MANAGEMENT OF ADVERSE REACTION TO CT CONTRAST PROTOCOL

Summary of Changes

	NEW	Previous
BC Cancer	February 2024	

1. Introduction

1.1. Focus

Adverse reactions to contrast agents range from mild to severe. Signs and symptoms may be self-limited without evidence of progression; more pronounced and require medical management; or severe and life-threatening resulting in death if not managed appropriately. Reactions may include urticarial, dyspnea, bronchospasm, angioedema, hypotension, and tachycardia. Previous allergic reactions to contrast material, asthma and allergies are factors associated with an increased risk of developing an adverse reaction. A standardized approach to medication management of CT contrast reactions may contribute to less patient safety events and better patient outcomes.

1.2. Health Organization Site Applicability

The medical (medication) management of CT contrast adverse reactions for BC Cancer patients will follow a standardized approach for safety and consistency.

1.3. Practice Level

This policy applies to Registered Nurses, Radiation Therapists and oncologists (RO's MO's and GPO's) who prescribe, administer and monitor patients receiving CT contrast at BC Cancer. Centers should follow their emergency management procedures for calling and responding to Code Blue events, should a reaction escalate.

1.4. Equipment and Supplies

Moderate (Grade 2) Reaction:

- Diphenhydramine 50 mg IV push
- Hydrocortisone sodium succinate 100mg IV per physician orders and VCH Parenteral Drug Therapy Manual (PDTM)

Severe (Grade 3-4) Reaction:

- Diphenhydramine 50 mg IV push
- Hydrocortisone sodium succinate 100mg IV per physician orders and VCH Parenteral Drug Therapy Manual (PDTM)
- Saline (if needed for hypotension per physician orders)
- Epinephrine 0.5 mg
- Oxygen if needed for dyspnea (see below).
- Bronchodilators if indicated (see below).

2. Protocol

CT Contrast Reaction	Immediate Management
Mild (Grade 1) *Mild-transient reaction; infusion interrupted, intervention may be indicated* **Any of the following symptoms may be observed:** • Mild flushing • Mild chills • Pruritus (mild or localized) • Transient rash (covering less than 10% body surface area with our without symptoms) • Mild allergic rhinitis	*Follow the management below based on clinical judgment* • Stop CT contrast infusion • Assess and monitor the patient until symptoms have resolved • Ensure equipment and medication are readily available should the reaction progress **If symptoms progress to Grade 2 proceed as outlined below.**
Moderate (Grade 2) *CT contrast infusion interruption indicated but responds promptly to symptomatic treatment (e.g. antihistamines, IV fluids); medications indicated for less than or equal to 24 hours* **Any of the following symptoms may be observed:** • Transient rash (covering 10-30% of body surface area with our without symptoms) • Moderate flushing • Dizziness (moderate unsteadiness or sensation of movement) • Pruritus (intense or widespread; intermittent) • Moderate allergic rhinitis • Urticaria (lesions covering 10-30% BSA) • Moderate dyspnea/facial edema (shortness of breath with minimal exertion)	• Stop CT contrast infusion • Notify that a reaction is taking place (follow centre specific procedures) • Give diphenhydramine 50 mg IV push and hydrocortisone sodium succinate 100mg IV per physician orders and VCH Parenteral Drug Therapy Manual (PDTM)

• Mild to moderate chest discomfort • Mild hypotension (less than or equal to 20mmHg drop from baseline) • Mild to moderate nausea/vomiting	
Severe (Grade 3) *Prolonged (i.e. not rapidly responsive to symptomatic medication and/or brief interruption of infusion); recurrence of symptoms following initial improvement; hospitalization indicated for clinical sequelae* **Any of the following symptoms may be observed:** • Severe rash (covering greater than 30% BSA with or without associated symptoms) • One or more symptoms of respiratory distress requiring treatment (e.g. repetitive cough, wheeze, throat tightness/change in voice) • Symptomatic bronchospasm with our without urticaria • Hypoxia; decreased oxygen saturation at rest (e.g. pulse oximeter less than 88%) • Diffuse erythema with hypotension • Edema/angioedema • Dizziness: severe unsteadiness or sensation of movement **Severe (Grade 4)** *Life-threatening consequences; urgent intervention indicated* **Any of the following symptoms may be observed:** • Hypoxia: Life-threatening airway compromise • Cyanosis • Altered level of consciousness • Severe angioedema (periorbital/facial)	• Stop CT contrast infusion and do not restart • Notify that a reaction is taking place (follow centre specific procedures) • Give diphenhydramine 50 mg IV push and hydrocortisone sodium succinate 100 mg IV per physician orders and VCH Parenteral Drug Therapy Manual (PDTM). • Normal saline if needed for hypotension per physician orders • Give epinephrine 0.5 mg* intramuscularly STAT. Repeat epinephrine at 5 minute intervals twice more as needed (i.e., if breathing becomes more labored or level of consciousness decreases). NOTE: Administer a maximum of three doses epinephrine. • Oxygen if needed for dyspnea (see below). • Bronchodilators if indicated (see below). *Initiate Emergency Response System appropriate for facility if patient condition warrants.*

2.1. Site Specific Practices

A standardized approach for the medical management of adverse reaction to CT contrast will be taken across BC Cancer (see 3.1). Centers should follow their emergency management procedures for calling and responding to Code Blue events, should a reaction escalate (see 3.1)

2.2. Documentation

Document according to your professional standards and applicable BC Cancer documentation policy.

Registered Nurses (RN's) and Licensed Practical Nurses (LPN's) should document within the patient's hard chart or within Cerner for sites that are live with CST Cerner. This should include the level of adverse reaction level 1-4 (see section 2), actions taken, patient response and plan (where applicable).

Documentation in the Allergy record should be entered for CT Contrast dye. For Cerner sites: VPP Allergy documentation

BC Cancer Nursing Allergy Documentation Procedure

A Patient Safety Learning System (PSLS) event should be entered and a PHSA Serious Adverse Drug Reaction report to Health Canada completed (if applicable – please see link under 3.1)

2.3. Patient/Client and Family Education

The patient should be counselled about the allergic reaction, including an understanding of when it could happen and their responsibility to inform subsequent healthcare professionals of this reaction.

3. Related Documents and References

3.1. Related Documents

BC Cancer Nursing C-240: Care of the Patient Receiving Computed Tomography (CT) with Intravenous Contrast Policy

BC Cancer Protocol Summary for Management of Infusion –Related Reactions to Systemic Therapy Agents

PHSA Serious Adverse Drug Reactions: Reporting to Health Canada

VPP Allergy Documentation

BC Cancer Nursing Allergy Documentation Procedure

3.2. References

ACR Manual on Contrast Media (V10.3 Edition) Segal AJ, Editor. American College of Radiology, Reston, VA, 2020. Retrieved from: https://www.acr.org/Quality-Safety/Resources/Contrast-Manual

Brockow, K., & Sanchez-Borges, M. (2014). Hypersensitivity to contrast media and dyes. Immunology & Allergy Clinics of North America, 34(3), 547-564. doi: http://dx.doi.org/10.1016/j.iac.2014.04.002

Ellis, J., MD, Davenport, M., MD, Dillman, J., MD, Hartman, R., MD, Herts, B., MD, & Herts, H., MD. (2016, June). ACR Manual on Contrast Media Version 10.2. Retrieved January 18, 2017, from http://www.acr.org/Quality-Safety/Resources/Contrast-Manual

Jung, J., MD, Kang, H., MD, Kim,M., MD, Lee, w., MD, Min, K., MD, & Han,M., MD, Cho, S., MD. (2012, August). Immediate Hypersensitivity Reaction to Gadolinium-based MR Contrast Media. Radiology: Volume 264: Number 2.

Maddox, T., MD. (2002, October) Adverse Reactions to Contrast Material: Recognition, Prevention, and Treatment. American Family Physician, 66(7): 1229-1235.

****Last page of document****

First Issued:	19-JAN-2022		
Approving Body:	Provincial Radiation Therapy Committee Professional Practice Nursing, Senior Practice Leaders		
Final Sign Off:	**Name**	**Title**	**Date Signed**
	Dr. Scott Tyldesley Ruby Gidda	Radiation Oncologist Executive Director, Abbotsford Center & Professional Practice Nursing & Allied Health	 18-FEB-2022
Developed By:	**Name**	**Dept.**	**HO**
	Joy Bunsko	Sr. Practice Leader, Med Res and Radiation Oncology	PHSA-BC Cancer
	James Sydney	Resource Therapist, Surrey	PHSA-BC Cancer
	Crystele Montpetit	Clinical Nurse Educator, Surrey	PHSA-BC Cancer
	Vicky Grant	Radiation Therapist, Surrey	PHSA-BC Cancer
Owner(s):	Professional Practice Nursing and Radiation Therapy Program		
Posted Date:	11-MAR-2022		
Version:	1.0		
Revision:	**Name of Reviser**	**Description**	**Date**
			DD-MMM-YYYY