AAVBC

AMERICAN ACADEMY OF VALUE BASED CARE

Myasthenia Gravis

Quick Reference Guide

2026

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1 CLINICAL SNAPSHOT

Definition: Myasthenia gravis (MG) is a chronic autoimmune neuromuscular junction disorder characterized by fatigable skeletal muscle weakness — strength that worsens with sustained or repeated activity and recovers with rest. Caused by autoantibodies disrupting neuromuscular transmission, most commonly blocking or destroying acetylcholine receptors (AChR) at the postsynaptic membrane; the thymus plays a central role in initiating the immune response. Classified by antibody status (AChR ~**85%**; MuSK ~**5–8%**; double-seronegative ~**5–10%** — some with LRP4 or agrin antibodies) and by clinical extent (ocular Class I vs generalized Classes II–V); ~**50%** of ocular MG converts to generalized within 2 years.[1–3]

ICD-10 Codes:

Primary: **G70.00** (without acute exacerbation), **G70.01** (with acute exacerbation/myasthenic crisis). Related: **G70.1** (toxic myoneural disorders), **G70.2** (congenital — NOT autoimmune MG), **G70.81** (Lambert-Eaton in disease classified elsewhere), **G70.80** (Lambert-Eaton unspecified), **G70.9** (unspecified — avoid once confirmed). Ancillary during crisis: **J96.00–J96.02** (acute respiratory failure — frequently undercoded), **R13.10–R13.19** (dysphagia), **C37** (thymoma — **~10-20%** of MG patients), **D15.0** (benign thymus), **E06.3/E05.x/E03.x** (thyroid), **M05.x/M06.x** (RA).

Prevalence and Burden: US MG prevalence is 14–20 per 100,000 and rising with an aging population. Medicare claims (2006–2019) show MG prevalence in beneficiaries ≥65 rose from 81 to 119 per 100,000 ($p<0.001$); **45–49%** of new MG diagnoses now occur in patients ≥65. Very late-onset MG (VLOMG, ≥65) is nearly universally AChR-positive (>**90%**) and presents with greater severity (more MGFA IVB/V at onset, $p=0.002$). Myasthenic crisis (acute respiratory failure requiring ventilation) occurs in **15–20%** overall and ~**21%** in elderly. Diagnostic delay disproportionately affects women — 4.9 providers seen before diagnosis vs 3.0 men in US data; median delay 6.0 vs 3.2 months in Finnish cohort ($p=0.012$).[1,4]

HCC/RAF V28 Mapping

ICD-10 CODE(S)	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
G70.01 (with acute exacerbation/ myasthenic crisis)	HCC 195 — Myasthenia Gravis with (Acute) Exacerbation	2.909	Acute respiratory failure, bulbar crisis, IVIG/PLEX rescue, or hospitalization; document deterioration from baseline; code J96.00–J96.02 separately for respiratory failure during crisis
G70.00 (without acute exacerbation)	HCC 196 — Myasthenia Gravis without Exacerbation and Other Myoneural Disorders	0.516	Stable/chronic MG; document MGFA class, current symptom burden, active treatment regimen, and last specialist contact

ICD-10 CODE(S)	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
G70.1 ((toxic myoneural disorders) G70.2 (congenital — NOT autoimmune MG) G70.81 (Lambert-Eaton in disease classified elsewhere), G70.9 (unspecified)	HCC 196	0.516	G70.1 (toxic myoneural — specify causative drug) G70.2 (congenital — distinct from autoimmune) G70.81 (Lambert-Eaton in disease classified elsewhere — code underlying disease first) G70.9 only before confirmatory testing
G70.80 (Lambert-Eaton unspecified)	No HCC	—	AVOID: Lambert-Eaton unspecified does NOT map to HCC. Code the underlying disease (e.g., C34.x for lung cancer) and use G70.81 (Lambert-Eaton in disease classified elsewhere) instead

ABBREVIATIONS: AChR = acetylcholine receptor; CMS = Centers for Medicare & Medicaid Services; CNA = Community Non-Dual Eligible, Aged; HCC = Hierarchical Condition Category; IVIG = intravenous immunoglobulin; LEMS = Lambert-Eaton Myasthenic Syndrome; MG = myasthenia gravis; MGFA = Myasthenia Gravis Foundation of America; MuSK = muscle-specific kinase; PLEX = plasmapheresis; RAF = Risk Adjustment Factor; V28 = CMS-HCC Model Version 28. * Annual value illustrative at ~$10,402/year base × 1.067 normalization factor. The 5.6× RAF difference between G70.01 and G70.00 is the single highest-stakes coding distinction in MG

RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Risk-Adjusted Care Resources per Patient/Year

Risk-adjusted care resource allocation — MA base rate ($10,402.34) × RAF coefficient; HCC 463 (ostomy)

MG with acute exacerbation	MG without acute exacerbations
$30K	**$5.3K**
HCC 195 · RAF 0.2909	HCC 196 · 0.516

Annual risk value illustrative at base rate ~$10,402/year; actual plan payment varies by county and contract year. RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

2 RECOGNITION AND DIAGNOSIS

To ensure accurate coding and resource allocation, identifying the underlying diagnosis through a rigorous clinical evaluation is essential.

Clinical Diagnostic Workup Covered Under Medicare Part B

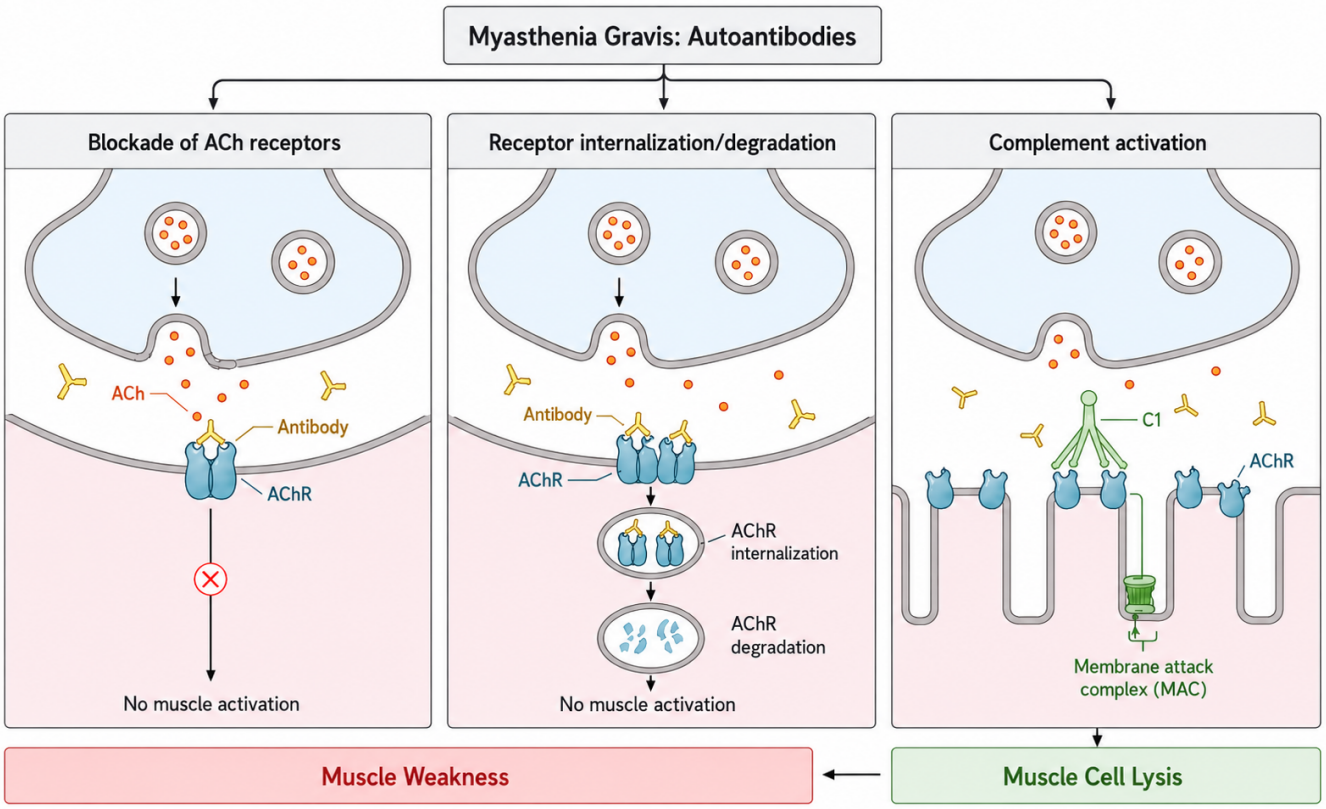
The following diagnostic pathway outlines the essential tests for confirming myasthenia gravis and ensuring proper Medicare Part B coverage.[4–6]

TEST	COVERAGE	FREQUENCY	CPT CODE	CLINICAL INDICATION
AChR antibody panel (binding + modulating + blocking)	Covered Part B for suspected MG	Once at diagnosis; repeat if changing pattern	86041/ 86042/ 86043	Binding ~**85%** sensitive in generalized MG; ~**50–60%** in ocular MG; specificity ~**95–100%**
MuSK antibody	Covered Part B when AChR negative	Once at diagnosis after AChR negative	86038 (modifier)	~**5–8%** of MG; predominantly younger women; higher crisis risk; poor pyridostigmine response
LRP4/agrin (cell-based assay)	Covered Part B when AChR and MuSK negative	Once when other antibodies negative	—	Subset of double-seronegative; document antibody status comprehensively
Repetitive nerve stimulation (RNS)	Covered Part B	Once at diagnostic workup	95937	Decrement ≥**10%** at 3 Hz supports diagnosis
Single-fiber EMG (SFEMG)	Covered Part B when RNS inconclusive	Once when needed	95872	Most sensitive electrophysiologic test; used when RNS negative but clinical suspicion remains
Chest CT or MRI for thymoma	Covered Part B for all confirmed MG patients	Once at diagnosis	71260/ 71550	Thymoma in ~**20%** of MG; CT or MRI chest is mandatory at diagnosis
Pulmonary function (FVC, NIF) during crisis	Covered Part B	Per crisis evaluation	94010/ 94375	**FVC <20 mL/kg or NIF <-30** cm H2O signals impending respiratory failure
MG-ADL/QMG (validated outcome measures)	Integrated into E/M; required for biologic prior authorization	Baseline + serial during therapy	99203–99215	**Document serial MG-ADL and QMG** to support biologic eligibility and treatment-response monitoring

TEST	COVERAGE	FREQUENCY	CPT CODE	CLINICAL INDICATION

ABBREVIATIONS: AChR = acetylcholine receptor; CT = computed tomography; E/M = evaluation and management; FVC = forced vital capacity; LRP4 = low-density lipoprotein receptor-related protein 4; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MRI = magnetic resonance imaging; MuSK = muscle-specific kinase; NIF = negative inspiratory force; QMG = Quantitative Myasthenia Gravis score; RNS = repetitive nerve stimulation; SFEMG = single-fiber electromyography

Pathophysiology of MG



Subtle Early Signs in Older Adults (Very Late-Onset MG)

Beyond standard diagnostic testing, it is essential to maintain high clinical suspicion for myasthenia gravis in older adults who may present with subtle or atypical symptoms that are frequently misattributed to other conditions.[1,2,7]

SIGN/SYMPTOM	CLINICAL SIGNIFICANCE
Fluctuating ptosis (worse later in day or with sustained upgaze)	~**50%** of MG presents initially with ocular symptoms; ice pack test (improvement with ice ≥2 mm) is a high-yield bedside maneuver
Diplopia (binocular, fluctuating)	Pupil-sparing ophthalmoplegia; rapid extraocular fatigue on prolonged gaze; resolves with eye closure

SIGN/SYMPTOM	CLINICAL SIGNIFICANCE
Bulbar weakness — dysarthria, dysphagia, nasal regurgitation	Higher crisis risk presentation; can present without limb weakness; code **R13.10–R13.19 separately for dysphagia**
Exertional limb weakness improving with rest	Pattern is the diagnostic clue — **strength returns after rest,** unlike fixed weakness from stroke, neuropathy, or myopathy
Sudden respiratory difficulty after surgery, infection, or new medication	Beta-blockers (OR 2.7 for exacerbation), aminoglycosides, fluoroquinolones, IV magnesium, neuromuscular blocking agents are common precipitants
Symptoms attributed to functional/psychiatric cause	**45%** of patients misdiagnosed initially received a functional neurological disorder label; women see a mean 4.9 providers before diagnosis — high index of suspicion for fatigable weakness
Antibody-negative but clinically suggestive	~**15%** of generalized MG and **40–50%** of ocular MG are AChR-seronegative; reflex testing algorithm: AChR → MuSK → LRP4/agrin (cell-based) — **do NOT stop at single negative AChR**

ABBREVIATIONS: AChR = acetylcholine receptor; LRP4 = low-density lipoprotein receptor-related protein 4; MG = myasthenia gravis; MuSK = muscle-specific kinase; OR = odds ratio

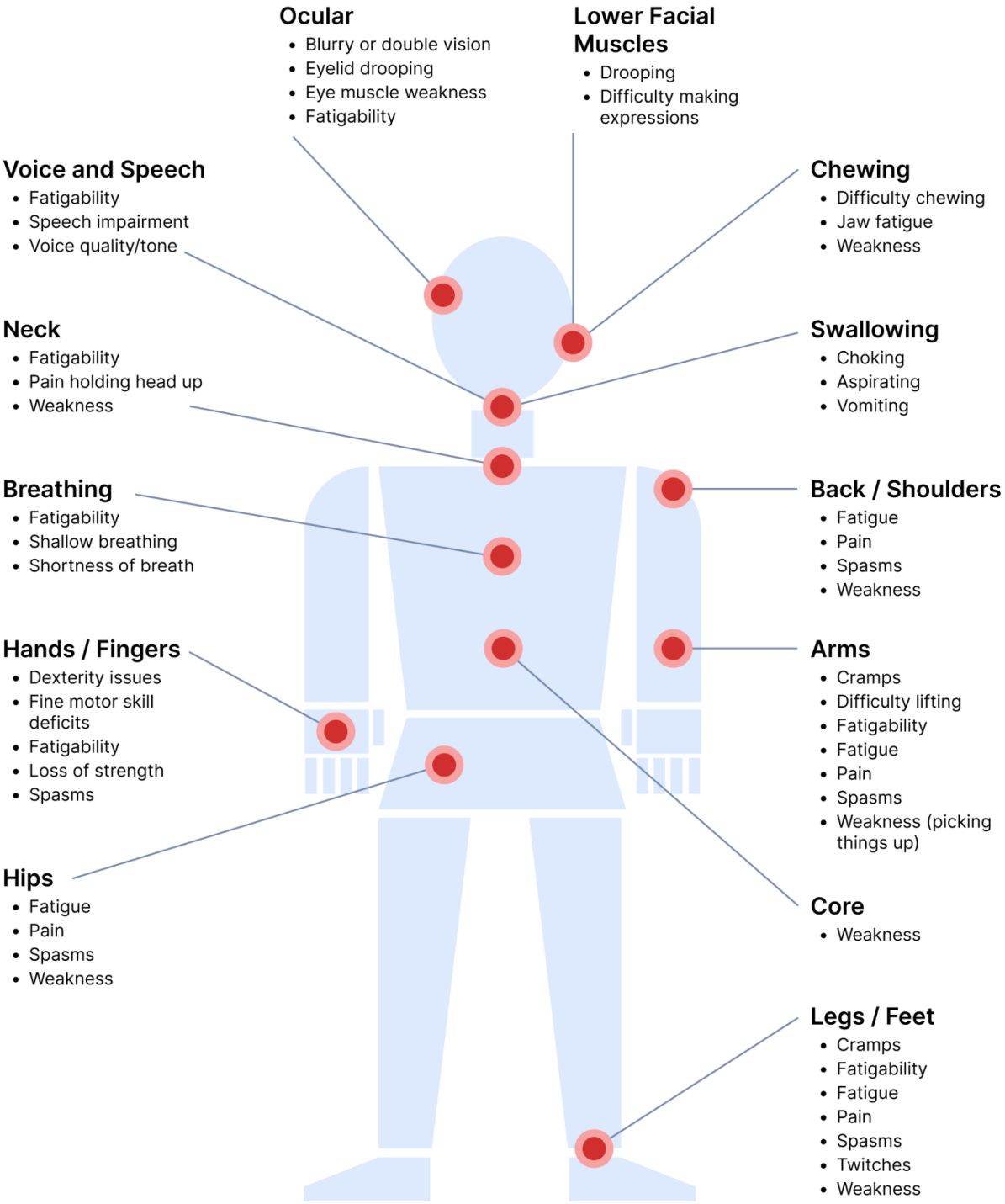
AAVBC PERSPECTIVE

***From the AAVBC's perspective**, value-based care in MG prioritizes early recognition and diagnosis. Significant clinical disparities exist across demographic and serological presentation:*

- ***Gender-Based Disparities:** Female patients consult an average of **4.9 providers** prior to receiving an accurate diagnosis, compared to **3.0 providers** for males*[8]
- ***Latency Timeline:** Women experience nearly double the diagnostic delay timeline of men, averaging **6.0 months** compared to **3.2 months***[9]
- ***Seronegative Mismanagement:** Misdiagnosed seronegative patients are frequently exposed to inappropriate, unnecessary treatments for a mean duration of **9 years***[10]

VBC models prioritize standardized clinical pathways that empower primary care physicians (PCPs) to recognize early, classic signs of MG, specifically fluctuating ocular or bulbar weakness. By initiating a streamlined diagnostic workup in the primary care setting, clinicians can bypass costly, redundant specialist cascades. Early recognition by a PCP directly reduces emergency department utilization, preventable myasthenic crisis admissions, and inappropriate psychiatric referrals.

Systemic and Anatomical Symptom Mapping



Geriatric Risk Factors

Considering these age-related nuances, the following diagnostic thresholds are essential for confirming MG and guiding appropriate clinical management in the geriatric population.[1,11,12]

FACTOR	RISK SIGNAL	NOTES
Age ≥65 (very late-onset MG)	**45–49%** of new MG diagnoses now ≥65; IRR 2.2 for rising incidence	AChR-positive in >**90%**; more severe presentation at onset; iatrogenic burden of immunosuppression may exceed disease burden
Cardiovascular comorbidity (HTN, CAD, DM)	**40.6%** prevalence in VLOMG cohorts	Beta-blocker exposure compounds exacerbation risk (OR 2.7, 95% CI 1.28–5.74)
Female sex (US data)	Mean 4.9 providers seen before diagnosis vs 3.0 men; median diagnostic delay 6.0 vs 3.2 months (Finnish cohort)	Symptoms more often misattributed to functional cause; psychiatric comorbidity at diagnosis **62.5%** anxiety, **46.9%** depressive symptoms
Seronegative status	AChR-seronegative in ~**15%** of generalized MG, **40–50%** of ocular	**45%** of seronegative patients ultimately not having MG received functional neurological disorder diagnosis; misdiagnosed patients had unnecessary immunotherapy for ~9 years (SD ±5.2)
MuSK antibody positive	~**5–8%** of MG; predominantly younger women but elderly cases exist	**Higher crisis risk**; poor pyridostigmine response; rituximab particularly effective
Cumulative immunosuppression and steroid exposure	Over **40%** of patients with MG onset >70 experience treatment adverse effects	Osteoporosis, infection, DM, glaucoma, cardiovascular events; DEXA + bone protection essential
Concurrent autoimmune disease	Hashimoto thyroiditis **10–15%**; thyroid dysfunction can worsen fatigue; RA, SLE may co-occur	TSH and autoimmune panel at diagnosis; code each separately
Thymoma (C37) at any age	~**20%** of MG patients	**Chest CT or MRI mandatory at diagnosis**; surgical resection alters MG course

ABBREVIATIONS: AChR = acetylcholine receptor; CAD = coronary artery disease; CT = computed tomography; DEXA = dual-energy X-ray absorptiometry; DM = diabetes mellitus; HTN = hypertension; IRR = incidence rate ratio; MG = myasthenia gravis; MRI = magnetic resonance imaging; MuSK = muscle-specific kinase; OR = odds ratio; RA = rheumatoid arthritis; SLE = systemic lupus erythematosus; TSH = thyroid-stimulating hormone; VLOMG = very late-onset MG

Diagnostic Thresholds

To further standardize clinical evaluation, the following diagnostic thresholds should be utilized for confirming myasthenia gravis and assessing disease severity.[1,5,6]

TEST/MARKER	DIAGNOSTIC CRITERION	NOTES
AChR binding antibody	Sensitivity ~**85%** generalized, ~**50–60%** ocular; specificity ~**95–100%**	Most commonly positive in VLOMG (>**90%**)
MuSK antibody	Reflex when AChR negative; positive in ~**5–8%** of MG	Predominantly younger women but elderly cases exist; pyridostigmine response often poor
LRP4/agrin (cell-based)	When AChR and MuSK negative; subset of double-seronegative	Helps clarify diagnosis in difficult cases
Repetitive nerve stimulation	Decrement ≥**10%** at 3 Hz	Class I evidence for diagnosis
Single-fiber EMG	Increased jitter; blocking on selected fiber pairs	Most sensitive electrophysiologic test
MGFA Clinical Classification	Class I (ocular only), II (mild generalized), III (moderate), IV (severe), V (crisis/intubation)	Document MGFA class on active problem list for treatment-response monitoring
MG-ADL score (0–24)	Patient-reported activity limitation	Required for biologic prior authorization; minimal clinically important difference ≥2 points
QMG score (0–39)	Clinician-assessed muscle strength	MCID ≥3 points; serial scoring during therapy escalation
Crisis criteria (FVC, NIF)	FVC <20 mL/kg OR NIF <−30 cm H2O signals impending respiratory failure	Triggers ICU and intubation planning

ABBREVIATIONS: AChR = acetylcholine receptor; EMG = electromyography; FVC = forced vital capacity; LRP4 = low-density lipoprotein receptor-related protein 4; MCID = minimal clinically important difference; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MGFA = Myasthenia Gravis Foundation of America; MuSK = muscle-specific kinase; NIF = negative inspiratory force; QMG = Quantitative Myasthenia Gravis score

Clues to Dig Deeper

Beyond standardized thresholds, identifying subtle clinical indicators is critical for avoiding diagnostic delays and ensuring timely intervention.[1,8,13,14]

CLINICAL CLUE	WHY IT MATTERS	NEXT DIAGNOSTIC STEP
Fluctuating ptosis worse end-of-day or with sustained upgaze	**Highly characteristi**c; ice pack test ≥2 mm improvement supports diagnosis	Ice pack test at bedside; AChR antibody panel; **neurology referral**
Bulbar weakness without limb involvement	**MuSK-positive** MG often presents this way and carries higher crisis risk	MuSK antibody (if AChR negative); chest CT for thymoma; **urgent neurology referral**

CLINICAL CLUE	WHY IT MATTERS	NEXT DIAGNOSTIC STEP
New respiratory difficulty after beta-blocker, aminoglycoside, or fluoroquinolone initiation	**Beta-blocker OR 2.7 for exacerbation**; these classes plus IV magnesium are common crisis triggers	**Stop offending agent if safe**; consider IVIG/PLEX if crisis criteria met; urgent neurology referral
Female patient seen by ≥4 providers without diagnosis for fatigable weakness	Women see mean 4.9 providers vs 3.0 men; **median diagnostic delay 6.0 vs 3.2 months**	Apply 3-pillar workup (clinical + serology + electrophysiology); maintain index of suspicion
AChR-seronegative patient with classical fatigable weakness	~**15%** of generalized and **40–50%** of ocular MG are AChR-seronegative	Reflex MuSK antibody; LRP4/agrin (cell-based) if both negative; SFEMG if RNS inconclusive
FVC <20 mL/kg or NIF <−30 cm H2O	Impending respiratory failure	**ICU;** IVIG (2 g/kg over 2–5 days) or PLEX (5 sessions over 7–10 days)

ABBREVIATIONS: AChR = acetylcholine receptor; CT = computed tomography; FVC = forced vital capacity; ICU = intensive care unit; IVIG = intravenous immunoglobulin; LRP4 = low-density lipoprotein receptor-related protein 4; MG = myasthenia gravis; MuSK = muscle-specific kinase; NIF = negative inspiratory force; OR = odds ratio; PLEX = plasmapheresis; RNS = repetitive nerve stimulation; SFEMG = single-fiber electromyography

CLINICAL PEARL

Increase index of suspicion for myasthenia gravis when encountering unexplained, fluctuating weakness — and **perform a sustained upgaze test and order an AChR antibody panel before attributing symptoms to aging, anxiety, or other common conditions**.
The specific action: When a patient presents with ptosis, diplopia, dysphagia, nasal speech, or proximal limb weakness that fluctuates and is worse with activity or later in the day — examine specifically for **fatigable weakness**, perform the sustained upgaze test (look for progressive ptosis over 60 seconds), apply an ice pack to a ptotic eyelid for 2 minutes (improvement suggests MG), and order AChR antibody panel with reflex to MuSK if negative.
Key nuance: A 'normal' morning exam does not rule out MG. Symptoms are often better in the morning and worsen as the day progresses. If MG is suspected, document this explicitly and arrange testing — do not wait for the next visit.

Common Oversights

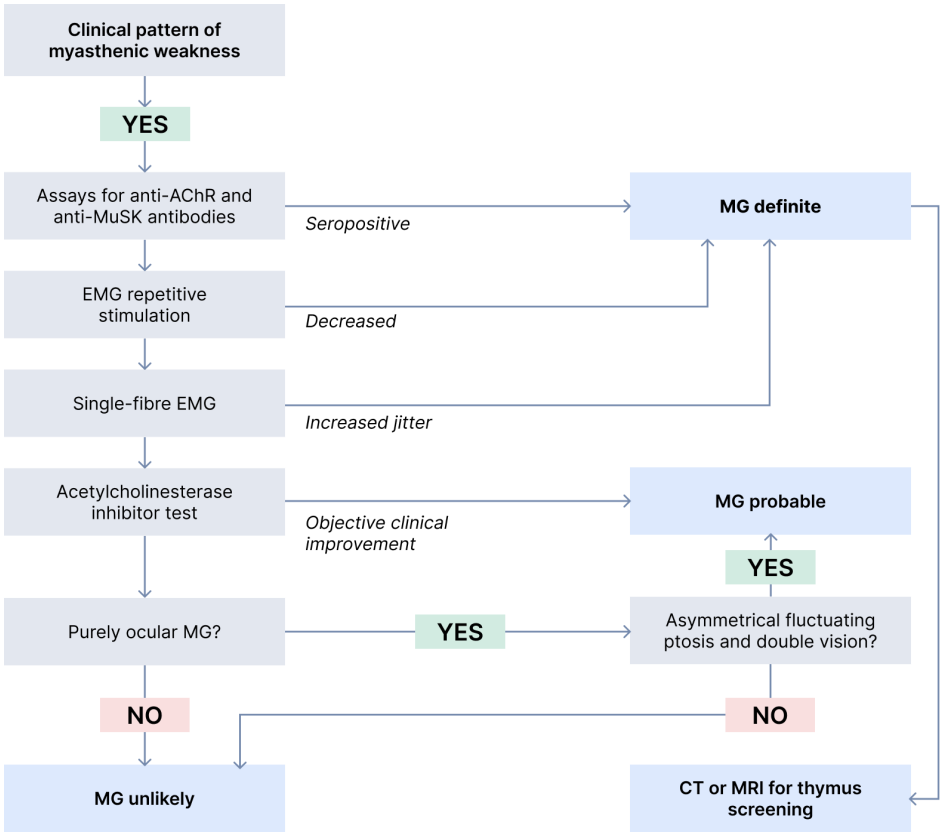
Even with a structured diagnostic workup, clinicians should remain vigilant for common practice patterns that may inadvertently delay diagnosis or patient stabilization.[1,2,15]

OVERSIGHT/SHORTCUT	WHY IT MATTERS — WHAT TO DO INSTEAD
Stopping at a single negative AChR antibody	~**15%** generalized MG and **40–50%** ocular MG are AChR-seronegative; apply reflex algorithm to MuSK then LRP4 / agrin

OVERSIGHT/SHORTCUT	WHY IT MATTERS — WHAT TO DO INSTEAD
Skipping chest imaging at MG diagnosis	Thymoma in ~**20%** of MG patients; **CT or MRI chest is mandatory at diagnosis** (C37 if confirmed)
Continuing beta-blocker/ aminoglycoside/ fluoroquinolone in known MG	Beta-blockers OR 2.7 for MG exacerbation; these classes plus IV magnesium and neuromuscular blockers can precipitate crisis
Initiating cumulative prednisone without bone protection	Over **40%** of patients with MG onset >70 experience treatment adverse effects; DEXA + calcium/vitamin D/bisphosphonate per fracture risk
Attributing fatigable weakness to functional neurological disorder without serology and electrophysiology	**45%** of misdiagnosed seronegative patients ultimately received functional neurological disorder label; mean unnecessary immunotherapy 9 years (SD ±5.2)
Initiating biologic without baseline MG-ADL/QMG	Documented outcome measures are required for prior authorization and treatment-response monitoring

ABBREVIATIONS: AChR = acetylcholine receptor; CT = computed tomography; DEXA = dual-energy X-ray absorptiometry; LRP4 = low-density lipoprotein receptor-related protein 4; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MRI = magnetic resonance imaging; MuSK = muscle-specific kinase; OR = odds ratio; QMG = Quantitative Myasthenia Gravis score

Clinical Pathway



Key Differentials in Elderly

Addressing these common clinical pitfalls is vital when evaluating older adults, as they often present with subtle or atypical signs that require a high index of suspicion.[7,16]

PRESENTATION	DIFFERENTIAL	KEY TESTS
Fatigable weakness	MG **vs**. Lambert-Eaton (LEMS); chronic inflammatory demyelinating polyneuropathy; thyroid myopathy; mitochondrial myopathy **SEE TABLE BELOW**	AChR/MuSK/LRP4; RNS; SFEMG; TSH; chest CT
Ptosis/diplopia	MG **vs.** cranial nerve palsies (III, IV, VI); Horner syndrome; ocular myopathy; thyroid eye disease	Ice pack test; AChR antibody; MRI brain/orbit if cranial nerve pattern
Bulbar weakness	MG (especially MuSK-positive) **vs.** ALS; brainstem stroke; cranial neuropathies; CIDP	AChR/MuSK; EMG (motor neuron disease pattern); brain MRI

PRESENTATION	DIFFERENTIAL	KEY TESTS
Acute respiratory failure	Myasthenic crisis **vs.** cholinergic crisis (overdose of pyridostigmine); Guillain-Barré; respiratory infection; congestive heart failure	FVC, NIF; medication review; ABG; MG-ADL; chest imaging
Functional presentation	MG (seronegative) **vs.** thyroid disease; fibromyalgia; chronic fatigue syndrome; conversion disorder	Comprehensive workup before functional diagnosis: AChR/MuSK/LRP4, RNS, SFEMG, TSH, autoimmune panel

ABBREVIATIONS: ABG = arterial blood gas; AChR = acetylcholine receptor; ALS = amyotrophic lateral sclerosis; CIDP = chronic inflammatory demyelinating polyneuropathy; CT = computed tomography; FVC = forced vital capacity; LEMS = Lambert-Eaton Myasthenic Syndrome; LRP4 = low-density lipoprotein receptor-related protein 4; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MRI = magnetic resonance imaging; MuSK = muscle-specific kinase; NIF = negative inspiratory force; RNS = repetitive nerve stimulation; SFEMG = single-fiber electromyography; TSH = thyroid-stimulating hormone

CLINICAL PEARL: FATIGABLE WEAKNESS NOT FATIGUE

Fatigable weakness — not fatigue. The distinction matters. MG patients have muscle strength that worsens with sustained or repeated activity and recovers with rest. This is different from the generalized exhaustion, malaise, and apathy of mood disorders. When a patient complains of 'fatigue,' the question to ask is: 'Is it worse when you use the muscle? Does it get better with rest?'

Key Differences Between Neuromuscular Conditions

FEATURE	MG	LEMS	CIDP	THYROID MYOPATHY	MITOCHONDRIAL MYOPATHY
Weakness pattern	Fatigable; ocular/ bulbar predominant	Proximal legs first; transient improveme nt with brief exercise	Symmetric proximal + distal; progressive >2 months	Proximal; non-fatigable	Ptosis + ophthalmoplegia ± proximal limbs; slowly progressive
Reflexes	Normal	Diminished/ absent (may return post-exercise)	Absent or diminished	Normal or delayed relaxation	Normal
Sensory findings	Absent	Absent	Present (numbness, paresthesias)	May have neuropathy (42% hypothyroid)	Usually absent

FEATURE	MG	LEMS	CIDP	THYROID MYOPATHY	MITOCHONDRIAL MYOPATHY
Autonomic features	Absent	Dry mouth, erectile dysfunction (~90%)	Absent	Absent	Variable
CK level	Normal	Normal	Normal	Elevated (hypothyroid); normal-low (hyperthyroid)	Normal to mildly elevated
Key antibody	AChR (~85%), MuSK (~5–8%)	VGCC (~90%)	Anti-NF155, anti-CNTN1 (subset)	None (TSH diagnostic)	None
RNS at 3 Hz	Decrement ≥10%; nadir at 4th–5th response	Decrement + low baseline CMAP + post-exercise increment ≥60%	Normal	Normal	Normal (minor NMJ abnormalities possible)
Malignancy screen	Chest CT for thymoma	CT chest/ abdomen for SCLC	Not indicated	Not indicated	Not indicated
Distinguishing clue	Fatigable weakness that worsens with activity and recovers with rest; ice pack test positive	Strength improves briefly after exercise; absent reflexes + autonomic symptoms	Areflexia + sensory loss + elevated CSF protein + demyelinating NCS	Resolves with thyroid correction; CK elevated in hypothyroid	Chronic progressive ophthalmoplegia without fluctuation; often misdiagnosed as MG

ABBREVIATIONS: AChR = acetylcholine receptor; CIDP = chronic inflammatory demyelinating polyneuropathy; CK = creatine kinase; CMAP = compound muscle action potential; CNTN1 = contactin-1; COX = cytochrome c oxidase; CPEO = chronic progressive external ophthalmoplegia; CSF = cerebrospinal fluid; Hz = hertz; LEMS = Lambert-Eaton myasthenic syndrome; MG = myasthenia gravis; MuSK = muscle-specific kinase; NCS = nerve conduction studies; NF155 = neurofascin-155; NMJ = neuromuscular junction; RNS = repetitive nerve stimulation; SCLC = small cell lung cancer; SFEMG = single-fiber electromyography; TSH = thyroid-stimulating hormone; VGCC = voltage-gated calcium channel

Comorbidity Screening

Beyond identifying the primary diagnosis and ruling out differentials, systematically screening for and managing common comorbidities is vital to optimizing overall care and long-term health outcomes.[17–20]

CONDITION	PREVALENCE/ ASSOCIATION	SCREENING APPROACH
Thymoma (C37)	~**20%** of MG patients	Chest CT or MRI **at diagnosis**; surgical resection alters MG course
Autoimmune thyroiditis (E06.3)/ hyper-/ hypothyroidism	~**10–15%** of MG	TSH **at diagnosis** and annually; treat to euthyroid
Cardiovascular comorbidity (HTN, CAD, DM)	**40.6%** in VLOMG cohorts	**Avoid beta-blockers when possible** (OR 2.7 for MG exacerbation); consider calcium channel blockers or other alternatives
Steroid-induced complications	Over **40%** with MG onset >70 experience treatment AEs	DEXA + calcium/vitamin D/bisphosphonate; glucose monitoring; eye exam annually
Depression/anxiety	62.5% anxiety, 46.9% depressive symptoms at diagnosis	**PHQ-9/GAD-7 at every visit;** coordinate psychiatry/behavioral health
Osteoporosis	Cumulative steroid exposure	**DEXA at diagnosis**; bone protection plan
Concurrent autoimmune disease (RA, SLE, vitiligo)	Co-occurrence elevated	Document and code each separately for complete clinical picture

ABBREVIATIONS: AE = adverse event; CAD = coronary artery disease; CT = computed tomography; DEXA = dual-energy X-ray absorptiometry; DM = diabetes mellitus; GAD-7 = Generalized Anxiety Disorder-7; HTN = hypertension; MG = myasthenia gravis; MRI = magnetic resonance imaging; OR = odds ratio; PHQ-9 = Patient Health Questionnaire-9; RA = rheumatoid arthritis; SLE = systemic lupus erythematosus; TSH = thyroid-stimulating hormone; VLOMG = very late-onset myasthenia gravis

MGFA Clinical Classification

The Myasthenia Gravis Foundation of America (MGFA) Clinical Classification classifies severity of myasthenia gravis.[13,21]

MGFA CLASS	CLINICAL FEATURES	MANAGEMENT EMPHASIS
Class I — Ocular only	Ptosis and/or diplopia only; no other weakness	Pyridostigmine first-line; ~**50%** convert to generalized within **2 years**; consider IS if conversion or refractory

MGFA CLASS	CLINICAL FEATURES	MANAGEMENT EMPHASIS
Class II — Mild generalized	IIa (limb predominant) or IIb (bulbar predominant); mild weakness	Pyridostigmine + low-dose prednisone; consider azathioprine for **steroid-sparing**
Class III — Moderate generalized	IIIa or IIIb; moderate limb/bulbar weakness	Pyridostigmine + prednisone + steroid-sparing IS (azathioprine, mycophenolate); consider biologic if refractory
Class IV — Severe generalized	IVa or IVb; severe weakness with risk of crisis	Optimize pharmacotherapy; **consider IVIG bridge or biologic; hospital admission threshold low**
Class V — Myasthenic crisis	Intubation; mechanical ventilation	Code G70.01 + J96.0x; ICU; IVIG (2 g/kg over 2–5 days) OR PLEX (5 sessions over 7–10 days)

ABBREVIATIONS: ICU = intensive care unit; IS = immunosuppression; IVIG = intravenous immunoglobulin; MG = myasthenia gravis; MGFA = Myasthenia Gravis Foundation of America; PLEX = plasmapheresis

While the MGFA classification provides a framework for tracking overall disease severity, clinicians must be equipped to recognize specific red flags that mandate immediate emergency or urgent response.

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE[1,22]

- **Myasthenic crisis — FVC <20 mL/kg OR NIF <−30 cm H2O OR clinical respiratory failure** — ED + ICU; IVIG or PLEX rescue
- **Acute bulbar deterioration with aspiration** — NPO; aspiration precautions; urgent neurology consult
- **New medication-induced exacerbation** (beta-blocker, aminoglycoside, fluoroquinolone, IV magnesium) — discontinue offending agent if safe; monitor respiratory status
- **Cholinergic crisis** from pyridostigmine overdose — distinguish from myasthenic crisis (pinpoint pupils, fasciculations, sweating, salivation); ICU; atropine; hold pyridostigmine
- **Severe infection in MG patient on biologic/immunosuppression** — ED; broad-spectrum antibiotics; coordinate with neurology re: IS modification

RED FLAG — URGENT (24–72 HOURS)

- **New or worsening bulbar weakness** — neurology consult; **FVC and NIF monitoring; consider IVIG bridge**
- **Rapid corticosteroid taper** — known crisis trigger; coordinate with neurology before adjustments
- **Surgery or anesthesia planning** — preoperative neurology evaluation; avoid depolarizing neuromuscular blockers; **consider IVIG/PLEX prep if MGFA III–IV**
- **New or worsening diplopia/ptosis interfering with ADLs** — pyridostigmine optimization; neurology re-evaluation; consider IS escalation
- **Functional decline on immunosuppression** — review for infection, drug toxicity, polypharmacy

3 MEAT DOCUMENTATION ESSENTIALS

Case vignette: A 72-year-old patient (former smoker, on metoprolol 50 mg/day for HTN) presents with 4 weeks of intermittent ptosis and diplopia, now adding mild dysphagia. Ice pack test improves ptosis by 3 mm. AChR antibody positive (high titer). Chest CT: small thymoma. RNS: decrement 18% at 3 Hz. MGFA Class IIb (mild generalized, bulbar predominant). MG-ADL 7; QMG 12.

MONITOR: **MGFA Classification: Class IIb —** mild generalized, predominantly bulbar. Bulbar symptoms (dysphagia, nasal speech) are the dominant clinical feature; limb strength preserved. **MG-ADL Score: 7** (baseline established today for longitudinal therapy response tracking). **QMG Score: 12 (baseline).** Metoprolol 50 mg daily identified. No fluoroquinolones, aminoglycosides, IV magnesium, or neuromuscular blocking agents on current medication list. **Pulmonary function: FVC 92% predicted; NIF (MIP) normal.** Patient is NOT in impending myasthenic crisis. Respiratory baseline established for future comparison. **Mental health screening: PHQ-9 and GAD-7** to be completed at this visit and every follow-up.

EVALUATE: **AChR binding antibody:** positive, high titer. **Repetitive nerve stimulation: 18%** decrement at 3 Hz (positive). **Chest CT:** small thymoma (C37) — surgical consult for thymectomy. **TSH and autoimmune panel:** TSH normal; no concurrent autoimmune disease identified.

ASSESS: **Active generalized myasthenia gravis without acute exacerbation, MGFA Class IIb, AChR-positive with thymoma: G70.00** (no crisis at this encounter). **Associated:** thymoma C37; HTN — switching from metoprolol due to MG-exacerbation risk.

TREAT: **Symptomatic:** pyridostigmine 30 mg TID, titrate to 60 mg TID as tolerated. **First-line IS:** prednisone 10–20 mg/day starting dose, titrate to 60–80 mg every other day; azathioprine 2 mg/kg/day for steroid-sparing. **Crisis-trigger avoidance:** switching metoprolol to amlodipine 5 mg/day. Patient educated to avoid fluoroquinolones, aminoglycosides, IV magnesium, or neuromuscular blocking agents. **Thymectomy:** surgical oncology referral for thymoma resection sent. **Bone protection:** DEXA scan ordered; calcium/vitamin D; bisphosphonate consideration per fracture risk. **Surveillance:** serial MG-ADL and QMG at every visit; PHQ-9/GAD-7. **Advance care planning:** CPT 99497 — initiated while patient is well-controlled.

Clinical Documentation Elements

- **Confirm exacerbation status at every encounter: G70.00** (stable) vs **G70.01** (acute exacerbation/crisis) — the 5.6× RAF difference is the highest-stakes coding distinction
- **Document crisis ancillary codes:** During **G70.01** encounter, code **J96.00–J96.02** for acute respiratory failure; **R13.10–R13.19** for dysphagia; **J69.0** for any aspiration event
- **Document antibody status and MGFA class:** AChR/MuSK/LRP4/agrin results; MGFA Class I–V supports treatment-decision narrative
- **Document MG-ADL and QMG serially:** Required for biologic prior authorization; document MCID-level changes
- **Document crisis-trigger medication review:** Beta-blockers (OR 2.7), aminoglycosides, fluoroquinolones, IV magnesium, neuromuscular blockers — explicit review at every visit
- **Document concurrent comorbidities:** Thymoma (**C37**), thyroid (**E06.3/E05.x/E03.x**), depression/anxiety (**F32.x/F41.x)**, osteoporosis (**M81.0)**, steroid exposure (**Z79.52**)

Reframing Common Documentation Shortcuts

INSTEAD OF...	DOCUMENT...
"Myasthenia gravis" without exacerbation status	"Active generalized myasthenia gravis without acute exacerbation **(G70.00)**" or "Myasthenic crisis with acute exacerbation **(G70.01)**" — always specify exacerbation status
"History of myasthenia" or Z87.x code for active disease	"Active generalized MG, MGFA Class [X], on [current regimen]" — code **G70.00/G70.01**, **never Z87.x** while on active treatment
Copy-forward of prior MG note without updating severity scores	Update MG-ADL and QMG at every visit; document trend from baseline. "MG-ADL 7 (baseline 12), QMG 10 (baseline 18) — improving on current regimen"
Listing medications without crisis-trigger review	"Crisis-trigger medication review: metoprolol identified — switching to amlodipine. Fluoroquinolones, aminoglycosides, IV magnesium, neuromuscular blockers on avoid list. Patient counseled"
"Thymoma — followed by oncology" without active coding	"**Thymoma (C37)** — status post thymectomy [date]/awaiting surgical resection; oncology co-managing; surveillance imaging current"
Omitting respiratory failure codes during crisis	"**Myasthenic crisis (G70.01**) with **acute hypoxic respiratory failure (J96.01)**; intubated day [X]; IVIG/PLEX initiated"
"Osteoporosis — on calcium" without steroid linkage	"Glucocorticoid-induced osteoporosis **(M81.0)**; DEXA T-score [X]; on calcium/vitamin D/bisphosphonate; prednisone [dose] for MG — fracture risk reassessed per ACR 2022 guideline"

INSTEAD OF...	DOCUMENT...
"Depression/anxiety — counseled" without screening tool	"PHQ-9: 8 (mild); GAD-7: 12 (moderate). Discussed treatment options. Referral to behavioral health placed. Follow-up PHQ-9/ GAD-7 at next visit"
"Continue current meds" without medication reconciliation	"Medication reconciliation performed: pyridostigmine 60 mg TID, prednisone 20 mg eod, azathioprine 150 mg daily — all confirmed with patient. No new OTC or urgent care prescriptions. Crisis-trigger avoid list reviewed"
Documenting AUD as "social history" only	"**Alcohol Use Disorder, moderate (F10.20)**; abstinence counseling reinforced; AUDIT-C [score]; naltrexone/ acamprosate discussed; hepatology co-managing"

4 TREATMENT AND REFERRAL QUICK GUIDE

MG treatment follows a stepwise escalation approach. Symptomatic therapy: Pyridostigmine should be part of the initial treatment in most patients with MG. Dose is adjusted based on symptoms, and the ability to discontinue pyridostigmine can indicate that treatment goals have been met. First-line immunosuppression: Corticosteroids (prednisone/prednisolone) are added when patients remain symptomatic on pyridostigmine. Azathioprine is added when steroid side effects develop, response to corticosteroids is inadequate, or the steroid dose cannot be reduced due to relapse. Second-line immunosuppression: Mycophenolate mofetil, tacrolimus, methotrexate, and cyclosporine are all used in MG. Always consult FDA drug labels for detailed dosing, selection and safety before prescribing medications.

MGFA Stepwise Treatment Pathway

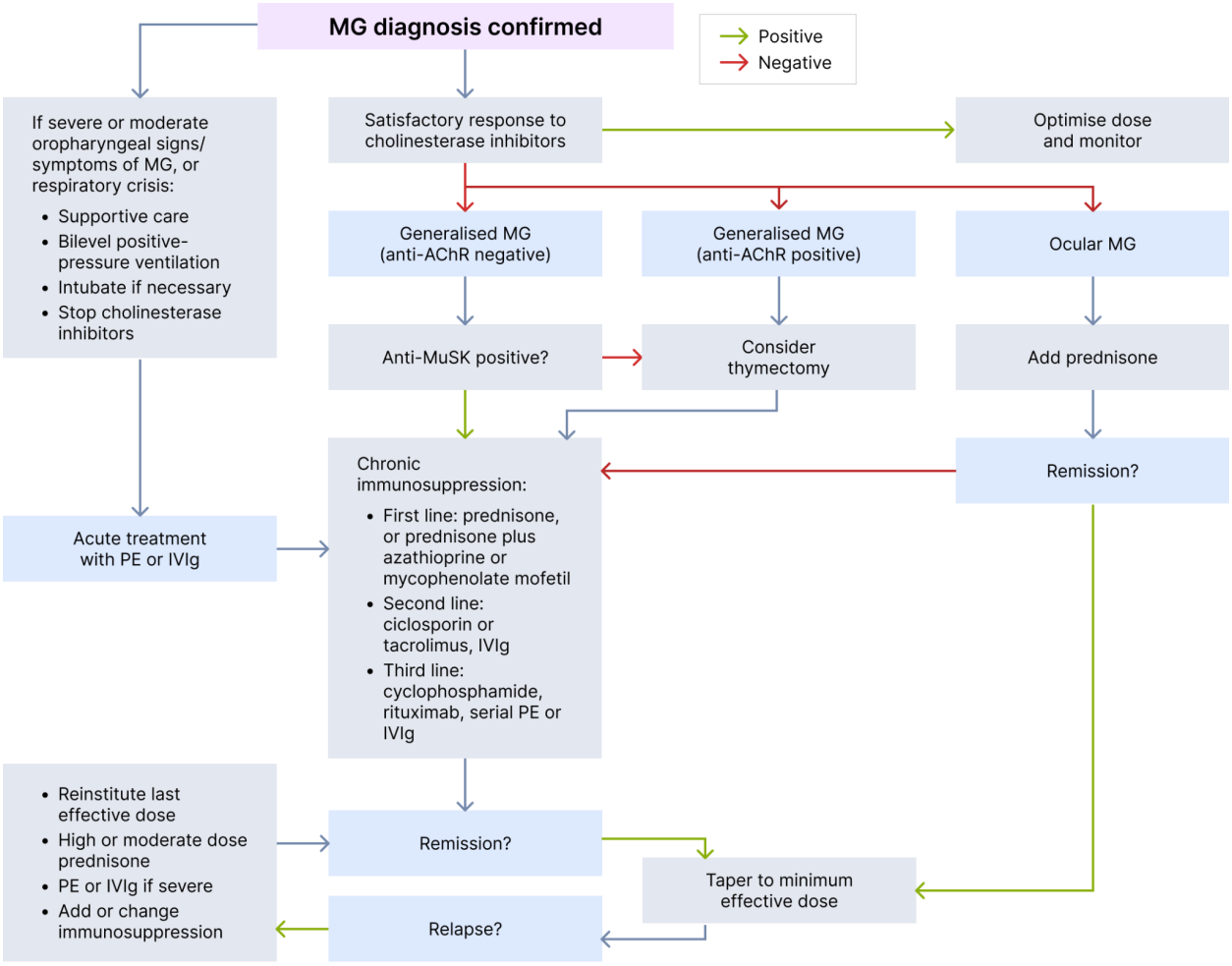
The following table summarizes this clinical approach, detailing the specific agents and key considerations for geriatric patients and value-based care.[2,13]

STEP	AGENT(S)	KEY GERIATRIC/VBC NOTES
Symptomatic	Pyridostigmine 30–60 mg TID titrated to max ~120 mg q3h	Start low in elderly; cholinergic side effects (diarrhea, bradycardia); MuSK-positive often poor response
First-line IS	Prednisone (start 10–20 mg/day, titrate to 60–80 mg every other day) + azathioprine 2–3 mg/kg/day; check TPMT before azathioprine	Over **40%** of patients >70 experience treatment AEs; conservative steroid dosing; bone protection essential
Second-line IS	Mycophenolate mofetil 2–3 g/day, methotrexate, tacrolimus, or cyclosporine	Tacrolimus preferred over cyclosporine in elderly (less renal toxicity); intensive medication reconciliation

STEP	AGENT(S)	KEY GERIATRIC/VBC NOTES
Targeted biologic (refractory gMG)	Complement inhibitors (AChR-Ab+): eculizumab, ravulizumab, zilucoplan; FcRn inhibitors (AChR or MuSK-Ab+): efgartigimod, rozanolixizumab, nipocalimab	Meningococcal vaccination required before complement inhibitors; limited elderly-specific pivotal trial data
Rituximab	Rituximab 375 mg/m^2 ×4 or 1000 mg ×2	Particularly effective for MuSK-positive disease; increased infection risk in elderly
Crisis/rescue	IVIG 2 g/kg over 2–5 days OR PLEX 5 sessions over 7–10 days	Class I evidence (AANEM 2023); ~**70%** improvement; PLEX may produce faster response in ventilated patients; code G70.01 + J96.0x
Thymectomy	Surgical resection of thymoma OR selected non-thymomatous patients per MGTX trial	Required when thymoma identified; consider in non-thymomatous AChR+ patients aged 18–65

ABBREVIATIONS: AAN = American Academy of Neurology; AANEM = American Association of Neuromuscular & Electrodiagnostic Medicine; AChR = acetylcholine receptor; FcRn = neonatal Fc receptor; gMG = generalized myasthenia gravis; IS = immunosuppression; IVIG = intravenous immunoglobulin; MGFA = Myasthenia Gravis Foundation of America; MGTX = Myasthenia Gravis Thymectomy Trial; MuSK = muscle-specific kinase; PLEX = plasmapheresis; TPMT = thiopurine methyltransferase. ***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**.

Diagnosis and Treatment Pathway



Non-Pharmacologic Care and Supportive Interventions

Beyond pharmacological management, proactive non-pharmacologic interventions are crucial for maintaining stability and preventing treatment-related complications.[2,22]

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Crisis-trigger medication avoidance	**Avoid** beta-blockers (OR 2.7), aminoglycosides, fluoroquinolones, IV magnesium, neuromuscular blockers	Document review at every visit; counsel patient and caregivers
Vaccination program	Meningococcal (required pre-complement inhibitor); pneumococcal; influenza; HZV per age	**Live vaccines contraindicated during immunosuppression**; coordinate with neurology

INTERVENTION	TARGET/RECOMMENDATION	NOTES
Bone protection (steroid-induced osteoporosis)	DEXA baseline + annual; calcium/vitamin D supplementation; bisphosphonate per fracture risk	Over **40%** of patients >70 experience steroid-related AEs
Dysphagia management	**SLP referral for symptomatic patients**; FEES; modified diet textures per IDDSI	Aspiration prevention; coordinate during exacerbations
Pulmonary function monitoring	FVC and NIF **during exacerbation or crisis evaluation**	FVC <20 mL/kg or NIF <−30 cm H2O signals impending failure
MG-ADL and QMG serial scoring	**Baseline + at each treatment escalation/de-escalation**	Required for biologic prior authorization; MCID ≥2 (MG-ADL), ≥3 (QMG)
Geriatric assessment in VLOMG	G8 + CGA for patients ≥70	Frailty (not age alone) predicts outcome and treatment tolerance
Advance care planning	Document advance directives during stable disease	**CPT 99497/99498** during AWV with no copay

ABBREVIATIONS: AE = adverse event; AWV = annual wellness visit; CGA = comprehensive geriatric assessment; DEXA = dual-energy X-ray absorptiometry; FEES = fiberoptic endoscopic evaluation of swallowing; FVC = forced vital capacity; G8 = Geriatric 8; HZV = herpes zoster virus; IDDSI = International Dysphagia Diet Standardisation Initiative; MCID = minimal clinically important difference; MG-ADL = Myasthenia Gravis Activities of Daily Living; NIF = negative inspiratory force; OR = odds ratio; QMG = Quantitative Myasthenia Gravis score; SLP = speech-language pathology; VLOMG = very late-onset myasthenia gravis

Medication Safety and Key Interactions

In addition to these non-pharmacologic strategies, meticulous management of the medication regimen is essential to avoid triggers that can exacerbate myasthenic weakness.[14,23,24]

DRUG/CLASS	INTERACTION/TOXICITY	CLINICAL ACTION
Beta-blockers	MG exacerbation OR 2.7 (95% CI 1.28–5.74); among most commonly prescribed cardiovascular drugs	**Avoid** in MG when possible; **prefer calcium channel blockers, ARBs, or ACE inhibitors for HTN**; if essential, document risk discussion
Aminoglycosides (gentamicin, tobramycin)	Inhibit NMJ transmission; can precipitate myasthenic crisis	Avoid in known MG when alternatives exist; if essential, **monitor pulmonary function closely**

DRUG/CLASS	INTERACTION/TOXICITY	CLINICAL ACTION
Fluoroquinolones (ciprofloxacin, levofloxacin)	Class-effect MG exacerbation; FDA boxed warning **Avoid in known MG** when alternatives exist; document risk discussion when essential	Avoid in known MG when alternatives exist; **document risk discussion when essential**
IV magnesium	Severe NMJ blockade; can trigger crisis	**Contraindicated** except for life-threatening hypomagnesemia or eclampsia per neurology consult
Neuromuscular blocking agents (succinylcholine, non-depolarizers)	Prolonged paralysis in MG patients	Pre-operative neurology consult; **avoid depolarizing agents**; reduce non-depolarizer dose; reverse with sugammadex when used
Macrolides (azithromycin, erythromycin)	May exacerbate MG; less clear risk than fluoroquinolones	**Use with caution**; consider alternatives; monitor closely
Pyridostigmine (intentional overdose/cholinergic crisis)	Salivation, sweating, miosis, bradycardia, fasciculations — mimics worsening MG	Distinguish from myasthenic crisis (mydriasis, no fasciculations); atropine; hold pyridostigmine
Prednisone (initiation surge)	Initial MG worsening in 5–10 days after high-dose initiation; cumulative AEs in elderly	Slow titration; bridge with IVIG/PLEX if initiating during exacerbation; monitor for paradoxical worsening
Azathioprine	TPMT-deficiency myelotoxicity; latency ~15 months to clinical effect	Check TPMT before initiation; monitor CBC and LFTs serially; not for acute control
Complement inhibitors (eculizumab, ravulizumab, zilucoplan)	Meningococcal infection risk (>1000× general population)	**Meningococcal vaccination mandatory** ≥2 weeks before initiation per FDA label; revaccinate per CDC

ABBREVIATIONS: ACE = angiotensin-converting enzyme; AE = adverse event; ARB = angiotensin receptor blocker; CBC = complete blood count; CDC = Centers for Disease Control; CI = confidence interval; FDA = Food and Drug Administration; HTN = hypertension; IVIG = intravenous immunoglobulin; LFTs = liver function tests; MG = myasthenia gravis; NMJ = neuromuscular junction; OR = odds ratio; PLEX = plasmapheresis; TPMT = thiopurine methyltransferase.
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**.

When to Refer

Beyond managing pharmacologic risks, determining the appropriate level and urgency of specialist referral is critical for ensuring optimal patient outcomes.[2,13]

CRITERION	SPECIALIST	URGENCY
Myasthenic crisis (FVC <20 mL/kg, NIF <−30, bulbar with aspiration risk)	Emergency department + ICU	**Emergent**
New fatigable weakness suspected MG	Neurology	**Urgent (1–2 weeks)**
Confirmed MG	Neurology specializing in NMJ disorders	**Urgent (within 1 week)**
Thymoma identified on chest imaging	Thoracic surgery/thoracic oncology	**Urgent — within 2 weeks**
Refractory disease requiring biologic	MG-specialist neurology + infusion center	**Routine — per biologic prior authorization**
Functional decline on immunosuppression, polypharmacy, frailty	Geriatrics + CGA	**Routine**
Severe depression/anxiety	Psychiatry/behavioral health	**Routine**
Advance care planning during stable disease	Palliative care	**Routine**

ABBREVIATIONS: CGA = comprehensive geriatric assessment; ED = emergency department; FVC = forced vital capacity; ICU = intensive care unit; MG = myasthenia gravis; NIF = negative inspiratory force; NMJ = neuromuscular junction

Follow-Up Timing

Once the appropriate referral pathways have been established, coordinating the ongoing follow-up schedule is critical to ensure continuity of care and proactive management of disease stability.[1]

STAGE/CATEGORY	FREQUENCY	LABS/MONITORING
Ocular MG (MGFA Class I)	**Neurology every 6 months; primary care every 3–6 months**	MG-ADL, QMG, ice pack test at every visit; counsel ~**50%** conversion to generalized within 2 years
Stable generalized MG on maintenance IS (MGFA II–III)	**Neurology every 3–6 months; primary care every 1–3 months**	MG-ADL, QMG every visit; CBC, CMP, LFTs on azathioprine/ mycophenolate; medication reconciliation focused on crisis triggers

STAGE/CATEGORY	FREQUENCY	LABS/MONITORING
On chronic corticosteroids (Z79.52)	**Every 3 months during taper; every 6 months on stable dose**	DEXA annually; glucose, BP, eye exam; HEDIS DAE and OMW supports documentation
On biologic (complement/ FcRn inhibitor)	**Per infusion/SC schedule; clinic every 4–8 weeks**	MG-ADL, QMG per cycle; meningococcal vaccination status (complement inhibitors); infection surveillance
Post-thymectomy	Surgical follow-up per thoracic surgery; **neurology every 3–6 months**	Imaging surveillance for thymoma recurrence per oncology; MG-ADL and QMG
Post-myasthenic crisis (step-down period)	**Weekly during initial 4 weeks; monthly during 2–6 months post-crisis**	FVC, NIF, MG-ADL, QMG; trigger-medication review; consider IS escalation

ABBREVIATIONS: BP = blood pressure; CBC = complete blood count; CMP = comprehensive metabolic panel; DAE = Use of High-Risk Medications in Older Adults; DEXA = dual-energy X-ray absorptiometry; FcRn = neonatal Fc receptor; FVC = forced vital capacity; HEDIS = Healthcare Effectiveness Data and Information Set; IS = immunosuppression; LFTs = liver function tests; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MGFA = Myasthenia Gravis Foundation of America; NIF = negative inspiratory force; OMW = Osteoporosis Management in Women; QMG = Quantitative Myasthenia Gravis score; SC = subcutaneous. ***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Comorbidity Management — Primary Care Role

In addition to maintaining a rigorous follow-up schedule, primary care providers are essential for the proactive management of chronic conditions that frequently co-occur with myasthenia gravis.[25]

COMORBIDITY	APPROACH	NOTES
Hypertension (I10)	**Avoid beta-blockers** (OR 2.7 for MG exacerbation); prefer calcium channel blockers, ARBs/ACE inhibitors	If beta-blocker is essential, document MG-related risk discussion
Diabetes (E11.x)	Glycemic management; HbA1c trend; coordinate steroid-induced hyperglycemia	**Baseline screening:** HbA1c and fasting plasma glucose before corticosteroid initiation. **HbA1c trend:** Document HbA1c every 3 months during active corticosteroid therapy and during taper.
Steroid-induced osteoporosis (M81.0)	DEXA; calcium/vitamin D; bisphosphonate per fracture risk	MD testing with DXA and vertebral fracture assessment (VFA) or spinal **X-ray as soon as possible after initiation of ≥2.5 mg/day GC treatment** expected to last >3 months in adults ≥40 years. **Repeat DEXA every 1–3 years while on GC therapy**

COMORBIDITY	APPROACH	NOTES
Depression/ anxiety	**PHQ-9/GAD-7 at every visit**; coordinate psychiatry	**62.5%** anxiety, **46.9%** depressive symptoms at diagnosis.
Thyroid disease	**TSH annually**; treat to euthyroid	Hashimoto thyroiditis in **10–15%** of MG; affects fatigue assessment
Infection prevention	Vaccinations (pneumococcal, influenza, HZV); meningococcal pre-complement inhibitor	Live vaccines **contraindicated** during IS
Polypharmacy	**Medication reconciliation at every visit**	Identify crisis-trigger medications; coordinate with neurology before changes

ABBREVIATIONS: ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; DEXA = dual-energy X-ray absorptiometry; GAD-7 = Generalized Anxiety Disorder-7; HEDIS = Healthcare Effectiveness Data and Information Set; HbA1c = glycated hemoglobin; HZV = herpes zoster virus; IS = immunosuppression; MG = myasthenia gravis; OMW = Osteoporosis Management in Women; OR = odds ratio; PHQ-9 = Patient Health Questionnaire-9; TSH = thyroid-stimulating hormone

Cost-Smart Options

BRAND (EST. ANNUAL COST)	GENERIC/ ALTERNATIVE (EST. ANNUAL COST)	EST. MONTHLY SAVINGS	COST-SMART TIP
Mestinon (pyridostigmine) ~$1,200–$2,400/yr (brand, dose-dependent)	Generic pyridostigmine ~$120–$360/yr	~$90–$170/mo	**First-line symptomatic therapy**; generics are AB-rated bioequivalent. Available as 60 mg tablets, 180 mg extended-release (Timespan), and oral solution for bulbar patients requiring dose fractions
Brand prednisone/ Imuran (azathioprine) Prednisone ~$25–$50/ yr; Imuran ~$3,000–$4,000/yr	Generic prednisone ~$25/yr; Generic azathioprine ~$1,200–$2,400/yr	~$50–$130/mo (azathioprine savings; prednisone already inexpensive)	**First-line immunosuppression for most MG.** Prednisone is among the lowest-cost medications in all of medicine. Azathioprine generic is clinically equivalent to Imuran — no significant difference reported. Check TPMT before starting

BRAND (EST. ANNUAL COST)	GENERIC/ ALTERNATIVE (EST. ANNUAL COST)	EST. MONTHLY SAVINGS	COST-SMART TIP
Complement inhibitors: Soliris (eculizumab) ~$653,000/yr; Ultomiris (ravulizumab) ~$458,000/yr; Zilbrysq (zilucoplan) ~$300,000–$400,000/yr (est.)	Eculizumab biosimilars now available: Epysqli, Bkemv (FDA-approved) — pricing not yet widely published but expected **15–30%** below originator. No biosimilars for ravulizumab or zilucoplan	Variable; biosimilar savings potentially $100,000–$200,000/yr for eculizumab	**Reserve for refractory AChR-positive gMG**. Require documented prior authorization with MG-ADL/QMG scores. **Meningococcal vaccination mandatory** ≥2 weeks before initiation. Eculizumab biosimilars (Epysqli, Bkemv) are FDA-approved and may offer cost reduction
FcRn inhibitors: Vyvgart (efgartigimod IV/SC) ~$225,000/yr; Rystiggo (rozanolixizumab) ~$200,000–$300,000/yr (est.); Imaavy (nipocalimab) — pricing not yet widely published	No biosimilars yet for any FcRn inhibitor	—	Efgartigimod demonstrated the **lowest cost per improved outcome (CPIO) among novel biologics** in network meta-analysis. Rozanolixizumab and nipocalimab are uniquely approved for both AChR-positive and MuSK-positive gMG. Cyclic dosing (not continuous) may reduce annual cost vs. complement inhibitors
CellCept (mycophenolate mofetil) ~$6,500–$8,000/yr at 2 g/day	Generic mycophenolate ~$1,200–$2,400/yr at 2 g/day	~$350–$450/mo	Second-line immunosuppression; effective in clinical practice despite negative RCTs. Generic is bioequivalent. Requires CBC monitoring. Teratogenic — pregnancy counseling mandatory

Patient Education and Adherence

In addition to selecting cost-effective therapeutic options, ensuring patient understanding and treatment adherence is fundamental to achieving stable long-term outcomes in myasthenia gravis.[2,16,23]

- **Diagnosis education:** Explain antibody status (AChR-positive, MuSK-positive, or seronegative) and MGFA class in plain language — patients should understand their specific subtype and what it means for treatment selection and prognosis
- **Crisis-trigger medication awareness:** Counsel on medications that can precipitate myasthenic crisis — beta-blockers (OR 2.7 for exacerbation), aminoglycosides, fluoroquinolones (FDA black box warning), IV magnesium, neuromuscular blocking agents, immune checkpoint inhibitors, and class Ia antiarrhythmics. Provide a written list and wallet card

- **Pyridostigmine dosing and side effects:** Educate on consistent dosing schedule (especially pre-meal timing for bulbar symptoms), maximum daily dose (450 mg), and recognition of cholinergic side effects (diarrhea, cramping, excessive salivation, bradycardia) — overdose can cause cholinergic crisis, which mimics myasthenic crisis
- **Vaccination schedule:** Ensure pneumococcal and influenza vaccines are current (inactivated vaccines only while on immunosuppression). Meningococcal vaccination (MenACWY + MenB) is mandatory at least 2 weeks before initiating complement inhibitors (eculizumab, ravulizumab, zilucoplan) due to risk of fatal meningococcal infection
- **Bone protection:** For patients on chronic corticosteroids — DEXA at baseline, calcium 1,200 mg + vitamin D 800–1,000 IU daily, FRAX assessment, and bisphosphonate consideration per fracture risk
- **Warning signs of crisis:** Instruct patient and family/caregivers to seek immediate emergency care for worsening dysphagia (inability to swallow pills, liquids, or saliva), new or worsening shortness of breath (especially supine), head drop, voice becoming inaudible, or any respiratory distress — call 911, do not drive to clinic

DOCUMENTATION — PATIENT EDUCATION

Document topics covered (diagnosis with antibody status, crisis-trigger medication review, pyridostigmine schedule, vaccination plan, bone protection, crisis warning signs, surgical/anesthesia precautions, advance directives), patient and caregiver present, materials provided, and patient understanding.

Quality Metrics Tie-In

MEASURE (MY2026)	STANDARD	APPLICABILITY TO MYASTHENIA GRAVIS
HEDIS COA: Care for Older Adults — Medication Review	**Denominator:** MA enrollees ≥66, continuously enrolled **Numerator:** 4 sub-measures documented annually: (1) functional status assessment, (2) medication review, (3) pain assessment, (4) advance care planning **Exclusions:** hospice, ESRD	Polypharmacy is the norm in MG — pyridostigmine, corticosteroids, steroid-sparing immunosuppressants, and potentially biologics all require reconciliation. **Crisis-trigger medications** (beta-blockers OR 2.7 for exacerbation, aminoglycosides, fluoroquinolones, IV magnesium, neuromuscular blockers) must be reviewed at every encounter[13]

MEASURE (MY2026)	STANDARD	APPLICABILITY TO MYASTHENIA GRAVIS
HEDIS COA: Care for Older Adults — Functional Status Assessment	**Denominator:** enrollees ≥66 **Numerator:** functional status assessment documented annually **Exclusions:** hospice, ESRD	**MG-ADL** (patient-reported, 0–24) and **QMG** (clinician-assessed, 0–39) directly satisfy this sub-measure and are required for biologic prior authorization (MCID ≥2 for MG-ADL, ≥3 for QMG). MGFA Clinical Classification (I–V) should be documented on the active problem list at every visit to track functional trajectory[14]
HEDIS COA: Care for Older Adults — Advance Care Planning	**Denominator:** enrollees ≥66 **Numerator:** advance care plan or surrogate decision-maker documented, OR documentation that ACP was discussed but patient declined **Exclusions:** hospice	Initiate while disease is stable — myasthenic crisis (MGFA Class V) requiring intubation occurs in 15–20% of MG patients overall and ~21% in elderly ACP should address ventilation preferences, crisis management wishes, and surrogate decision-making[24]
HEDIS DAE: Use of High-Risk Medications in Older Adults	**Denominator:** enrollees ≥66 **Numerator**: ≥2 dispensing events for same high-risk medication during measurement year (lower is better); includes anticholinergics, benzodiazepines, skeletal muscle relaxants per AGS Beers Criteria	Beta-blocker review is high-yield in MG (OR 2.7 for exacerbation, 95% CI 1.28–5.74). Anticholinergic burden review is critical — high anticholinergic load compounds cognitive impairment risk. Beers Criteria review at each visit should document absence of potentially inappropriate medications[14]
HEDIS TRC: Transitions of Care	**Denominator:** enrollees ≥18 with inpatient discharge **Numerator:** 4 sub-measures within 30 days: (1) notification of inpatient admission, (2) receipt of discharge information, (3) patient engagement after discharge, (4) medication reconciliation post-discharge **Exclusions:** hospice	Crisis-trigger medication reconciliation is critical post-hospitalization — fluoroquinolone or beta-blocker prescribed by non-MG-aware providers during admission is a common preventable trigger. **Medication reconciliation should explicitly flag MG-contraindicated drugs**[26]
HEDIS PCR: Plan All-Cause Readmissions	**Denominator:** enrollees ≥18 with acute inpatient discharge **Numerator:** unplanned readmission within 30 days (lower is better) **Exclusions:** planned readmissions, hospice, psychiatric	Post-crisis follow-up within 7 days with neurology, medication reconciliation focused on crisis triggers, and IS optimization reduces preventable readmissions[16]

MEASURE (MY2026)	STANDARD	APPLICABILITY TO MYASTHENIA GRAVIS
HEDIS OMW: Osteoporosis Management in Women Who Had a Fracture	**Denominator:** women ≥67 with fracture **Numerator:** BMD testing or osteoporosis medication within 6 months of fracture	Directly relevant for steroid-exposed MG patients — the ACR 2022 guideline strongly recommends osteoporosis treatment for all adults on prednisone ≥2.5 mg/day for >3 months at moderate-to-very-high fracture risk. DEXA at baseline + annually; calcium/vitamin D supplementation; bisphosphonate or denosumab per fracture risk. **Over 40% of patients with MG onset >70 experience steroid-related adverse effects**[26]
HEDIS DMS-E: Utilization of the PHQ-9 to Monitor Depression Symptoms	**Denominator:** enrollees ≥12 with diagnosis of major depression or dysthymia AND elevated PHQ-9 ≥10 **Numerator:** follow-up PHQ-9 documented within 4–8 months of index elevated score; **Exclusions:** hospice	**Psychiatric comorbidity is highly prevalent in MG** — 62.5% anxiety and 46.9% depressive symptoms at diagnosis. PHQ-9/GAD-7 at every visit with follow-up plan if positive; functional decline, steroid side effects, and social isolation compound depression risk in VLOMG[19]
HEDIS AIS: Adult Immunization Status	**Denominator:** enrollees ≥19 **Numerator:** up-to-date on pneumococcal, influenza, Td/Tdap, HZV per age-appropriate schedule	Inactivated vaccines only while on immunosuppression (live vaccines contraindicated). **Meningococcal vaccination** (MenACWY + MenB) is mandatory at least 2 weeks before initiating complement inhibitors (eculizumab, ravulizumab, zilucoplan) due to risk of fatal meningococcal infection. **Coordinate vaccination timing with neurology before biologic initiation**[25]

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ELEMENT	DOCUMENTATION REQUIREMENT
Exacerbation status (G70.00 vs G70.01)	5.6× RAF difference (**HCC 196 0.516 vs HCC 195 2.909**) — explicit documentation of acute exacerbation, crisis, IVIG/PLEX rescue, or hospitalization supports G70.01

ELEMENT	DOCUMENTATION REQUIREMENT
Acute respiratory failure during crisis	**Code J96.00 (unspecified), J96.01 (hypoxic), or J96.02 (hypercapnic) separately alongside G70.01**; frequently undercoded
Antibody status and MGFA class	Document AChR/MuSK/LRP4/agrin results and MGFA Class I–V on active problem list
MG-ADL and QMG scores	Serial scoring required for biologic prior authorization; document MCID-level changes
Thymoma (C37)	Present in ~**20%** of MG patients; code separately; mandates chest CT/MRI **at diagnosis**
Dysphagia during bulbar disease	**R13.10–R13.19 by phase**; **J69.0 for aspiration events**
Long-term corticosteroid use	**Z79.52 when applicable**; supports DEXA/bone protection rationale
Concurrent autoimmune disease and thyroid status	**E06.3/E05.x/E03.x for thyroid; M05.x/M06.x for RA**; document and code each separately

ABBREVIATIONS: AChR = acetylcholine receptor; CT = computed tomography; DEXA = dual-energy X-ray absorptiometry; HCC = Hierarchical Condition Category; LRP4 = low-density lipoprotein receptor-related protein 4; MCID = minimal clinically important difference; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MGFA = Myasthenia Gravis Foundation of America; MRI = magnetic resonance imaging; MuSK = muscle-specific kinase; QMG = Quantitative Myasthenia Gravis score; RA = rheumatoid arthritis

Annual Clinical Review and Confirmation

- **Annual review:** Active MG requires annual MEAT documentation; explicit exacerbation status (G70.00 vs G70.01) updated at every encounter
- **Visit modality:** Face-to-face or synchronous audio-video telehealth qualifies when it supports meaningful clinical evaluation
- **Clinical context:** Under CMS-HCC V28, **G70.00** → HCC 196 (CNA RAF 0.516 ≈ $5,367/year illustrative); **G70.01** → HCC 195 (CNA RAF 2.909 ≈ $30,260/year illustrative) — the 5.6× difference is the highest-stakes documentation lever
- **Avoid rollover:** Do not copy forward last year's MG note without updating MGFA class, MG-ADL/QMG, current treatment regimen, crisis-trigger medication review, and concurrent comorbidities

Good Documentation is Comprehensive Coding

EHR SHORTCUT/RISK	PREFERRED DOCUMENTATION
Coding G70.9 (unspecified) after MG is confirmed	Once antibody/electrophysiology confirms **MG, code G70.00 (stable)** or **G70.01 (acute exacerbation/crisis)**
Coding G70.00 during active crisis encounter	Document and code **G70.01 + J96.0x for acute respiratory failure** during the crisis encounter; the 5.6× RAF difference reflects the dramatically higher resource utilization of crisis care
'Myasthenia, stable'	'Active generalized MG, AChR-positive, MGFA Class IIb, MG-ADL 5/QMG 9; **G70.00 (stable, no exacerbation this encounter)**; on pyridostigmine 60 mg TID + prednisone 5 mg every other day + azathioprine 150 mg/day; crisis-trigger medication review completed (no beta-blocker)'
'Hospital admission for MG flare'	'**Active myasthenic crisis with acute hypoxic respiratory failure (G70.01 + J96.01)**; intubated day 2; IVIG 2 g/kg started; pre-crisis MGFA IIb, now MGFA V; trigger identified — recent fluoroquinolone for UTI'
Not documenting MG-ADL/QMG for biologic candidate	'MG-ADL 8 (baseline 5); QMG 14 (baseline 9); persistent symptoms despite optimized prednisone + mycophenolate — meets refractory criteria; efgartigimod prior authorization initiated'
'On meds'	'Refractory generalized AChR-positive MG on efgartigimod 10 mg/kg IV weekly × 4 weeks per cycle (cycle 3); meningococcal vaccination current; pre-cycle MG-ADL 5/QMG 9'

ABBREVIATIONS: AChR = acetylcholine receptor; IVIG = intravenous immunoglobulin; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MGFA = Myasthenia Gravis Foundation of America; QMG = Quantitative Myasthenia Gravis score; UTI = urinary tract infection

EHR Workflow Tips

TAG	TIP
SMARTPHRASE	Build '.mg' dot phrase: **G70.00 vs G70.01** explicit status, antibody profile, MGFA class, MG-ADL/QMG, crisis-trigger medication review, current treatment, vaccination status
FILTER	Worklist filter: **active G70.x** with beta-blocker on medication list — flag for review; secondary filter: G70.x on prednisone >3 months without DEXA
PROBLEM LIST	**Maintain G70.00 or G70.01 explicitly**; concurrent thymoma (C37), thyroid status, depression/anxiety, osteoporosis, long-term steroid use Z79.52
ANNUAL DX	Year-end flag for **active G70.x** without face-to-face/video encounter + MEAT in past 12 months
ORDER SET	MG workup: AChR + MuSK reflex panel, RNS, SFEMG if needed, chest CT for thymoma; pre-biologic bundle: meningococcal vaccine, MG-ADL, QMG, infection screen

TAG	TIP
REFERRAL	Triggered referrals: crisis → ED + ICU; new fatigable weakness → neurology; thymoma → thoracic surgery; refractory disease → MG-specialist + infusion center

ABBREVIATIONS: AChR = acetylcholine receptor; CT = computed tomography; DEXA = dual-energy X-ray absorptiometry; ED = emergency department; ICU = intensive care unit; MG = myasthenia gravis; MG-ADL = Myasthenia Gravis Activities of Daily Living; MGFA = Myasthenia Gravis Foundation of America; MEAT = monitor/evaluate/assess/treat; MuSK = muscle-specific kinase; QMG = Quantitative Myasthenia Gravis score; RNS = repetitive nerve stimulation; SFEMG = single-fiber electromyography

Brief Case Examples

SU SUCCESS: COMPREHENSIVE DOCUMENTATION

Patient: 72-year-old patient (former smoker, on metoprolol 50 mg/day for HTN) presents with 4 weeks of intermittent ptosis, diplopia, and mild dysphagia. PCP recognized fatigable pattern, performed ice pack test (+3 mm improvement), ordered AChR antibody (positive high titer), and referred urgently to neurology. RNS **18%** decrement; chest CT identified small thymoma.

Documentation: "Active generalized AChR-positive myasthenia gravis without acute exacerbation, MGFA Class IIb, MG-ADL 7/QMG 12 — **G70.00; thymoma (C37)** — surgical oncology referral; HTN—discontinuing metoprolol (beta-blocker OR 2.7 for MG exacerbation), switching to amlodipine 5 mg/day. Starting pyridostigmine 30 mg TID titrated; prednisone 20 mg/day starting dose, planned alternate-day taper to 60–80 mg every other day; azathioprine 2 mg/kg/day (TPMT checked); DEXA at baseline; calcium/vitamin D started. Meningococcal vaccination current (in case future complement inhibitor); PHQ-9 negative; advance care planning CPT 99497 documented while stable."

Outcome: MG HCC recorded with explicit **G70.00**; **thymoma (C37)** coded; crisis-trigger medication eliminated; bone protection plan documented; concurrent comorbidities all on active problem list.

P PITFALL: INSUFFICIENT DOCUMENTATION

Documentation: "Myasthenia, hospital admission for flare." Coded as G70.00. Patient was intubated day 2 of admission, treated with IVIG 2 g/kg, transferred from floor to ICU. Acute hypoxic respiratory failure noted in ICU notes but not on PCP problem list. Prior to admission, patient was prescribed ciprofloxacin for UTI by urgent care — not noted as a trigger.

Consequence: **G70.00 (MG without exacerbation)** understates the encounter — the patient was in active myasthenic crisis requiring intubation and IVIG rescue, which is **G70.01 (MG with acute exacerbation)**. **J96.01 (acute hypoxic respiratory failure)** not coded (frequently undercoded ancillary diagnosis that should accompany **G70.01** in crisis encounters). Trigger medication (fluoroquinolone) not documented (misses an opportunity to add to medication-allergy/avoid list and counsel patient).

RAF Impact: Lost higher-severity HCC recorded for the crisis encounter; **missing concurrent J96.01** understates the acute respiratory failure resource utilization.

Quantified cost impact using the $10,402.34 base rate:

- **G70.00 coded (HCC 196, RAF 0.516):** illustrative annual value ≈ $5,368

- **G70.01 correctly coded (HCC 195, RAF 2.909**): illustrative annual value ≈ $30,260
- **RAF differential:** 2.393 (2.909 − 0.516) ≈ $24,893/year in unrepresented care resources

Fix: Update problem list and encounter assessment: "Active myasthenic crisis with acute hypoxic respiratory failure (**G70.01 + J96.01**); intubated day 2, on IVIG 2 g/kg over 5 days; trigger identified — fluoroquinolone (ciprofloxacin) for UTI 3 days before admission; patient counseled to avoid fluoroquinolones, aminoglycosides, IV magnesium, and beta-blockers; pre-crisis MGFA IIb, now MGFA V; planned step-down per neurology." Document MEAT for each at next encounter; **ensure J96.0x and crisis-trigger documentation accompany G70.01.**

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