Myasthenic Crisis and Guillain-Barré Syndrome

Neuromuscular respiratory failure, NIV or intubation, IVIG and plasma exchange, crisis drugs and ICU care

RECOGNIZE NEUROMUSCULAR RESPIRATORY FAILURE

20/30/40 rule (Lawn 2001; EAN/PNS 2023 swaps the MIP and MEP numbers). Trend it every 4 h while weakness progresses (EAN/PNS 2023).

BEDSIDE TEST	DANGER	NOTES
Vital capacity (VC)	Under 20 mL/kg, or down over 30%	Normal 60–70 mL/kg; ≤10: ventilation near certain (EAN/PNS)
NIF (MIP)	Weaker than −30 cm H_2O	Inspiratory strength
MEP	Under 40 cm H_2O	Cough and secretion clearance
Single-breath count	Under 20	Count aloud after a full breath; normal about 30–50

- Bulbar: weak or nasal voice, drooling, choking, pooled secretions, weak cough
- Neck flexion weakness: cannot lift the head
- Paradoxical breathing: belly sinks on inspiration (diaphragm failing)
- Rapid shallow breaths, accessory muscles, staccato speech, sweating, rising HR

SAFETY SpO_2 and ABG change late. Weak muscles first give small, fast breaths that keep $PaCO_2$ normal; a rising $PaCO_2$ or falling SpO_2 means fatigue and imminent arrest. Oxygen can mask hypoventilation.

NIV OR INTUBATION

SITUATION	PLAN
Myasthenic crisis, $PaCO_2$ under 45–50, clears secretions	BiPAP trial; avoided intubation in 14 of 24 (Seneviratne 2008)
GBS with bulbar weakness, dysautonomia or fast progression	Elective intubation; BiPAP tends to fail
Rising $PaCO_2$, aspiration, exhaustion	Intubate now

- Intubate electively, with a vasopressor and atropine ready
- GBS: no succinylcholine (denervation hyperkalemia, even in recovery)
- MG: resists succinylcholine; deep, long block with rocuronium, so less drug, train-of-four, sugammadex
- Lungs usually normal: Vt 6–8 mL/kg PBW, PEEP 5–8, full support first

GUILLAIN-BARRÉ SYNDROME (GBS)

- Two-thirds follow an infection within 6 weeks (Campylobacter, CMV, EBV)
- Symmetric weakness rising from the legs; reflexes low or absent; nadir by 2–4 weeks
- Pain in two-thirds, a third before weakness; facial and bulbar palsy common
- Miller Fisher variant: ophthalmoplegia, ataxia, areflexia (anti-GQ1b)
- CSF: high protein, normal cells (albuminocytologic dissociation); protein normal in half before day 3; over 50 cells suggests another cause (EAN/PNS 2023)

IVIG and plasma exchange are equally effective; do not combine them.

TREATMENT	EAN/PNS 2023
IVIG	0.4 g/kg/day for 5 days, within 2 weeks if unable to walk unaided
Plasma exchange	12–15 L in 4–5 exchanges over 1–2 weeks, within 4 weeks
Steroids	Not recommended; oral steroids slowed recovery
Second IVIG course	Not recommended (SID-GBS: no gain, more clots)

EGRIS 0–7 (days from onset to admission, facial or bulbar weakness, MRC sum score): at 5 or more, 65% need ventilation within a week (Walgaard 2010). mEGRIS (2023) uses neck and hip flexion; mEGOS predicts walking at 4 weeks to 6 months.

GBS DYSAUTONOMIA

- Up to two-thirds: BP swings, tachycardia, ileus, urinary retention, SIADH
- Suctioning or turning can trigger bradycardia or asystole: preoxygenate, brief passes, atropine at the bedside, pacing if recurrent
- Treat only sustained extremes, with short-acting drugs; avoid scheduled β-blockers
- Expect hypotension with sedation, induction and positive pressure

MYASTHENIC CRISIS

Respiratory or bulbar weakness needing intubation or NIV; 15–20% of people with MG have one. Triggers: infection (most common), surgery, aspiration, missed doses, steroid start, pregnancy, drugs.

- Worsen MG: fluoroquinolones (boxed warning), aminoglycosides, macrolides, IV magnesium, β-blockers, procainamide, neuromuscular blockers, volatile anesthetics, checkpoint inhibitors

STEP	DETAIL
IVIG or plasma exchange	IVIG 2 g/kg over 2–5 days, or about 5 exchanges over 10 days
Pyridostigmine	Hold while intubated (secretions); restart as strength returns
Prednisone	42% worsen at first (Bae 2006): start low or after IVIG/PLEX

CLUE	MYASTHENIC	CHOLINERGIC (RARE)
Cause	Disease flare	Too much pyridostigmine
Secretions, gut	Not increased; may pool	Bronchorrhea, drooling, cramps, diarrhea
Pupils, HR	Normal; often tachycardic	Small pupils; bradycardia
Treat	IVIG or PLEX; airway	Stop the drug; atropine; airway

ICU NURSING CARE

- Cough and swallow checks; HOB up; NPO until a swallow screen
- VTE: SC heparin or LMWH plus IPC until walking (NCS 2016)
- GBS pain: gabapentinoid or TCA first, then carbamazepine; opioids cautiously (ileus)
- Eye care for facial palsy; skin, bowel and bladder care; early PT
- IVIG: hydrate, start slowly; headache, clots, kidney injury, anaphylaxis in IgA deficiency
- Plasma exchange: hypotension, low calcium (citrate), bleeding, line infection

Awake and paralyzed: assume full hearing, explain every step, set up eye-blink or letter-board signals, treat pain, sleep and fear. About a third have vivid dreams or hallucinations (Cochen 2005). In GBS, 80% walk again by 6 months.

EXAM TIP Exams test: SpO_2 is late; 20/30/40; no steroids or succinylcholine in GBS; question fluoroquinolones and magnesium in MG; atropine for cholinergic crisis.

Sources (25) are listed with links at icubasics.com/sheets/neuromuscular-crisis.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.