1. Have multiple brain MRIs been performed?  Yes  No, single brain MRI
   1. If yes, how many have been performed?  2  3  4  5  6  >6
   2. If >6 specify:

Table for recording MRI results

| Brain MRI | Date Performed | Age of affected | Site Performed |
| --- | --- | --- | --- |
| 1st | Data to be filled in by site | [derived field] | Data to be filled in by site |
| 2nd | Data to be filled in by site | [derived field] | Data to be filled in by site |
| 3rd | Data to be filled in by site | [derived field] | Data to be filled in by site |

1. Was sedation used?  Yes  No
2. General description of field of view/ anatomical positioning:
3. Magnetic field strength of scanner used:

1.5 T  3.0 T  7.0 T  Other: T

1. Head circumference at time of scan: cm
2. Total time in scanner (include all studies done within each particular session): HH:MM
3. RF receiver coil(s) and number of channels: (Choose all that apply)

Head coil  Neck coil  Spine Array  Body coil (transmit)

1. Sequences used:  T1-weighted  T2-weighted  FLAIR  DWI  SWI  GE  Other, specify:
2. Specify sequence name of T1 or T2 used:
3. Contrast used:  Yes  No
   1. If YES, name of the contracts: dosage:
4. T1-MRI sequence parameters
   1. Slice orientation:  Axial  Coronal  Sagittal  Oblique
   2. Field of view: x mm2
   3. In-plane resolution: x mm2
   4. Slice thickness: mm
   5. Gap between slices: mm or % (for 2D acquisition)
   6. Number of slices:
   7. Repetition time (TR): ms
   8. Echo time (TE): ms
   9. Acquisition time: minutes

Check box if items #11 a-f are the same for all sequences.

1. T2 sequence parameters (copy the following sections if parameters are different for the 2 sequences)
   1. Slice orientation:  Axial  Coronal  Sagittal  Oblique
   2. Field of view: x mm2
   3. In-plane resolution: x mm2
   4. Slice thickness: mm
   5. Gap between slices: mm or %
   6. Number of slices:
   7. Repetition time (TR): ms
   8. Echo time (TE): ms
   9. Acquisition time: minutes
2. FLAIR sequence parameters (copy the following sections if parameters are different for the 2 sequences)
   1. Slice orientation:  Axial  Coronal  Sagittal  Oblique
   2. Field of view: x mm2
   3. In-plane resolution: x mm2
   4. Slice thickness: mm
   5. Gap between slices: mm or %
   6. Number of slices:
   7. Repetition time (TR): ms
   8. Echo time (TE): ms
   9. Acquisition time: minutes
   10. Inversion time (TI): ms
3. DWI sequence parameters
   1. Type of diffusion sequence:  Single shot EPI  Multi shot EPI
   2. Slice orientation:  Axial  Sagittal  Coronal
   3. Slice thickness: mm
   4. Gap between slices: mm
   5. B0:  B1000  Other, specify:
4. Post contrast T1WI
   1. Specify type/name of postcontrast T1 sequence used:
   2. Slice orientation:  Axial  Sagittal  Coronal
   3. Slice thickness: mm
   4. Gap between slices: mm
   5. Repetition time (TR): ms
   6. Echo time (TE): ms
5. Name of the scanner manufacturer:

GE Siemens Philips Toshiba Other, specify:

1. Clinical read of MRIs
   1. Reader blinded to clinical data? Yes  No
   2. Quality of images technically satisfactory? Yes  No  Partially, specify:
2. Lesions found Yes  No
   1. If YES, type of lesion(s):  Cortical  WM  Striatal  Globus Pallidus  Thalamic

Brainstem  Cerebellum  Other, specify:

* 1. If vascular infarct or other abnormalities, specify:

1. Malformations
   1. Cortical migration anomalies:  Yes  No
      1. If YES, indicate location and specify(s):  Frontoparietal Temporal Occipital Insular
   2. Commissural:  Normal  Abnormal
      1. If Abnormal, specify:
   3. Striatum:  Normal  Abnormal
      1. If Abnormal, specify:
   4. Brainstem:  Normal  Abnormal
      1. If Abnormal, specify:
   5. Cerebellum:  Normal  Abnormal
      1. If Abnormal, specify:
2. White matter changes
   1. White matter on T2 weighted images:  Normal  Abnormal (if diffuse mark all)
      1. If Abnormal, indicate location(s):

Frontal

Parietal

Temporal

Occipital

Brainstem

Superficial

Periventricular

Deep

Cerebellar

* + 1. If Abnormal, indicate pattern if possible:

Leukodystrophy

Hypomyelination/delayed myelination

Tigroid

Vanishing

Vascular injury

Non-specific

* 1. Compacted white matter tracts:
     1. Corpus Callosum: Involved Spared
     2. Anterior limb internal capsule: Involved Spared
     3. Posterior limb internal capsule: Involved Spared
     4. Anterior commissure: Involved Spared
  2. White matter on DWI:  Normal  Abnormal: (if diffuse mark all)
     1. If Abnormal, indicate location(s) and specify the DWI characteristic (facilitated/ homogeneous reduced / heterogeneous components)

Frontal

Parietal

Temporal

Occipital

Superficial

Periventricular

Deep

Cerebellar

Brainstem

1. Cavitation:  Yes  No
   1. If Abnormal, indicate location(s):

Frontal

Parietal

Temporal

Occipital

Periventricular

Deep WM

Cerebellar WM

Diffuse

Striatal

Thalamic

1. Grey matter hyperintensity
   1. Grey matter hyperintensityon T2/FLAIR images**:**  Yes  No
      1. If YES, specify**:**

Cortex

Caudate

Putamen

Pallidum

Thalamus

Subthalamic nucleus

Mammillary body

Substantia nigra

Red Nucleus

Periaqueductal Grey

Cerebellar Nuclei

Floor of the Fourth Ventricle

Colliculi

Other, specify:

* 1. If cortical involvement:  Classic MELAS stroke  Atypical metabolic stroke

Vascular stroke  POLG-RD cortical involvement  Other, specify:

* 1. If cortical involvement location:

Frontal

Parietal

Temporal

Occipital

Insular

Cerebellar

1. Subependymal cysts:  Yes  No
   1. If YES, indicate location(s):  Frontoparietal  Temporal  Occipital
2. Ventricles**:**  Normal  Abnormal
   1. Dilation  Other, specify:
3. Abnormal Enhancement:  Yes  No
   1. If Abnormal, indicate location(s): Cortex  White matter  Basal Ganglia  Thalamus  Brainstem Cerebellum  Cranial nerve enhancement
4. Eye abnormalities:  Yes  No
   1. If YES, specify:

Optic Nerve Abnormalities

Microphthalmia

Cataract

1. Comments if needed:

Recorder Signature: Date:

## General Instructions

This form contains data elements that are collected for brain magnetic resonance imaging. Responses to categories are obtained from health professionals performing the procedure.

Important note: All of the data elements included on this CRF Module are classified as Core (i.e., strongly recommended for all mitochondrial disease clinical studies to collect).

Please see the Data Dictionary for element classifications.

## Specific Instructions

Please see the Data Dictionary for definitions for each of the data elements included in this CRF Module.

* Multiple MRIs performed – Answer, only if brain MRI was performed.
* Brain MRI date performed - Date/time should be recorded to the level of granularity known (e.g., year, year and month, complete date plus hours and minutes, etc.) and in an unambiguous format acceptable to the study database like DD-MMM-YYYY. When date/time data are prepared for aggregation or sharing, they should be converted to the format specified by [ISO 8601](https://www.iso.org/iso-8601-date-and-time-format.html); YYYY-MM-DD T:hh:mm:ss.
* Brain MRI age of affected – This is recorded for each brain MRI performed. This is a derived element based on Date of Birth and Visit Date.
* Scanner strength – Choose one.
* Head circumference – Record the head circumference of the participant as well as the units for the measurement. Answer should be recorded in centimeters (cm).
* RF receiver coil(s) and number of channels – Choose all that apply.
* T2 sequence parameters – If the sequences are different for T1 and T2 sequence parameters, record the T2 parameters as indicated. If they are the same, leave the T2 parameters section blank.
* FLAIR sequence parameters – If the sequences are different for T1 and FLAIR sequence parameters, record the FLAIR parameters as indicated. If they are the same, leave the FLAIR parameters section blank.
* Contrast used – Choose one. If yes, record the name of the contrast agent and its dosage.
* Field of view – Answer should be recorded as a dimension (AAxAA) and in millimeters squared (mm2).
* Plane resolution – Answer should be recorded as a dimension (AAxAA) and in millimeters squared (mm2).
* Slice thickness – Answer should be recorded in millimeters squared (mm2).
* Gap between slices – Answer should be recorded in millimeters squared (mm2) or % (for 2D acquisition).
* Repetition time – Answer should be recorded in milliseconds (ms).
* Acquisition time – Answer should be recorded in minutes.