



# AUTONOMIC DYSREFLEXIA

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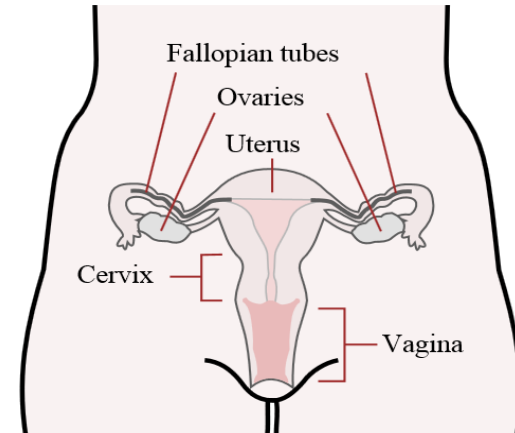
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## DERMATOLOGY



- Constrictive clothing
- Contact with sharp objects
- Blister
- Burn
- Frostbite
- Ingrown toenail
- Insect bite
- Pressure ulcer

## REPRO. SYSTEM



- Labor and delivery
- Menstruation
- Intercourse
- Ejaculation
- STD
- Scrotal compression
- Epididymitis
- Vaginitis

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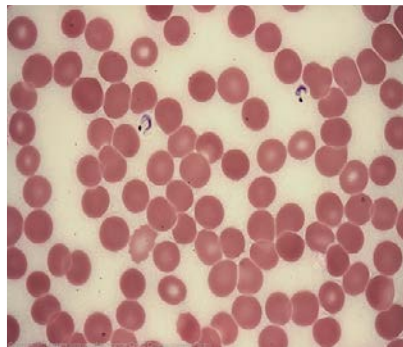
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## HEMATOLOGY



- Pulmonary embolism
- Deep vein thrombosis

## MUSCULOSKELETAL



- Fracture
- Trauma
- Joint dislocation

## MEDS



- Excessive alcohol intake
- Excessive caffeine
- Excessive diuretic intake
- Nasal decongestants
- Sympathomimetics





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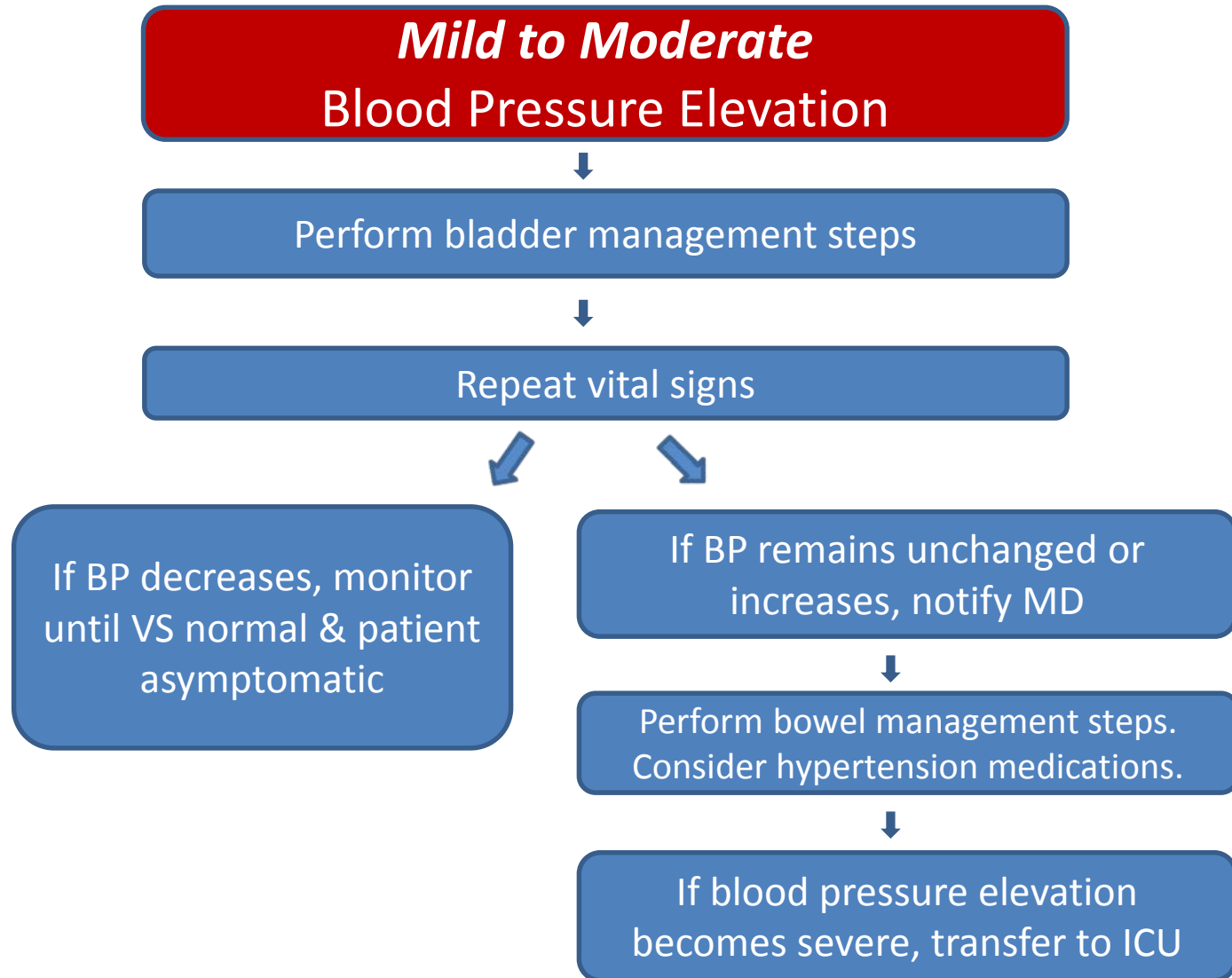
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## **Severe** Blood Pressure Elevation

Notify MD

Consider nifedipine or nitropaste

Perform bladder management steps\*

Place patient on monitor

If BP remains elevated, perform bowel management steps,\* and start hypertension medications if not previously done

If BP elevation remains severe, prepare for transfer to ICU



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# BOWEL MANAGEMENT STEPS





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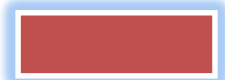
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## Nitroglycerin paste



Rapid onset, reversible



Venous pooling and the drop in BP may trigger an alpha agonist release thereby exacerbating the AD



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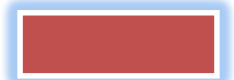
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## Nifedipine



Rapid onset



May cause headache, tachycardia, dizziness, fatigue, nausea, or orthostatic hypotension



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## Hydralazine



Rapid onset, titratable



May cause reflex tachycardia, prolonged hypotension, nausea.

Requires IV access



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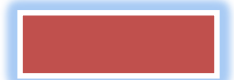
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## Clonidine



Rapid onset with oral form



Withdrawal can cause life threatening hypertension



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## Other Medications

- Phenoxybenzamine
- Prazosin
- Mecamylamine
- Oxybutynin
- Nitroprusside
- Diazoxide
- Trimethaphan camphorsulfonate
- Phentolamine



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## Please take note of the following prior to using this formulary:

- Most of these medications are not FDA approved for the treatment of dysautonomia, particularly in the pediatric population.
- The dosage information provided here is a combination of recommendations from the *Pediatric Dosing Handbook Formulary* and expert opinion.
- It is important for this dosing information to be used with caution and only after full review of the entire dysautonomia module.
- We highly encourage you to discuss medication dosing with a pharmacist and/or pediatric physiatrist if you have any questions or concerns.



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## Nitroglycerin

**Mechanism of Action**

Direct acting vasodilator; causes dilation of the venous system; decreases preload of the heart

**Dose**

- Nitroglycerin 2% paste: Start with 0.5 inch and increase by 0.5 inch increments to achieve desired results. Apply topically 1 inch above the spinal cord injury level (max of 2 doses/day)
- Sublingual (adults): 0.3-0.6 mg q5 minutes (max of 3 doses in 15 minutes)

**Onset**

10-30 minutes

**Duration**

3-6 hours; may wipe away paste to stop action

**Precautions**

May aggravate AD by reflexively increasing sympathetic alpha agonist release secondary to venous pooling and drop in BP

**Dosage Forms**

Topical: 2% ointment  
SL: 0.3 mg, 0.4 mg, 0.6 mg tablets

Nitroglycerin

Nifedipine

Nifedipine Capsule

Hydralazine

Clonidine



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## Nifedipine

### Mechanism of Action

Calcium channel blocker; potent coronary and peripheral arterial vasodilator

### Dose

Children: 0.25-0.5mg/kg/dose (max 10 mg), may repeat every 4-6 hours as needed  
Adult: 10mg chewable

### Onset

SL/"bite and swallow": within 1 – 5 minutes  
IR: within 20 – 30 minutes

### Duration

4 – 8 hours

### Precautions

May cause headache, tachycardia, dizziness, fatigue, nausea, or orthostatic hypotension. Ineffective at prevention of episodes. Do not use the sustained release form.

### Dosage Forms

10 mg capsule (contains 10 mg/0.34 mL); liquid must be withdrawn from capsule

Nitroglycerin

Nifedipine

Nifedipine Capsule

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## Nifedipine Capsule: 10 mg contains 0.34 mL

Weight (Kg)	Dose Range	Volume
≥ 10	2.5 mg – 5 mg	0.09 ml – 0.17 ml
≥ 15	3.75 mg – 7.5 mg	0.13 ml – 0.26 ml
≥ 20	5 mg – 10 mg	0.17 ml – 0.34 ml
≥ 30	7.5 mg – 10 mg	0.26 ml – 0.34 ml
≥ 40	10 mg	0.34 ml

McGinnis et al. J Spinal Cord Med. 2004.

Nitroglycerin

Nifedipine

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## Hydralazine

**Mechanism of Action**

Relaxes smooth muscle; causes peripheral vasodilation.

**Dose**

IV push: 0.1-0.2 mg/kg/dose IM/IV every 4-6 hours as needed (max dose 20mg/dose).

**Onset**

5 – 20 minutes

**Duration**

2 – 6 hours

**Precautions**

May cause tachycardia, vomiting, flushing and headache. May give with diuretic and a beta-blocker to counteract side effects of sodium and water retention and reflex tachycardia.

**Concentration**

20 mg/mL

Nitroglycerin

Nifedipine

Nifedipine Capsule

Hydralazine

Clonidine



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## Clonidine

### Mechanism of Action

Alpha-2 agonist; decreases sympathetic outflow from CNS; peripheral vascular resistance, heart rate, blood pressure, and renal vascular resistance.

### Dose

1-17 years old: 0.05 – 0.1 mg/dose (may repeat hourly up to max total dose 0.8 mg)  
< 1 year old: not recommended (could use dose of 2.5 mcg/kg/dose if no other options)

### Onset

30 – 60 minutes

### Duration

6 – 10 hours

### Precautions

Serious bradycardia may occur if given with other sympatholytic drugs. Rebound hypertension may develop with abrupt withdrawal. May also cause sedation and CNS side effects.

### Dosage Forms

0.1 mg tablet

Nitroglycerin

Nifedipine

Nifedipine  
Capsule

Hydralazine

Clonidine