

## TELE-REHABILITATION GUIDELINE

### Management of Acute Autonomic Dysreflexia (AD)

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#### I. Definition, assessment, and diagnosis

##### A. Definition

1. Autonomic Dysreflexia (AD) is a spasm of the autonomic nervous system due to noxious stimulation below the level of the spinal cord injury, resulting in hypertension with relative bradycardia in a patient with a spinal cord injury (SCI) at or above the T6 neurological level. Cases involving the T8 neurologic level have been reported (Erickson, 1980).
  - a. AD results when noxious stimuli trigger unopposed sympathetic hyperactivity, resulting in widespread vasoconstriction and elevation in blood pressure (Elliot & Krassioukov, 2006). The descending sympathetic inhibitory signals that originate above T6 are unable to traverse the zone of the spinal cord injury to mitigate the hyperactivity (Teasell, et al., 2000).
  - b. Parasympathetic activity to counter the sympathetic hyperactivity results in relative bradycardia through the input of the vagus nerve.
  - c. AD must be properly assessed and treated quickly to prevent a potentially life-threatening crisis, specifically the effects of elevated blood pressure and stroke or intracranial bleed.

##### B. Assessment

1. Signs and symptoms
  - a. Hypertension (blood pressure 20-40mmHg above baseline) often but not always an associated bradycardia
  - b. Pounding headache
  - c. Profuse sweating, vasodilation or skin flushing
  - d. Piloerection or goose bumps
  - e. Blurred vision
  - f. Spots in the visual fields
  - g. Nasal congestion
  - h. Apprehension or anxiety
  - i. Minimal to no symptoms despite elevated blood pressure
2. Evaluate for causes of noxious stimuli
  - a. Urinary system
    - 1) Bladder distention/urinary tract infection
    - 2) Kidney stones
    - 3) Obstructed urinary catheter
    - 4) Urological instrumentation of genitourinary tract
      - a) Catheterization of urethra
      - b) Cystoscopy
  - b. Gastrointestinal system
    - 1) Bowel distention
    - 2) Bowel impaction
    - 3) Appendicitis
    - 4) Gallstones

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- 5) Gastric ulcers or gastritis
  - 6) Gastrointestinal tract instrumentation
  - 7) Hemorrhoids
  - c. Integumentary system
    - 1) Pressure ulcers
    - 2) Constrictive clothing, shoes or appliances
    - 3) Contact with hard or sharp objects
    - 4) Blisters
    - 5) Burn, sunburn or frostbite
    - 6) Ingrown toenail
    - 7) Insect bite
  - d. Reproductive system
    - 1) Intercourse
    - 2) Sexually transmitted diseases
    - 3) Ejaculation
    - 4) Epididymitis
    - 5) Scrotal compression
    - 6) Vibratory stimulation
    - 7) Menstruation
    - 8) Pregnancy
    - 9) Vaginitis
  - e. Other
    - 1) Performance-enhancing drugs (e.g. stimulants)
    - 2) Deep vein thrombosis
    - 3) Excessive alcohol
    - 4) Excessive caffeine or other diuretic intake
    - 5) Fractures or trauma
    - 6) Heterotopic ossification
    - 7) Pulmonary emboli
    - 8) Substance abuse
    - 9) Surgical or invasive diagnostic procedures
- C. Diagnosis
1. Patients have T6 and above spinal cord injury (SCI) with an increase in blood pressure and relative bradycardia. AD often manifests with vasodilation and sweating above the level of spinal cord injury and vasoconstriction below the level of the spinal cord injury.
  2. AD in pregnant women and children with SCI present similar to those of the adult SCI. AD in pregnant women can be mistaken for preeclampsia.

## II. Management and treatment recommendations (Consortium 2002)

- A. Recognize the signs and symptoms. Eighty-five percent of cases are related to either bladder distention or bowel impaction (Teasell, et al., 2000; Mathias & Frankel 2002).
- B. Check blood pressure
  1. If blood pressure is not elevated but signs and symptoms present and the cause has not been identified, refer to an appropriate consultant depending upon the symptoms.
  2. If blood pressure is elevated
    - a. Immediately sit the person up if the individual is supine
    - b. Loosen any clothing or constrictive devices

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- c. Monitor blood pressure and heart rate frequently (every 2-5 minutes)
- C. Quick survey for instigating causes, beginning with urinary system
  - 1. If an indwelling urinary catheter is not in place, catheterize the individual. Prior to inserting the catheter, instill 2% Lidocaine jelly into urethra and wait two minutes, if possible.
  - 2. If the individual has an indwelling catheter
    - a. Check the system along entire length for kinks, folds, constrictions or obstructions.
    - b. Check for correct placement of the indwelling catheter.
    - c. If a problem is found, correct it immediately.
      - 1) If the catheter appears blocked, gently irrigate with 10-15 mL of normal saline (in children <2, use 5-10 mL) warmed to body temperature.
      - 2) If the catheter is draining and the blood pressure remains elevated, suspect fecal impaction.
      - 3) If the catheter is *not* draining and the blood pressure remains elevated, remove and replace the catheter.
    - d. Prior to replacing the catheter, repeat 2% Lidocaine jelly installation and wait two minutes. If difficulties arise in replacing the catheter, consider attempting to pass a coudé catheter or consult urology.
    - e. Monitor blood pressure during bladder drainage.
    - f. If acute symptoms of AD persist, including a sustained elevated blood pressure, suspect fecal impaction.
- D. Survey GI system, beginning with evaluation for fecal impaction.
  - 1. For systolic blood pressure (SBP)  $\leq 150$  mmHg, consider pharmacologic management to reduce the SBP without causing hypotension prior to checking for fecal impaction.
    - a. Use an anti-hypertensive agent with rapid onset and a short duration while the causes are being investigated (Braddom & Rocco, 1991).
      - 1) Nitrates and Nifedipine are the most commonly used agents.
      - 2) Nitrates are contraindicated if Sildenafil (or other PDE5 inhibitors) is being used
      - 3) Monitor the individual for symptomatic hypotension.
  - 2. For elevated SBP < 150 mmHg, proceed to check the rectum or stool.
    - a. Exam steps: using gloved hands, apply topical anesthetic and perform manual evacuation
    - b. Stop exam if blood pressure worsens. Instill more anesthetic, wait 20 minutes and resume exam.
- E. If the precipitating cause has not been determined, check for less frequent causes of noxious stimulation delineated above that can cause AD. The individual may need to be admitted to the hospital. SBP > 150 mmHg may warrant pharmacological management. The goal is to alleviate symptoms and avoid complications of uncontrolled hypertension (Valles, et al., 2005).

### III. Follow up

- A. Following an episode of AD, instruct the individual to monitor symptoms and blood pressure for at least 2 hours after resolution.
- B. Consider admission for monitoring to maintain pharmacologic control of the blood pressure and to investigate other causes.
- C. Document the episode in the medical record and include evaluation of treatment efficacy.

- D. Once the patient is stabilized, review with the patient, family and friends the causes of AD and preventative measures.
- E. Schedule a detailed evaluation for patients with recurrent AD.

*This guideline was developed to improve health care access in Arkansas and to aid health care providers in making decisions about appropriate patient care. The needs of the individual patient, resources available, and limitations unique to the institution or type of practice may warrant variations.*

## Guideline Developers

Guideline developed by Saint Adeogba, MD, in collaboration with the TRIUMPH team led by Thomas Kiser, MD, and Rani Lindberg, MD.

## Selected References

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