



TITLE

AUTONOMIC DYSREFLEXIA: ADULT

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NOTE: The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

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OBJECTIVES

- To provide direction on the recognition and management of autonomic dysreflexia (AD) in adult patients with a spinal cord injury (SCI).
- To outline recommended strategies for the prevention of AD.

APPLICABILITY

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

ELEMENTS

1. Points of Emphasis

- 1.1 For the purposes of this Protocol only, Acute Care settings includes all AHS urban and rural hospitals (including the Emergency Department), psychiatric facilities, and Urgent Care Centres.
- 1.2 This Protocol may be used in non-Acute Care settings. Site or Unit **Managers** are responsible for determining whether this Protocol (in whole or in part) is appropriate for their patient care setting.
- 1.3 AD is a potentially life-threatening condition that most commonly occurs in patients with an SCI at or above the T6 neurological level; however, AD may also occur in some patients with an SCI at level T7-8.

- 1.4 AD is a medical emergency and if left untreated, may result in serious complications (e.g., stroke, seizure, cardiac arrest, death).
- a) Early management may prevent serious complications.
- 1.5 AD is characterized by a sudden rise in systolic blood pressure (SBP) 20 – 40 millimetres of mercury (mmHg) above the patient’s baseline with or without symptoms. However, the increase in SBP may be significantly higher.
- a) Patients with an SCI may have a low baseline SBP (e.g., 85 – 110 mmHg), and an increase of 20 – 40 mmHg may still appear to be within normal range.
- 1.6 The patient may report feeling “dysreflexic”.
- 1.7 AD is caused by noxious or irritating stimuli that occurs below the level of injury.
- a) The most common cause of AD is related to the urinary system.
- b) AD normally will not resolve (and SBP may worsen) until the noxious stimuli is identified, removed, and/or corrected.
- 1.8 AD causes a range of symptoms which may vary in intensity. The patient with AD may be asymptomatic, or their symptoms may range from experiencing mild discomfort and/or headache to a life-threatening emergency (such as stroke, seizures, and death).
- 1.9 A SBP of 150 mmHg is the value at which pharmacological treatment should be considered when the blood pressure remains elevated with a cause either not yet identified, or not able to be quickly removed (as per the *Acute Management of Autonomic Dysreflexia: Individuals with Spinal Cord Injury Presenting to Health-Care Facilities [Consortium for Spinal Cord Medicine]*).
- 1.10 An **authorized prescriber’s order** is not required for topical anesthetic lidocaine 2% gel when administered prior to catheterization or bowel disimpaction as outlined in this Protocol.

2. Inclusion Criteria

- 2.1 This Protocol is intended for all adult patients with an SCI at or above the T6 neurological level, however, AD may also occur in some patients with an SCI at level T7-8.

3. Exclusion Criteria

- 3.1 Patients without an SCI, or those with an SCI below the T8 neurological level.

4. Recognition of Autonomic Dysreflexia

- 4.1 Sudden increase in SBP of at least 20 – 40 mmHg above systolic baseline (with or without the following symptoms) includes but is not limited to:
- a) bradycardia (although tachycardia is possible);
 - b) pounding headache;
 - c) profuse sweating above the level of the injury, especially in the face, neck, and shoulders;
 - d) flushing of the skin above the level of the injury that may also present as contrasting a pallor and/or coolness to the skin below the level of the injury;
 - e) blurred vision or appearance of spots in the visual fields;
 - f) nasal congestion;
 - g) feelings of apprehension or anxiety; and/or
 - h) piloerection (goose bumps) below the level of the injury.
- 4.2 If the patient reports any of the signs and symptoms listed above, the patient's blood pressure should be taken immediately.

5. Management of Autonomic Dysreflexia

- 5.1 If possible, sit the patient up in bed or a chair to help decrease the patient's blood pressure.
- 5.2 Monitor blood pressure and heart rate every two (2) – five (5) minutes until the patient's blood pressure returns to baseline.
- a) The patient's blood pressure may continue to rise, often rapidly, until successfully treated.
- 5.3 Loosen tight clothing if appropriate (e.g., zippers, abdominal binder, compression stockings, leg bag straps, and/or shoes).
- 5.4 Notify the **most responsible health care practitioner (MRHP)** if the SBP is greater than 150 mmHg, and there are no AD treatment order(s) on the patient's **health record**.
- 5.5 Ask the patient and/or **family**:
- a) if they suspect a cause;
 - b) if there is a known or common resolution; and

- c) if it has occurred before.
- 5.6 Identify the trigger of the noxious stimulus and remove and/or resolve (if possible). The most common causes include the following:
- a) Bladder or urinary system (most common cause):
- (i) full bladder (or high bladder volume) resulting from:
 - kinked or blocked indwelling catheter;
 - inability to void;
 - delayed intermittent catheterization; or
 - increased urinary output;
 - (ii) bladder infection or bladder stones; or
 - (iii) tests done on the bladder (e.g., cystoscopy, urodynamic studies, lithotripsy).
- b) Bowel/gastrointestinal:
- (i) full bowel or constipation, fecal impaction;
 - (ii) gaseous distension;
 - (iii) rectal irritation (e.g., enema or manual evacuation); or
 - (iv) other potential triggers, which may include:
 - hemorrhoids;
 - colonoscopy/sigmoidoscopy;
 - gallstones or cholecystitis;
 - appendicitis;
 - gastric ulcer; and/or
 - gastritis.
- c) Integument:
- (i) sitting/lying on something hard (e.g., wrinkles, object between surface and skin);
 - (ii) tight clothing or shoes, skin or body hair zipped into zippers; or

- (iii) other potential triggers, which may include:
 - pressure injury;
 - wounds or burns; and/or
 - ingrown toenails.
 - d) Other triggers that may cause discomfort below the level of injury should be considered. This may include but is not limited to the following:
 - (i) severe pain (e.g., traumatic or cancer related);
 - (ii) fractures or other injuries;
 - (iii) menstrual cramps;
 - (iv) pregnancy or labour and delivery (clinically important to differentiate from pre-eclampsia);
 - (v) constrictive devices (e.g., seatbelts, tight shoes, abdominal binder);
 - (vi) complications of an indwelling vascular access device (e.g., extravasation, vasculitis, or infection); and/or
 - (vii) any procedures without general or adequate local anesthetic.
- 5.7 Topical anesthetic lidocaine 2% gel should be considered prior to catheterization or disimpaction during episodes of AD (see Section 6.2 below). If topical anesthetic lidocaine 2% gel is not readily available, proceed with catheterization or disimpaction during episodes of AD.
- 5.8 It is recommended that pharmacological management be considered when the SBP remains greater than or equal to 150 mmHg, and a cause is either not yet identified or able to be quickly resolved.
- 5.9 If SBP remains greater than or equal to 150 mmHg:
- a) notify the MRHP;
 - b) obtain orders for pharmacological management as per Section 6 below (if not already in the patient's chart); and
 - c) initiate pharmacological management.

6. Pharmacological Management

6.1 Treatment of AD hypertension

- a) Anti-hypertensive medication with quick onset and short duration are recommended for management of hypertension in AD.
- b) Pharmacological management may be initiated for AD with an order from an authorized prescriber for persistent SBP greater than or equal to 150 mmHg after initial non-pharmacological management has been ineffective for reducing blood pressure.
 - (i) If symptoms still present and SBP is greater than or equal to 150 mmHg, treat hypertension with captopril 12.5 milligrams (mg) sublingual once, and then repeat after 10 minutes if SBP remains greater than or equal to 150 mmHg.
 - (ii) If SBP remains greater than 150 mmHg after 30 minutes of initial captopril dose, then administer nifedipine immediate release (IR) 5 – 10 mg, bite and swallow once.
 - (iii) Refer to Appendix A: *Autonomic Dysreflexia Recognition and Management Algorithm*.

6.2 Prevention of AD noxious stimuli

- a) Topical anesthetic lidocaine 2% gel should be considered and may be administered without an order provided there is no history of severe allergy (i.e., difficulty breathing or airway swelling), anaphylaxis, or is contraindicated:
 - (i) Routine: prior to catheterization or disimpaction if patient is prone to AD with these interventions; or
 - (ii) (Pro re nata [PRN]), prior to catheterization or disimpaction during episodes of AD.
 - Intra-urethra: instill 5 – 10 millilitres (mL) into urethra five (5) minutes prior to intermittent catheterization.
 - Anorectal: apply 5 – 10 mL to the anorectal area five (5) minutes prior to digital stimulation or disimpaction of the rectum.
 - (iii) Refer to Appendix B: *Methods for Removal and Resolution of Common AD Triggers*.

7. Monitoring and Resolution of Autonomic Dysreflexia

7.1 The following should be monitored during an episode of AD:

- a) blood pressure and heart rate every two (2) - five (5) minutes; and

- b) any change in the patient's neurological status (e.g., reduced level of consciousness, new weakness, numbness above level injury or signs of stroke such as facial droop, slurred speech, or visual changes).
- 7.2 If SBP is less than 70 mmHg and/or symptoms of hypotension arise after treatment of AD:
- a) place the patient in a Trendelenburg position; and
 - b) contact the MRHP.
 - c) IV fluid resuscitation should be considered as needed and per MRHP orders.
- 7.3 AD is resolved when the SBP returns to or is below baseline, and signs and symptoms resolve.
- 7.4 Resolution may occur without pharmacological management. Pharmacological management should not be initiated or continued after AD has resolved.
- 7.5 After AD is resolved, monitor blood pressure and heart rate every 15 minutes for one (1) hour, then every 30 minutes until a total of two (2) hours with normal vital signs and patient symptoms have resolved.
- 7.6 If AD does not resolve with non-pharmacological and pharmacological management, the MRHP and/or emergency response team should be called, and a critical care consult should be considered.
- 8. Documentation**
- 8.1 The **health care professional** shall document on the patient's health record:
- a) assessments;
 - b) interventions including identified trigger(s);
 - c) patient's responses to interventions;
 - d) reassessments; and
 - e) after-care education provided.
- 9. Education**
- 9.1 Education shall be provided to the patient and family during the early phase of learning to manage the patient's SCI.
- a) If a knowledge gap is identified, additional education should be provided by a member of the health care team to ensure patient safety.

- 9.2 The following examples are the minimum education components that should be provided to the patient and family:
- a) recognizing the signs and symptoms of AD;
 - b) understanding that AD may present differently for different patients;
 - c) understanding and/or tracking personal AD triggers;
 - d) non-pharmacological and pharmacological management of AD, including having medication (if prescribed) on hand for self-administration for such occasions that symptoms occur and persist when outside a health care facility;
 - e) activating emergency services as needed; and
 - f) advocating for appropriate prevention and management when navigating the health care system where staff may be unfamiliar with AD, including carrying an AD card with instructions for health care professionals with them.
- 9.3 Refer patients and families to MyHealth.Alberta.ca *Spinal Cord Injury: Autonomic Dysreflexia* for further information.

10. Prevention of Autonomic Dysreflexia

- 10.1 Care should be taken to avoid the underlying triggers of AD when possible. AD is not always avoidable, but the risk of AD may be decreased by avoiding noxious stimuli below the level of injury (refer to triggers in Section 5.6 above).
- 10.2 Appropriate bladder and bowel management in accordance with the AHS *Provincial Bladder Management Protocol for Patients with SCI* and AHS *Provincial Bowel Management Guidelines for Patients with SCI* (pending).
- 10.3 Topical anesthetic lidocaine 2% gel should be considered and may be administered without an order provided there is no history of severe allergy (i.e., difficulty breathing or airway swelling), anaphylaxis, or is contraindicated:
- a) Routine: prior to catheterization or disimpaction if patient is prone to AD with interventions; or
 - b) (Pro re nata [PRN]): prior to catheterization or disimpaction during episodes of AD only.
 - c) Refer to pharmacological management in Section 6.2 above and Appendix A: *Autonomic Dysreflexia Recognition and Management Algorithm*.
- 10.4 Patients with an SCI at or above the T6 neurological level should have order(s) for medical management of AD in their health record.

11. Transition and Discharge

- 11.1 The patient's risk for AD shall be communicated during transitions between care areas, multidisciplinary providers, and on discharge.
- 11.2 An AD card should be provided to the patient.
- a) The card is a resource for the patient and family that provides instructions for emergency personnel, care providers, and/or bystanders in case of AD.
 - b) It includes the patient's approximate baseline blood pressure and information on recognition of AD and non-pharmacological and pharmacological management recommendations.
 - c) The patient should be encouraged to carry this card with them at all times.
 - d) The AD card is available on MyHealth.Alberta.ca *Spinal Cord Injury: Autonomic Dysreflexia*.

DEFINITIONS

Adult means a person aged 18 years and older.

Authorized prescriber means a health care professional who is permitted by federal and provincial legislation, their regulatory college, Alberta Health Services, and practice setting (where applicable) to prescribe medications.

Family(-ies) means one or more individuals identified by the patient as an important support, and who the patient wishes to be included in any encounters with the health care system, including but not limited to, family members, legal guardians, friends, and informal caregivers.

Health care professional means an individual who is a member of a regulated health discipline, as defined by the Health Professions Act (Alberta), and who practices within scope and role.

Health record means the collection of all records documenting individually identifying health information in relation to a single person.

Manager means the individual(s) who has the delegated human resource authority for directly planning, monitoring, and supervising direct (employee) reports.

Most responsible health practitioner (MRHP) means the health practitioner who has responsibility and accountability for the specific treatment/procedure(s) provided to a patient and who is authorized by AHS to perform the duties required to fulfill the delivery of such a treatment/procedure(s) within the scope of their practice.

Order means a direction given by a regulated health care professional to carry out specific activity(-ies) as part of the diagnostic and/or therapeutic care and treatment to the benefit of a

patient. An order may be written (including handwritten and/or electronic), verbal, by telephone, or facsimile.

Patient means an adult or child who receives or has requested health care or services from Alberta Health Services and its health care providers or individuals authorized to act on behalf of Alberta Health Services. This term is inclusive of residents, clients and outpatients.

REFERENCES

- Appendix A: *Autonomic Dysreflexia Recognition and Management Algorithm*
- Appendix B: *Methods for Removal and Resolution of Common AD Triggers*
- Alberta Health Services Resources:
 - *Urinary Catheter Management Clinical Care Topic*
 - *Provincial Bladder Management Guidelines for Patients with SCI*
 - *Provincial Bowel Management Guidelines for Patients with SCI*
- Non-Alberta Health Services Documents:
 - *Acute Management of Autonomic Dysreflexia: Individuals with Spinal Cord Injury Presenting to Health-Care Facilities* (2001) (Consortium for Spinal Cord Medicine)
 - *Spinal Cord Essentials Autonomic Dysreflexia* (www.spinalcordessentials.ca)
 - *Spinal Cord Injury: Autonomic Dysreflexia* (MyHealth.Alberta.ca)
 - *Tele-Rehabilitation Guideline: Management of Acute Autonomic Dysreflexia. TRIUMPH Spinal Cord Injury Guidelines* (2018) (University of Arkansas for Medical Sciences)
 - *Treatment of Autonomic Dysreflexia for Adults and Adolescents with Spinal Cord Injuries* (2014) (NSW Agency for Clinical Innovation)

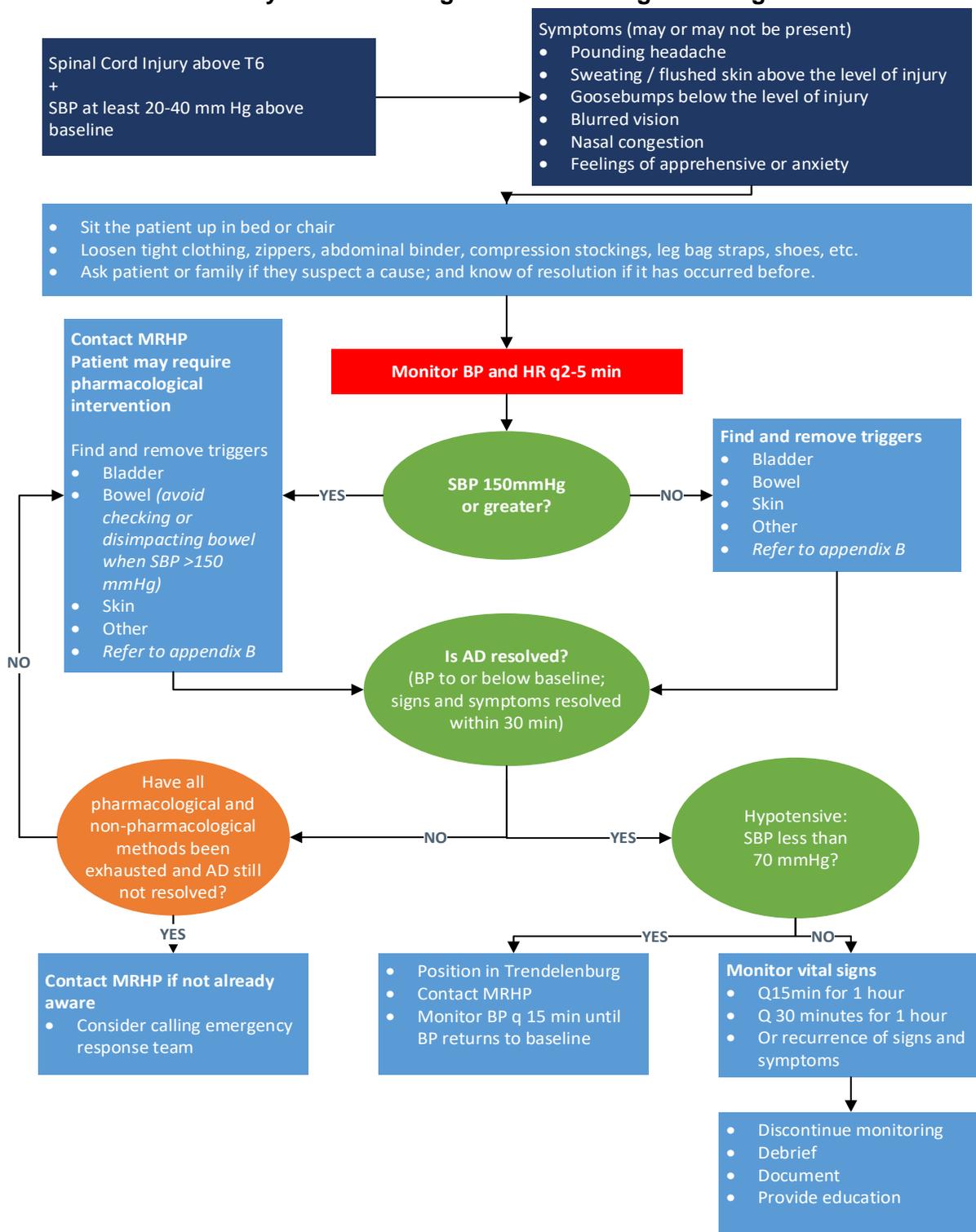
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APPENDIX A

Autonomic Dysreflexia Recognition and Management Algorithm



APPENDIX B

Methods for Removal and Resolution of Common AD Triggers

Common AD triggers and points of emphasis	Methods for trigger removal/resolution
<p>Bladder or urinary system</p> <p><i>Most common (trigger in 75-90% of cases)</i></p> <p>Monitor blood pressure during bladder drainage.</p> <p>If acute symptoms of AD persist, including a sustained elevated blood pressure, suspect fecal impaction.</p>	<p>Patients are often experts in their care and may help inform their plan of care. Ask patient and/or family if they suspect a cause, as well as a known or common resolution if it has occurred before.</p> <ul style="list-style-type: none"> • If no indwelling catheter, perform intermittent catheterization. <ul style="list-style-type: none"> ○ Lidocaine 2% gel is preferred 5 minutes prior to catheterization, if possible, in order to prevent additional painful sensory input and may be administered without an order provided there is no history of severe allergy (i.e., difficulty breathing or airway swelling), anaphylaxis, or is contraindicated. • If patient has indwelling catheter, check for tubing kinks or catheter blockage, and ensure drainage bag is not overfilled. <ul style="list-style-type: none"> ○ If catheter seems blocked, irrigate the bladder GENTLY with no more than 10 to 15 mL of sterile normal saline at body temperature. ○ If the catheter is still not draining and the blood pressure remains elevated, remove and replace the catheter. Lidocaine gel is preferred 5 minutes prior, as above. • Be alert for sudden hypotension due to rapid draining of an over-distended bladder and/or sudden resolution of AD. • Leave catheter in situ until reason for retention is identified and remedied. • Collect urine specimen for possible culture and sensitivity as per order set. • Other potential causes: bladder infection, bladder stones or tests done on the bladder (e.g., cystoscopy, urodynamic studies, lithotripsy).
<p>Gastro-intestinal system</p> <p><i>2nd most common (trigger in 13-19% of cases)</i></p>	<ul style="list-style-type: none"> • Do not perform bowel care of any kind if the systolic blood pressure is 150 mmHg or higher. • If the systolic blood pressure is less than 150 mmHg, insert lubricated finger into rectum, and check the bowel for stool. Disimpact bowels if rectum is impacted with stool. • Lidocaine gel is preferred prior to disimpaction and does not require an order. Using gloved hands apply 2% lidocaine jelly into rectum; wait 5 minutes to proceed if possible. • Stop exam if blood pressure continues to rise.
<p>Integument</p>	<ul style="list-style-type: none"> • Assess skin for obvious sign of injury such as burns or cuts. • Assess skin for pressure injuries. Assess known pressure injuries for new infection. • Offload any loaded areas, and new areas of redness. • Ensure patient is not sitting on scrotum. • Inspect for wrinkles in clothing or bedding or items that are between the patient and seating/sleep surface such as caps, tubing or other medical devices. • Inspect seating/sleep surface for appropriate inflation.
<p>Other</p>	<p>Other triggers that can cause discomfort below level of injury should be considered. This may include, however is not limited to the following:</p> <ul style="list-style-type: none"> • severe pain (e.g., traumatic or cancer related); • fractures or other injuries; • menstrual cramps; • pregnancy or labor and delivery (differentiate from pre-eclampsia); • constrictive devices (seatbelts, tight shoes, abdominal binder); • infiltrated lines/access; • penile erection or sexual activity/arousal; and/or • any procedures without general or adequate local anesthetic.