**Autonomic Dysreflexia**

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| **Pathophysiology** | * **Uninhibited** **sympathetic** **reflex** caused by a noxious stimulus below the level of SCI
* **Most commonly occurs in SCI at level T6 or above**; complete more common than incomplete
* Lesions below T6 have improved sympathetic inhibitory outflow to the splanchnic nerve
* Clinical emergency in SCI
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| **Etiologies** | * Most commonly from **bowel, bladder, and skin irritation**
* Other causes: ingrown nails, medications, systemic reactions, abdominal conditions (appendicitis, cholecystitis, or kidney stones), unhealed surgical site, orgasm, menstrual cycle and labor in female patients, etc.
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| **Presentations** | * **Hypertension** (**SBP>20mm over post-SCI baseline**), **bradycardia**/tachycardia, headache, sweating, flushing, dilated pupils, nasal congestion, piloerection, etc. (Some patients have no symptoms at all)
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| **Management** | Find and address the underlying causes:* GU - drain bladder; flush Foley catheter
* GI - evaluation of bowel program; check for rectal impaction (use lidocaine before evaluation as a rectal exam could worsen AD)
* Skin - assess for pressure injury (especially **sacral** **dermatomes**)
* If nothing else works: Topical nitro paste to prevent cerebral injury (contraindicated in patients on vasodilators) until cause is identified and treated
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| **Complications** | * Stroke, MI, seizures, and intracerebral hemorrhage
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**Pressure Injuries**

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| **Common locations** | * First two years: **Sacrum**, **calcaneus**, and **ischium** (occiput and scapula in cervical level injuries)
* Greater than 2 years post injury: **Ischium** and **trochanters** in chronic SCI patients
* 25% of SCI patients experience at least one pressure injury in the acute hospital or rehab setting
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| **Stages of pressure injury** | * Stage I – intact skin with an area of **non-blanchable** erythema; no skin breakdown/drainage
* Stage II – **partial thickness skin loss** with exposure of dermis, pink or red base
* Stage III – **full-thickness skin loss with exposed fat**, granulation tissue, and rolled wound edges; no muscle, tendon, or bone present
* Stage IV – **exposed muscle, tendon, ligament, or bone**; commonly have undermined edges and tunneling
* Unstageable – presence of eschar or slough in the wound bed
* Deep tissue injuries – **deep, maroon, non-blanchable, no skin breakdown**; possible underlying stage III or IV injury
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| **Prevention** | * Pressure relief
	+ **Offloading areas for 2 minutes every 15-30 minutes**
	+ Forward lean, side-to-side lean, push-up, tilting of chair
	+ If needed in an acute rehab setting, can be turned every 2 hours or be placed prone if tolerable
* Close examination of wheelchair and cushion
* Obtaining a pressure map
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| **Treatment** | * Debridement of slough or eschar
* Alginate for substantial drainage
* Cover the area with a large, foam-type dressing
* Consider oral antibiotics if there is frank pus or the surrounding skin is erythematous
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**Sexual Dysfunction**

**Conversation set up – quiet space, adequate time to discuss sexuality and fertility**

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| **Key anatomic areas for sexual function** – erection and vaginal vaso-congestion | * **Erection/vaginal vasocongestion – parasympathetic nervous system**
	+ Psychogenic component – centrally mediated causing modulation of the sacral reflex arc
	+ Reflexogenic component – parasympathetic nervous system (sacral reflex arc - S2-S4)
	+ Sacral reflex arc
		- Afferent: genitals → pudendal nerve → spinal cord
		- Efferent: parasympathetic fibers from S2-S4; also referred to as pelvic splanchnic nerve
* **Ejaculation – sympathetic nervous system**, specifically the hypogastric nerve (T11-L2)
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| **Erectile dysfunction in SCI patients** | * Most SCI patients only achieve erections through the **reflexogenic mechanism** (sacral reflex)
	+ Reflexogenic erections occur in >90% of complete and incomplete UMN injuries, and 25% of complete LMN lesions
* Psychogenic erections
	+ Occur in about 50% of incomplete UMN injuries, and 25% of complete LMN lesions
	+ Better prognosis with incomplete lesions
* Treatment
	+ Pharmacotherapy
		- Phosphodiesterase inhibitors; caution if patients are already on nitrates, have low baseline blood pressure, or are at risk for AD
		- Intracorporeal injection with prostaglandin E1, alpha-blockers, or vasodilators
	+ Implants, vacuum devices, and ring devices
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| **Ejaculation** | * 10-20% of men can ejaculate normally after SCI injury
	+ Higher chance of ejaculation in incomplete lesions
* Higher success rate with manual or partner masturbation, penile vibratory stimulation (home use, caution in AD patients), and electroejaculation (medical supervision required, caution in AD patients)
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| **Fertility** | * **Male fertility – decreased after SCI**
	+ Quality of semen decreases after SCI
		- Occurs primarily due to **decreased sperm motility** related to prostatic fluid stasis
		- Also impacted by atrophy of the seminiferous tubules
* **Female fertility – maintained after SCI**
	+ Menstrual cycle often stops initially, but returns to normal by 6-12 months after the injury
	+ Gynecologist assessment needed if amenorrhea lasts longer than a year
	+ Important considerations in SCI patients who are pregnant
		- Often have increased spasticity, decreased pulmonary function, recurrent UTIs
		- AD may be the only clinical manifestation of labor
			* Managed with epidural anesthesia
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