

PRODUCT MONOGRAPH

PrTOPOTECAN FOR INJECTION
(Topotecan hydrochloride)

Powder for injection, 4 mg topotecan (as topotecan hydrochloride) per vial

Antineoplastic Agent

Fresenius Kabi Canada Ltd.
165 Galaxy Blvd, Suite 100
Toronto, ON M9W 0C8

Date of Revision:
April 17, 2019

Submission Control No: 226732

Table of Contents

PART I: HEALTH PROFESSIONAL INFORMATION.....3

SUMMARY PRODUCT INFORMATION3

INDICATIONS AND CLINICAL USE.....3

CONTRAINDICATIONS3

WARNINGS AND PRECAUTIONS.....4

ADVERSE REACTIONS.....6

DRUG INTERACTIONS11

DOSAGE AND ADMINISTRATION11

OVERDOSAGE13

ACTION AND CLINICAL PHARMACOLOGY14

STORAGE AND STABILITY15

SPECIAL HANDLING INSTRUCTIONS15

DOSAGE FORMS, COMPOSITION AND PACKAGING16

PART II: SCIENTIFIC INFORMATION17

PHARMACEUTICAL INFORMATION.....17

CLINICAL TRIALS.....17

DETAILED PHARMACOLOGY22

MICROBIOLOGY22

TOXICOLOGY22

REFERENCES23

PART III: CONSUMER INFORMATION.....25

Pr **TOPOTECAN FOR INJECTION**
(Topotecan hydrochloride)

PART I: HEALTH PROFESSIONAL INFORMATION

SUMMARY PRODUCT INFORMATION

Route of Administration	Dosage Form / Strength	Clinically Relevant Nonmedicinal Ingredients
Intravenous infusion	Lyophilized powder Topotecan 4 mg per vial, incorporated as topotecan hydrochloride for reconstitution.	mannitol and tartaric acid <i>For a complete, listing see DOSAGE FORMS, COMPOSITION AND PACKAGING section.</i>

INDICATIONS AND CLINICAL USE

Adults

Topotecan for Injection (topotecan hydrochloride) is indicated for the treatment of:

- metastatic carcinoma of the ovary after failure of initial or subsequent therapy;
- sensitive small cell lung cancer after failure of first line chemotherapy (defined as recurrence at least 60 days after first line chemotherapy).

Geriatrics

No data is available.

Pediatrics

Safety and effectiveness in pediatric patients have not been established, therefore is not recommended for use in this population.

CONTRAINDICATIONS

Topotecan for Injection (topotecan hydrochloride) is contraindicated:

- in patients who have a history of hypersensitivity reactions (anaphylactoid reactions) to topotecan or to any of its excipients;
- in patients who are pregnant or breast-feeding;
- in patients who already have severe bone marrow depression prior to starting first course, as evidenced by baseline absolute neutrophils $< 1.5 \times 10^9/L$ and/or a platelet count of $< 100 \times 10^9/L$;

- in patients with severe renal impairment (creatinine clearance of < 20 mL/min or < 0.33 mL/sec).

WARNINGS AND PRECAUTIONS

Serious Warnings and Precautions

Topotecan for Injection (topotecan hydrochloride) should be prescribed by a qualified healthcare professional who is experienced in the use of antineoplastic therapy agents.

The following is a clinically significant adverse event:

- **Bone marrow suppression, primarily neutropenia (see WARNINGS AND PRECAUTIONS, Hematologic);**
- **Potentially fatal neutropenic colitis (see WARNINGS AND PRECAUTIONS, Gastrointestinal);**
- **Potentially fatal interstitial lung disease (see WARNINGS AND PRECAUTIONS, Respiratory).**

General

Topotecan for Injection (topotecan hydrochloride) should be administered under the supervision of a physician experienced in the use of cancer chemotherapeutic agents. Bone marrow suppression, primarily neutropenia, is the dose-limiting toxicity. Therapy with Topotecan for Injection should not be given to patients with baseline absolute neutrophil counts of $1.5 \times 10^9/L$ or less. In order to monitor the occurrence of bone marrow suppression, frequent peripheral blood cell counts should be performed on all patients receiving Topotecan for Injection (see DOSAGE AND ADMINISTRATION).

Inadvertent extravasation with topotecan hydrochloride has been associated only with mild local reactions such as erythema (and bruising).

Caution should be observed when driving or operating machinery if fatigue or asthenia persist.

Selection of Patients In Small Cell Lung Cancer

Clinical studies were conducted in patients with sensitive and refractory small cell lung cancer; a reduced chance for benefit in the refractory patients was noted with response rates ranging from 11-31% for patients with sensitive disease and 2.1% to 7.3% for patients with refractory disease. As the risk for toxicity is similar, the overall benefit/risk is reduced.

The benefit to patients versus the risk of toxicity must be carefully weighed.

Carcinogenesis and Mutagenesis

The carcinogenic potential of topotecan hydrochloride has not been studied (see WARNINGS AND PRECAUTIONS, Special Populations, Pregnant Women).

Topotecan hydrochloride has been shown to be genotoxic to mammalian cells (mouse lymphoma

cells and human lymphocytes) *in vitro*, and mouse bone marrow cells *in vivo*, but is not mutagenic in bacterial cells (*Salmonella typhimurium* and *Escherichia coli*).

Gastrointestinal

Topotecan-induced neutropenia can cause neutropenic colitis (cectitis or typhlitis). Fatalities due to neutropenic colitis have been reported in clinical trials with topotecan. In patients presenting with fever, neutropenia, and a compatible pattern of abdominal pain, the possibility of neutropenic colitis should be considered.

Gastrointestinal perforations (including life-threatening and fatal cases) have been reported with topotecan-treated patients. Monitor patients with symptoms of severe stomach pain, nausea, vomiting and bloody stool for a possibility of GI perforation. Discontinue Topotecan for Injection in patients who experience a GI perforation.

Hematologic

Bone marrow suppression (primarily neutropenia) is the dose-limiting toxicity of topotecan. Neutropenia is not cumulative over time. Myelosuppression leading to sepsis and fatalities due to sepsis have been reported in patients treated with topotecan [2% fatalities across all SCLC studies (n = 426 subjects), which includes 3% fatalities in one Phase III SCLC study (n = 107 subjects, Table 4)] (see ADVERSE REACTIONS).

Topotecan for Injection should not be administered to patients with baseline absolute neutrophil counts of less than $1.5 \times 10^9/L$. To monitor the occurrence of myelotoxicity, it is recommended that frequent peripheral blood cell counts be performed on all patients receiving topotecan hydrochloride. Patients should not be retreated with subsequent courses of topotecan hydrochloride until neutrophils recover to a level $> 1 \times 10^9/L$; platelets recover to a level $> 100 \times 10^9/L$ and hemoglobin recovers to 90 g/L, using transfusion if necessary.

Neutropenia

Grade 4 neutropenia ($< 0.5 \times 10^9/L$) occurred in 78% of patients and in 39% of all courses, with a median duration of 7 days. The nadir neutrophil count occurred at a median of 12 days. Therapy-related sepsis or febrile neutropenia occurred in 23% of patients and sepsis was fatal in 1.3%.

Topotecan-induced neutropenia can cause neutropenic colitis (see WARNINGS AND PRECAUTIONS, Gastrointestinal).

In the case of severe neutropenia ($< 0.5 \times 10^9/L$ for 7 days or more) during a course of Topotecan for Injection, a reduction in dose of $0.25 \text{ mg}/\text{m}^2$ for subsequent courses of therapy is recommended (see DOSAGE AND ADMINISTRATION).

Thrombocytopenia

Grade 4 thrombocytopenia ($< 25 \times 10^9/L$) occurred in 27% of patients and in 9% of courses, with a median duration of 5 days and platelet nadir at a median of 15 days. Platelet transfusions were given to 15% of patients in 4% of courses.

Anemia

Severe anemia (Grade 3/4, < 80 g/L) occurred in 37% of patients and in 14% of courses. Median nadir was at day 15. Transfusions were needed in 52% of patients in 22% of courses.

Monitoring of Bone Marrow Function

Topotecan for Injection should only be administered in patients with adequate bone marrow reserves including baseline absolute neutrophil counts of at least $1.5 \times 10^9/L$ and platelet count at least $100 \times 10^9/L$. Frequent monitoring of blood counts should be instituted during treatment with Topotecan for Injection (see DOSAGE AND ADMINISTRATION).

Respiratory

Topotecan has been associated with reports of interstitial lung disease (ILD), some of which have been fatal (see ADVERSE REACTIONS). Underlying risk factors include history of ILD, pulmonary fibrosis, lung cancer, thoracic exposure to radiation and use of pneumotoxic drugs and/or colony stimulating factors. Patients should be monitored for pulmonary symptoms indicative of ILD (e.g., cough, fever, dyspnoea and/or hypoxia), and topotecan should be discontinued if a new diagnosis of ILD is confirmed.

Special Populations

Pregnant Women

Topotecan hydrochloride may cause fetal harm when administered to a pregnant woman. Topotecan was shown to cause embryonic and fetal lethality when given to rats (0.59 mg/m^2) and rabbits (1.25 mg/m^2) at doses less than the human clinical intravenous dose (1.5 mg/m^2). At maternally toxic doses (0.59 mg/m^2), topotecan caused malformations, primarily of the eye, brain, skull, and vertebrae. This drug is contraindicated during pregnancy. Women of childbearing potential should be advised to avoid becoming pregnant during therapy with Topotecan for Injection and to inform the treating physician immediately should this occur.

Nursing Women

Topotecan for Injection is contraindicated during breast-feeding (see CONTRAINDICATIONS).

Pediatrics

Safety and effectiveness of topotecan in pediatric patients have not been established, and therefore is not indicated for use in this population.

ADVERSE REACTIONS

Clinical Trial Adverse Drug Reactions

Data in the following section are based on the combined experience of 453 patients with metastatic ovarian carcinoma, and 426 patients with small cell lung cancer, treated with topotecan hydrochloride. Table 1 lists the principal hematologic toxicities and Table 2 lists non-hematologic toxicities occurring in at least 15% of patients.

Table 1 Summary of Hematologic Adverse Events in Patients Receiving Topotecan Hydrochloride

Hematologic Adverse Events	Patients n=879	Courses n=4124
	% Incidence	% Incidence
Neutropenia < 1.5 x 10 ⁹ /L	97	81
< 0.5 x 10 ⁹ /L	78	39
Leukopenia < 3 x 10 ⁹ /L	97	80
< 1 x 10 ⁹ /L	32	11
Thrombocytopenia < 75 x 10 ⁹ /L	69	42
< 25 x 10 ⁹ /L	27	9
Anemia < 100 g/L	89	71
< 80 g/L	37	14
Sepsis or fever/infection with Grade 4 neutropenia	23	7
Platelet transfusions	15	4
RBC transfusions	52	22

Table 2 Summary of Non-hematologic Adverse Events in Patients Receiving Topotecan Hydrochloride

Non-hematologic Adverse Events	All Grades % Incidence		Grade 3 % Incidence		Grade 4 % Incidence	
	n=879 Patients	n=4124 Courses	n=879 Patients	n=4124 Courses	n=879 Patients	n=4124 Courses
Gastrointestinal						
Nausea	64	42	7	2	1	<1
Vomiting	45	22	4	1	1	<1
Diarrhea	32	14	3	1	1	<1
Constipation	29	15	2	1	1	<1
Abdominal Pain	22	10	2	1	2	<1
Stomatitis	18	8	1	<1	<1	<1
Anorexia	19	9	2	1	<1	<1
Body as a Whole						
Fatigue	29	22	5	2	0	0
Fever	28	11	1	<1	<1	<1
Pain*	23	11	2	1	1	<1
Asthenia	25	13	4	1	2	<1
Skin/Appendages						
Alopecia	49	54	N/A	N/A	N/A	N/A
Rash**	16	6	1	<1	0	0
Respiratory System						
Dyspnea	22	11	5	2	3	1
Coughing	15	7	1	<1	0	0
CNS/Peripheral Nervous System						
Headache	18	7	1	<1	<1	0

*Pain includes body pain, back pain and skeletal pain.

** Rash also includes pruritus, rash erythematous, urticaria, dermatitis, bullous eruption and rash maculo-papular.

Hematologic (see WARNINGS AND PRECAUTIONS)

Gastrointestinal

The prophylactic use of anti-emetics was not routine in patients treated with topotecan hydrochloride. Gastrointestinal effects were usually mild at the recommended dose level. The incidence of nausea was 64% (8% Grade 3/4) and vomiting occurred in 45% (6% Grade 3/4) of patients (see Table 2).

Thirty-two percent of patients had diarrhea (4% Grade 3/4), 29% constipation (2% Grade 3/4) and 22% had abdominal pain (4% Grade 3/4). Grade 3/4 abdominal pain was 6% in ovarian cancer patients and 2% in small cell lung cancer patients.

After intravenous administration of topotecan hydrochloride, drug-related diarrhea (Grade 1/2) was 10% in patients greater than 65 years of age (see DOSAGE AND ADMINISTRATION).

Skin/Appendages

Total alopecia (Grade 2) occurred in 31% of patients.

Central and Peripheral Nervous System

Headache (18%) was the most frequently reported neurologic toxicity. Paresthesia occurred in 7% of patients, but was generally Grade 1.

Liver/Biliary

Grade 1 transient elevations in hepatic enzymes (8%); Grade 3/4 elevated Bilirubin occurred in < 2% of patients.

Respiratory

The incidence of Grade 3/4 dyspnea was 3.8% in ovarian cancer patients and 12.2% in small cell lung cancer patients. Table 3 shows the Grade 3/4 hematologic and major non-hematologic adverse events in the topotecan/paclitaxel comparator trial. Table 4 shows the Grade 3/4 hematologic and major non-hematologic adverse events in the topotecan/CAV comparator trial in small cell lung cancer.

Note: All grading scales are based on National Cancer Institute criteria.

Table 3 Comparative Toxicity Profiles for Ovarian Cancer Patients Randomized to Receive Topotecan Hydrochloride or Paclitaxel

Adverse Event	Topotecan Hydrochloride		Paclitaxel	
	Patients n=112 %	Courses n=597 %	Patients n=114 %	Courses n=589 %
Hematologic Grade 3/4				
Grade 4 Neutropenia ($< 0.5 \times 10^9/L$)	80.2	35.8	21.4	8.6
Grade 3/4 Anemia (Hgb < 80 g/L)	41.4	16.1	6.3	1.9
Grade 4 Thrombocytopenia	27	10	2.7	0.5

Adverse Event	Topotecan Hydrochloride		Paclitaxel	
	Patients n=112 %	Courses n=597 %	Patients n=114 %	Courses n=589 %
(< 25 x 10 ⁹ /L)				
Fever/Grade 4 Neutropenia	23.2	6	4	1
Documented Sepsis	4.5	0.8	1.8	0.3
Death related to Sepsis	1.8	N/A	0	N/A
Non-hematologic Grade 3/4				
Gastrointestinal				
Abdominal Pain	5.4	1.3	3.5	0.9
Constipation	5.4	1	0	0
Diarrhea	6.3	1.9	0.9	0.2
Intestinal Obstruction	4.5	1	4.4	0.8
Nausea	9.8	2.7	1.8	0.3
Stomatitis	0.9	0.2	0.9	0.2
Vomiting	9.9	1.9	2.7	0.5
Constitutional				
Anorexia	3.6	0.8	0	0
Dyspnea	6.3	1.8	5.4	1.2
Fatigue	7.1	1.8	6.1	2.2
Malaise	1.8	0.5	1.8	0.3
Neuromuscular				
Arthralgia	0.9	0.2	2.6	0.5
Asthenia	5.4	1.6	2.6	1
Headache	0.9	0.2	1.8	0.8
Myalgia	0	0	2.6	1.5
Pain*	4.5	1	7	2.2
Chest Pain	1.8	0.3	0.9	0.3
Skin/Appendages				
Rash**	0	0	0.9	0.2
Liver/Biliary				
Increased Hepatic Enzymes+	0.9	0.2	0.9	0.2

* Pain includes body pain, skeletal pain, and back pain.

** Rash also includes pruritus, rash erythematous, urticaria, dermatitis, bullous eruption, and rash maculo-papular.

+Increased Hepatic Enzymes includes increased SGOT/AST, increased SGPT/ALT and increased hepatic enzymes.

Table 4 Comparative Toxicity Profiles for Small Cell Lung Cancer Patients Randomized to Receive Topotecan Hydrochloride or CAV

Adverse Event	Topotecan Hydrochloride		CAV	
	Patients n=107 %	Courses n=446 %	Patients n=104 %	Courses n=359 %
Hematologic Grade 3/4				
Grade 4 Neutropenia (< 0.5 x 10 ⁹ /L)	70	38	72	51
Grade 3/4 Anemia (Hgb < 80 g/L)	42	18	20	7
Grade 4 Thrombocytopenia (< 25 x 10 ⁹ /L)	29	10	5	1
Fever/Grade 4 Neutropenia	28	9	26	13

Adverse Event	Topotecan Hydrochloride		CAV	
	Patients n=107 %	Courses n=446 %	Patients n=104 %	Courses n=359 %
Documented Sepsis	5	1	5	1
Death related to Sepsis	3	N/A	1	N/A
Non-hematologic Grade 3/4				
Gastrointestinal				
Abdominal Pain	6	1	4	2
Constipation	1	<1	0	0
Diarrhea	1	<1	0	0
Nausea	8	2	6	2
Stomatitis	2	<1	1	<1
Vomiting	3	<1	3	1
Constitutional				
Anorexia	3	1	4	2
Dyspnea	9	5	14	7
Fatigue	6	4	10	3
Neuromuscular				
Asthenia	9	4	7	2
Headache	0	0	2	<1
Pain*	5	2	7	4
Respiratory System				
Pneumonia	8	2	6	2
Coughing	2	1	0	0
Skin/Appendages				
Rash**	1	<1	1	<1
Liver/Biliary				
Increased Hepatic Enzymes+	1	<1	0	0

*Pain includes body pain, skeletal pain, and back pain.

**Rash also includes pruritus, rash erythematous, urticaria, dermatitis, bullous eruption, and rash maculo-papular.

+Increased Hepatic Enzymes includes increased SGOT/AST, increased SGPT/ALT and increased hepatic enzymes.

Premedications were not routinely used in patients randomized to topotecan hydrochloride, while patients receiving CAV received routine pretreatment with corticosteroids, diphenhydramine, and histamine receptor type 2 blockers.

Postmarket Adverse Drug Reactions

Reports of adverse events in patients taking topotecan hydrochloride after market introduction include the following:

Body as a Whole: allergic manifestations, angioedema, anaphylactoid reactions, extravasation*, pancytopenia

Gastrointestinal: abdominal pain**, gastrointestinal perforation, mucosal inflammation

Hematologic: severe bleeding (in association with thrombocytopenia)

Immune: Anaphylactic reaction

Respiratory, Thoracic
and Mediastinal Disorders: interstitial lung disease

Skin/Appendages: severe dermatitis, severe pruritus

*Reactions associated with extravasation have been mild and have not generally required specific therapy.

** Neutropenic colitis, including fatal neutropenic colitis, has been reported to occur as a complication of topotecan-induced neutropenia (see WARNINGS AND PRECAUTIONS).

DRUG INTERACTIONS

There are no adequate data to define a safe and effective regimen for topotecan hydrochloride in combination with other cytotoxic agents. Preliminary studies combining topotecan hydrochloride with platinum-containing agents (e.g., cisplatin or carboplatin) suggest a sequence-dependent interaction whereby greater myelosuppression is seen when the platinum-containing agent is given on day 1 compared to day 5 of the topotecan hydrochloride dosing. If topotecan is administered in combination with other cytotoxic agents, dose reduction may be necessary.

DOSAGE AND ADMINISTRATION

Dosing Considerations

Initial Dose

Prior to administration of the first course of Topotecan for Injection (topotecan hydrochloride), patients must have:

- A baseline absolute neutrophil count of $\geq 1.5 \times 10^9/L$
- A platelet count of $\geq 100 \times 10^9/L$
- A hemoglobin level of $\geq 90 \text{ g/L}$

Recommended Dose and Dosage Adjustment

Initial Dose

The recommended dose of Topotecan for Injection is 1.5 mg/m^2 by intravenous infusion over 30 minutes daily for 5 consecutive days, starting on day one of a 21-day course. Because median time to response in three ovarian cancer clinical trials was 9 to 12 weeks and median time to response in four small cell lung cancer trials was 5 to 7 weeks, a minimum of 4 courses of Topotecan for Injection is recommended.

Subsequent doses

Topotecan for Injection should not be re-administered unless the absolute neutrophil count is more than or equal to $1 \times 10^9/L$, the platelet count is more than or equal to $100 \times 10^9/L$, and the hemoglobin level is more than or equal to 90 g/L (after transfusion if necessary).

Standard oncology practice for the management of neutropenia is either to administer Topotecan for Injection with other medications (e.g., G-CSF) or to dose reduce to maintain neutrophil counts.

If dose reduction is chosen for patients who experience severe neutropenia (absolute neutrophil count less than $0.5 \times 10^9/L$) for 7 days or more, or severe neutropenia associated with fever or infection, or who have had treatment delayed due to neutropenia, the dose should be reduced by $0.25 \text{ mg/m}^2/\text{day}$ to $1.25 \text{ mg/m}^2/\text{day}$ (or subsequently down to $1 \text{ mg/m}^2/\text{day}$ if necessary).

Doses should be similarly reduced if the platelet count falls below $25 \times 10^9/L$.

Routine pre-medication for the prevention of non-hematological adverse events is not required with Topotecan for Injection.

Hepatic impairment: No dosage adjustment is required for treating patients with hepatic impairment [plasma bilirubin > 1.5 to $< 10 \text{ mg/dL}$ or (SI units) > 25.7 to $< 171 \text{ mc mol/L}$].

Renally impaired patients: No dosage adjustment is required for patients with mild renal impairment (CrCl 40 to 60 mL/min or 0.67 to 1 mL/sec). Dosage adjustment to $0.75 \text{ mg/m}^2/\text{day}$ is recommended for patients with moderate renal impairment (CrCl 20 to 39 mL/min or 0.33 to 0.65 mL/sec). Advice on dosing of topotecan for patients with moderate renal impairment (creatinine clearance of 20 to 39 mL/min) is based on studies involving patients with advanced cancer. Treatment with Topotecan for Injection in patients with severe renal impairment (CrCl $< 20 \text{ mL/min}$ or 0.33 mL/sec) is not recommended (see CONTRAINDICATIONS).

Neutropenia: In the case of severe neutropenia ($< 0.5 \times 10^9/L$ for 7 days or more) during a course of Topotecan for Injection, a reduction in dose of 0.25 mg/m^2 for subsequent courses of therapy is recommended (see WARNINGS AND PRECAUTIONS, Neutropenia).

Use in Children: Insufficient data are available in pediatric patients to provide a dosage recommendation (see WARNINGS AND PRECAUTIONS).

Use in the Elderly: No dosage adjustment appears to be needed in the elderly, other than adjustments related to renal function.

After intravenous administration of Topotecan for Injection, drug-related diarrhea (Grade 1/2) was 10% in patients greater than 65 years of age (see ADVERSE REACTIONS, Clinical Trial Adverse Drug Reactions, Gastrointestinal). Patients over the age of 65 should be closely monitored for diarrhea and treated accordingly.

Dosage in Combination with Cytotoxic Agents: Dose adjustment may be necessary if topotecan is administered in combination with other cytotoxic agents (see DRUG INTERACTIONS).

Administration

Topotecan for Injection is a cytotoxic anticancer drug. As with other potentially toxic compounds, Topotecan for Injection should be prepared under a vertical laminar flow hood while wearing gloves and protective clothing. If Topotecan for Injection solution contacts the skin, wash the skin immediately and thoroughly with soap and water. If Topotecan for Injection contacts mucous membranes, flush thoroughly with water.

Preparation for Intravenous Administration

Each Topotecan for Injection 4 mg vial is reconstituted with 4 mL Sterile Water for Injection, giving a final concentration of 1 mg/mL.

Then the appropriate volume of the reconstituted solution is further diluted to an infusion concentration of 20 - 500 mcg/mL in 50 to 100 mL of either 0.9% Sodium Chloride Intravenous Infusion or 5% Dextrose Intravenous Infusion prior to administration.

Since the vials contain no preservative, it is recommended that the product be used immediately after reconstitution. If not used immediately, the reconstituted product should be stored in a refrigerator, for up to 24 hours.

As with all parenteral drug products, intravenous admixtures should be inspected visually for clarity and particulate matter, discoloration and leakage prior to administration, whenever solution and container permit.

OVERDOSAGE

For management of a suspected drug overdose, contact your regional Poison Control Centre.

There is no known antidote for overdose with topotecan hydrochloride. Further management should be as clinically indicated. Overdoses (from 1.1 fold up to 10 fold of the prescribed dose) have been reported in patients being treated with intravenous topotecan hydrochloride. The primary complication of overdose is bone marrow suppression.

The observed signs and symptoms for overdose are consistent with the known adverse reactions associated with topotecan hydrochloride (see ADVERSE REACTIONS). In addition, elevated hepatic enzymes, mucositis, fatal hemorrhagic necrotising colitis, hypotension and tachycardia have been reported following overdose. In a phase I study, one patient was incorrectly dosed at 35 mg/m² during course 9 of therapy and experienced hematologic toxicity associated with this increased dose.

The LD₁₀ rate in mice receiving single intravenous infusions of topotecan hydrochloride was 74.85 mg/m² (CI 95%: 47.22 to 97.41).

ACTION AND CLINICAL PHARMACOLOGY

Mechanism of Action

Topotecan hydrochloride inhibits topoisomerase-I, an enzyme that functions in DNA replication to relieve the torsional strain introduced ahead of the moving replication fork. Topotecan inhibits topoisomerase-I by stabilizing the covalent complex of enzyme and strand-cleaved DNA, which is an intermediate of the catalytic mechanism, thereby inducing breaks in the protein-associated DNA single-strands, resulting in cell death.

Pharmacodynamics

The dose-limiting toxicity for topotecan is leukopenia. The relationship between decreased white blood count and either topotecan or total topotecan AUC can be described by a Sigmoid E_{max} Model.

Pharmacokinetics

Following intravenous administration of topotecan at doses of 0.5 to 1.5 mg/m² as a 30-minute infusion daily for 5 days, topotecan demonstrated a clearance of 1030 mL/min with a plasma half-life of 2 to 3 hours.

Comparison of pharmacokinetic parameters did not suggest any change in pharmacokinetics over the dosing period. Area under the curve increased approximately in proportion to the increase in dose.

Distribution

Topotecan has a volume of distribution of 130 L. Binding of topotecan to plasma proteins is about 35%. Topotecan is evenly distributed between blood cells and plasma.

Metabolism

Topotecan undergoes pH dependent hydrolysis, with the equilibrium favouring the ring-opened hydroxy-acid form at physiologic pH.

Excretion

The renal clearance of topotecan could not be measured in humans due to the effect of urine pH on interconversion, although measurement of total topotecan (the lactone ring and the ring-opened hydroxy acid) in urine suggests that a variable fraction of the dose (generally 20 to 60%) is excreted in urine. Topotecan has also been measured in human bile samples indicating that topotecan is excreted by both biliary and urinary routes in humans.

Special Populations and Conditions

Pediatrics

The pharmacokinetics of topotecan were studied in 12 pediatric patients treated with topotecan at doses between 2 and 7.5 mg/m² as a 24-hour continuous infusion. Mean plasma clearance was 28.3 L/h/m² with a range of 18.1 to 44.2 L/h/m². These values are similar to plasma clearance values seen in adults (approx. 36 L/h/m²) who received 24-hour topotecan infusions.

Geriatrics

Topotecan pharmacokinetics has not been specifically investigated in elderly patients. However, a population pharmacokinetic analysis in female patients did not identify age as a significant factor. Renal clearance is likely to be a more important determinant of topotecan clearance than age in this patient population.

Gender

The overall mean topotecan plasma clearance in male patients was approximately 24% higher than in female patients, largely reflecting difference in body size.

Race

The effect of race on topotecan pharmacokinetics has not been determined.

Hepatic Insufficiency

Based on clinical data and total topotecan pharmacokinetics, no dosage adjustment is required in patients with hepatic impairment (serum bilirubin < 10 mg/dL or 171 μ mol/L). Plasma clearance in patients with hepatic impairment decreased to about 67% when compared with a control group of patients. Topotecan half-life was increased by about 30% but no change in volume of distribution was observed. Total topotecan clearance in patients with hepatic impairment only decreased by about 10% compared with the control group of patients.

Renal Insufficiency

Plasma clearance of topotecan in patients with mild renal impairment (creatinine clearance [CrCl] of 40 to 60 mL/min or 0.67 to 1 mL/sec) decreased to about 67% compared with control patients. Volume of distribution was slightly decreased and thus half-life only increased by 14%.

In patients with moderate renal impairment (CrCl of 20 to 39 mL/min or 0.33 to 0.65 mL/sec), topotecan plasma clearance was reduced to 34% of the value in control patients. Volume of distribution also decreased by about 25%, which resulted in an increase in mean half-life from 1.9 hours to 4.9 hours. Total topotecan clearance also decreased by 57% in patients with moderate renal impairment and by 17% in patients with mild renal impairment. Based on clinical data and on total topotecan pharmacokinetics, no dosage adjustment is required for patients with mild renal impairment (CrCl 40 to 60 mL/min or 0.67 to 1 mL/sec). Dosage adjustment to 0.75 mg/m²/day is recommended for patients with moderate renal impairment. Topotecan for Injection is not recommended for patients with a creatinine clearance of < 20 mL/min (0.33 mL/sec).

STORAGE AND STABILITY

Unopened vials of Topotecan for Injection (topotecan hydrochloride) are stable until the date indicated on the package, when stored between 15 °C and 30 °C and protected from light in the original package.

Reconstituted Solutions

Since the vials contain no preservative, it is recommended that the product be used immediately after reconstitution. If not used immediately, the reconstituted solution should be stored in a refrigerator between 2 °C and 8 °C or stored at room temperature between 15 °C and 30 °C and discarded after 24 hours.

Diluted solutions

Reconstituted vials of Topotecan for Injection diluted for infusion are stable for up to 24 hours at room temperature between 15 °C and 30 °C with ambient lighting conditions. If not used immediately, the diluted solution should be stored in a refrigerator between 2 °C and 8 °C, up to 24 hours, and in line with good pharmaceutical practice.

SPECIAL HANDLING INSTRUCTIONS**Handling and Disposal**

Procedures for proper handling and disposal of anticancer drugs should be used. Several guidelines on this subject have been published.

DOSAGE FORMS, COMPOSITION AND PACKAGING

Topotecan for Injection is supplied as a sterile lyophilized, buffered, light yellow to greenish powder available in single-dose vials. Each vial contains topotecan hydrochloride equivalent to 4 mg of topotecan as free base. The reconstituted solution ranges in colour from yellow to yellow-green and is intended for administration by intravenous infusion.

Inactive ingredients consist of mannitol and tartaric acid. Hydrochloric acid and sodium hydroxide may be used to adjust to a pH of 3. The solution pH ranges from 2.5 to 3.5.

Topotecan for Injection is supplied in a 4 mg (free base) single-dose vial, in a package of 5 vials.

PART II: SCIENTIFIC INFORMATION

PHARMACEUTICAL INFORMATION

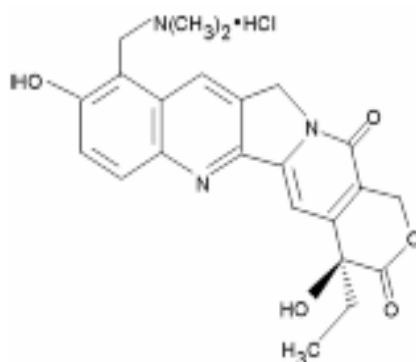
Drug Substance

Proper name: Topotecan hydrochloride

Chemical name: (S)-10-[(dimethylamino)methyl]-4-ethyl-4,9-dihydroxy-1H-pyrano[3',4':6,7]indolizino[1,2-b]quinoline-3,14-(4H,12H)-dione monohydrochloride.

Molecular formula and molecular mass: $C_{23}H_{23}N_3O_5 \cdot HCl$
457.9 g / mol

Structural formula:



Physicochemical properties:

Description: Topotecan hydrochloride is a light yellow to greenish powder. It is soluble in water and melts with decomposition at 223 °C to 225 °C.

CLINICAL TRIALS

Ovarian Cancer

Study Demographics and Trial Design

Topotecan hydrochloride was studied in four clinical trials of 453 patients with metastatic ovarian carcinoma.

Patients in these four studies received an initial dose of 1.5 mg/m² given by intravenous infusion over 30 minutes for the first five consecutive days of a 21-day course.

In a randomized Phase III study, topotecan hydrochloride was compared with paclitaxel in patients with recurrent ovarian cancer who had failed initial treatment with a platinum containing regimen. This study treated 112 patients with topotecan hydrochloride (1.5 mg/m²/day for the first 5 consecutive days of a 21-day course) and 114 patients with paclitaxel (175 mg/m² over 3 hours on day one of a 21-day course).

Response rates, response duration (measured from the time of documented response), time to progression, time to response and survival for the comparative study are provided in Table 5.

Study Results

Patients receiving topotecan hydrochloride achieved a higher response rate (21% vs. 14%, p = 0.196) than those receiving paclitaxel; a longer duration of response (median of 26 vs. 22 weeks, Hazard-ratio = 0.778, p = 0.476); a longer time to progression (median of 19 vs. 15 weeks, Hazard-ratio = 0.764, p = 0.0718); and a longer estimated median survival (63 vs. 53 weeks, Hazard-ratio = 0.986, p = 0.9315).

However, the median time to response was longer with topotecan hydrochloride compared to paclitaxel: median of 8 vs. 6 weeks (Hazard-ratio = 0.615, p = 0.1465). Consequently there is a risk of underestimating the expected efficacy of topotecan hydrochloride if patients are withdrawn from treatment prematurely (see DOSAGE AND ADMINISTRATION).

Table 5 Comparative Efficacy Parameters of Topotecan Hydrochloride vs. Paclitaxel in Ovarian Cancer

Parameter	Topotecan Hydrochloride (n=112)	Paclitaxel (n=114)
Complete Response Rate (%)	4.5	2.6
Partial Response Rate (%)	16.1	11.4
Overall Response Rate (%)	20.5	14
95% CI	(13.1, 28)	(7.7, 20.4)
(p-value)	(0.196)	
Response Duration (weeks)		
Median	26*	22*
95% CI	(22.1, 32.9)	(16, 34.6)
Hazard-ratio (p-value)	0.778 (0.476)	
Time to Progression (weeks)		
Median	19	15
95% CI	(12.1, 23.6)	(11.9, 18.3)
Hazard-ratio (p-value)	0.764 (0.0718)	
Time to Response (weeks)		
Median	8*	6*
Range	3.1 to 19	2.4 to 12.3
Hazard-ratio (p-value)	0.615 (0.1465)	
Survival (weeks)		
Median	63	53
Range	0.7 to 122.1	0.6 to 129.9
Hazard-ratio (p-value)	0.97 (0.87)	

*topotecan (n=23) paclitaxel (n=16)

Patients who failed on the initial arm of this study were allowed to switch to the alternate treatment. Eight of 61 (13.1%) patients who received topotecan hydrochloride after paclitaxel

responded. Five of 49 (10.2%) patients who received paclitaxel after topotecan hydrochloride responded.

Topotecan hydrochloride was active in ovarian cancer patients who had developed resistance to platinum-containing therapy, defined as tumour progression while on, or tumour relapse within 6 months after completion of a platinum-containing regimen. One complete and seven partial responses were seen in 60 patients, for a response rate of 13%. In the same study, there were no complete responders and only four partial responders on the paclitaxel arm, for a response rate of 7%.

Topotecan hydrochloride remained active in patients who did not respond to or eventually failed paclitaxel, as shown by the responders in this trial and the trial in platinum and paclitaxel failures (see below).

The safety profile for paclitaxel in this study was consistent with the product's monograph; the safety profile for topotecan hydrochloride in this study was consistent with that observed in all 453 patients from the four ovarian clinical trials (see ADVERSE REACTIONS).

The three additional studies were open-label and non-comparative in design. The first study enrolled 111 patients with recurrent ovarian cancer who had failed one prior platinum-containing regimen. The response rate was 14% (95% CI: = 7.9% - 20.9%). The median duration of response was 16 weeks (range: 4.6 to 41.9 weeks). The time to progression was 11 weeks (range: 0.7 to 72.1 weeks). The median survival was 52 weeks (range: 1.4 to 72.3 weeks).

A second open study enrolled 139 patients with recurrent ovarian cancer who had failed one (62 patients) or two (77 patients) prior regimens containing platinum and paclitaxel. The response rates in this study for evaluable patients were 12.9% and 16.9%, respectively. Median response duration was 18.1 weeks. Median time to progression was 12 weeks (range: 0.6 – 52.7 weeks). Median survival was 51.3 weeks for patients failing first-line therapy.

The third open study enrolled 30 patients with recurrent ovarian cancer who had failed one or two prior platinum-containing regimens. The response rate was 13% (95% CI: = 3.8 - 30.7%). The median duration of response was 28 weeks (range: 16 - 59 weeks).

Small Cell Lung Cancer

Study Demographics and Trial Design

Topotecan hydrochloride was studied in 426 patients with recurrent or progressive small cell lung cancer in one randomized Phase III, comparative study and in three non-randomized, Phase II studies.

In a randomized, Phase III, comparative trial, 107 patients were treated with topotecan hydrochloride (1.5 mg/m²/day x 5 days starting on day one of a 21-day course) and 104 patients were treated with CAV (1000 mg/m² cyclophosphamide, 45 mg/m² doxorubicin, 2 mg vincristine administered sequentially on day one of a 21 day course). All patients were considered sensitive to first-line chemotherapy (responders who then subsequently progressed ≥ 60 days after completion of first-line therapy). A total of 77% of patients treated with topotecan

hydrochloride and 79% of patients treated with CAV received platinum/etoposide with or without other agents as first-line chemotherapy.

Response rates, response duration, time to progression, and survival are shown in Table 6.

Table 6 Efficacy of Topotecan Hydrochloride vs. CAV (cyclophosphamide-doxorubicin-vincristine) in Small Cell Lung Cancer Patients Sensitive to First-Line Chemotherapy

Parameter	Topotecan Hydrochloride (n=107)	CAV (n=104)
Complete Response Rate	0%	1%
Partial Response Rate	24.3%	17.3%
Overall Response Rate	24.3%	18.3%
95% Confidence Interval*	16.17 to 32.43%	10.84 to 25.7%
(p-value)	(0.285)	
Response Duration (weeks)	n=26	n=19
Median	14.4	15.3
95% Confidence interval	13.1 to 18	13.1 to 23.1
Hazard-ratio (topotecan hydrochloride: CAV) (p-value)	1.42 (0.3)	
Time to Progression (weeks)		
Median	13.3	12.3
95% Confidence Interval	11.4 to 16.4	11 to 14.1
Hazard-ratio (topotecan hydrochloride: CAV) (p-value)	0.92 (0.55)	
Survival (weeks)		
Median	25	24.7
95% Confidence Interval	20.6 to 29.6	21.7 to 30.3
Hazard-ratio (topotecan hydrochloride: CAV) (p-value)	1.04 (0.8)	

The calculation for duration of response was based on the interval between first response and time to progression.

*95% confidence interval for the difference in the rate of response (6%) was -6 to 18%.

The time to response was similar in both arms: topotecan hydrochloride median of 6 weeks (range 2.4 to 15.7) versus CAV median of 6 weeks (range 5.1 to 18.1).

Palliation of disease-related symptoms was greater in patients who received topotecan hydrochloride than in patients who received CAV. These clinically important improvements occurred at a higher rate in 8 of 9 symptoms in patients treated with topotecan hydrochloride. Symptom improvement was statistically significant in 5 of 9 symptoms. These data are presented in Table 7.

Patients treated with topotecan hydrochloride also experienced a longer time to worsening in 7 of 9 disease-related symptoms (shortness of breath, anorexia, interference with daily activity, cough, insomnia, hoarseness and fatigue). Time to worsening of chest pain and hemoptysis were similar for both treatment groups. Statistically significant differences in the length of time to worsening of shortness of breath ($p = 0.046$) and anorexia ($p = 0.003$) were noted, with the topotecan hydrochloride group worsening at a slower rate.

Table 7 Percentage of Patients with Symptom Improvement+: Topotecan Hydrochloride versus CAV in Patients with Small Cell Lung Cancer

Symptom	Topotecan Hydrochloride (n = 107)		CAV (n=104)		Pearson chi-square p-value
	n++	(%)	n++	(%)	
Shortness of Breath	68	(27.9)	61	(6.6)	0.002
Interference with Daily Activity	67	(26.9)	63	(11.1)	0.023
Fatigue	70	(22.9)	65	(9.2)	0.032
Hoarseness	40	(32.5)	38	(13.2)	0.043
Cough	69	(24.6)	61	(14.8)	0.16
Insomnia	57	(33.3)	53	(18.9)	0.085
Anorexia	56	(32.1)	57	(15.8)	0.042
Chest Pain	44	(25)	41	(17.1)	0.371
Hemoptysis	15	(26.7)	12	(33.3)	0.706

+ Defined as improvement sustained over at least 2 courses compared to baseline.

++ Number of patients with baseline and at least one post-baseline assessment.

Topotecan hydrochloride (1.5 mg/m²/day x 5 days starting on day one of a 21-day course) was also studied in three open-label, non-comparative trials in 319 patients with recurrent or progressive small cell lung cancer after treatment with first-line chemotherapy. In all three studies, patients were stratified as either sensitive (responders who then subsequently progressed \geq 90 days after completion of first-line therapy) or refractory (no response to first-line chemotherapy or who responded to first-line therapy and then progressed within 90 days of completing first-line therapy).

In one study, the median response rate was 15.4% for sensitive (n = 52) and 2.1% for refractory patients (n = 47). Median time to response was 6.1 weeks (sensitive) and 5.4 weeks (refractory). The median duration of response was 23.1 weeks (sensitive) and 24.9 weeks (refractory). Median time to progression was 13.1 weeks (sensitive) and 9.6 weeks (refractory). Median survival time was 28.3 weeks (sensitive) and 21.4 weeks (refractory). Disease-related symptoms resolved or improved versus baseline in 20% of patients (n = 65), remained unchanged in 60%, or worsened in 20%.

In an EORTC (European Organization for Research and Treatment of Cancer) Study, the median response rate was 31.1% for sensitive (n = 45) and 7.3% for refractory patients (n = 55). Median time to response was 7 weeks for sensitive and 5.6 weeks for refractory patients. The median duration of response was 20.7 weeks (sensitive) and 30.7 weeks (refractory). Median time to progression was 17.7 weeks (sensitive) and 8.3 weeks (refractory). Median survival was 35.6 weeks (sensitive) and 20.9 weeks (refractory).

In a third study, the median response rate was 11.3% for sensitive (n = 71) and 2.1% for refractory patients (n = 48). Median time to response was 5.6 weeks (sensitive) and 5.7 weeks (refractory). The median duration of response was 21.9 weeks (sensitive) and 22 weeks (refractory). Median time to progression was 10.3 weeks (sensitive) and 6.4 weeks (refractory). Median survival time was 26.4 weeks (sensitive) and 15.9 weeks (refractory).

DETAILED PHARMACOLOGY

Pharmacokinetics

Metabolism

Topotecan undergoes pH dependent hydrolysis, with the equilibrium favouring the ring-opened hydroxy-acid form at physiologic pH. The metabolism of topotecan in humans has not been extensively studied. However in rats and dogs, approximately 4% and 17% of the dose, respectively, was excreted as N-desmethyl derivatives of topotecan and its ring opened hydroxy-acid form. In vitro studies in rat, dog and human liver microsomes indicate that the rate of metabolism of topotecan to the N-demethylated metabolite in human microsomes is between that in rat and dog liver microsomes.

No other metabolite of topotecan has been identified. A major route of clearance of topotecan was by hydrolysis of the lactone ring to form the ring-opened hydroxy acid.

Drug Interactions

When given in combination with cisplatin (cisplatin day 1, topotecan days 1 to 5), the clearance of topotecan was reduced on day 5 compared to day 1 (19.1 L/h/m² compared to 21.3 L/h/m²) (see DRUG INTERACTIONS).

In vitro, topotecan did not inhibit human P450 enzymes CYP1A2, CYP2A6, CYP2C8/9, CYP2C19, CYP2D6, CYP2E, CYP3A, or CYP4A nor did it inhibit the human cytosolic enzymes dihydropyrimidine or xanthine oxidase. Following 14 days of intravenous dosing in rats at doses up to 1.36 mg/m² topotecan free base, no inductive effect was observed on P450 enzymes 1A, 2B, 3A, and 4A.

MICROBIOLOGY

Not applicable.

TOXICOLOGY

The toxicity of topotecan in animals has been predictive of the toxicity observed thus far in patients, where neutropenia (the most common dose-limiting toxicity) was often associated with thrombocytopenia and anemia.

Carcinogenicity

Carcinogenicity studies are not generally performed with antineoplastic agents and have not been performed for topotecan.

Mutagenicity

Topotecan was not mutagenic in bacterial mutagenicity tests using *Salmonella typhimurium* and *Escherichia coli*. Topotecan was genotoxic in mammalian cells (mouse lymphoma cells and human lymphocytes) *in vitro* and in mouse bone marrow cells *in vivo*. Similar findings have been observed for another topoisomerase I inhibitor, CPT-11.

REFERENCES

1. AMA Council Report. Guidelines for handling parenteral antineoplastics. *Journal of the American Medical Association* 1985; 253(11): 1590-1592.
2. American Society of Hospital Pharmacists Technical Assistance Bulletin on Handling Cytotoxic and Hazardous Drugs. *American Journal of Hospital Pharmacy* 1990; 47(5): 1033-1049.
3. Ardizzoni A, Hansen H, Dombernowsky P, Gamucci T, Kaplan S, Postmus P, et al. Topotecan, A New Active Drug in the Second-Line Treatment of Small-Cell Lung Cancer: A Phase II study in Patients with Refractory and Sensitive Disease. *J of Clin Oncol*. 1997; 15(5): 2090-2096.
4. Blaney SM, Balis FM, Cole DE, Craig C, Reid JM, Ames MM, et al. Pediatric Phase I Trial and Pharmacokinetic Study of Topotecan Administered As A 24- Hour Continuous Infusion. *Cancer Res*. 1993; 53(5): 1032-1036.
5. Clinical Oncological Society of Australia. Guidelines and recommendations for safe handling of antineoplastic agents. *The Medical Journal of Australia* 1983; 1(9): 426-428.
6. Creemers GJ, Bolis G, Gore M, Scarfone G, Lacave AJ, Guastalla JP, et al. Topotecan, An Active Drug in the Second-Line Treatment of Epithelial Ovarian Cancer: Results of A Large European Phase II Study. *J Clin Oncol* 1996; 14(12): 3056-3061.
7. Goodwin JE, Shin DD – Neutropenia. *E-medicine.com*. 2005.
8. Jones RB, Frank R, Mass T. Safe handling of chemotherapeutic agents: a report from The Mount Sinai Medical Center. *CA: a cancer journal for clinicians* 1983; 33(5): 258-263.
9. Miller AA, Hargis JB, Lilenbaum RC, Fields SZ, Rosner GL, Schilsky RL. Phase I study of topotecan and cisplatin in patients with advanced solid tumors: A cancer and leukemia group B study. *J Clin Oncol* 1994; 12(12): 2743-2750.
10. National Study Commission on Cytotoxic Exposure-recommendations for handling cytotoxic agents.
11. O'Reilly S, Rowinsky EK, Slichenmyer W, Donehower RC, Forastiere AA, Ettinger DS, et al. Phase I and Pharmacologic Study of Topotecan in Patients with Impaired Renal Function. *J Clin Oncol* 1996; 14(12): 3062-3073.
12. OSHA Work-Practice guidelines for personnel dealing with cytotoxic (antineoplastic) drugs. *American Journal of Hospital Pharmacy* 1986; 43(5): 1193-1204.

13. Recommendations for the Safe Handling of Parenteral Antineoplastic Drugs. Superintendent.
14. Rowinsky EK, Kaufmann SH, Baker SD, Grochow LB, Chen TL, Peereboom D, et al. Sequences of Topotecan and cisplatin: Phase I, pharmacologic, and in vitro studies to examine sequence dependence. *J Clin Oncol* 1996; 14(12): 3074-3084.
15. Rowinsky EK, Grochow LB, Sartorius SE, Bowling MK, Kaufmann SH, Peereboom D, et al. Phase I and Pharmacologic Study of High Doses of the Topoisomerase I Inhibitor Topotecan with Granulocyte Colony-Stimulating Factor in Patients with Solid Tumors. *J Clin Oncol*. 1996; 14(4): 1224-1235.
16. Talcott JA, Siegel RD, Finberg G, Goldman L. Risk Assessment in Cancer patients with Fever and Neutropenia: A Prospective Two-Center Validation of a Predication Rule. *J Clin Oncol*. 1992; 10(2): 316-322.
17. HYCAMTIN[®] (Topotecan hydrochloride for Injection 4 mg / vial), submission control No. 222202, Product Monograph, Novartis Pharmaceuticals Canada Inc. (Feb. 15, 2019).

PART III: CONSUMER INFORMATION

Pr^rTOPOTECAN FOR INJECTION
Topotecan 4 mg per vial, incorporated as topotecan hydrochloride for reconstitution

This leaflet is part III of a three-part "Product Monograph" published when Topotecan for Injection (topotecan hydrochloride) was approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about Topotecan for Injection. Contact your doctor or pharmacist if you have any questions about the drug.

You may want to read this leaflet again. **Please Do Not Throw It Away**, until you have finished your medicine.

ABOUT THIS MEDICATION

What the medication is used for

Topotecan for Injection (topotecan hydrochloride) is used for the treatment of:

- ovarian cancer (metastatic) after failure of initial or subsequent therapy.
- sensitive small cell lung cancer after failure of first line chemotherapy (defined as recurrence at least 60 days after first line chemotherapy).

What it does

Topotecan for Injection helps destroy tumours. It acts on an enzyme (topoisomerase-I) to prevent growth of tumour cells.

When it should not be used

Do not take Topotecan for Injection if:

- you are hypersensitive (allergic) to topotecan or any of the other ingredients of Topotecan for Injection.
- you are pregnant or breast-feeding;
- you have severe kidney disease;
- results of your last blood test show that you are not able to receive topotecan hydrochloride (severe bone marrow depression). Your doctor will tell you.

What the medicinal ingredient is

The medicinal ingredient is topotecan hydrochloride.

What the important nonmedicinal ingredients are

The nonmedicinal ingredients consist of mannitol, tartaric acid, hydrochloric acid and/or sodium hydroxide may be added to adjust the pH.

What dosage forms it comes in

Topotecan for Injection (topotecan hydrochloride) is supplied as sterile powder in single-dose vials. Each vial contains 4 mg of topotecan. Before infusion the powder needs to be reconstituted and diluted.

WARNINGS AND PRECAUTIONS

Serious Warnings and Precautions

Topotecan for Injection should be administered under the supervision of a physician experienced in the use of cancer chemotherapeutic agents.

Possible serious side effect includes:

- a decrease in the number of cells produced in your bone marrow (bone marrow suppression), especially a type of white blood cells called neutrophils (neutropenia).
- Bowel inflammation which may cause severe pain in your abdomen, with fever and a decrease in white blood cells which can potentially be fatal (neutropenic colitis).
- Lung inflammation which may cause severe coughing, shortness of breath and fever which can potentially be fatal (interstitial lung disease).

BEFORE you use Topotecan for Injection talk to your doctor or pharmacist if:

- you are hypersensitive (allergic) to topotecan or any of the other ingredients of Topotecan for Injection.
- you are pregnant or breast-feeding.
- results of your last blood test show that you are not able to receive topotecan hydrochloride, your doctor will tell you.
- you have kidney disease.

Use of this medicine during Pregnancy and Breast Feeding

You should not be given Topotecan for Injection if you are pregnant or think you are pregnant.

Nursing Mothers

Do not breast-feed if you are receiving Topotecan for Injection. You should not restart breast-feeding until the doctor tells you it is safe.

Use in Children

Use in children is not recommended as safety and effectiveness have not been established.

Effect on ability to drive and use machinery

Topotecan for Injection may make you feel tired. Do not drive or operate any tools or machines if you feel tired or weak.

INTERACTIONS WITH THIS MEDICATION

It is important that your doctor know about all your medications so that you get the best possible treatment. Tell your doctor about all the medicines you are taking including those you have bought without a prescription.

PROPER USE OF THIS MEDICATION

Usual dose

The dose of Topotecan for Injection which you will receive will be based on your body size (surface area) and the results of blood tests carried out before treatment.

The recommended dose of Topotecan for Injection is 1.5 mg/m² by intravenous infusion over 30 minutes daily for 5 consecutive days, starting on day one of a 21-day course. Prior to administration, Topotecan for Injection powder must be dissolved with water. The topotecan solution will be diluted further using either Sodium Chloride solution or Dextrose solution. A minimum of four courses of Topotecan for Injection is recommended.

Insufficient data are available in children to provide a dosage recommendation.

Remember: This medicine is for you. Only a doctor can prescribe it for you. Never give it to someone else. It may harm them even if their symptoms are the same as yours.

Overdose

If you think you have been given too much Topotecan for Injection, contact your healthcare professional, hospital emergency department or regional Poison Control Centre immediately, even if there are no symptoms.

Accidental overdosage may result in low blood pressure, fast heart rate and bleeding of the bowel.

SIDE EFFECTS AND WHAT TO DO ABOUT THEM

Like all medicines, Topotecan for Injection can have side effects. The most common side effects with Topotecan for Injection are:

- a temporary reduction in the amount of new blood cells produced by your body, particularly of a type of white blood cell which is important for your body to prevent and fight-off an infection. In approximately 1 in 20 patients a serious infection is caught during treatment which can be fatal. If at any time during treatment you feel unwell or develop a temperature you should contact your doctor immediately.
- you may become temporarily anemic and tired or take longer for a minor injury to stop bleeding. The reduction in the amount of blood cells (lasts for only a few days), starting from approximately day 8 of each treatment cycle and lasting for about a week. In most cases the level of blood cells return to normal in time for the next cycle of treatment.
- Gastrointestinal perforations (including life-threatening and fatal cases) have been reported with topotecan-treated patients. Your doctor will monitor you for the possibility of GI perforation if you experience symptoms of severe stomach pain, nausea, vomiting and/or bloody stool and will discontinue Topotecan for Injection if you have an intestinal perforation.

Other possible side effects are:

- nausea (feeling sick or queasy or having the urge to throw up)
- vomiting (throwing up)

- diarrhea (frequent and watery bowel movements)
- fever
- hair loss
- stomach pain
- constipation
- swelling and pain of the mouth, tongue or gums
- fatigue (tiredness)
- weakness
- anorexia (weight loss and loss of appetite)
- feeling unwell
- headache
- coughing
- shortness of breath
- yellow skin (jaundice)
- rash
- itching sensation
- mild pain and inflammation at the site of injection. Severe allergic reactions have been reported rarely.
- lung inflammation (interstitial lung disease) has been reported rarely. Signs include difficulty in breathing, severe cough and fever.

Several of these effects may occur during your treatment. If you notice any of these, or any other effects not mentioned in this leaflet between courses or when you leave hospital/after treatment has finished, tell your doctor, nurse or pharmacist.

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM

Frequency	Side Effect/Symptom	Talk with your Doctor immediately
Very common	Any sign of fever or infection, or any unexpected bruising or bleeding	X
Common	Serious infection; local symptoms such as sore throat or urinary problems (for example, a burning sensation when urinating, which may be caused by a urinary infection)	X
Uncommon	Severe allergic reaction and symptoms such as swelling of the mouth, throat, difficulty in breathing, rash, hives, increased heart rate, and collapse	X
Rare	Severe bleeding	X
	Severe abdominal pain, fever and diarrhoea (rarely with blood). These could be signs of bowel inflammation (colitis)	X
	Severe cough, shortness of breath, fever (interstitial lung disease). You are at increased risk if you have had radiation treatment to your lungs, or have previously taken	X

	medicines that caused lung damage.	
Frequency not known (events from spontaneous reports)	Severe stomach pain, nausea, vomiting of blood, black or bloody stools. (Possible symptoms of gastrointestinal perforation).	X
	Mouth sores, difficulty swallowing, abdominal pain, nausea, vomiting, diarrhoea, bloody stool which could be signs and symptoms of inflammation of the inner lining of the mouth, stomach and/or gut (mucosal inflammation).	X

This is not a complete list of side effects. For any unexpected effects while taking Topotecan for Injection contact your doctor or pharmacist.

Canada website (<https://health-products.canada.ca/dpd-bdpp/index-eng.jsp>); Fresenius Kabi Canada's website (<http://www.fresenius-kabi.com/en-ca/>), or by calling 1-877-821-7724.

This leaflet was prepared by

Fresenius Kabi Canada Ltd.
165 Galaxy Blvd, Suite 100
Toronto, ON M9W 0C8

Last Revised: April 17, 2019

HOW TO STORE IT

Unopened vials of Topotecan for Injection are stable until the date indicated on the package, when stored between 15 °C and 30 °C and protected from light in the original package.

Reconstituted Solutions

Since the vials contain no preservative, it is recommended that the product should be used immediately after reconstitution. If not used immediately, the reconstituted solution should be stored in a refrigerator between 2 °C and 8 °C or stored at room temperature between 15 °C and 30 °C and discarded after 24 hours.

Diluted solutions

Reconstituted vials of Topotecan for Injection diluted for infusion are stable up to 24 hours at room temperature between 15 °C and 30 °C with ambient lighting conditions. If not used immediately, the diluted solution should be stored in a refrigerator between 2 °C and 8 °C, up to 24 hours, and in line with good pharmaceutical practice.

Reporting Side Effects

You can report any suspected side effects associated with the use of health products to Health Canada by:

- Visiting the Web page on Adverse Reaction Reporting (<https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting.html>) for information on how to report online, by mail or by fax; or
- Calling toll-free at 1-866-234-2345.

NOTE: Contact your health professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.

MORE INFORMATION

This document plus the full product monograph, prepared for health professionals can be obtained by visiting the Health