imaging (MRI)—might distinguish surgical responders from early non-responders. **Methods:** We retrospectively identified 35 TN patients treated surgically from 2005-2017 with high-resolution, pre-operative MRI scans adequate for quantitative structural analysis. Patients were classified as *non-responders* if, within 12-months after surgery, they: 1) underwent or were offered another surgical procedure; or 2) reported persistent, inadequately-controlled pain. Volumes of pain-relevant subcortical structures (amygdala, thalamus, and hippocampus) were measured on T1-weighted MRI scans using an automated approach (FSL-FIRST). **Results:** Surgical responders had significantly larger hippocampi bilaterally compared to early non-responders. Thalamus and amygdala volumes did not differ between groups. **Conclusions:** Pre-operative differences in brain structure, notably in the hippocampus, may predict durability of response to surgery in patients with TN.

Table 1: Demographic and Clinical Characteristics of TN Patients:

	Responders	**Non-Responders**	**P-value (2-tailed)**
Outcome Group	23	12	N/A
Sex (Female/Male)	9/14	6/6	0.5591
Age, years	4.35 ± 11.36	53.75 ± 16.33	0.9111
Affected Side (Left/Right)	5/18	5/7	0.2630
# of Previous treatments	0.13 ± 0.34	1.42 ± 1.40	0.0105*
Surgery Performed (MVD/PRR)	21/2	10/2	0.9722
Volumetric Assessment:			
	Responders (mm3)	**Non-Responders (mm3)**	**P-value (2-tailed)**
Hippocampus:			
Ipsilateral	3440 ± 365	697 ± 318	0.0415*
Contralateral	3381 ± 375	3727 ± 215	0.0015*
Left	3357 ± 373	3669 ± 231	0.0046*
Right	3464 ± 361	3754 ± 301	0.0178*
* p<0.05			
MVD – microvascular decompression surgery PRR – percutaneous retrogasserian rhizotomy			
Values are mean +/- standard deviation where appropriate			

Neuromuscular Disease and EMG

P.069

Respiratory dysfunction and sleep disordered breathing in children with Myasthenia Gravis

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Background: Myasthenia Gravis (MG) is an autoimmune disease that affects the neuromuscular junction. It typically presents with fluctuating muscle weakness which can affect respiratory muscles. Data about the prevalence of sleep disordered breathing in children with MG and the benefits of non-invasive ventilation outside the setting of MG crisis has not been studied so far. **Methods:** Eleven children between 3 and 18 years old with confirmed MG were recruited from the The Hospital for Sick Children Neuromuscular clinic in a prospective observational study. Informed consent was obtained and patients underwent PFTs, MIP/MEP, SNIP, FVC and standard polysomnography testing's. **Results:** In our study, we found that 2/11 children had abnormal Apnea Hypopnea index (AHI) and were diagnosed with obstructive sleep apnea (OSA). One of them has juvenile ocular MG with mild to moderate OSA and the second child has congenital MG with mild OSA. CPAP therapy was initiated for both patients. **Conclusions:** In our cohort, obstructive sleep apnea rate was significantly higher in children with MG than the known prevalence in general pediatric population (18% vs 2-3%). Early diagnosis and management of OSA can have great impact on children's health and quality of life. A larger study is needed to validate our findings.

P.070

Autosomal dominant MARS mutation linked to severe early onset CMT2U

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Background: Methionyl-tRNA synthetase (MARS) links methionine to its cognate tRNA required for translation. MARS mutations have been linked to adult-onset CMT2U. **Methods:** The proband had weakness in her first year of life, sitting at 11 months and walking at 20 months old. At 4 years old she was areflexic with distal > proximal weakness. Nerve conduction studies showed normal median and sural sensory responses with absent common peroneal, low median and tibial motor amplitudes. EMG noted denervation and quadriceps biopsy revealed neurogenic atrophy. Genetic testing for spinal muscular atrophy and sequencing of *MNF2, RAB7A, LMNA, MPZ, HSPB1, NEFL, GADP1, TRPV4, HSPB8, GJB1* and *PLEK8G5* were negative. She stopped walking at 9 years old and could not raise her arms above her head at 11 years old. **Results:** Exome sequencing identified *MARS*: c.1189G>A; p.Ala397Thr. To determine the functional consequences of p.A397T-*MARS*, yeast complementation assays were performed. Wild type or mutant *MARS* were cloned into yeast lacking the endogenous *MARS* ortholog. Wild-type *MARS*

supported robust cellular growth, while the p.A397T-*MARS* insert did not support cellular growth confirming deleterious effect of this variant. **Conclusions:** Our patient's phenotype was similar to children with motor-predominant *GARS* mutations. Functional data notes this *MARS* variant to be damaging and predictive of a severe, early-onset phenotype.

P.071

Novel mutations in SPG7 identified from patients with late-onset spasticity

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Background: Hereditary spastic paraplegia (HSP) is a group of genetic diseases that cause progressive degeneration of the corticospinal tract. Historically, this disease was divided into two types:the classic subtype, with leg weakness and hypertonic bladder, and the complicated subtype, with features such as cerebellar ataxia or optic atrophy.Mutations in *SPG7 (*encoding paraplegin) leads to complicated HSP causing cerebellar ataxia, progressive external ophthalmoplegia in addition to the classical symptoms. AFG3L2 is a binding partner of paraplegin and mutations in *AFG3L2* cause a similar syndrome **Methods:** From a neurogenetic clinic , we identified 11 patients with late-onset HSP. Sequencing of *SPG7* and *AFG3L2* was performed using a customised assay, and/or clinical diagnostic sequencing panels.*SPG7* transcript level quantification was performed from whole blood RNA on a digital droplet qPCR system. **Results:** We identified 4 patients with pathogenic variants or variants of unknown significance in *SPG7*. No *AFG3L2* mutations were identified. We provide evidence for pathogenicity for three mutations that were not previously associated with SPG7-related disease, based on their occurrence in context of the correct phenotype, and the reduction of transcript levels measured with RT-qPCR.A curious association of the heterozygous p.Gly349Ser mutation in association with an ALS-like syndrome is reported. **Conclusions:** *SPG7* mutations sequencing has high diagnostic yield in late onset paraparesis

P.072

Agreement between children and their parents' ratings of the health-related quality of life of children with Duchenne Muscular Dystrophy

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Background: When measuring young Duchenne Muscular Dystrophy (DMD) patients' health-related quality of life (HRQoL), parent-proxy reports are heavily relied on. Therefore, it is imperative that the relationship between parent-proxy and child self-report HRQoL is understood. This study examined the level of agreement between children and their parent-proxy rating of the child's HRQoL. **Methods:** We used FOR-DMD clinical trial baseline data. HRQoL, measured using the PedsQL inventory, was reported by 178 parent and child (ages 4 to 7 years) dyads. Intracorrelation coefficients (ICC) measured absolute agreement while paired t-tests determined differences in the average HRQoL ratings between groups. **Results:** The level of agreement between child and parent-proxy ratings of HRQoL was poor for the generic PedsQL scale (ICC: 0.29) and its subscales; and, similarly low for the neuromuscular disease module (ICC:0.16). On average, parents rated their child's HRQoL as poorer than the children rated themselves in all scales except for psychosocial and school functioning. **Conclusions:** Child and parent-proxy HRQoL ratings are discordant in this study sample, as occurs in other chronic pediatric diseases. This should be taken into account when interpreting clinical and research HRQoL findings in this population. Future studies should examine reasons for parents' perception of poorer HRQoL than that reported by their children.

P.073

Cardiac dysfunction in mitochondrial disease: systematic review and metaanalysis

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Background: Cardiac dysfunction has significant impact on morbidity and mortality in patients with mitochondrial disorders. Cardiac screening tests are generally recommended because cardiac dysfunction can occur at any point in the disease course, and is amenable to treatment. However there is no clear evidence indicating the best screening strategy in patients with mitochondrial myopathy. **Methods:** Systematic review of the literature for cardiac investigations in adult patients with mitochondrial myopathy. We considered 1303 relevant abstracts, from which 58 full-length articles were reviewed. Seventeen articles including 701 total participants met inclusion criteria. Data extracted included age, diagnosis, and results from ECG, echocardiogram, cardiac MRI, nuclear medicine studies, and Holter monitor. **Results:** We identified echocardiogram and ECG as the principal screening modalities, that identify cardiac structural (26%) and conduction abnormalities (37%) in patients from various mitochondrial myopathy syndromes. Holter monitor was not a high yield investigation and limited studies were identified using cardiac MRI or nuclear medicine. **Conclusions:** We recommend screening with ECG and echocardiogram every 1-2 years in MERRF/MELAS, and every 3-5 years in milder syndromes when cardiac symptoms are not present. Only five of the included studies provided any follow-up data. We recommend studies of natural history, therapeutic response, and of cardiac MRI as areas for future study.

P.074

Clinical features of a family with distal myopathy and rimmed vacuoles due to a digenic interaction

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Background: The interaction between mutations in two or more genes is increasingly recognised as an important contributor to the phenotypic variability in genetic disorders. Co-occurrence of variants in SQSTM1 and TIA1 is reported as a cause of myopathy