir in 205 treatment-naive patients. Both regimens resulted in a similar magnitude of suppression of HIV-1 RNA levels and increases in CD4 cell counts through 48 weeks.

Study AI454-148 was a randomized, open-label, multicenter study comparing treatment with VIDEX (400 mg once daily) plus stavudine (40 mg twice daily) and nelfinavir (750 mg three times daily) versus zidovudine (300 mg twice daily) plus lamivudine (150 mg twice daily) and nelfinavir (750 mg three times daily) in 756 treatment-naive patients, with a median CD4 cell count of 340 cells per mm^3 (range 80 to 1568 cells per mm^3) and a median plasma HIV-1 RNA of 4.69 log_{10} copies per mL (range 2.6 to 5.9 log_{10} copies per mL) at baseline. Median CD4 cell count increases at 48 weeks were 188 cells per mm^3 in both treatment groups. Treatment response and outcomes through 48 weeks are shown in Figure 1 and Table 14.

Figure 1: Treatment Response Through Week 48*, AI454-148



* Percent of patients at each time point who have HIV RNA <400 or <50 copies/mL, are on their original study medication (except stavudine-zidovudine switches), and have not experienced an AIDS-defining event.

Table 14: Outcomes of Randomized Treatment Through Week 48, AI454-148

Week 48 Status	Percent of Patients with HIV-1 RNA less than 400 copies/mL (less than 50 copies/mL)	
	VIDEX/stavudine/nelfinavir n=503	lamivudine/zidovudine/nelfinavir n=253
Responder[a]	50* (34*)	59 (47)
Virologic failure[b]	36 (57)	32 (48)
Death or disease progression	less than 1 (less than 1)	1 (less than 1)
Discontinued due to adverse events	4 (2)	2 (less than 1)
Discontinued due to other reasons[c]	6 (3)	4 (2)
Never initiated treatment	4 (4)	2 (2)

* p less than 0.05 for the differences between treatment groups, by Cochran-Mantel-Haenszel test.
[a] Patients achieved virologic response [two consecutive viral loads less than 400 (less than 50) copies/mL] and maintained it to Week 48.
[b] Includes viral rebound and failing to achieve confirmed less than 400 (less than 50) copies/mL by Week 48.
[c] Includes lost to follow-up, noncompliance, withdrawal, and pregnancy.

Monotherapy

The efficacy of VIDEX was demonstrated in two randomized, double-blind studies comparing VIDEX, given on a twice-daily schedule, to zidovudine, given three times daily, in 617 (ACTG 116A, conducted 1989-1992) and 913 (ACTG 116B/117, conducted 1989-1991) patients with symptomatic HIV infection or AIDS who were treated for more than one year. In treatment-naive patients (ACTG 116A), the rate of HIV disease progression or death was similar between the treatment groups; mortality rates were 26% for patients receiving VIDEX and 21% for patients receiving zidovudine. Of the patients who had received previous zidovudine treatment (ACTG 116B/117), those treated with VIDEX had a lower rate of HIV disease progression or death (32%) compared to those treated with zidovudine (41%); however, survival rates were similar between the treatment groups.

Studies have demonstrated that the clinical benefit of monotherapy with antiretrovirals, including VIDEX, was time limited.

14.2 Pediatric Patients

Efficacy in pediatric patients was demonstrated in a randomized, double-blind, controlled study (ACTG 152, conducted 1991-1995) involving 831 patients 3 months to 18 years of age treated for more than 1.5 years with zidovudine (180 mg per m^2 every 6 hours), VIDEX (120 mg per m^2 every 12 hours), or zidovudine (120 mg per m^2 every 6 hours) plus VIDEX (90 mg per m^2 every 12 hours). Patients treated with VIDEX or VIDEX plus zidovudine had lower rates of HIV-1 disease progression or death compared with those treated with zidovudine alone.

16 HOW SUPPLIED/STORAGE AND HANDLING

VIDEX (didanosine, USP) Pediatric Powder for Oral Solution is supplied as shown in Table 15:

Table 15: VIDEX Pediatric Powder for Oral Solution

NDC NO.	Packaging Information	Product Quantity
0087-6632-41	One, 4-ounce glass, bottle per carton	2 g/bottle
0087-6633-41	One, 8-ounce glass, bottle per carton	4 g/bottle

Storage

The bottles of powder should be stored at 59° F to 86° F (15° C to 30° C). The VIDEX admixture may be stored up to 30 days in a refrigerator, 36° F to 46° F (2° C to 8° C). Discard any unused portion after 30 days.

17 PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Medication Guide).

Pancreatitis

Advise patients that a serious toxicity of VIDEX, used alone and in combination regimens, is pancreatitis, which may be fatal.

Peripheral Neuropathy

Advise patients that peripheral neuropathy, manifested by numbness, tingling, or pain in hands or feet, may develop during therapy with VIDEX. Patients should be counseled that peripheral neuropathy occurs with greatest frequency in patients with advanced HIV-1 disease or a history of peripheral neuropathy, and that discontinuation of VIDEX may be required if toxicity develops.

Lactic Acidosis and Severe Hepatomegaly with Steatosis

Advise patients that lactic acidosis and severe hepatomegaly with steatosis, including fatal cases, have been reported with the use of nucleoside analogues alone or in combination, including didanosine and other antiretrovirals.

Hepatic Toxicity

Advise patients that hepatotoxicity including fatal hepatic adverse events were reported in patients with preexisting liver dysfunction. The safety and efficacy of VIDEX have not been established in HIV-infected patients with significant underlying liver disease.

Non-cirrhotic Portal Hypertension

Advise patients that non-cirrhotic portal hypertension has been reported in patients taking VIDEX, including cases leading to liver transplantation or death.

Retinal Changes and Optic Neuritis

Advise patients that retinal changes and optic neuritis have been reported in adult and pediatric patients, which may result in dry eyes and/or blurred vision. Advise patients to have regular eye exams while taking VIDEX.

Fat Redistribution

Advise patients that redistribution or accumulation of body fat may occur in patients receiving antiretroviral therapy and that the cause and long-term health effects of these conditions are not known at this time.

Concomitant Therapy

Advise patients that when VIDEX is used in combination with other agents with similar toxicities, the incidence of adverse events may be higher than when VIDEX is used alone. These patients should be followed closely.

Patients should be cautioned about the use of medications or other substances, including alcohol, which may exacerbate VIDEX toxicities.

Information for Patients

VIDEX is not a cure for HIV-1 infection, and patients may continue to experience illnesses associated with HIV-1 infection, including opportunistic infections. Therefore, patients should remain under the care of a physician when using VIDEX.

Advise patients to avoid doing things that can spread HIV-1 infection to others.

- Do not share needles or other injection equipment.
- Do not share personal items that can have blood or body fluids on them, like toothbrushes and razor blades.
- Do not have any kind of sex without protection. Always practice safer sex by using a latex or polyurethane condom to lower the chance of sexual contact with semen, vaginal secretions, or blood.
- Do not breastfeed. It is not known if VIDEX can be passed to your baby in your breast milk and whether it could harm your baby. Also, mothers with HIV-1 should not breastfeed because HIV-1 can be passed to the baby in breast milk.

Advise patients that the preferred dosing frequency of VIDEX is twice daily because there is more evidence to support the effectiveness of this dosing frequency. Once-daily dosing should be considered only for patients whose management requires once-daily dosing of VIDEX.

Advise patients to not miss a dose but if they do, patients should take VIDEX as soon as possible. Patients should be told that if it is almost time for the next dose, they should skip the missed dose and continue with the regular dosing schedule.

Advise patients to contact a poison control center or emergency room right away in case of an overdose.

Medication Guide

VIDEX® (VY-dex)
(didanosine, also known as ddI)
Pediatric Powder for Oral Solution

Read this Medication Guide before you start taking VIDEX and each time you get a refill. There may be new information. This information does not take the place of talking with your healthcare provider about your medical condition or your treatment. You should stay under your healthcare provider's care when taking VIDEX.

What is the most important information I should know about VIDEX?

VIDEX may cause serious side effects, including:

1. **Swelling of your pancreas (pancreatitis) that may cause death. Pancreatitis can happen in people:**

   - who take VIDEX by itself, and in people who also take other antiviral medicines along with VIDEX to treat their HIV-1 infection **and**
   - who have never taken anti-HIV medicines before, and also in people who have taken antiviral medicines to treat their HIV-1 infection.

   People who take VIDEX with the medicine stavudine (ZERIT®), and people with kidney problems may have an increased risk for developing pancreatitis. People who have advanced HIV-1 infection, especially the elderly, have an increased risk of developing pancreatitis. Your dose of

VIDEX may need to be decreased by your healthcare provider, or your healthcare provider may need to hold or stop your treatment with VIDEX if you develop pancreatitis.

Before you start taking VIDEX, tell your healthcare provider if you:

- have had pancreatitis
- have kidney problems
- drink alcoholic beverages
- take the medicine stavudine (ZERIT)

Call your healthcare provider right away if you develop:

- stomach-area (abdomen) pain
- swelling of your stomach area
- nausea and vomiting
- fever

2. **Build-up of acid in your blood (lactic acidosis).** Lactic acidosis can happen in some people who take VIDEX alone or with other antiviral medicines. Lactic acidosis is a serious medical emergency that can lead to death. Death has happened in pregnant women who take VIDEX and the medicine stavudine (ZERIT), along with other antiviral medicines. The risk for lactic acidosis may be higher if you:

   - are pregnant
   - are taking stavudine (ZERIT)
   - have liver problems
   - are overweight
   - are taking HIV medicines for a long time

   Lactic acidosis treatment usually requires hospitalization.

   Lactic acidosis can be hard to identify early, because the symptoms could seem like symptoms of other health problems. Call your healthcare provider right away if you get the following symptoms which could be signs of lactic acidosis:

   - feel very weak or tired
   - have unusual (not normal) muscle pain
   - have trouble breathing
   - have stomach pain with nausea and vomiting
   - feel cold, especially in your arms and legs
   - feel dizzy or light-headed
   - have a fast or irregular heartbeat

3. **Severe liver problems.** Severe liver problems can happen in people, including pregnant women, who take VIDEX alone or with other antiviral medicines. In some cases, these severe liver problems can lead to the need for you to have a liver transplant, or cause death. Your liver may become large (hepatomegaly), you may develop fat in your liver (steatosis), liver failure, or high blood pressure in the large vein of your liver (portal hypertension). Your healthcare provider should examine you and check your liver function while you are taking VIDEX.

   It is not known if VIDEX is safe and effective in people with HIV-infection who also have liver disease.

Call your healthcare provider right away if you develop:

- yellowing of your skin or the white of your eyes (jaundice)
- dark urine
- pain on the right side of your stomach area (abdomen)
- swelling of your stomach area
- easy bruising or bleeding
- loss of appetite
- nausea or vomiting
- vomiting of blood
- dark-colored stools (bowel movements)

You may be more likely to develop severe liver problems if you:

- are a woman
- are pregnant
- are overweight
- have been treated for a long time with other medicines to treat HIV

What is VIDEX?

VIDEX is a prescription medicine used with other antiretroviral medicines to treat human immunodeficiency virus type 1 (HIV-1) infection in children and adults. VIDEX belongs to a class of drugs called nucleoside analogues.

When used with other HIV medicines, VIDEX may help:

- reduce the amount of HIV in your blood. This is called “viral load.”
- increase the number of white blood cells called CD4+ (T) cells in your blood, which may help fight off other infections.

Reducing the amount of HIV-1 and increasing the CD4+ (T) cells in your blood may help improve your immune system. This may reduce your risk of death or getting infections that can happen when your immune system is weak (opportunistic infections).

VIDEX does not cure HIV-1 infection or AIDS. You must stay on continuous HIV-1 therapy to control infection and decrease HIV-related illnesses.

Avoid doing things that can spread HIV-1 infection to others.

- Do not share or re-use needles or other injection equipment.
- Do not share personal items that can have blood or body fluids on them, like toothbrushes and razor blades.
- Do not have any kind of sex without protection. Always practice safer sex by using a latex or polyurethane condom to lower the chance of sexual contact with any body fluids such as semen, vaginal secretions, or blood.

Ask your healthcare provider if you have any questions about how to prevent passing HIV to other people.

Who should not take VIDEX?

Do not take VIDEX if you take:

- allopurinol (ZYLOPRIM®, LOPURIN®, ALOPRIM®)
- ribavirin (COPEGUS®, REBETOL®, RIBASPHERE®, RIBAVIRIN®, VIRAZOLE®)

What should I tell my healthcare provider before taking VIDEX?

Before you take VIDEX, tell your healthcare provider if you:

- have had pancreatitis
- have or had kidney problems
- have or had liver problems (such as hepatitis)
- have or had persistent numbness, tingling, or pain in the hands or feet (neuropathy)
- drink alcoholic beverages
- have any other medical conditions
- are pregnant or plan to become pregnant. It is not known if VIDEX will harm your unborn baby. Tell your healthcare provider right away if you become pregnant while taking VIDEX. You and your healthcare provider will decide if you should take VIDEX while you are pregnant. **Pregnancy Registry:** There is a pregnancy registry for women who take antiviral medicines during pregnancy. The purpose of the registry is to collect information about the health of you and your baby. Talk to your healthcare provider about how you can take part in this registry.
- **are breastfeeding or plan to breastfeed. Do not breastfeed if you take VIDEX.** You should not breastfeed because of the risk of passing HIV to your baby. It is not known if VIDEX passes into your breast milk. Talk to your healthcare provider about the best way to feed your baby while taking VIDEX.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. VIDEX may affect the way other medicines work, and other medicines may affect how VIDEX works.

Especially tell your healthcare provider if you take:

- tenofovir disoproxil fumarate (VIREAD®, ATRIPLA, COMPLERA, STRIBILD, TRUVADA)
- hydroxyurea (DROXIA®, HYDREA®)
- delavirdine mesylate (RESCRIPTOR®)
- ganciclovir (CYTOVENE®, VALCYTE®)
- indinavir (CRIXIVAN®)
- methadone hydrochloride (DOLOPHINE® HYDROCHLORIDE, METHADOSE®)
- nelfinavir (VIRACEPT®)
- antacids that contain magnesium or aluminum
- the antifungal medicines ketoconazole (NIZORAL®) and itraconazole (SPORANOX®, ONMEL)
- a type of antibiotic called a “quinolone,” such as ciprofloxacin (CIPRO®)
- an antibiotic that contains tetracycline
- stavudine (ZERIT)

Know the medicines you take. Keep a list of your medicines and show it to your healthcare provider and pharmacist when you get a new medicine.

Ask your healthcare provider if you are not sure if you take one of the medicines listed above.

How should I take VIDEX?

- Take VIDEX exactly as your healthcare provider tells you to take it.
- Your healthcare provider will tell you how much VIDEX to take and when to take it.

- Your healthcare provider may change your dose. Do not change your dose of VIDEX without talking to your healthcare provider.
- **Do not take VIDEX with food.** Take VIDEX on an empty stomach at least 30 minutes before or 2 hours after you eat.
- VIDEX comes as a Powder for Oral Solution. Your pharmacist will give you a bottle that contains VIDEX as a solution that has been mixed with acid-reducing medicines (antacids).
- Shake the bottle well before taking each dose of VIDEX.
- Be sure to close the bottle tightly after each use.
- Try not to miss a dose of VIDEX, but if you do, take it as soon as possible. If it is almost time for the next dose, skip the missed dose. Then continue your regular dosing schedule.
- **Some medicines should not be taken at the same time of day that you take VIDEX.** Check with your healthcare provider.
- If your kidneys are not working well, your healthcare provider will need to do regular blood and urine tests to check how they are working while you take VIDEX. Your healthcare provider may also lower your dose of VIDEX if your kidneys are not working well.
- **If you take too much VIDEX**, call a poison control center or go to an emergency room right away.

What are the possible side effects of VIDEX?

VIDEX can cause serious side effects.

- See “What is the most important information I should know about VIDEX?”
- **Vision changes.** Contact your healthcare provider if you have changes in vision, such as dry eyes and/or blurred vision. You should have regular eye exams while you take VIDEX.
- **Nerve damage.** Symptoms include numbness, tingling, or pain in your hands or feet. These are common with VIDEX, but are more likely to happen in people who have had these problems before, in people who take medicines that can affect the nerves, including stavudine (ZERIT), and in people who have advanced HIV disease. A child may not notice the symptoms. Ask your healthcare provider about the signs and symptoms of nerve problems that you should look for in your child during and after treatment with VIDEX.
- **Changes in your immune system (immune reconstitution syndrome)** can happen when you start taking HIV-1 medicine. Your immune system may get stronger and begin to fight infections that have been hidden in your body for a long time. Tell your healthcare provider if you start having new symptoms after starting to take HIV-1 medicine.
- **Changes in body fat** can happen in people who take HIV-1 medicines. These changes may include increased amount of fat in the upper back and neck (“buffalo hump”), breast, and around the main part of your body (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.

The most common side effects of VIDEX include:

- diarrhea
- stomach-area (abdomen) pain
- nausea
- vomiting
- headache
- rash

Tell your healthcare provider if you have any side effect that bothers you or that does not go away.

These are not all the possible side effects of VIDEX. For more information, ask your healthcare provider or pharmacist.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

How should I store VIDEX?

- Store VIDEX oral solution in a tightly closed container in the refrigerator between 36° F to 46° F (2° C to 8° C) for up to 30 days.
- Safely throw away any unused VIDEX after 30 days.

Keep VIDEX and all medicines out of the reach of children.

General information about the safe and effective use of VIDEX

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use VIDEX for a condition for which it was not prescribed.

If you would like more information, talk with your healthcare provider. You can ask your pharmacist or healthcare provider for information about VIDEX that is written for health professionals. For more information, go to www.bms.com/products/Pages/home.aspx or call 1-800-321-1335.

What are the ingredients in VIDEX?

Active ingredient: didanosine

Pediatric Oral Solution inactive ingredients: Purified Water, USP and an antacid containing aluminum hydroxide (400 mg per 5 mL), magnesium hydroxide (400 mg per 5 mL), and simethicone (40 mg per 5 mL).

This Medication Guide has been approved by the U.S. Food and Drug Administration.

Distributed by:
Bristol-Myers Squibb Company
Princeton, NJ 08543 USA

Product of Japan

1351316

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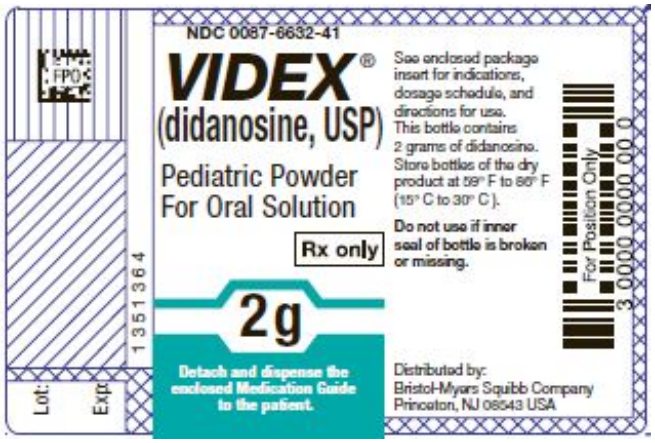
VIDEX 2 g Pediatric Powder Representative Packaging

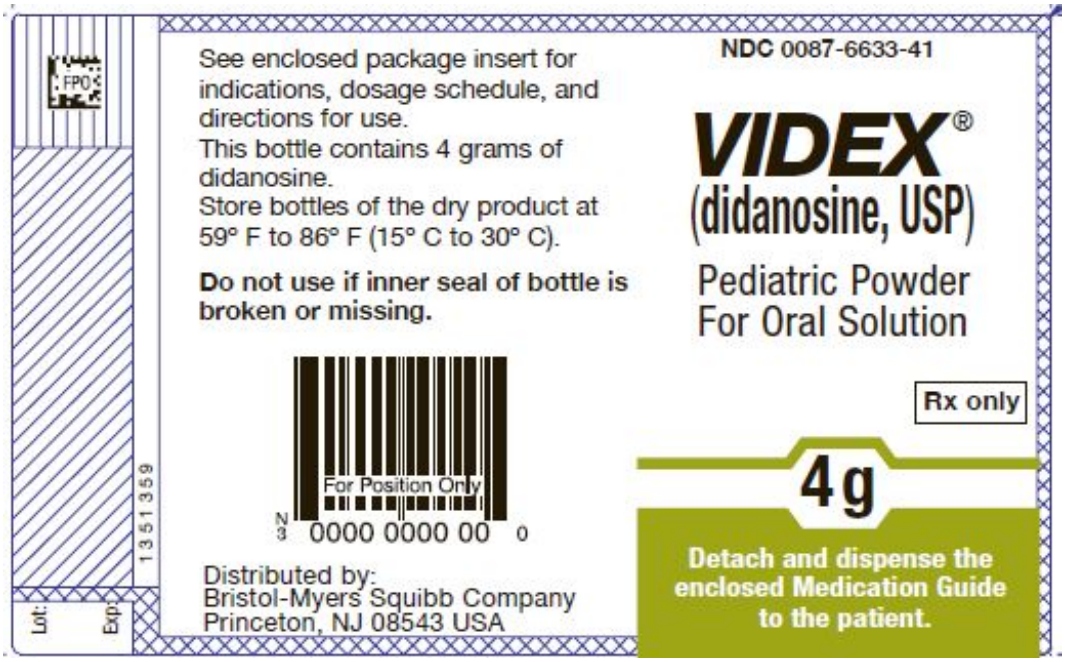
See **How Supplied** section for a complete list of available packages of VIDEX.

NDC 0087-6632-41
VIDEX®
(didanosine, USP)
Pediatric Powder
For Oral Solution
Rx only
2 g
Detach and dispense the enclosed Medication Guide to the patient.



VIDEX 4 g Pediatric Powder Representative Packaging

NDC 0087-6633-41
VIDEX®
(didanosine, USP)
Pediatric Powder
For Oral Solution
Rx only
4 g
Detach and dispense the enclosed Medication Guide to the patient.



VIDEX
didanosine powder, for solution

Product Information			
Product Type	HUMAN PRESCRIPTION DRUG	**Item Code (Source)**	NDC:0087-6632
Route of Administration	ORAL		

Active Ingredient/Active Moiety		
Ingredient Name	Basis of Strength	Strength
didanosine (UNII: K3GDH6OH08) (didanosine - UNII:K3GDH6OH08)	didanosine	10 mg in 1 mL

Product Characteristics			
Color	WHITE	Score	
Shape		Size	
Flavor		Imprint Code	
Contains			

Packaging				
#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:0087-6632-41	1 in 1 CARTON		
1		200 mL in 1 BOTTLE; Type 0: Not a Combination Product		

Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
NDA	NDA020156	10/09/1991	

VIDEX

didanosine powder, for solution

Product Information			
Product Type	HUMAN PRESCRIPTION DRUG	Item Code (Source)	NDC:0087-6633
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Active Ingredient/Active Moiety		
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Product Characteristics			
Color	WHITE	Score	
Shape		Size	
Flavor		Imprint Code	
Contains			

Packaging				
#	Item Code	Package Description	Marketing Start Date	Marketing End Date

1	NDC:0087-6633-41	1 in 1 CARTON		
1		400 mL in 1 BOTTLE; Type 0: Not a Combination Product		

Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
NDA	NDA020156	10/09/1991	

Labeler - Bristol-Myers Squibb Company (102826703)

Revised: 8/2015 Bristol-Myers Squibb Company