Cancer Drug Manual©

USER'S GUIDE

Updated: November 1, 2021

The Cancer Drug Manual© (CDM) provides concise, evaluative drug information on drugs used in an oncology setting. The first edition of the Cancer Drug Manual© was published by BC Cancer in 1990, followed by a complete revision in 1994. Since 2001, the Cancer Drug Manual© has become a continuously updated BC Cancer website resource. Documents prepared after 1994 follow a different template format including fully referenced citations in lieu of a bibliography.

Drug monographs and patient handouts are arranged alphabetically by generic name and indexed separately. The Chemotherapy Preparation and Stability Chart, created in 2006, includes basic information for the preparation and stability of parenteral benefit drugs and drugs approved for use at BC Cancer. The Hazardous Drug List, created in 2010, identifies those drugs which will be handled as hazardous at BC Cancer.

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Referencing the Cancer Drug Manual©

Suggested style:
Abiraterone Monograph. Revised 1 August 2017. In: BC Cancer Drug Manual©. Badry, Nadine (editor). BC Cancer. Vancouver, British Columbia. Available at http://www.bccancer.bc.ca/. (Accessed 14 February 2019).

CANCER DRUG MANUAL© DRUG MONOGRAPH:

Each drug monograph contains the following sections:

DRUG NAME:

- Generic name as listed in the Health Canada approved product monograph.

SYNONYM(S):

- Includes alternate generic names used in Canada and the US

COMMON TRADE NAMES:

- Trade names used in Canada and the US.
- For biologicals, biosimilars of the reference biologic will be indicated if available in Canada.

CLASSIFICATION:

- General pharmacologic classification.

MECHANISM OF ACTION:

- Brief description of the mechanism of action to provide the rationale for drug choice and to help predict the effect and toxicity of a drug.

PHARMACOKINETICS:

- Brief description of pharmacokinetic data to help predict the effect and toxicity of a drug, including any known variability affected by patient factors (e.g., gender, age, ethnicity). Unless otherwise specified, numeric data are presented as mean ± standard deviation.

USES:

- Includes only malignant conditions that may be treated with this drug.
- Health Canada approved indications and common off label indications may be included. NOTE: Inclusion of an indication in this section does NOT imply that it is a BC Cancer approved indication.
- For biologicals, Health Canada approved indications will be as specified for the reference biologic.

SPECIAL PRECAUTIONS:

- Includes contraindications and special considerations for identifying patients who should NOT receive a drug, or should receive it with specific cautions or dose adjustment.
- Includes sections for carcinogenicity, mutagenicity, fertility, pregnancy and breastfeeding.

SIDE EFFECTS:

- Includes adverse events that may present during drug treatment but do not necessarily have a causal relationship with the drug, as well as adverse reactions that may be suspected to be related to the drug.[1,2]
- Side effects are presented in table format; selected side effects may be described in greater details in paragraphs after the table.
- Side effects are categorized according to the US National Cancer Institute *Common Terminology Criteria for Adverse Events (CTCAE),*[1] with the exception of febrile neutropenia which is included in the *blood/bone marrow* category for ease of cross-reference between course of neutropenia and infection.
- Side effect categorization within the table is subject to change and corresponds with periodic revisions of the CTCAE.

- Inclusion of side effects is based on the following:

  - unintended effects related to the pharmacology (side effects) or noxious and unintended responses to the drug (adverse drug reactions).[2]
  - case reports showing at least possible causal association[2] and collaborated with other investigations (e.g., pharmacokinetic evidence).[3]
  - reported frequency of > 1% in the product monograph or pivotal trials.[3] For data arising from placebo-controlled trials, side effects are generally included if the reported frequency was > 5% higher than the placebo group.
  - rare side effects that are potentially life-threatening, more commonly reported in related drugs, or of special interest to cancer patients (e.g., alopecia).
- Other features of the table include:
  - *Extravasation hazard* is classified as vesicant, irritant, or none. See BC Cancer Policy III-20 Prevention and Management of Extravasation of Chemotherapy.
  - *Emetogenic potential* is classified according to the percentage of patients who will vomit without antiemetics: high (>90%); moderate (30-90%); low (10- <30%); minimal/rare (<10%). See BC Cancer Protocol SCNausea: Guidelines for Prevention and Treatment of Chemotherapy-Induced Nausea and Vomiting in Adults.
  - Frequency for overall (all grades) and severe (grade 3 or 4) side effects are reported when known. It is not always possible to reliably estimate frequency or establish a causal relationship to drug exposure for adverse reactions which are reported through post-marketing or case reports as these reactions are reported voluntarily from a population of uncertain size.
  - Assigning onset of side effects was discontinued for monographs developed or revised after July 2006.

INTERACTIONS:

- Interaction table includes evidence-based drug-drug, drug-herb, drug-food, and drug-lab interactions, including outcome of the interaction, mechanism, and suggested management strategy.
- Interactions due to obvious, simple additive or antagonistic effects based on known pharmacologic activity of the interacting agents are NOT usually included.[4]
- Theoretical interactions are included below the Interaction table. Readers are encouraged to speculate about potential interactions, especially for new agents.
- Data from *in vitro* studies of cytochrome P-450 enzymes are included as their clinical utility is increasingly recognized by regulatory authorities.[5,6]
- Extreme caution and vigilance should prevail when drugs used in combination share a metabolic pathway with the drug in question, particularly where one is highly plasma protein bound or has a narrow therapeutic range.
- Grapefruit interactions are included; however, interactions with other foods susceptible to interaction (i.e., pomelo, lime, bitter orange, etc.) are NOT routinely included as this information is not readily available in standard references and the clinical significance is unknown.

SUPPLY AND STORAGE:

- Identifies available pharmaceutical products and proper storage;
- Includes inactive ingredients of potential clinical significance.[7-9]
- For parenteral drugs, refer to Chemotherapy Preparation and Stability Chart for basic information on the current brand(s) prepared and administered at BC Cancer.

SOLUTION PREPARATION AND COMPATIBILITY:

- Identifies information pertinent to the safe preparation of the drug.
- For parenteral drugs, refer to Chemotherapy Preparation and Stability Chart for basic information on the current brand(s) prepared and administered at BC Cancer.
- For details relating to physicochemical compatibility, refer to current specialty references dealing specifically with injectable drugs.

PARENTERAL ADMINISTRATION:

- Includes commonly used routes and rates of administration, as well as routes that are relatively or absolutely contraindicated.
- Infusion time is the suggested usual time or range of time for administration, and does not necessarily imply a maximum or minimum infusion time, unless specified.
- Indicates recommended in-line filters when applicable for administration.
- BC Cancer recommended routes and rates of administration are indicated in ***bold and italics***.

DOSAGE GUIDELINES:

- Includes the most common average dosage range and routes of administration; provides the common dosing regimens used without support by colony stimulating factors and other cytokines.
- Usual dosing regimens used at BC Cancer are indicated in ***bold and italics***.
- Inclusion of a dosing regimen in this section does not imply efficacy or safety for a particular indication. Refer to the BC Cancer protocol by which a patient is being treated.
- For dosing related to bone marrow transplant (BMT), refer to current specialty references.
- Dosing regimens are generally based on the recommendations of the US National Institutes of Health and National Cancer Institute[10,11]:
  - cycle length (except chronic daily dosing, e.g., tamoxifen),
  - dosage (usually expressed per body surface area or weight),
  - amount of drug per dose and range,
  - frequency of administration and/or days on which the drug is given,
  - total dose per cycle and range, and
  - any other information pertinent to the safe administration of the drug.
  - additional information such as maximum lifetime dose, dose modifications for toxicity or disease states (e.g., renal failure, hepatic failure), and children's doses.

REFERENCES:

- Identifies cited references used in the writing of the monograph

CANCER DRUG MANUAL© PATIENT HANDOUT: FOR THE PATIENT

- Briefly describes how a drug works, how it is administered, and identifies information that a patient needs to know to identify, predict, prevent or manage side effects.
- Includes a side effect table for side effects having a reported incidence of 10% or more. A brief description of clinical manifestations and suggested management strategy is included. Rare, but serious side effects are included after the side effect table.
- Information provided after the side effect table is intended to help the patient identify symptoms which are considered medical emergencies and those which should be reported to the doctor in a timely manner.

CANCER DRUG MANUAL© "INTERIM" DRUG MONOGRAPH AND PATIENT HANDOUT:

Interim monographs and patient handouts may be provided for non-benefit drugs which are available at BC Cancer through the BC Cancer Compassionate Access Program (CAP). Interim monographs may also be provided for parenteral non-benefit drugs which are not yet marketed in Canada but are accessible through the Health Canada Special Access Program (SAP) and approved for use at BC Cancer through CAP. In some cases, these drugs may be supplied by companies outside of Canada.

Interim monographs are limited in scope and will mainly provide information that is necessary to ensure safe preparation and administration of the drug at BC Cancer (e.g., dosing, preparation, administration, and toxicity). See BC Cancer Policy III-90: Parenteral Drug Therapy Policy. Some sections of the interim documents may be

abbreviated or omitted as compared to the full drug monograph, particularly if prepared in an expedited fashion for a specific CAP request. Refer to the CAP approval by which a patient is being treated.

Each **interim** drug monograph contains the following sections:

DRUG NAME:

- Depending on the country of origin, generic name will be listed as per the approved monograph from Health Canada, US Food and Drug Administration, or European Medicines Agency as applicable or, if not yet marketed, from the available product information.

SYNONYM(S):

- Includes alternate generic names used in Canada and the US (if applicable).

COMMON TRADE NAME(S):

- Trade names used in Canada and the US (if available).
- For biologicals, biosimilars of the reference biologic will be indicated if available in Canada.

CLASSIFICATION:

- General pharmacologic classification.

MECHANISM OF ACTION:

- Brief description of the mechanism of action to provide the rationale for drug choice and to help predict the effect and toxicity of a drug.

USES:

- Includes only malignant conditions that may be treated with this drug.
- Health Canada approved indications and common off label indications may be included (if applicable). NOTE: Inclusion of an indication in this section does NOT imply that it is a BC Cancer approved indication.
- For biologicals, Health Canada approved indications will be as specified for the reference biologic.

SPECIAL PRECAUTIONS:

- Includes special considerations for identifying patients who should NOT receive a drug or should receive it with cautions or dose adjustment.
- May be abbreviated compared to the full CDM monograph and may not contain information about carcinogenicity, pregnancy, fertility, etc.

SIDE EFFECTS:

- Focus is primarily on acute reactions.
- Includes adverse events that may present during drug treatment but do not necessarily have a causal relationship with the drug, as well as adverse reactions that are suspected to be related to the drug.[1,2]
- Side effects are presented in table format; although some selected side effects may be described in greater detail in paragraphs after the table.
- Side effects are categorized according to the US National Cancer Institute *Common Terminology Criteria for Adverse Events (CTCAE)*[1], with the exception of febrile neutropenia which is included in the *blood/bone marrow* category for ease of cross-reference between course of neutropenia and infection.
- Side effect categorization within the table is subject to change and corresponds with periodic revisions of the CTCAE.
- Other features of the table include:
  - *Extravasation hazard* is classified as vesicant, irritant, or none. See BC Cancer Policy III-20 Prevention and Management of Extravasation of Chemotherapy..
  - *Emetogenic potential* is classified according to the percentage of patients who will vomit without antiemetics: high (> 90%); moderate (30-90%); low (10- <30%); minimal/rare (< 10%). See BC

Cancer Protocol SCNausea: Guidelines for Prevention and Treatment of Chemotherapy-Induced Nausea and Vomiting in Adults.

- Frequency for overall (all grades) and severe (grade 3 or 4) side effects are reported when known. It is not always possible to reliably estimate frequency or establish a causal relationship to drug exposure for adverse reactions which are reported through post-marketing or case reports as these reactions are reported voluntarily from a population of uncertain size.
- Clinically significant or dose limiting side effects are in ***bold and italics***.

INTERACTIONS:

- Information may be limited for drugs which are not yet marketed in Canada.
- Focus is primarily on evidence-based interactions. This section may be abbreviated compared to the full CDM monograph.
- If available, interaction table includes evidence-based drug-drug, drug-herb, drug-food, and drug-lab interactions.
- Interactions due to obvious, simple additive or antagonistic effects based on known pharmacologic activity of the interacting agents are not included.[4]
- Theoretical interactions may be included below the interaction table if considered potentially clinically significant.
- Grapefruit interactions are included; however, interactions with other foods susceptible to interaction (i.e., pomelo, lime, bitter orange, etc.) are not routinely included as this information is not readily available in standard references and the clinical significance is unknown.

SUPPLY AND STORAGE:

- Identifies available pharmaceutical products and storage.
- Includes inactive ingredients of potential clinical significance.[7-9]
- For parenteral drugs, refer to Chemotherapy Preparation and Stability Chart for basic information on the current brand(s) prepared and administered at BC Cancer.

SOLUTION PREPARATION AND COMPATIBILITY:

- Identifies information pertinent to the safe preparation of the drug.
- For parenteral drugs, refer to Chemotherapy Preparation and Stability Chart for basic information on the current brand(s) prepared and administered at BC Cancer.
- For details relating to physicochemical compatibility, refer to current specialty references dealing specifically with injectable drugs.

PARENTERAL ADMINISTRATION:

- Includes commonly used routes and rates of administration, as well as routes that are relatively or absolutely contraindicated. Refer to the CAP approval by which a patient is being treated.
- Infusion time is the suggested usual time or range of time for administration, and does not necessarily imply a maximum or minimum infusion time, unless specified.
- Indicates recommended in-line filters when applicable for administration.

DOSAGE GUIDELINES:

- Includes the most common average dosage range for parenteral routes of administration in adults. Refer to the CAP approval by which a patient is being treated.
- Inclusion of a dosing regimen in this section does not imply efficacy or safety for a particular indication.
- Dosing regimen information is generally based on the recommendations of the US National Institutes of Health and National Cancer Institute[10,11]:
  - cycle length,
  - dosage (usually expressed per body surface area or weight),
  - amount of drug per dose and range,
  - frequency of administration and/or days on which the drug is given, and
  - total dose per cycle and range.

REFERENCES:

- Identifies cited references used in the writing of the interim monograph.

APPENDICES to CANCER DRUG MANUAL©:

Includes ancillary information on safe handling of hazardous drugs and bodily fluids, extravasation, auxiliary labelling for outpatient medications, etc.

Chemotherapy Preparation and Stability Chart:

- Provides basic information for the preparation and stability of parenteral drugs prepared and administered at BC Cancer. See User's Guide to the Chemotherapy Preparation and Stability Chart for details.

Hazardous Drug List:

- Identifies drugs which are considered hazardous at BC Cancer; including drugs on the current published NIOSH HD list, as well as drugs not otherwise evaluated by NIOSH but which have been evaluated as hazardous by BC Cancer. See BC Cancer Provincial Pharmacy Directive VI-80: Hazardous Drug List.
- Includes only those drugs approved for use at BC Cancer regional centres as per BC Cancer Benefit Drug List or via BC Cancer Compassionate Access Program (CAP).
- For non-oncology drugs, refer to the current published NIOSH List.

Extravasation Hazard Table:

- Identifies the extravasation hazard (described as vesicant, irritant, and none) for oncology drugs available at BC Cancer. See BC Cancer Policy III-20 Prevention and Management of Extravasation of Chemotherapy.

REFERENCES:

1. National Cancer Institute. Common Terminology Criteria for Adverse Events (CTCAE), version 5.0. Bethesda (MD). Available at: https://ctep.cancer.gov/protocolDevelopment/adverse_effects.htm. Accessed 4 February 2019.
2. WHO Collaborating Centre for International Drug Monitoring: The Uppsala Monitoring Centre. Common concepts and terms in pharmacovigilance.. Available at: https://www.who-umc.org/safer-use-of-medicines/safer-use-of-medicines-the-basics/common-concepts-and-terms/. Accessed 4 February 2019.
3. CIOMS Working Groups III and V. Guidelines for preparing core clinical-safety information on drugs. 2nd ed. Geneva: Council for International Orgnizations of Medical Sciences (CIOMS); 1999. p. 35.
4. User's guide. In: Drug interaction facts [book on CD-ROM]. St Louis, Missouri: Facts and Comparisons; January 2000.
5. CYP3A. In: Levy RH, Thummel KE, Trager WF, Hansten PD, Eichelbaum M, editors. Metabolic drug interactions. Philadelphia, PA: Lippincott Williams and Wilkins; 2000. p. 115-34.
6. Center for Drug Evaluation and Research. Guidance for Industry: In Vitro Metabolism- and Transporter-Mediated Drug-Drug Interaction Studies. Federal Drug Adminstration. October 2017. Available at: https://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/DrugInteractionsLabeling/ucm093606.htm.
7. Clinical Information: Nonmedicinal ingredients in pharmaceuticals and packaging. Compendium of Pharmaceuticals and Specialties Online version (CPS)©. Canadian Pharmacists Association. Accessed 4February 2019.
8. American Academy of Pediatrics Committee on Drugs. "Inactive" ingredients in pharmaceutical products: update. Pediatrics 1997;99(2):268-78.
9. Napke E. Excipients, adverse drug reactions and patients' rights. Can Med Assoc J 1994;151(5):529-33.
10. Kohler D, Montello M, Green L, et al. Standardizing the expression and nomenclature of cancer treatment regimens. American Society of Health-System Pharmacist (ASHP), American Medical Association (AMA), American Nurses Association (ANA). Am J Health Syst Pharm 1998;55(2):137-44.
11. National Cancer Institute. Cancer Therapy Evaluation Program. Guidelines for Treatment Regimens: Expression and Nomenclature. Available at: https://ctep.cancer.gov/protocoldevelopment/policies_nomenclature.htm. Last updated 29 May 2008. Accessed 4February 2019.