Queensland Spinal Cord Injuries Service

Procedural Skill

Autonomic Dysreflexia

Facilitator Resource Kit

CSDS
Clinical Skills Development Service

Queensland Government

QSCIS

The Queensland Spinal Cord Injuries Service, located in Brisbane, Queensland, Australia, has developed a unique continuum for the acute care, rehabilitation and ongoing management of individuals with spinal cord injuries, representing a best practice model in this field.

The Queensland Spinal Cord Injuries Service provides world-class care to people with spinal cord injury. We aim to assist individuals who have had spinal cord injury to reach their maximum potential, and stay healthy.

Developed by Julie Bundz, Clinical Nurse Consultant, Spinal Outreach Team (SPOT) QSCIS with support from the Brain and Spinal Cord Injury (BaSCI) project.

Reviewed by Dr Sridhar Atresh Medical Director, Spinal Injuries Unit and Dr Claire Panagoda Staff Specialist, Spinal Injuries Unit/ BaSCI project Clinical Lead

About this training resource kit

Queensland Spinal Cord Injuries Service
Autonomic Dysreflexia: Procedural skill – Facilitator resource kit
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This resource kit provides healthcare workers with knowledge of awareness of the cause for and management plan of Autonomic Dysreflexia (AD).

National Safety and Quality Health Service (NSQHS) Standards

Target audience

Ward medical and nursing clinicians

Allied Health

Duration

30-45 minutes.

Group size

Small group participation (2-4 participants).

Learning objectives

By the end of this session the participant will be able to:

- Identify people at risk of Autonomic Dysreflexia (AD)
- Know the signs and symptoms of AD
- Perform an assessment to identify causes of AD
- Discuss the challenges of managing someone with AD

Facilitation guide

1. Provide associated participant resource kit to the learner.
2. Use the infographic to discuss the background information on AD, including signs and symptoms.
3. Discuss assessment of person with AD signs and symptoms and the acute management of AD.
4. Facilitate group discussion using suggested questions.

Overview Autonomic Dysreflexia

AD is a medical emergency characterised by acute elevation of arterial blood pressure greater than 20mmHg above the usual resting systolic blood pressure. It occurs in individuals with an SCI at or above T6 due to unregulated sympathetic activity below the level of injury in response to a noxious stimuli. Symptoms range in severity and may include pounding headache, sweating, chest tightness, blurred vision, nasal congestion, piloerection and anxiety. Untreated episodes can result in stroke, seizures, myocardial infarction and death.

The cause for AD is most commonly a bladder, bowel or skin issues but it can occur with any potentially irritating stimulus. People with SCI should be educated to recognise AD early and to seek urgent medical treatment. Patients and carers can often suggest the cause. Wallet-sized AD management cards are available, as local health services may not be experienced in its management.

Further reading

Video: Pathophysiology of Autonomic Dysreflexia	
Organisation	Explanation of Autonomic Dysreflexia: Dr Matt and Dr Mike's Medical Education
Link	Autonomic Dysreflexia - YouTube

Autonomic Dysreflexia Following Spinal Cord Injury	
Organisation	SCIRE Project
Link	https://scireproject.com/wp-content/uploads/2022/04/AD-Chapter-Mar-26-18-FINAL.pdf

Treatment of Autonomic Dysreflexia for Adults & Adolescents with SCI	
Organisation	NSW State Spinal Cord Injury Service
Link	https://aci.health.nsw.gov.au/__data/assets/pdf_file/0007/155149/Autonomic-Dysreflexia-Treatment.pdf

Treatment Algorithm for Autonomic Dysreflexia (Hypertensive Crisis) in SCI	
Organisation	Quality & Safety Unit, NSW Health Department
Link	https://aci.health.nsw.gov.au/__data/assets/pdf_file/0019/155143/algorithm.pdf

Autonomic Dysreflexia management cards	
Organisation	Queensland Government
Link	https://www.health.qld.gov.au/__data/assets/pdf_file/0027/422685/ad-card.pdf

Procedural skill

Resources required

Equipment	• Mannequin/simulated patient • Catheter tubing and leg bag • Sphygmomanometer

Case 1

32yo male with C5 tetraplegia AIS A. He has an indwelling urethral catheter in-situ with a leg bag attached. He has returned from the physiotherapy gym and has noted a red rash on his chest (see photograph). He has an abdominal binder and is sitting in his wheelchair in a tilted back position.

Question and answer guide

Ask the learner to assess what they would clinically review:

Would this be a red flag for autonomic dysreflexia and why?

Appropriate response:

An individual with C5 tetraplegia would be at risk of AD. This person has flushing above their level of injury which indicates vasodilation above the level of injury.

What should the clinician do to initially assess if the person has autonomic dysreflexia or not?

- Take a blood pressure. Person's usual BP is 90/65.
- Check the catheter tubing and bag.
- Other measures: release abdominal binder, loosen tight clothing and sit upright in wheelchair if BP elevated.
- Perform bladder scan
- Ask about whether the bowels have been emptying well.
- Monitor person and ask if they are experiencing any other symptoms such as a headache. Provide reassurance that the issue is being managed.

Assessment findings:

- Blood pressure is 130/85 and the PR is 60BPM. Person's usual BP is 90/65.
- Urine drainage- 100ml of dark coloured urine in bag and the catheter tubing is cool to the touch.
- The binder is released and the BP drops to 120/80 and the PR is 67 BPM.
- Bowels opened well that morning and nil concerns for constipation.

Take a moment to discuss information from clinical assessment.

Appropriate response:

- Reducing the blood pressure can be done through removing compression such as the binder and stockings as well as sitting the person up.
- Bladder is likely to be cause of the AD. The bladder scan may not be accurate but can assist with providing a possible cause until the person can be fully assessed. A cool touch of the urinary catheter also a good indicator that urine has not been flowing from the bladder into the bag.

Actions and Plan:

- Hoist the person back to bed and perform a bladder scan, check blood pressure and plan to change the catheter.
- Upon returning to bed the BP increases to 140/90 and the PR is 58BPM.
- Bladder scan shows 250ml of urine in the bladder.
- Continue with the plan to change the catheter. Upon removal of the catheter, insert lignocaine gel into the urethra with time allowed for anaesthetic to take effect before inserting the catheter to reduce further noxious stimuli.
- If the bladder is overdistended, drain 500ml initially, then 250ml every 10-15 minutes to avoid hypotension.
- Monitor BP at least every 2-5 minutes.

Case 2

41yo male with T4 paraplegia and a sudden onset of headache. He is lying in bed with the head raised and has just finished his breakfast. The only medication he is taking is baclofen 10mg TDS, 15mg sennokot nocte and enemas in the morning which he has after breakfast. He has an IDC in-situ. He has noticed an increase in spasms this morning too.

Question and answer guide

Ask the learner to assess what they would clinically review:

Would this be a red flag for autonomic dysreflexia and why?

Appropriate response:

An individual with T4 paraplegia would be at risk of AD and this person has a potential symptom of AD which is a sudden onset headache.

What should the clinician do to assess that if the person has AD or not?

- Take a blood pressure. Person's usual BP is 100/70.
- Check the catheter tubing and the bag for kinking or blockages.

- Ask about the bowels and recent activity.

Assessment findings:

- Blood pressure is 140/85 and the PR is 58 BPM.
- The catheter tubing feels warm to touch and the urine bag was emptied on night duty and there is another 300ml urine in the bag.
- Bowels have been opening small amounts for the last 3 days and the stool was described as type 2 on a Bristol Stool Chart.
- This person has been a hospital inpatient for primary spinal cord injury rehabilitation and has not been prescribed any medications for erectile dysfunction.

Take a moment to discuss information from clinical assessment.

Plan for management and further clinical information:

- Two people are required to manage this situation
- Sit the person upright or elevate the head of the bed. Loosen clothes and remove compression stockings or abdominal binders.
- Empty the catheter bag. A further check shows urine flowing through the catheter.
- The blood pressure is now 172/111 with PR 48 BPM.
- Pharmacological intervention should be considered if the systolic BP is above 150 mmHg. This should be used if the cause cannot be alleviated quickly or is difficult to isolate. After undertaking an assessment of whether contraindications to the administration of GTN exist, the treating team must ensure the medication is correctly prescribed. BP must be checked every 2-5 minutes after medication administration, monitoring closely for rebound hypotension. Doses can be repeated at 5-10 minutes or as advised by the treating medical officer.
- Do not use glyceryl trinitrate (GTN) if sildenafil (Viagra) or vardenafil (Levitra) has been taken in the previous 24 hours or tadalafil (Cialis) in the previous 4 days.

REFER TO THE SUPPORTING DOCUMENT:

Clinical Treatment Procedure

- Re-checked the blood pressure and it is 172/111 PR is 48 BPM.
- As this person does not have contraindications to the use of GTN, give one spray of glyceryl trinitrate (Nitrolingual Pump spray) under the tongue OR apply 5mg transdermal patch to chest or upper arms. Remove patch once BP settles.
- If GTN is not available or is contraindicated, give 25mg of Captopril under the tongue.
- Lie the person down to allow for a roll of the person to check for stool in the rectum.
- Insert a generous amount of lignocaine gel prior to a rectal assessment. If there is faecal matter present, gently remove. Monitor the person and their BP throughout the procedure. Insert an enema after faecal matter is removed to complete the rectal evacuation.
- Raise the head of the bed as soon as able and continue to closely monitor the person.

- The BP settles quickly to 106/70 after a large bowel motion.
- Document the episode in the clinical notes and provide a plan of care for the person. Monitor the person's vital signs for at least four (4) hours following the AD episode.
- Consider the need for additional aperients and/or abdominal x-ray to review constipation.
- Provide ongoing education to the person on diet and fluid intake and the impact of constipation after SCI.

Discussion questions and notes

Who is at risk of AD?

Complete and incomplete SCI at or above the neurological level of T6. People with complete injuries are more susceptible due to the sympathetic nervous system being unregulated by their parasympathetic nervous system.

What is considered an average BP in someone with a high-level SCI?

An acceptable blood pressure for someone with SCI at T6 and above could be as low as 90/60 in supine, potentially lower in sitting.

This could vary depending on other health issues, including pre-existing hypertension and medications.

Why is the pathological response different above and below the injury?

There is message disruption at the site of the spinal cord damage. When the body detects the noxious stimuli, the response causes vasoconstriction below the level of injury and a subsequent hypertensive crisis.

Above the level of injury, the hypertensive crisis in detected in the carotid baroceptors and responds by stimulating vasodilation above the level of spinal cord injury. This can result in a headache, bradycardia, a rash above level of injury and sweating.

Catecholamine released during the autonomic dysreflexia causes the side effects of feeling anxious and chest tightness.

What are the common signs and symptoms of AD?

Common signs and symptoms are

1. Increase in systolic BP at least 20mmHg above person's usual BP
2. Bradycardia
3. Pounding headache
4. Sweating and flushing/rash above the level of injury
5. Chest tightness or anxiety

Not all people experience signs of Autonomic Dysreflexia. This is called ‘silent’ Autonomic Dysreflexia (AKA as asymptomatic AD) and should be assessed and managed with the same clinical urgency as in cases where symptoms are present.

What are the common causes of AD?

Any noxious stimuli below the level of injury can cause AD. The most common causes are bladder and bowel issues. The following can be examples of causes:

- full bladder
- urinary tract infection
- renal stones/ureteric calculi
- epididymo-orchitis
- testicular torsion
- constipation and faecal impaction
- rectal trauma or related injury such as haemorrhoids, fissures, prolapse
- pressure injuries and skin damage
- tight clothing including shoes
- fractures
- heterotopic ossification
- ingrown toenails
- gallstones
- intrauterine ossification
- menstruation, pregnancy and labour

What should the clinician do when they identify the person has AD?

1. If able, sit the person upright to lower the blood pressure
2. Request assistance and notify the nursing and medical team.
3. Check blood pressure every 2-5 minutes
4. Loosen tight clothing such as binders, shoes and stockings
5. Investigate the cause of the problem with consideration to hoisting the person back to bed to complete a full assessment and/or attend intervention
    a. Ask the person if they suspect a cause
    b. Bladder:
        i. Feel the catheter tubing- if it is cool to touch then the catheter isn't draining
        ii. Check the volume of urine in the bag and assess fluids input and output
        iii. If the person is doing intermittent catheterisation, consider passing a catheter to empty the bladder regardless of when the last one was done
    c. Bowel:
        i. Get a history of the recent bowel output
        ii. Attend to a rectal examination to check the lower bowel with the use of lignocaine gel
    d. Skin:
        i. Attend a full skin check looking for any evidence of wounds or infection

    e. Other:
        i. If still not able to identify or resolve the cause of the Autonomic Dysreflexia, undertake a take a thorough history and assessment in conjunction with the medical officer to explore other potential issues like fractures, renal stones, menstrual cycles or any other health concerns.
6. Document:
    a. Description of the cause
    b. Changes in BP to the response to the intervention
    c. Signs and symptoms experienced by the person
    d. Any medication was given and the clinical response
    e. A plan for further follow up including any investigations required and any changes to the medication routine such as increasing aperients for the bowels.
7. Provide ongoing education to the person and their supports. Education is especially important when planning for discharge. This should also include any scripted medication as well as the storage and use of same.

When is the episode of AD considered to be resolved?

- The cause has been identified and management commenced.
- Blood pressure and pulse rate return to the person's baseline.
- The person isn't experiencing any further signs or symptoms of AD.

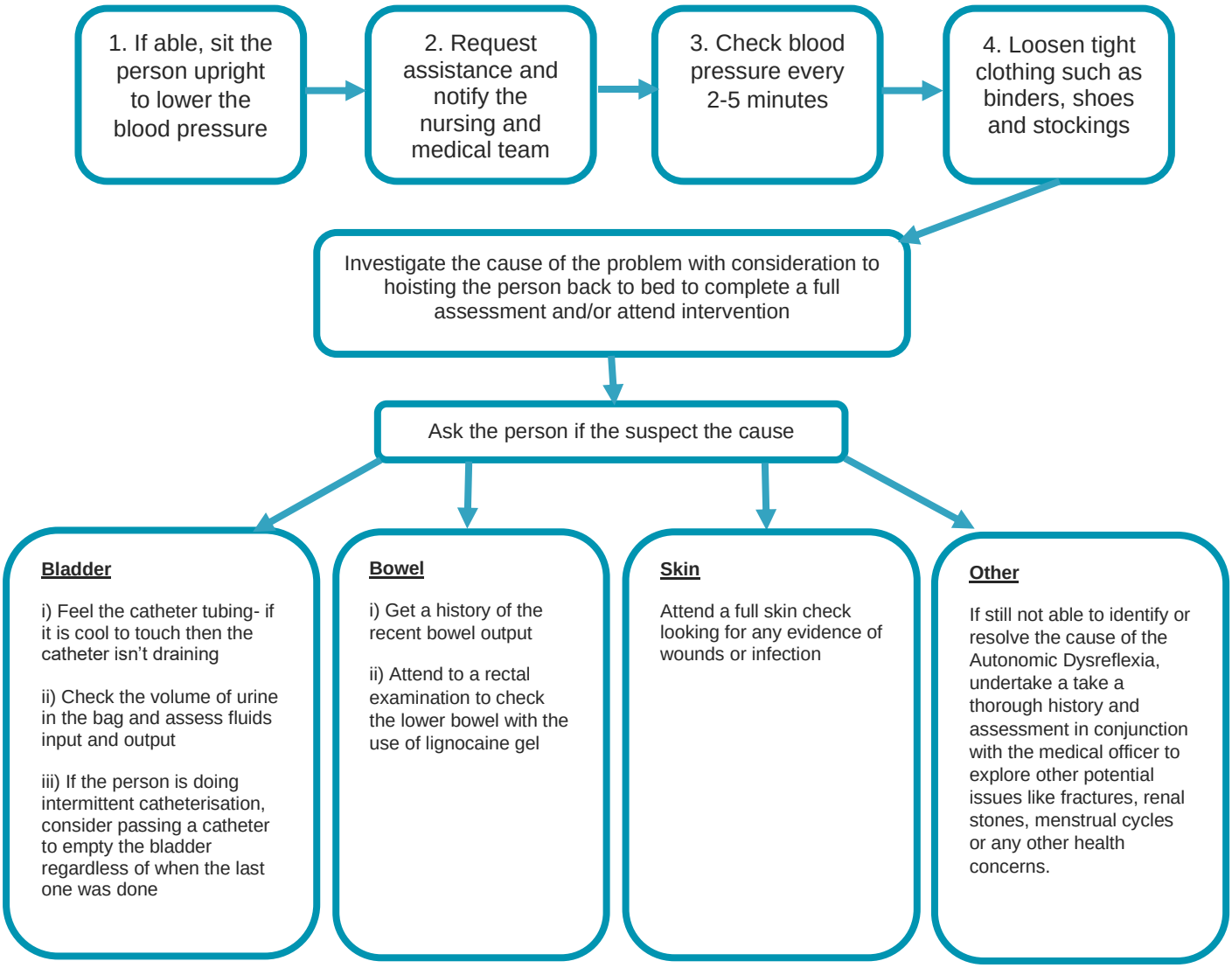
What is the recommended follow up after the AD event?

- Monitor patient vital signs for at least four (4) hours post the AD episode.
- The person may experience residual effects of the catecholamine release with symptoms of anxiety or sleep disturbances.
- Prevention is the best method management. This requires education of the person and their caregivers on bowel, bladder and skin management.

If glyceryl trinitrate or captopril do not lower the blood pressure sufficiently AND The cause of the autonomic dysreflexia has not been identified, please contact for further advice: The On Call Consultant Spinal Injuries Unit, Princess Alexandra Hospital Ipswich Road, Woolloongabba, Qld, 4102 Princess Alexandra Hospital Switch: Ph (07) 3176 2111 and ask for the SIU Registrar in business days or on-call SIU Consultant during after hours for the Spinal Injuries Unit OR Arrange transport to the nearest emergency department

Supporting document

Clinical treatment procedure



Acronyms and abbreviations

Term	Definition
EG	EXAMPLE
SCI	Spinal cord injury
AD	Autonomic dysreflexia
SIU	Spinal Injuries Unit

References

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https://www.surveymonkey.com/r/3FWL3ZD

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Visit csds.qld.edu.au/qfe
Email CSDS-Admin@health.qld.gov.au
Phone +61 7 3646 6500

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