Autonomic Dysreflexia (AD) v2.0

In Patients with Spinal Cord Injury

Approval & Citation | Summary of Version Changes | Explanation of Evidence Ratings

E.D., INPATIENT, or OUTPATIENT

Signs & Symptoms of AD

- Elevated BP (see parameters)
- Headache
- Blurred Vision
- Nasal Congestion
- Gooseflesh/goosebumps
- Above level of injury:
  - Sweating
  - Flushing

Inclusion Criteria

- Spinal cord injury at T6 or above
- Patients identified as AD or At Risk for AD
- Place this sheet behind Code sheet at Head of Bed and in "AD Kit"

! AD is a MEDICAL EMERGENCY!
Call Rehab Charge RN upon initiation of pathway

Systolic Blood Pressure (SBP) Parameters

Patient's baseline SBP _____ mmHg
Add 15 (0-12yr) or 20 (>12yr) + _____ mmHg
Threshold to initiate interventions (Total) _____ mmHg

Check BP every 3-5 minutes throughout algorithm (program monitor if available)

SBP Parameters for pharmacologic intervention

SBP persistently elevated *(circle patient's age parameter)*

0-5 yrs: >120 mmHg
6-12 yrs: >130 mmHg
≥ 13 yrs: >140 mmHg

! Does patient have acute injury, illness, or reason for pain?

YES → **Administer oral or IV fast acting Opioid**

! What triggered AD?

Unrecognized discomfort and **Bladder Distention** are the most common triggers of AD.
Look for cause as you treat and monitor for resolution.

- **Simultaneously** initiate Interventions and consider Medications as you monitor SBP (**every 3-5 min**)
- Notify Provider if symptoms persist after interventions and proceeding to medications

Interventions

IMMEDIATE INITIAL INTERVENTIONS

- Sit patient upright in bed ≥ 45 degrees (during/between interventions)
- If in wheelchair, transfer to bed with HOB ≥ 45 degrees
- Call Rehab Charge RN at 7-6538
- Call RRT if unfamiliar with AD to assist with management
- Loosen clothing, diaper, abdominal binder
- Remove Compression Stockings or SCDs
- Remove Orthotics (AFOs, hand splints)
- Obtain patient's prepared "AD Kit"

EMPTY BLADDER

If on Intermittent Catheterization:

- Catheterize
- If unable to pass catheter, try Coude catheter or consult Urology urgently

If Indwelling Catheter (Foley or Suprapubic):

- Check for kinks or plug
- Empty bag if full
- IF PLUGGED:
  - Gently irrigate with 10-15 mL NS and withdraw
  - Stop if more than mild resistance encountered
- Change catheter, as needed

CHECK RECTAL VAULT FOR STOOL

- Perform digital rectal exam and remove stool
- If AD worsens with manual evacuation, stop. Coat the external surface of the anus with 2% lidocaine jelly and insert a small amount into the rectum. Wait 2 minutes to remove stool.
- Use more lidocaine jelly as lubricant for rectal check.

When BP normalizes, may stop interventions and checking BP. EXIT ALTORITHM. If medications were administered, GO TO MEDICATION FOLLOW-UP PLAN.

Medications

Has Pt taken Sildenafil or Tadalafil in past 24hr?

NO →

Primary Antihypertensive: Nitroglycerin Ointment

- Apply 1 inch of nitroglycerin 2% topical ointment on hairless skin of upper chest or arm (wear gloves while applying)
- If after 10 mins, blood pressure is still above pharmacologic intervention parameters, add 1 more inch of nitroglycerin ointment
- Wipe off ALL nitroglycerin ointment when SBP < 100 mmHg
- If SBP remains elevated, escalate care: RRT or Code Blue and proceed to Secondary Antihypertensive

YES →

Secondary Antihypertensive

- Hydralazine 0.25 mg/kg PO (max 10mg), may repeat x1 dose in 10 minutes

MEDICATION FOLLOW-UP PLAN

- Once SBP normalizes, Recheck Vital Signs q15 min X 1 hr and at 2 hr post-event

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For questions concerning this pathway, contact: Autonomicdysreflexia@seattlechildrens.org

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Last Updated: July 2020
Next Expected Review: October 2021

Evidence for Symptoms and Parameters

- Signs and symptoms of AD include: (Solinsky, R., Kirshblum, S and Burns, S. 2018)
- Elevated BP (see below)
  - Headache
  - Blurred Vision
  - Nasal Congestion
  - Gooseflesh/goosebumps
  - Above level of injury:
  - Sweating
  - Flushing

- *Systolic BP parameters of AD (Solinsky, R., Kirshblum, S and Burns, S. 2018)*
  - Adults: significant increase in BP of 20-40 mmHg above baseline
  - Adolescents: 15-20mmHg above baseline
  - Children: >15mmHg above baseline

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Evidence on BP Parameters

- Acute Management of Autonomic Dysreflexia Clinical Practice Guideline recommends the following thresholds *[LOE: Guideline (III/IV) (Parsons 2001)]*
  - Children: >15mmHg above baseline
  - Adolescents: 15-20mmHg above baseline
  - Adults: significant increase in BP of 20-40 mmHg above baseline

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Evidence on Treatment of AD

Acute Management of Autonomic Dysreflexia Clinical Practice Guideline recommends the following steps [LOE: Guideline (Parsons 2001)]

- *Sit up (III/V)*
- *Loosen clothing (III/V)*
- *Monitor BP and pulse frequently (III/V)*
- *Survey the individual for instigating causes, beginning with the urinary system (III/V)*
- Catheterize (expert consensus)
- If indwelling catheter, check system for patency (expert consensus)
- If catheter is blocked, irrigate with 10-15cc fluid, limit 5-10ml for children <2y, 10-15ml for older children and adolescents. Avoid manually compressing or tapping the bladder (expert consensus)

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Evidence on Treatment of AD, continued

Acute Management of Autonomic Dysreflexia Clinical Practice Guideline recommends the following steps, continued [LOE: Guideline (Parsons 2001)]

- *If acute symptoms persist with elevated BP, rectal check (II/V)*
- *Seek emergent medical intervention to investigate other causes (V)*
- Once stabilized, monitor closely for recurrence for at least 2 hours (expert consensus)

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Evidence on Medications for Treatment of AD

Acute Management of Autonomic Dysreflexia Clinical Practice Guideline recommends the following medications [LOE: Guideline (V) (Parsons 2001)]

- *Consider prazosin, captopril, hydralazine, nitroglycerin ointment. (no evidence on best agent to use)*
- *Consider sodium nitroprusside infusion for rapid titration in a setting with close monitoring*
- *Avoid nifedipine due to uncontrollable decrease in blood pressure*
- *Nitrates are contraindicated if sildenafil has been used in past 24 hours*

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Autonomic Dysreflexia Approval & Citation

Approved by the CSW Autonomic Dysreflexia for October 6, 2016 go live

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Retrieval Website: http://www.seattlechildrens.org/pdf/autonomic-dysreflexia-pathway.pdf

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Evidence Ratings

This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children's. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94.):

Quality ratings are *downgraded* if studies:

- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are *upgraded* if it is felt that:

- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

Guideline – Recommendation is from a published guideline that used methodology deemed acceptable by the team. US Preventative Health Services Task Force rating system is as follows (Parsons 2001):

I – Large RCTs
II – Small RCTs
III – Nonrandomized trials with concurrent or contemporaneous controls
IV - Nonrandomized trials with historical controls
V – Case series with no controls

Expert Opinion – Our expert opinion is based on available evidence that does not meet GRADE criteria (for example, case-control studies).

Quality of Evidence:
✪✪✪✪ High quality
✪✪✪○ Moderate quality
✪✪○○ Low quality
✪○○○ Very low quality
Guideline
Expert Opinion

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Summary of Version Changes

- **Version 1 (10/6/2016):** Go live
- **Version 2 (7/21/2020):** Updated signs and symptoms along with some minor visual edits.

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Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children's Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.

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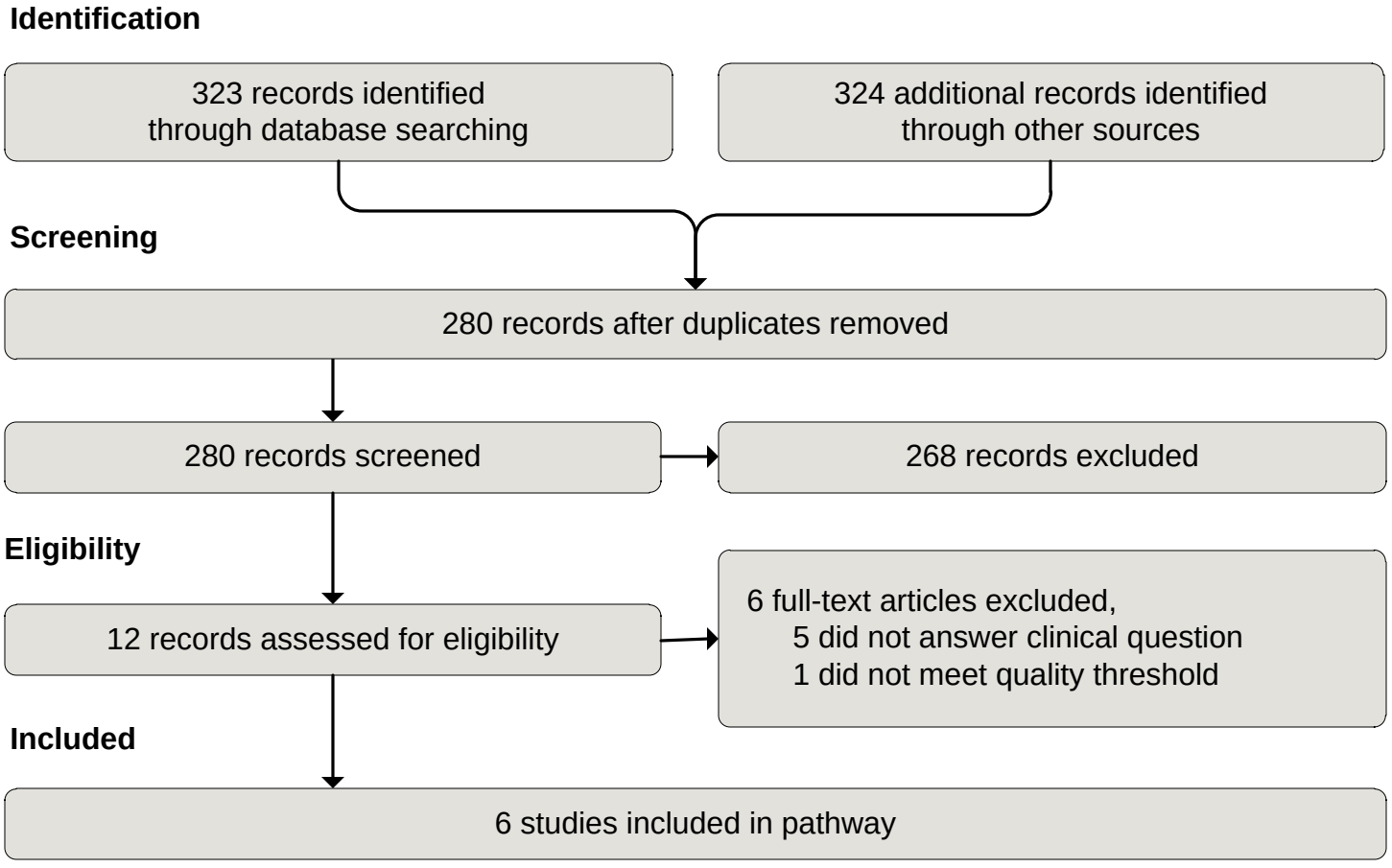
Bibliography

Search Methods, Autonomic Dysreflexia

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Jackie Morton. The searches were performed in September 2015. The following databases were searched – on the Ovid platform: Medline, Cochrane Database of Systematic Reviews; elsewhere – Embase, National Guideline Clearinghouse, TRIP and Cincinnati Children's Evidence-Based Recommendations. The search was conducted from 2006 to September 2015. Retrieval was limited to humans and English language. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases using their controlled vocabularies, where available, along with text words. Concepts searched were autonomic dysreflexia or spinal cord injuries autonomic pathways or sympathetic nervous system or with the following complications (hyperreflexia or hypertension or headache or cardiac arrhythmias). The retrieval was further limited to certain evidence categories, such as relevant publication and study types.

Jackie Morton, MLS
July 8, 2016



Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535

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Added June 2020

Solinsky, R., Kirshblum, S and Burns, S. 2018. Exploring detailed characteristics of autonomic dysreflexia, The Journal of Spinal Cord Medicine, 42:5, 549-555.

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