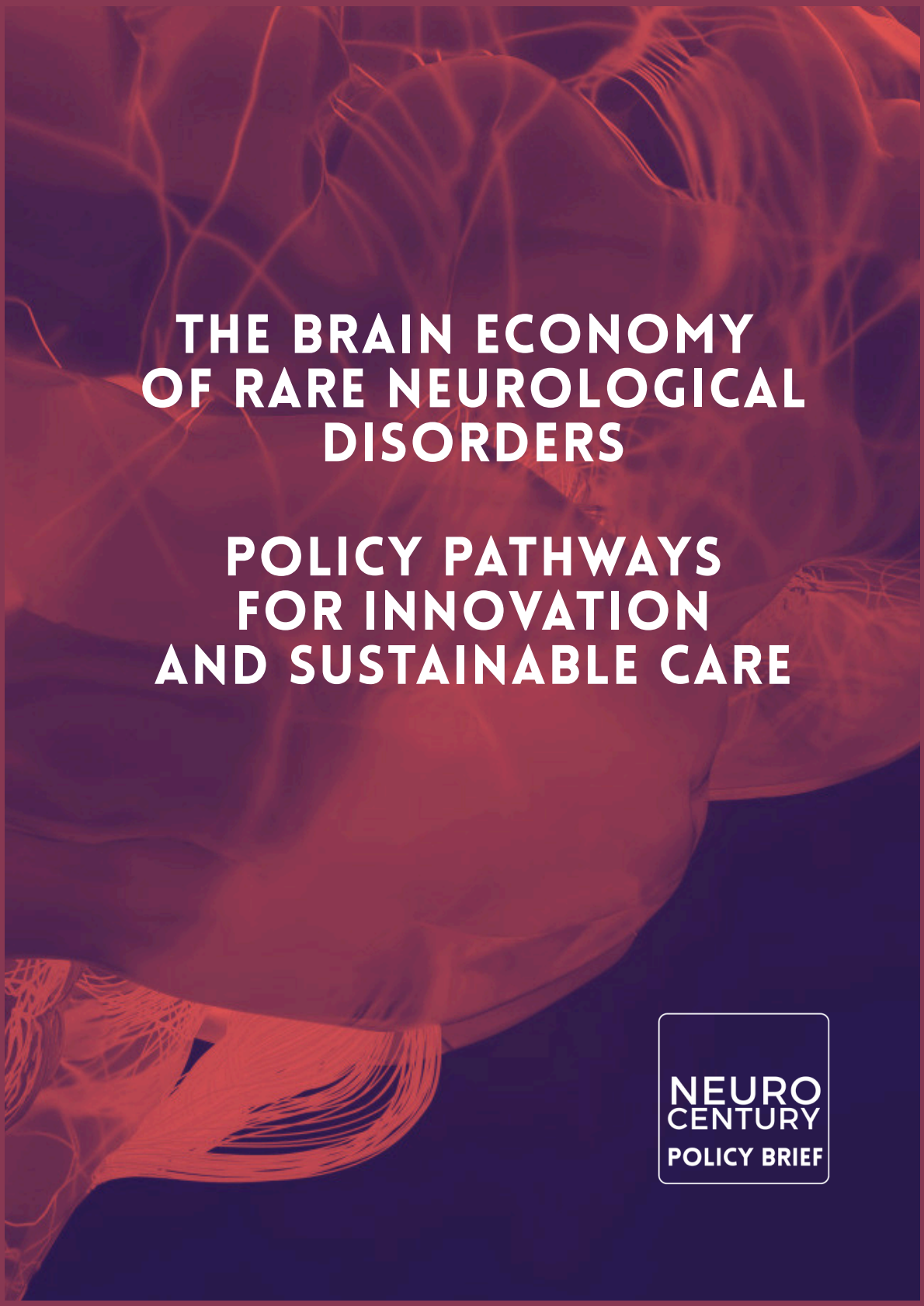


THE BRAIN ECONOMY OF RARE NEUROLOGICAL DISORDERS

POLICY PATHWAYS FOR INNOVATION AND SUSTAINABLE CARE

NEURO CENTURY
POLICY BRIEF

JULY 2026

Although there is a growing awareness of the socio-economic burden of rare neurological disorders, **its translation into comprehensive policy action and more effective innovation frameworks remains incomplete**. Scientific advancement has never been more promising, with numerous new approaches addressing key unmet needs. However, the economics of translating innovation into accessible treatments for patients has never been more challenging. Persistent barriers to access reflect deeper shortcomings in incentive structures, value assessment frameworks, and coordination across the ecosystem of care.

Rare and other less common neurological disorders account for 6% of global neurological DALYs, as a measure that captures the total health loss from disease by combining years lived with disability and years of life lost due to premature death[2]. This highlights a substantial burden that remains insufficiently recognised in policy discussions. According to estimates by the Institute for Health Metrics and Evaluation, rare neurological disorders account for about 650,000 healthy years of life lost each year[3]. This holistic metric captures not just premature mortality, but the years of acute lived disability that define the true burden of rare conditions.

Myasthenia gravis (MG) is the most frequent disorder affecting the neuromuscular junction. Characterised by fluctuating muscle weakness and fatigability, MG profoundly impacts patient quality of life, resulting in considerable burden of disease. Typically, MG initially presents with symptoms confined to ocular muscles, but it can progress to limb, bulbar and respiratory muscles, resulting in generalised MG (referred to as gMG). Advancements in novel treatments that target key pathological mediators of MG offer the potential to optimize disease management and reduce burden of disease. However, adoption remains inconsistent across countries due to differences in national reimbursement policies and varying healthcare guidelines.

Despite the growing availability of new treatment options, a significant unmet medical need remains. A substantial proportion of patients continue to experience persistent

symptoms despite treatment, while others are intolerant to available therapies[4]. As such, **MG represents an important case study** for the need to rethink how the socio-economic underpinnings of rare neurological disorders are understood.

The Brain Economy perspective can contribute to this shift of paradigm by providing a more complete understanding of the burden of rare neurological disorders, **reflecting both the totality of the associated costs**, and pointing out ways in which the socio-economic system needs to adjust to the needs of patients and caregivers. As a result, it opens new avenues to ensure that the contributions, competencies and skills of people with rare neurological disorders are better accounted for and protected at the societal level.

1
Towards a Holistic Assessment of Disease Burden

1a.
Disease Experience and Patient Outcomes

The patient experience of MG is **a function of a complex interplay of persistent physical symptoms, together with psychological distress, and comorbidities**. Fatigue and muscle weakness are the dominant contributor to disease burden, while anxiety, depression, and coexisting conditions further compound their impact on quality of life. In a study examining the management of MG in five European countries, 11% of patients experienced severe fatigue, with general fatigue consistently identified as the most burdensome symptom across all participating countries[5]. A substantial proportion of patients also reported depression, anxiety, or both. In addition, two-thirds of patients were living with one or more comorbidities, which add to the disease burden and affect functional independence.
Another review revealed that the most problematic symptoms for patients were blurry / double vision, breathing difficulties, all-over fatigue, and swallowing problems[6]. It is assessed that in 15% of cases[7], MG can lead to a myasthenic crisis, a neurologic emergency characterised by respiratory failure, which requires mechanical ventilation and/or nasogastric tube feeding.

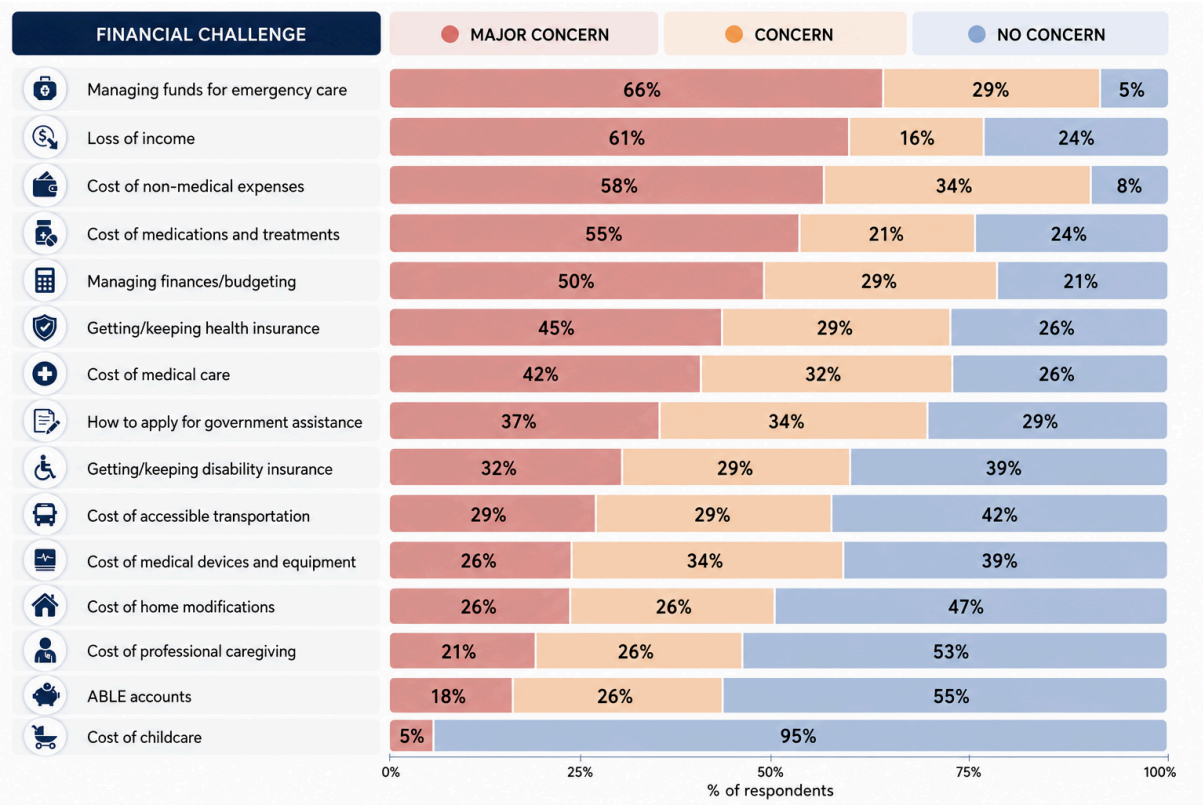
Although therapeutic options for Myasthenia gravis are being successively extended, they remain relatively limited when compared with more prevalent conditions. The natural history of MG and other rare neurological disorders is often less well characterised, with **considerable uncertainty regarding disease progression and long-term outcomes**. Despite positive developments in disease management, the existing evidence gaps complicate clinical decision-making, trial design, and value assessment.

1b.
Economic Burden: Direct and Indirect Costs

People living with Myasthenia gravis and other rare neurological disorders face a **substantial economic burden, encompassing both direct and indirect costs**. Direct healthcare expenses are often cited as the biggest source of concern by patients, particularly the costs associated with emergency care, medications, and ongoing treatment[8].

Indirect costs follow closely as the second major concern, especially loss of income, cost of non-medical expenses, and managing everyday finances and budgets[9]. Other economic concerns include the cost of accessible transportation, professional caregiving, and childcare.

Figure 1. Most common major economic concerns for individuals living with gMG and SDOH barriers.



Source: Hughes, Tom et al., "The economic burden of individuals living with generalized myasthenia gravis and facing social determinants of health challenges", Frontiers Public Health, 12 September 2023, https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2023.1247931/full

Delays in receiving an accurate diagnosis generate significant financial burden, which is further enhanced by the cost of caregiving, and loss of income. Patients living in more remote areas may require assistance to attend medical appointments. They may also need additional support at home, especially when family members remain in employment.

Around 50% of MG patients are in employment, which is comparatively low given the mean age of respondents involved in the included studies – 48 years, hence in peak of working life[10]. Many patients experience **repeated periods of sick leave or are unable to maintain consistent employment**, which affects long-term financial security. In one recent study, 67 days of work absence were reported for employed patients in the first year after diagnosis[11].

In high-severity situations, family members often feel obliged to quit working, and dedicate their entire time to supporting the patients. These caregiving responsibilities have a significant impact not only on household impact, but also for labour participation and carers' broader wellbeing. It is for this reason that **supporting informal carers is a growing policy priority**, in line with the EU Care Strategy[12].

In OECD countries, more than one in eight (13%) people aged 50 and over are informal carers. In Austria and Belgium, this is more than 20%[13]. Informal caregiving is known to reduce labour market participation, working hours and productivity. It is also associated with earlier retirement. The OECD estimates that these labour-market effects translate into a reduction of economic growth by approximately 0.5% annually across the OECD[14]. **Three-quarters of unpaid care work in Europe is provided by women**[15]. This is a major contributing factor to gender inequalities in employment and pensions.

From the broader societal perspective, **long-term consequences of interrupted careers and reduced working capacity, need to be considered**. They often translate into lower retirement income and difficulties accessing disability recognition and support. Delayed diagnosis and insufficiently timely treatments often translate into reduced workforce participation. The economic burden of MG is high and severity-driven, with hospitalisations and intensive treatments as primary cost drivers. The economic burden is particularly high for working patients[16]. Indirect costs, including productivity losses and early retirement, amount to 50% of the total burden, with intangible costs often unreported. It is worth noting that traditional health technology assessments regularly ignore the massive economic implications of unpaid informal caregiving and caregiver disutility - the measurable impact on a family member's quality of life and formal employment capacity.

1c.
Addressing the Intangible Burden of Disease

The WHO definition of brain health from 2022[17] draws attention to the need to examine the burden of disease holistically, through the prism of both the visible but also the invisible burden. Indeed, **a substantial part of the disease burden in MG falls outside routine measurement** and is underrepresented in traditional value assessments. Such invisible costs encompass the cumulative effects of fatigue, fluctuating disability, interrupted careers, informal caregiving, financial insecurity, reduced pension accumulation, lost educational opportunities, and reduced participation in family and community life. These dimensions are largely underrepresented in traditional value assessments.

Mental health conditions, particularly depression and anxiety, are common and often underdiagnosed, contributing significantly to the overall burden. In a recent study, 69.6% and 18.5% of patients with MG reported moderate-to-severe HADS-anxiety and HADS-depression levels[18]. The same study found statistically significant and strong associations between fatigue, sleep dyspnea, usual activities, and emotions. Caregiver involvement tends to be greater in patients with more severe disease and poorer mental health status.

In everyday life, patients with MG experience a wide range of symptoms which are not easily reflected in the existing clinical framework or surrogate endpoints. **Capturing in a more complete way the burden of disease in MG** requires integrating data points across clinical, economic, and societal domains. Diverse aspects need to be measured, including persistent impairment in quality of life, psychological effects, effects on family planning and partnership. **Even if MG symptoms are well controlled, the consequences can remain substantial**, extending beyond physical symptoms to affect emotional wellbeing, family roles, relationships, reproductive choices, and long-term career decisions. They should be fully integrated in the existing assessment tools and questionnaires such as the MG-QoL-15r[19].

A **patient-centred comparative clinical effectiveness research framework**[20] can be seen as a fit for purpose assessment of the disease burden in rare neurological disorders, especially Myasthenia gravis. Its advantage lies in encompassing both direct and indirect costs, as well as the invisible burden emphasised by the WHO. The approach stands out by engaging patients, caregivers and other stakeholders from across the health and healthcare community.

The ability to continue contributing professionally and socially remains deeply important for many people living with MG. Rigid workplaces structures and practices are especially challenging for people whose symptoms fluctuate significantly on the daily basis. **Young people diagnosed with MG early in life may face particularly severe barriers** to building sustainable careers, regardless of educational qualifications.

Expanding the Solution Space:

*

Flexible working arrangements are essential for managing the unpredictable and heterogenous nature of symptoms in rare neurological disorders. Targeted adjustments, including flexible schedules, remote or hybrid working arrangements, and more individualised performance and training frameworks can tip the balance in favour of sustained participation in the labour market. The objective should be to create working environments where people with MG and other rare neurological disorders are not merely in continued employment, but are genuinely able to flourish and realise their full potential

*

Since obtaining formal disability recognition, not uncommon for patients with MG, can be a lengthy and complex process and it is often made more difficult by the lack of available information and guidance, **clearer patient navigation and advisory services are needed** to make sure that patients receive timely information about disability recognition procedures, labour market rights, and available social support, as reflected in the EU Disability Strategy's emphasis on accessibility and equal access to services. In addition, disability assessment framework should better recognise fluctuating and invisible disabilities. Finally, administrative procedures should be better coordinated across healthcare, social security and labour market services.

*

Informal care for MG patients should be recognised as part of the broader social production satellite account, the established mechanism in the System of National Accounts for measuring a domain that lies outside the GDP boundary without altering GDP[21]. Introducing a formal measurement method enables social production to be tracked, evaluated, strengthened, and protected. It also enables the issue to move into the visible space in the fiscal calculus.

2
From Fragmentation of Care to Dedicated Care Pathways

While understanding the socio-economic dimension of rare neurological disorders is essential, **the relevance of the organisational dimension and the fragmentation of care cannot be underestimated**. Care pathways in rare neurological disorders are frequently characterised by long diagnostic delays, high rates of misdiagnosis, and unequal access to specialised care.

2a.
Addressing the Causes of Diagnostic Delays

In one recent study, patients with generalised MG reported mean diagnostic journey time of 11.8 months, with standard deviation (SD) of 22.5 months from symptom onset to seeking care and 15.5 months (SD 36.7 months) from seeking care to diagnosis[22], with female patients reporting more negative experiences. The **reasons for diagnostic delays** had to do with a variety of factors, including difficulty in accessing specialty care, especially in non-urban settings, clinicians mistaking gMG symptoms as female health issues, and lack of gMG knowledge among healthcare professionals. Understanding the way symptoms affect patients' daily lives has been shown to build trust and improve treatment adherence[23].

Both patients and providers often assume that the symptoms are unrelated, instead of forming a constellation that suggests a neurological condition. **The prolonged diagnostic process often contributes to high stress during the patient journey**. It has been shown that patients whose diagnoses take longer than a year experience more fatigue, anxiety, and poorer health-related quality of life[24].

Expanding the Solution Space:

*

Both patients and clinicians agree that **patient/care navigators would be helpful in booking appointments**. Diagnostic journeys are shorter when referring clinicians can make appointments with specialists directly for patients.

*

Clinical support tools for primary care physicians would be helpful in improving their knowledge about gMG. Similarly, **referral networks** connecting primary care doctors with specialists are highly desirable. Dedicated clinical decision-support tools should be developed, including with sympto-based algorithmic systems.

*

Education on rare neurological disorders needs to strengthen among primary care physicians, emergency clinicians, ophthalmologists, ENT specialists and rehabilitation experts, all of whom can come across early manifestations of MG. Healthcare professionals should be encouraged to thoroughly examine the full spectrum of symptoms and their impact on patients, building a safe space for the latter to share insights on their lived experience. Recognising fluctuating muscle weakness, dysphagia and fatigue as potential indicators of MG should prompt earlier referral to specialist care.

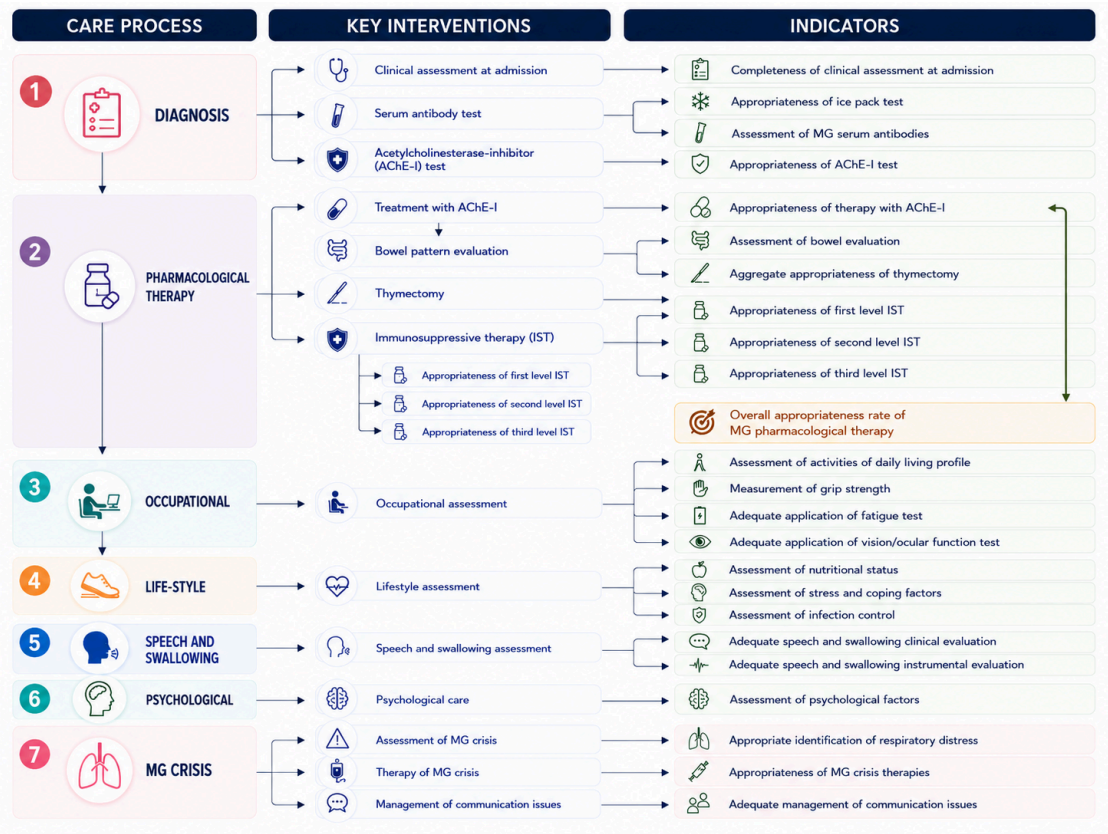
2b.
Towards Better Coordinated Care Pathways and Hybrid Models of Care

In many cases, there are **significant gaps between patient and clinician perspectives regarding treatment priorities**. For this reason, approaches are needed that combine patient-centred care with a broader perspective on the disease trajectory. This requires the systematic incorporation of patient-reported experience and outcome measures into clinical practice, health technology assessment, and decision-making, ensuring that treatment success is evaluated not only against clinical endpoints but also through impact on patients' quality of life.

Ultimately, **the critical challenge is the one of system readiness**: ensuring that organisational structures in healthcare match the pace of scientific progress. While therapeutic innovation in MG has accelerated considerably in recent years, care pathways and reimbursement schemes have not followed this evolution. Improving system readiness calls for integrated models of care that connect primary care, specialist neurology services, rehabilitation, mental health support, and social care. Hybrid models of care, which combine in-person consultations with telemedicine and remote monitoring, can improve continuity of care and access. System readiness requires investing in **workforce capacity**, including better education of frontline healthcare professionals, stronger multidisciplinary collaboration, and greater engagement of patients.

The **development of a model Care Pathway** for rare neurological disorders has been strongly recommended by experts, given the need for knowledge aggregation[25] and improvement of patient access. In a dedicated proposal for MG, Anil Payedimarri and colleagues stressed the need for an inclusive, comprehensive, and multidisciplinary nature of a model Care Pathway[26]. They argued that such a model would help clinical teams to better organise a timely diagnosis and targeted care for patients, and identified 14 key interventions, while noting the need to develop more guidelines covering non-pharmacological therapies. Different centres should validate core performance measures, and integrate the preference of patients.

Figure 2. Key interventions and relative process indicators in the implementation of a model Care Pathways for MG.



Source: Payedimarri, Anil et al., “Development of model care pathway for MG”, International Journal of Environmental Research and Public Health, November 2021, https://www.mdpi.com/1660-4601/18/21/11591

Expanding the Solution Space:

*

MG care pathways should pay **particular attention to the detection and treatment of anxiety and depression**. This implies routine use of screening tools for mental health conditions in MG care centres. In addition, many patients with MG may benefit from respiratory physiotherapy to address symptoms of dyspnea. Breathing has been found to be moderately to strongly connected to fatigue and sleep quality[27]

*

Validated outcome measures, including Myasthenia Gravis Activities of Daily Living (MG-ADL) and Myasthenia Gravis Quality of Life 25-item revised (MG-QoL 15r) and Myasthenia Gravis Quantitative Myasthenia Gravis (QMG) **should be routinely integrated in care pathways.**

*

Comprehensive care, including psychosocial support, should be prioritised as the model Care Pathway is further refined, and as common principles for MG care pathways are further developed across Europe[28]. **Hybrid models** can better address both the visible and invisible burdens of the disease, as well as comorbidities

2c.
Integration of Digital Health and Telemedical Solutions

Given the variety and fluctuating nature of symptoms associated with MG, **digital health and telemedical solutions have shown to have significant potential**. Examples include virtual neurology visits, digital MG-ADL or fatigue tracking, symptom diaries, video checks of ocular symptoms, and alerts when symptoms worsen. They have the potential to improve care continuity and access to specialist expertise, especially for patients living far from the reference centres. Teleconsultations can alleviate the burden of frequent travel, allowing remote therapy adjustments and ongoing monitoring, particularly as part of an established relationship with a treating physician, although frequency of therapy adjustment is an aspect that future innovation is expected to address.

Successful deployment of digital solutions depends not only on technological capability, but also on their effective integration. In the case of digital health solutions, it is difficult to define an appropriate benchmark, understand what is today's standard of care, and then demonstrate that a given solution delivers measurable added value in order to obtain the reimbursement.

Implementation barriers remain, including limited interoperability and lack of standardisation. The challenge is to include digital tools in a structured way into the patient care pathways. This is often **not a technology issue, but an organisational one.**

Expanding the Solution Space:

*

Digital health solutions should be fully integrated into the standard care pathway for MG, enabled by the relevant reimbursement solutions, and facilitated by interoperability standards and clinical guidelines. Instead of relying exclusively on scheduled clinic visits, care pathways should support remote monitoring, more personalised treatment adjustments, and early intervention if needed, hence creating the basis for continuous care.

*

In the evaluation of digital solutions, **their ability to preserve functional independence and improve labour market participation should be taken into account** alongside being able to improve clinical outcomes.

*

Reimbursement pathways should be established for validated digital therapeutics and remote monitoring solutions in rare neurological disorders, so as to fully integrate them into routine care, going beyond isolated pilot projects.

3
Innovation Approach Focused on Closing the Delivery Gap

Facilitating **the way for the innovation to reach the patients** remains one of the most important challenges from the point of view of improving treatment options with genuine impact on the quality of life. Given how healthcare systems are organised, innovators with novel solutions have a windy road to navigate from the moment of the breakthrough to the time the product is delivered to the patient.

The recent reform of the EU pharmaceutical legislation clearly acknowledged that **all orphan medicines are medicines which address unmet medical needs**. This means that products will be eligible for specific incentives or supportive regulatory solutions. Given the widely recognised reality of unequal access to treatments for rare diseases across the EU, companies will be expected to ensure adequate supply of medicines across EU member states, with compliance leading to potential extensions of regulatory protection periods.

A range of incentives and regulatory tools currently available include the Priority Medicines (PRIME) scheme, administered by the European Medicines Agency. It supports innovative products addressing unmet medical needs by means of early scientific and regulatory guidance, which is of particular value to smaller companies, including startups and academic institutions. The recent pharma reform also strengthens market incentives, envisaging up to eleven years of market exclusivity to "**breakthrough orphan medicinal products**" addressing a disease where no satisfactory treatment currently exists. This is among the highest levels of exclusivity globally.

The reform also introduces several **operational flexibilities designed to accelerate access** to innovative therapies such as **phased or "rolling" reviews**, similar to the approach used during the COVID-19 pandemic. The latter allows the EMA to assess data incrementally once it becomes available, with the intention of shortening timelines for products addressing major public health needs.

Introduction of regulatory sandboxes is a potentially groundbreaking development which can provide controlled frameworks for the development and authorisation of highly innovative products, that do not fit easily within existing regulatory approaches. They can also ultimately inform future adaptations of the regulatory framework itself.

Nevertheless, the **specificities of orphan drug development** need to be more fully recognised in the innovation process, given that approaches and evidence requirements that may be appropriate for more prevalent diseases are not necessarily suited to the realities of rare disorders. The incentive structures introduced under the revised pharma legislation may prove **particularly challenging to apply in the context of**

rare neurological disorders such as MG. Drug development in these areas is scientifically complex, lengthy, and resource-intensive. It requires highly specialised expertise, and innovative clinical trial designs. Unlike in the case of more prevalent conditions, projects in orphan medicines must generate robust evidence on the basis of data coming from relatively small patient populations. Consequently, predictable and proportionate incentive frameworks are particularly relevant.

The resulting therapies may not ultimately benefit from sufficiently long periods of effective market exclusivity. **Given the small size of patient populations, prices cannot be reduced indefinitely without putting under question the economic model for innovation**. If conditions attached to obtaining regulatory incentives are difficult to meet in practice, this can additionally weaken the case for investing in rare neurological disorders. The challenge is unfolding in the context of mounting financial pressures on European healthcare systems. Policy should therefore aim to reach an equilibrium between affordability and the interests of research sustainability.

4
Specificity of Rare Neurological Disorders to be Reflected in the Assessment Process

Given national fragmentation, a 3–5-year gap exists between market authorisation by the European Medicines Agency and patient access. The EU Health Technology Assessment (HTA) is a potentially valuable tool for supporting reimbursement decisions, especially **if its findings were to be reused more extensively across member states**.

Reimbursement authorities often require additional evidence-generation, leading to duplication across the different stages of medicines assessment and access pathways and additional financial burdens for industry. Products are often assessed multiple times: during marketing authorisation, pricing negotiations, and reimbursement processes. Closer integration between European-level structures and national HTA agencies can lead to **combining expertise and evidence sources to improve robustness of assessments**.

The European Commission facilitates coordination among national pricing and reimbursement bodies. Possible joint approaches to negotiations for orphan medicines are being examined as part of the implementation of the revised pharmaceutical legislation. While pricing and reimbursement decisions are the competence of Member States, these initiatives aim to reduce fragmentation across the EU.

Given the inherently small populations, uncertainty is not uncommon in rare neurological disorders, that often leads to rejection or delayed access. **A more tailored**

assessment framework for orphan medicines would allow uncertainty to be managed through mechanisms such as conditional approval and adaptive evidence generation, rather than rejection.

Although many symptoms of MG, such as muscle weakness and swallowing are measured in a standardised way using the MDG-ADL, disease-specific measurement is not always translated or adequately considered in approval / reimbursement decisions. This is due to the fact that payers require data from generic instruments like the EQ-5D and SF-36.

The Joint Clinical Assessment (JCA) for medicinal products, introduced under the EU Health Technology Assessment Regulation, aims to support greater cooperation among Member States in the clinical evaluation of new medicines. Establishing a common European assessment of the relative clinical effectiveness and safety of innovative therapies is expected to reduce duplication at national level and facilitate later pricing and reimbursement decisions. At the same time, it will focus exclusively on clinical domains, provide a shared scientific evidence base, and will not make any conclusions on reimbursement, with the latter remaining in the mandate of the Member States.

The JCAs will be conducted by assessors from different Member States, who will define the assessment scope. Patients, clinical experts and other relevant experts will also be involved. The entire process should be concluded within 30 days after the Commission grants marketing authorisation for the given medicinal product. It would then be considered by national authorities in their national HTAs and decision-making process. The JCA framework will become fully applicable to orphan medicines in 2028.

The JCA works on the basis of established principles, assessing the comparative clinical benefit of a new intervention, hence favouring robust clinical data generated through large, well-controlled clinical trials. **These evidence requirements may be difficult to satisfy in the context of rare neurological disorders**, where patient populations are small, while disease heterogeneity is high. Suitable comparator treatments may be less readily available. As a result, uncertainty in the evidence base is a feature of orphan drug development. Methodological adaptions are needed to ensure that evidence uncertainty does not translate into less favourable clinical assessments.

Expanding the Solution Space:

*

A dedicated evidence pathway should be created for orphan medicines as part of the JCA process, placing greater emphasis on the totality of available evidence, including real-world evidence, patient-

*

While value assessments focus primarily on comparative clinical and cost-effectiveness, **they should make greater**

reported outcomes, and clinically meaningful options. It would define how small trials, patient-reported outcomes, caregiver impact, and real-world evidence will be assessed. In conditions such as MG, uncertainty at launch should be managed through registries, managed access agreements, and adaptive evidence generation, rather than becoming a reason for delayed or denied reimbursement.

The framework should allow appropriately managed uncertainty to be addressed through post-authorisation evidence generation. In this way, scientific rigour would be respected, without acting as a barrier of access.

consideration of the quality of life and the value related to the patient experience expressed in patient experience data (PED). The latter reflects day-to-day impact of disease, treatment burden, and the practical realities of living with a disease such as MG and should be systematically incorporated alongside clinical and economic evidence.

5
Enabling Role of Data Integration

All innovation needs to be **underpinned by strong data integration**. Patient registries and data collection play a growing role in this framework. The gap between clinical trial populations and everyday patient reality remains significant, which testifies to the critical importance of robust real-world data registries capable of capturing the broader spectrum of patient experiences and outcomes.

Real-world data registries are particularly significant for rare disorders. The current regulatory requirements often compel pharmaceutical companies to design highly controlled “ideal” clinical trials that include only narrowly defined patient populations. In practice, however, these trial populations frequently do not reflect the complexity of patients’ experience seen in real clinical settings. As a result, clinicians are often faced with the challenge of translating trial outcomes derived from highly selected patients into treatment decisions for much more complex real-world cases.

Given the growing role of new forms of data, including patient-reported outcomes, patient-reported experience measures, digital biomarkers, and data generated through connected health technologies, **developing standardised methodologies and validated endpoints is essential** to make sure that data can be consistently understood and used by researchers, regulators, and health systems. Structured collaboration between regulators, HTA bodies, clinicians, patients, academia and industry is needed to make sure that novel outcome measures are developed and integrated in care pathways. Their early engagement helps to ensure that data generated through research is relevant, usable, and capable of supporting the future regulatory and reimbursement decisions. Public-private research partnerships,

especially those executed via the Innovative Health Initiative, would be an important pathway for **reaching agreement on common standards** before entering the phase of regulatory assessment.

The **European Reference Networks (ERNs)**, established under the EU Directive on application of patients' rights in cross-border healthcare are a critical component of both research, and healthcare delivery in rare neurological disorders. They have become an indispensable part of the European rare disease ecosystem, improving access to expertise and facilitating collaboration. While originally created to improve access to diagnosis, and support more effective treatment pathways, they have over time evolved into important platforms for research collaboration and data sharing. This capacity is extremely valuable for rare disorders, where patient populations are often too small and fragmented in each individual country to generate meaningful insights.

However, the full potential of the ERNs remains underutilised. Despite the high-quality clinical expertise, they have a limited role to play in regulatory decision-making and health technology assessment. The long-term sustainability of the ERNs continues to depend on successive funding arrangements, while collaboration with industry through public-private partnerships remains limited. **A crucial next step is to transfer the results into national health systems**, so that the ERNs might really become a tool to promote brain health.

Expanding the Solution Space:

*

As EURORDIS has recommended, **a sustainable funding model should be established**, integrating the ERNs more firmly into regulatory, research and HTA processes[29]. Consequently, the ERNs would in a better position to generate high-quality real-world evidence, with clear governance frameworks, that should attract more interest on the part of industry. Closer integration of the ERNs into the European Health Data Space would make them more relevant in innovation and clinical trials. The overarching objective should be for the ERNs to become key components of the European health ecosystem, contributing to the translation of scientific advances into improved outcomes.

*

Early joint scientific advice coming from the EMA, HTA bodies, and developers would go a long way towards making sure that endpoints are accepted by both regulators and payers. **A European disease-specific endpoint platform should be established**, bringing together regulators, HTA bodies, ERNs, patients, academia and industry to co-develop, validate and update clinical and digital endpoints, bearing in mind relevance for patients. Validated endpoints and emerging evidence should be translated without delay into clinical practice guidelines.

Conclusions

Rare neurological disorders such as MG impact not only health-related quality of life but also patients' social participation, psychological wellbeing, and economic security. Many of these dimensions have been found to be mutually-reinforcing. This means that health policy should not only focus on addressing MG symptoms but also consider their impact on all aspects of patients' daily lives.

Undisputably, **there is a growing momentum for rare disease policy in Europe**, including within the broader brain health agenda. The EU already deploys a broad spectrum of instruments to support innovation in rare neurological disorders such as collaborative research initiatives, or public-private partnerships.

At the same time, the current policy landscape forms a dense and often contradictory ecosystem, where different legislative and policy initiatives are not always perfectly aligned. While the proposed EU Biotech Act aims to strengthen competitiveness and incentivise innovation, **other reforms, including to the pharmaceutical regulation, may unintentionally create barriers for rare disease innovation**. This can be the case where criteria designed for more prevalent diseases are applied without sufficient adaptation. Smaller European markets are also a source of concern, given that insufficient incentives may further weaken access to innovative therapies and reduce the attractiveness of the EU market more broadly.

Internal cohesion is a precondition of success for complex innovation systems. It necessitates better coordination of evidence requirements and reimbursement mechanisms, to overcome today's fragmentation. Should the latter persist, it would create further uncertainty for innovators and risk undermining Europe's attractiveness for investment in areas where unmet medical need remains weakly defined.

Rare diseases need to be understood through a broader socioeconomic prism. This would necessitate more granular cost-effectiveness frameworks, which today often fail to capture indirect and societal costs such as productivity losses, burdens on family and caregivers, impact on quality of life, workforce participation, as well as broader social inequalities. Should these wider impacts not be integrated into decision-making processes, the true burden of rare neurological disorders would remain underestimated, hampering investment decisions and the development of future innovation. **Making the everyday realities faced by patients and their families visible and translating them into policy and investment decisions must be an important future priority.**

Flexibility is needed in the face of rapidly evolving global dynamics. Changes in pricing and reference mechanisms outside of Europe have a growing bearing on the European innovation ecosystem. At the same time, Europe cannot operate in isolation.

Patient-directed approaches are of foundational importance. Better integration of patient experience into research, clinical trials, or HTA, needs to be coupled with a genuine reflection on how employment policy and broader socioeconomic evaluations need to be structured. Employment and social support systems need to adapt to fluctuating disease realities from the outset, enabling people living with rare neurological disorders to remain active contributors to society. **The rare disease space is one in which no single stakeholder can deliver solutions alone.** Programmatic collaboration between patients, clinicians, researchers, industry, policymakers, regulators, and payers is needed.

This Policy Brief draws on the discussions at the
NeuroCentury – Brain Capital Alliance Round Table held in Brussels on 4 May 2026.

The author is grateful for invaluable insights to the speakers and the participants of the Round Table: Rym Ayadi, Lutgarde Allard, Jenny Ceccarini, Amanda Cole, Sabrina Conti, Rossella Di Bidino, Ondřej Dostál, Dimitrios Georgiopoulos, Marcus Guardian, William Heisel, Kaja Kantorska, Isabel Klinnert, Magda Krakowiak, Hélène Le Borgne, Sophie Lehnerer, Simone Mohrs, Vinciane Quoidbach, Paola A.Rivera Ramirez, Kamila Repanova, Pier Luigi Sacco, Paweł Świeboda, Giuseppe Turchetti, Daniel Zolnierz, Elisabetta Vaudano. Special thanks to Lutgarde Allard, William Heisel and Sophie Lehnerer for reviewing an earlier draft of the paper.

***

This project is supported by
Merck KGaA, Darmstadt, Germany

[1] The author is Founder and Director of NeuroCentury, Co-Founder of the Brain Capital Alliance, Senior Fellow for Neurotechnology at the Centre for Future Generations and Senior Visiting Fellow at the European Policy Centre.

[2] Analysis based on the Global Burden of Disease 2021 study, see: https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(24)00038-3/fulltext

[3] Presentation of William Heisel, Director for Global Services, Institute for Health Metrics and Evaluation, at the Round Table in Brussels, 4 May 2026.

[4] See: Bril, Vera, et al., "Safety and efficacy of rozanolixizumab in patients with generalized myasthenia gravis (MycarinG): a randomized, double-blind, placebo-controlled, adaptive phase 3 study, Lancet Neurology, October 2023, https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(23)00077-7/abstract; Howard, James et al., "Safety, efficacy, and tolerability of efgartigimod in patients with generalized myasthenia gravis (ADAPT): a multicentre, randomized, placebo-controlled, phase 3 trial",

Lancet Neurology, July 2021, https://pubmed.ncbi.nlm.nih.gov/34146511/; Howard, James et al., "Post-hoc analyses from the ADAPT clinical study demonstrate aggregate sustained benefit of Efgartigimod in generalized myasthenia gravis", Journal of the Neurological Sciences, 15 November 2024, https://www.sciencedirect.com/science/article/pii/S0022510X24004003

[5] Scowcroft, Anna et al, "Physician- and patient-reported perspectives on myasthenia gravis in Europe: a real-world survey", Orphanet Journal of Rare Diseases, 29 June 2023, https://link.springer.com/article/10.1186/s13023-023-02727-0

[6] Lehnerer, Sophie et al., "Burden of disease in myasthenia gravis: taking the patient's perspective", Journal of Neurology, 20 November 2021, https://link.springer.com/article/10.1007/s00415-021-10891-1

[7] Ciafaloni, Emma, "Myasthenia gravis and congenital myasthenic syndromes", Continuum, December 2019, https://continuum.aan.com/doi/10.1212/CON.0000000000000800?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed

[8] In a recent study, 66% of respondents identified the cost of emergency care as a major concern (plus 29% as a concern), and 55% referred in the same terms to the affordability of medications and treatments (and 76% as a concern to any extent). See: Hughes, Tom et al., "The economic burden of individuals living with generalized myasthenia gravis and facing social determinants of health challenges", Frontiers Public Health, 12 September 2023, https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2023.1247931/full

[9] Loss of income has been cited as a major concern for 77% of respondents, while the cost of non-medical expenses for 58% patients in Huges, Tom et al. op.cit.

[10] See Gustafierro, Erika et al., "Employment in Myasthenia Gravis: A Systematic Literature Review and Meta-Analysis", Neuroepidemiology (2020) 54 (4), https://karger.com/ned/article-abstract/54/4/304/226605/Employment-in-Myasthenia-Gravis-A-Systematic?redirectedFrom=fulltext

[11] See Lehnerer, Sophie et al., "The economic burden of Myasthenia gravis from the patient's perspective and reflected in the German claims data", Scientific Reports, 25 February 2025, https://www.nature.com/articles/s41598-025-91372-7

[12] See: "A European Care Strategy for caregivers and care receivers", European Commission, 7 September 2022, https://employment-social-affairs.ec.europa.eu/news/european-care-strategy-caregivers-and-care-receivers-2022-09-07_en

[13] OECD, "Health at a Glance", 2025, https://www.oecd.org/en/publications/health-at-a-glance-2025_8f9e3f98-en/full-report/informal-carers_6f243c4d.html

[14] OECD, "Health at a Glance", 2025, op. cit.

[15] Draft Report on advancing towards a care society: addressing the gender care gap, Committee on Employment and Social Affairs, Committee on Women's Rights and Gender Equality, European Parliament, 1 September 2025, https://www.europarl.europa.eu/doceo/document/CJ21-PR-776815_EN.pdf

[16] See Lehnerer, Sophie et al., "The economic burden of Myasthenia gravis from the patients' perspective and reflected in German claims data", op. cit.

[17] See: https://www.who.int/news/item/09-08-2022-launch-of-first-who-position-paper-on-optimizing-brain-health-across-life

[18] Dewilde, S., et al., "The Burden patients with MG experience in terms of breathing, fatigue, sleep, mental health, discomfort and usual activities in comparison to the general population", Advances in Therapy, 3 November 2023, https://link.springer.com/article/10.1007/s12325-023-02704-w

[19] The MG-QoL-15r is a validated HRQoL measure for patients with MG, which assesses the impact of MG over the course of a few weeks covering the following dimensions: emotions, physical health, self-care, social life, and impact on role.

[20] See: https://www.pcori.org/about/about-pcori

[21] Proposed by the Mental Wealth Initiative, University of Sydney. Method developed and refined in partnership with representatives from a broad range of institutions and multilateral organisations and has been peer reviewed and published in Nature Mental Health (2023): https://www.nature.com/articles/s44220-023-00044-w

[22] Kielhorn, Adrian et al., "Patient journey in generalized Myasthenia gravis in the

United States: Barriers to timely diagnosis and proposed solutions", Journal of the Neurological Sciences, 15 December 2025, https://www.jns-journal.com/article/S0022-510X(25)02288-9/fulltext

[23] Acosta Reyes, Cornelia et al., "What patients don't say and physicians don't ask: a needs assessment in MG integrating patient and healthcare professional perspectives", Neurology and Therapy, 15 May 2025, https://link.springer.com/article/10.1007/s40120-025-00751-9

[24] Borsi, A., Nissinen R., Gary C., et al. "Delayed diagnosis amongst GMG patients: Results from a European real-world study", Value in Health, December 2022, https://www.valueinhealthjournal.com/article/S1098-3015(22)04534-X/fulltext

[25] Turchetti, Giuseppe et al., "RarERN Path: a methodology towards the optimization of patients' care pathways in rare and complex diseases developed within the European Reference Networks", Orphanet Journal of Rare Diseases, 14 December 2020, https://link.springer.com/article/10.1186/s13023-020-01631-1

[26] Payedimarri, Anil et al., "Development of model care pathway for MG", International Journal of Environmental Research and Public Health, November 2021, https://www.mdpi.com/1660-4601/18/21/11591

[27] See: Dewilde, S., et al., "The Burden patients with MG experience in terms of breathing, fatigue, sleep, mental health, discomfort and usual activities in comparison to the general population", Advances in Therapy, 3 November 2023, https://link.springer.com/article/10.1007/s12325-023-02704-w

[28] See: "Rethinking Myasthenia Gravis", Policy Brief, European Brain Council, https://www.braincouncil.eu/3d-flip-book/rethinking-myasthenia-gravis-policy-brief/

[29] "Recommendations to achieve a mature ERN system by 2030", EURORDIS, December 2020, https://download2.eurordis.org/documents/pdf/EURORDIS_vision_on_mature_ERNs_FINAL.pdf; "EURORDIS welcomes the milestone 5-year evaluations of the European Reference Networks", November 2024, https://www.eurordis.org/eurordis-welcomes-ern-evaluations/