# Guillain-Barré Syndrome

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## Risk

- Occurs in both sexes, all races, all ages, but mostly affects young and middle-aged adults.
- Worldwide illness and occurs at all times of the year.
- Mortality rate is 3–7%; most pts eventually fully recover and 20% have significant residual weakness.

## Perioperative Risks

- Resp failure secondary to polyneuropathy
- Autonomic dysfunction with profound CV instability

## Worry About

- Rapidity of symptoms; respiratory paralysis may occur within 24 h of onset
- Pulm complications

## Overview

- Polyneuropathy often encountered in critical care practice.
- Pts present initially with lower limb weakness that ascends.
- Widespread, patchy, inflammatory demyelination of peripheral and autonomic nervous systems.
- Dysautonomia occurs from chromatolysis of anteromediolateral cell column and autonomic ganglia: Fluctuating BP, Htn, hypotension, postural hypotension, tachycardia, and arrhythmias.
- CSF protein is usually normal during first few days of illness and steadily rises and remains elevated for several months, even after recovery.

## Etiology

- Evidence points to infection-induced autoimmune response.
- Typically antecedent illness occurs within 4 wk of onset, with respiratory or GI infection (*Campylobacter jejuni*) in 60–70% of cases.
- Other predisposing factors incl surgery, pregnancy, malignancy, and acute seroconversion to HIV.
- Epidural or spinal anesthesia may be antecedent to the event or associated with recurrence.

## Usual Treatment

- Basis of treatment is symptomatic care and plasma exchange or IVIG.
- Maintain daily bedside evaluation of vital capacity and respiratory muscle strength; pts with decreased respiratory reserve should be moved to ICU.
- Utilize elective tracheal intubation and mechanical ventilatory support when signs of respiratory distress are present before $Paco_2$ rises or vital capacity falls.
- Anticipating requirements for ventilatory support include:
  - Vital capacity <20 mL/kg or reduction of 30% from baseline.
  - Maximum inspiratory pressure <30 cm $H_2O$.
  - Maximum expiratory pressure <40 cm $H_2O$.
  - Facial and/or bulbar weakness, autonomic dysfunction, rapid disease progression.
  - Lack of foot flexion at ICU admission/end of immunotherapy, which predicts need for prolonged mechanical ventilation.
- Plasmapheresis or IVIG reduces hospital stay and time spent on ventilator if given to pts who do not improve or who worsen within first 2 wk of symptom onset.

## Assessment Points

| System | Effect | Assessment by Hx | PE | Test |
|---|---|---|---|---|
| HEENT | Inability to close eyes | Dry eyes | Dry eyes | |
| CV | Fluctuating hypotension and Htn, postural hypotension, sinus tachycardia, arrhythmias<br>DVT risk | Orthostatic Sx<br>Palpitations<br>Asymmetric limb swelling | BP/pulse<br>Asymmetric limb swelling | ECG<br>Doppler US |
| RESP | Respiratory failure secondary to weakness<br>Aspiration risk with bulbar dysfunction | Stamina—for breathing | Decreased strength on repeated ventilation<br>Inability to sustain head lift | VC<br>Maximum inspiratory pressure<br>Maximum expiratory pressure |
| GI | Bowel obstruction | Constipation | Abdominal exam | Abdominal x-ray |
| CNS | Autonomic dysfunction<br>Pain: Acute nociceptive and chronic neuropathic | Early satiety<br>Orthostatic hypotension<br>Lack of sweating<br>Pain | BP lying and standing | ECG with R-R interval on deep breathing |
| MS | Weakness, joint fixation | Lack of stamina | | |

**Key References:** Liu J, Wang LN, McNicol ED: Pharmacological treatment for pain in Guillain-Barré syndrome, *Cochrane Database Syst Rev* 4:CD009950, 2015; McSwain JR, Doty JW, Wilson SH: Regional anesthesia in patients with pre-existing neurologic disease, *Curr Opin Anesth* 27(5):538–543, 2014.

## Perioperative Implications

### Preoperative Preparation

- Avoid rapid turning of pt; autonomic instability and postural hypotension may result.
- Avoid head-up (reverse Trendelenburg) position; pt will be unable to maintain CV stability with tilt.
- Treat increased gastric acidity; use antacid and metoclopramide, 10 mg/70 kg.
- Maintain appropriate environmental temp.
- Coagulopathy and hypocalcemia may complicate plasma exchange therapy.

### Monitoring

- Arterial line for continuous pressure monitoring started prior to anesthetic induction.
- Monitor for potential fluid shifts that result from positional changes and cardiac dysrhythmias.
- Temperature; pts may become poikilothermic.
- Neuromuscular monitoring; pt may be sensitive to relaxants.

### Airway

- Most pts have early tracheostomy; airway access should not be a problem; previous tracheostomized pts may have tracheal stenosis.
- Endotracheal suction may provoke bradydysrhythmias and asystole.

### Induction

- Avoid barbiturates and phenothiazines, which may produce profound CV depression.

### Maintenance

- Local anesthesia is preferred.
- GA: Nonsympatholytic technique.
- Pt may be sensitive to positive pressure ventilation, which may result in autonomic instability.

### Extubation

- Continue to ventilate postop if pt required ventilatory support preop.
- Residual weakness from anesthetic agents and muscle relaxants may necessitate postop ventilation in pts not ventilated preop.

### Adjuvants

- Muscle relaxants:
  - Avoid succinylcholine; can cause hyperkalemia with cardiac arrest.
  - Pts have increased sensitivity to nondepolarizing muscle relaxants.
  - May have residual muscle weakness after apparent full recovery from GA.
- Anticonvulsants:
  - Low-quality evidence demonstrates gabapentin and carbamazepine to reduce pain in short term.

## Anticipated Problems/Concerns

- Autonomic instability
- Respiratory failure
- Parturient: Third trimester and postpartum, risk of exacerbation; for labor, a regional anesthetic indicated to avoid exaggerated hemodynamic response to pain from autonomic dysfunction. Aspiration pneumonitis and respiratory failure may result in premature labor and maternal mortality. For C-section, implement a regional anesthetic relatively contraindicated even for pt with mild respiratory involvement. Some cases have reported newborns with GBS features following delivery by affected mother.
- Fecal impaction
- Stress ulcers