Background

Autonomic dysreflexia is a medical emergency that can occur in people with spinal cord injury at or above the sixth thoracic (T6) level. It is a sudden and severe rise in blood pressure resulting from overactivity of an isolated sympathetic nervous system below the lesion, triggered by a nociceptive stimulus that can result in intracranial haemorrhage, fits, arrhythmias, hypertensive encephalopathy and even death. This potentially life-threatening condition requires immediate and decisive action.

Spinal units are very familiar with the diagnosis and treatment of autonomic dysreflexia. However, people with spinal cord injury most often present or are taken by an ambulance to their nearest healthcare facility. As spinal cord injury is not a common condition local healthcare professionals may have little or no experience in recognising or managing autonomic dysreflexia. This has resulted in preventable adverse outcomes with a minimum of 3-4 critical incidents per annum in NSW.

Symptoms and Signs

The person may present with all or some of the following:

- Pounding headache, which gets worse as the blood pressure rises
- Flushing or blotching of the skin and/or profuse sweating above SCI lesion level
- Skin pallor and piloerection (goose pumps) below spinal cord injury lesion level
- Blurred vision, nasal congestion (stuffiness)
- Chills without fever
- Shortness of breath, sense of apprehension or anxiety
- Hypertension - blood pressure is significantly elevated (at least 20-40 mmHg above normal resting systolic level) in people with autonomic dysreflexia

Note: It is important to remember that blood pressure for individuals with high paraplegia or tetraplegia may usually be low, around 90-100/60 mmHg lying down and possibly lower whilst sitting. Therefore, patients with spinal cord injury may become symptomatic with blood pressure in the normal range for the general population

- Bradycardia (as secondary compensatory response to raised blood pressure).

Common Causes of Autonomic Dysreflexia

Any irritating stimulus below the level of the spinal cord injury lesion may precipitate autonomic dysreflexia. Causes of irritation include the following:

- Bladder-related: bladder distension, urine infection, calculus, epididymo-orchitis
- Bowel-related: bowel distension from constipation, inflamed haemorrhoids, chemical irritation from suppositories
- Skin-related: pressure sore, burn, ingrowing toe nail
- Other: fractured bones, contracting uterus, acute abdominal condition.

Treatment

Refer to page 4 for the Autonomic Dysreflexia Treatment Algorithm.

Suggested Actions by Area Health Services

1. Review local practices to include the suggested actions.
2. Ensure an autonomic dysreflexia management algorithm is available in each health service.
Treatment Alert
DO NOT use glyceryl trinitrate if sildenafil (Viagra) or vardenafil (Levitra) has been taken in the previous 24 hours or tadalafil (Cialis) in the previous 4 days. A rectal examination or insertion of an indwelling catheter may exacerbate autonomic dysreflexia.

Suggested Actions
Emergency Departments and the Ambulance Service are often the first point of contact for the person with autonomic dysreflexia. To prevent delayed or missed diagnosis of autonomic dysreflexia, it is recommended that the following steps be followed.

Ambulance Officers and Services
- Ambulance triage officers should be familiar with the symptoms and signs of autonomic dysreflexia and be able to alert and dispatch Paramedics to respond quickly to this situation.
- When assessing a person with spinal cord injury at/above the T6 level, a high index of suspicion for autonomic dysreflexia is required. The person should be asked if they have had autonomic dysreflexia before and simple measures to reduce blood pressure should be taken.
- Ring ahead to alert the Emergency Department that a person with suspected autonomic dysreflexia is arriving.
- Ensure the autonomic dysreflexia management algorithm is readily available in ambulances.
- Provide education on autonomic dysreflexia management on a regular basis.
- Have nitrolingual spray, anginine tablets or glyceryl trinitrate transdermal patch available.

Emergency Departments
- On arrival at the Emergency Department, the patient should be seen immediately by the triage nurse. Suspected autonomic dysreflexia should be assigned a Category 2.
- A senior registrar or consultant should assess the patient as soon as possible to establish the diagnosis of autonomic dysreflexia and initiate appropriate treatment.
- The cause of autonomic dysreflexia needs to be identified and treated for resolution. If no cause is found and/or autonomic dysreflexia persists, blood pressure must be adequately controlled. Management of hypertensive crisis with intravenous medication may be required to control blood pressure, while contact is being made with a spinal specialist about further management (see below).
- After resolution of an autonomic dysreflexia episode, blood pressure should be monitored for 4 hours. In some severe cases of autonomic dysreflexia, the person should be admitted for observation.
- Ensure the autonomic dysreflexia management algorithm (refer to page 4) is easily available in the Emergency Department and education on autonomic dysreflexia management is provided.
- For facilities using the EDIS/Firstnet a clinical alert should be entered onto the system noting that “the patient is at risk of autonomic dysreflexia please refer to Safety Notice 011/08 – Autonomic Dysreflexia for guidance in the management of this condition”.

Staff in general hospitals and wards
- Any person with spinal cord injury at/above the T6 level should have a “when necessary” order for nitrolingual spray or anginine tablet/s recorded on the drug chart on admission.
- Development of symptoms and signs of autonomic dysreflexia requires immediate attention to assess blood pressure and look for reversible causes. If a reversible cause is not rapidly found, prompt medical review is necessary to further assess possible causes and initiate appropriate treatment.
- The autonomic dysreflexia management algorithm (refer to page 4) should be easily available.
- For facilities using the electronic medical record a clinical alert should be entered onto the system noting that “the patient is at risk of autonomic dysreflexia please refer to Safety Notice 011/08 – Autonomic Dysreflexia for guidance in the management of this condition”.

Further Advice about Patient Management
If glyceryl trinitrate or nifedipine do not lower the blood pressure sufficiently and/or the cause of the autonomic dysreflexia has not been identified please contact, via the hospital switch board, the on-call Spinal Cord Injury Physician at either Royal North Shore Hospital (02) 9926 7111 or Prince of Wales Hospital (02) 9382 2222.
Other Suggested Actions

Patient Management Plans

- Patients and carers know about this condition and can often suggest a cause of the symptoms and management strategies.
- Patients may be carrying an Autonomic Dysreflexia Management Card with them that can assist to identify the cause of symptoms and provide treatment strategies.
- It is suggested that Autonomic Dysreflexia is noted in the EDIS, NSW Health medical record or Electronic Medical Record Alert and NSW Ambulance Service Alert (Protocol 71 or electronic Mobile Data Terminal) systems.

Further Information about Autonomic Dysreflexia

The NSW State Spinal Cord injury Service website includes clinical information sheets and practice guides about:

- Treatment of Autonomic Dysreflexia for Adults with spinal cord injury
- An Overview of Skin and Pressure Ulcer Management
- Management of the Neurogenic Bladder in spinal cord injury
- Management of the Neurogenic Bowel in spinal cord injury
Treatment Algorithm for Autonomic Dysreflexia (Hypertensive Crisis) In Spinal Cord Injury

Symptoms and signs of Autonomic Dysreflexia
ASK PERSON AND CARER IF A CAUSE IS SUSPECTED
(Common causes to exclude first are:

Check Blood Pressure (BP)
Is BP ≥ 20mmHg above resting level ?
(NB BP in a person with tetraplegia or high paraplegia is typically low e.g. 90-100/60mmHg)

NOTE: THIS REQUIRES IMMEDIATE INTERVENTION
Monitor BP & pulse until symptoms have resolved
Sit person upright and lower legs, if possible
Loosen any tight clothing/leg straps
Remove compression stockings/abdominal binder

CHECK FOR BLADDER DISTENSION
How does person empty bladder?
By intermittent self-catheterisation, reflex or ‘spontaneous’ voiding

Is catheter now draining?
YES

Insert generous amount of Lignocaine (2% anaesthetic) gel into urethra;
wait 3-5 mins and pass/replace catheter

If BP not settling promptly or cause not identified,
admit to hospital for BP control & investigation.

CHECK FOR CONSTIPATION
Insert generous amount of Lignocaine (2% anaesthetic) gel into rectum;
wait 3-5 mins, then perform gentle PR exam

If rectum is full and systolic BP < 150mmHg, perform manual evacuation

If BP not settling promptly or cause not identified,
admit to hospital for BP control & investigation.
Intravenous medication may be necessary
CONTACT SPINAL PHYSICIAN/REGISTRAR ON CALL AT YOUR NEAREST SPINAL INJURIES UNIT FOR SPECIALIST ADVICE

WARNING:
BEFORE ADMINISTERING ANY ANTI-HYPERTENSIVE MEDICATION,
ALWAYS CHECK FOR RECENT USE OF MEDICATION FOR ERECTILE DYSFUNCTION.
DO NOT USE GTN SPRAY, TABLETS OR PATCH
IF SILDENAFIL (VIAGRA) OR VARDENAFIL (LEVITRA)
HAS BEEN INUSED IN LAST 24 HOURS OR TADALAFIL (CIALIS) HAS BEEN TAKEN WITHIN LAST 4 DAYS!
MONITOR FOR HYPOPOTENSION

Administer 1 Nitroglycerine spray OR 1/2 Anginine tablet under tongue
(Dose can be repeated in 5-10 mins).
Alternatively, apply one 5mg GTN Transdermal Patch to chest or upper arm. (NB. Remove patch once stimulus and hypertension has resolved or if BP drops too low).

Swallow 1 crushed 10mg Nifedipine tablet.

DISCLAIMER
All recommendations are intended for people with spinal cord injury as a group. Individual therapeutic decisions must be made by combining the recommendations with clinical judgement, informed by a detailed knowledge of the individual person’s unique risks and medical history, findings on physical examination, as well as the resources available.
This algorithm was endorsed for use by the Australian and New Zealand Spinal Cord Society (ANZSCOS) in March 2006.
Information contained in this algorithm will be periodically reviewed and updated on the NSW Health CIAP website.
This project was funded by the Motor Accidents Authority of NSW.

NB. Commence anticholinergic medication
'prolonged' voiding

If the bladder is overdistended, drain 500mls initially,
then 250mls every 10-15 mins to avoid hypotension.

If systolic BP ≥170mmHg?

If BP ≥ 20mmHg above resting level?

Is systolic BP increases ≥ 20mmHg above resting level?

Check for kinked tubing, full leg bag or blocked catheter
Estimate volume in leg bag; compare with fluid intake & usual urine drainage pattern

Is catheter draining satisfactorily?
YES
NO

IDC/SPC is blocked
Irrigate catheter gently with no more than 30mls of normal saline

Is catheter now draining?
YES
NO

If BP not settling down?
 YES
NO

If systolic BP ≥170mmHg?

Check BP before proceeding

Is BP ≥ 20mmHg above resting level?

Is BP ≥ 20mmHg above resting level?

If symptomatic hypotension, lay the person down and
-if symptomatic hypotension, lay the person down and
elevate legs
-IF SYMPTOMS RECUR CONTACT A SPINAL PHYSICIAN URGENTLY

Is BP settling down?

If systolic BP ≥150mmHg

If rectum is full and systolic BP < 150mmHg, perform manual evacuation

If systolic BP ≥150mmHg

If BP not settling promptly or cause not identified,

LOOK FOR OTHER CAUSES OF NOCICEPTION
Exclude intra-abdominal pathology, epididymo-orchitis,
pressure sores, burns, ingrown toenail, fracture.
Ensure adequate analgesia (eg. morphine) is given when there is a persisting known cause of noxious stimulation

If BP not settling promptly or cause not identified, admit to hospital for BP control & investigation.
Intravenous medication may be necessary
CONTACT SPINAL PHYSICIAN/REGISTRAR ON CALL AT YOUR NEAREST SPINAL INJURIES UNIT FOR SPECIALIST ADVICE

NB BP in a person with tetraplegia or high paraplegia is typically low e.g. 90-100/60mmHg

Is BP ≥ 20mmHg above resting level?

Check for kinked tubing, full leg bag or blocked catheter
Estimate volume in leg bag; compare with fluid intake & usual urine drainage pattern

Is catheter draining satisfactorily?

If systolic BP increases ≥ 20mmHg above resting level?

Check for kinked tubing, full leg bag or blocked catheter
Estimate volume in leg bag; compare with fluid intake & usual urine drainage pattern

Is catheter draining satisfactorily?

If symptomatic hypotension, lay the person down and
-if symptomatic hypotension, lay the person down and
elevate legs
-IF SYMPTOMS RECUR CONTACT A SPINAL PHYSICIAN URGENTLY

Is BP ≤ 150mmHg?

Is systolic BP ≥170mmHg?

Check BP before proceeding

Is BP ≥ 20mmHg above resting level?

Is systolic BP ≥150mmHg

If symptomatic hypotension, lay the person down and
-if symptomatic hypotension, lay the person down and
elevate legs
-IF SYMPTOMS RECUR CONTACT A SPINAL PHYSICIAN URGENTLY

Is BP ≤ 150mmHg?

Is systolic BP ≥170mmHg?

Check BP before proceeding

Is BP ≥ 20mmHg above resting level?

Is systolic BP ≥150mmHg

If symptomatic hypotension, lay the person down and
-if symptomatic hypotension, lay the person down and
elevate legs
-IF SYMPTOMS RECUR CONTACT A SPINAL PHYSICIAN URGENTLY

Is BP ≤ 150mmHg?