

Mitochondrial Disease CDE Highlight Summary Document

NIH Resources

The NINDS also strongly encourages researchers to use these NIH developed materials for NINDS-sponsored research, when appropriate. Utilization of these resources will enable greater consistency for NINDS-sponsored research studies. These tools are free of charge.

- National Institutes of Health (NIH) Toolbox
- Quality of Life in Neurological Disorders (Neuro-QOL)
- Patient-Reported Outcomes Measurement Information System (PROMIS)

Suicidal Ideation

Investigators should review the FDA’s ["Guidance for Industry: Suicidal Ideation and Behavior: Prospective Assessment of Occurrence in Clinical Trials"](#) for the most up-to-date information about suicidal ideation and behavior. One scale that FDA suggests is the Columbia Suicide Severity Rating Scale (C-SSRS) (available at [Columbia Suicide Severity Rating Scale](#))

Disease/Domain	Recommendations
Mitochondrial Disease	<p>These instruments and elements are recommended for use in Mitochondrial Disease studies:</p> <p>Core elements: None</p> <p>See Start-Up Resources Listing document (Mitochondrial Disease Start-Up Resource Listing)</p> <p>Supplemental – Highly Recommended instruments (for specific disease conditions or types of study):</p> <p>Anthropometrics- Vital Signs, Apathy Evaluation Scale, Automated Self-Administered 24-hour Dietary Recall (ASA 24), Barry Albright Dystonia Scale (BADs), Behavior Rating Inventory of Executive Function (BRIEF), Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P), Conners 3, Diabetes-Related Medical History, Echocardiogram, Genetic Testing Short Form, Genetic Testing Clinical Diagnostics, Laboratory Tests and Non-Imaging Diagnostics (Diabetes), Maximal Exercise Test, Modified Hammersmith Functional Motor Scale (MHFMS-SMA, MHFMS), Peabody Development Motor Scale II, Pediatric Quality of Life Inventory (PEDIQL), Pulmonary Function, Scale for the Assessment and Rating of Ataxia (SARA), Sub-Maximal Exercise Test, Test of Variable Attention (TOVA), The Borg Scale of Perceived Exertion, Vineland Adaptive Behavior Scales, 2nd Ed., World Health Organization Quality of Life Assessment (WHOQOL)</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Participant/Subject Characteristics; Demographics	<p>Core: General Core</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: None</p> <p>Exploratory: None</p>
Participant/Subject History and Family History; General Health History	<p>Core: None</p> <p>Supplemental – Highly Recommended: Diabetes-Related Medical History</p> <p>Supplemental: Dietary Supplements, Reproductive and Hormonal History</p> <p>Exploratory: None</p>
Assessments and Examinations; Physical Examinations	<p>Core: None</p> <p>Supplemental – Highly Recommended: Automated Self-Administered 24-hour Dietary Recall (ASA 24)*</p> <p>Supplemental: Mitochondrial and Gastrointestinal Diseases Assessment</p> <p>Exploratory: None</p>
Assessments and Examinations; Imaging Diagnostics	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Brain Magnetic Resonance Imaging (MRI), Brain Perfusion Magnetic Resonance Imaging, Cardiac Magnetic Resonance Imaging (MRI), Imaging – Mitochondrial Disease, Electrocardiogram (ECG), Imaging Guidelines and Definition</p> <p>Exploratory: Phosphorus Magnetic Resonance Spectroscopy (31PMRS), Two Dimensional Speckle Tracking Echocardiography Imaging</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Assessments and Examinations; Laboratory Tests and Biospecimens/Biomarkers	<p>Core: None</p> <p>Supplemental – Highly Recommended: Laboratory Tests and Non-Imaging Diagnostics (Diabetes)</p> <p>Supplemental: Biomarkers Guidelines Mitochondrial Disease, Biomarkers in Mitochondrial Disease, Genetic Testing Short Form*, Genetics Testing Clinical Diagnostics*</p> <p>Exploratory: None</p>
Assessments and Examinations; Non-Imaging Diagnostics	<p>Core: None</p> <p>Supplemental – Highly Recommended: Echocardiogram</p> <p>Supplemental: Holter Examination</p> <p>Exploratory: None</p>
Assessments and Examinations; Vision	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Vision Mitochondria Disease OCT Guidelines, Vision Mitochondrial Disease Test Guidelines, Vision Mitochondrial Disease Visual Fields Guidelines</p> <p>Exploratory: None</p>
Assessments and Examinations; Vital Signs and Other Body Measures	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Vital Signs</p> <p>Exploratory: None</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Outcomes and End Points; Academic Achievement	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: American National Adult Reading Test (AmNART)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Adaptive	<p>Core: None</p> <p>Supplemental – Highly Recommended: Vineland Adaptive Behavior Scales</p> <p>Supplemental: Adaptive Behavior Assessment Scale (ABAS-II), Delis Kaplan Executive Functioning System (DKEFS), 2nd Ed. (Vineland-II)</p> <p>Exploratory: None</p>
Outcomes and End Points; Attention	<p>Core: None</p> <p>Supplemental – Highly Recommended: Conners III*, Test of Variable Attention (TOVA)</p> <p>Supplemental: Delis Kaplan Executive Function System (DKEFS), National Institutes of Health (NIH) Toolbox</p> <p>Exploratory: None</p>
Outcomes and End Points; Ataxia and Performance Measures	<p>Core: None</p> <p>Supplemental – Highly Recommended: Scale for the Assessment and Rating of Ataxia*</p> <p>Supplemental: International Cooperative Ataxia Rating Scale (ICARS)</p> <p>Exploratory: None</p>
Outcomes and End Points; Cognitive	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Automated Neuropsychological Assessment Metrics (ANAM), Axon Sports Computerized Cognitive Assessment, Brief Test of Adult Cognition by Telephone (BTACTION), Cambridge Cognitive Assessment Revised (CAMCOG-R)</p> <p>Exploratory: None</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Outcomes and End Points; Dementia	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), Montreal Cognitive Assessment (MoCA)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Emotional/Behavioral	<p>Core: None</p> <p>Supplemental – Highly Recommended: Apathy Evaluation Scale*</p> <p>Supplemental: ALS Depression Inventory (ADI-12), Apathy Scale (AS), , Autism Diagnostic Interview (ADI), Autism Diagnostic Observation Schedule (ADOS), Beck Anxiety Inventory (BAI), Brief Infant Toddler Social Emotional Assessment (BISTEA), Brief Psychiatric Rating Scale (BPRS), Cambridge Behavioral Inventory – Revised, Center for Epidemiological Studies – Depression Scale (CES-D), Child Behavior Checklist (CBCL), Child Depression Inventory (CDI), Children Depression Inventory – 2 (CDI-2), Columbia Suicide Severity Rating Scale (CSSRS), Diagnostic and Statistical Manual of Mental Disorders (DSM-5), Generalized Anxiety Disorder (GAD-7), Hamilton Anxiety Rating Scale (HAM-A), Hamilton Depression Rating Scale (HDRS), Irritability Scale, Modified Overt Aggression Scale (MOAS), Montgomery- Åsberg Depression Scale (MADRS), Mood Disorder Questionnaire (MDQ), Problem Behaviours Assessment HD – Short Version (PBA-S), Social Responsiveness Scale (SRS)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Executive Functioning	<p>Core: None</p> <p>Supplemental – Highly Recommended: Adaptive Behavior Assessment System-II (ABAS-II) *, Behavior Rating Inventory of Executive Function (BRIEF) *, Behavior Rating Inventory of Executive Function – Preschool Version (BRIEF-P) *</p> <p>Supplemental: None</p> <p>Exploratory: None</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
<p>Outcomes and Endpoints; Motor/Physical Function</p>	<p>Core: None</p> <p>Supplemental – Highly Recommended: Borg Rating of Perceived Exertion (RPE) Scale*, Modified Hammersmith Functional Motor Scale for Children with Spinal Muscular Atrophy (MHFMS-SMA/MHFMS-Extend)*, Peabody Developmental Motor Scale II (PDMS-2) *, Barry Albright Dystonia Scale (BADs) *</p> <p>Supplemental: 6 Minute Walk Test, Physical Activity Questionnaire for Adolescents (PAQ-A), Beery-Buktenica Developmental Test of Visual-Motor Integration (Beery VMI), Burke-Fahn-Marsden Movement Scale (BFMMS), Newcastle Mitochondrial Disease Adult Scale, Newcastle Pediatric Mitochondrial Disease Scale (NPMDS), Unified Dystonia Rating Scale (UDRS)</p> <p>Exploratory: 2 Minute Walk Test, Alberta Infant Motor Scale, Gross Motor Function Measure (GMFM-88, GMFM-66), Motor Function Measure (MFM), Physical and Neurological Examination for Subtle Signs (PANESS), International Pediatric Mitochondrial Disease Score (IPMDS)</p>
<p>Outcomes and Endpoints; Intellectual Functioning</p>	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Kaufman Assessment Battery for Children, Leiter International Performance Scale-3 (Leiter-3), Reynolds Intellectual Assessment Scale (RIAS), Wechsler Abbreviated Scale of Intelligence Scale – Fourth Edition (WAIS-IV), Wechsler Intelligence Scale for Children-IV (WISC-IV), Wechsler Preschool and Primary Scale of Intelligence (WPPSI-III)</p> <p>Exploratory: None</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Outcomes and Endpoints; Language	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Boston Diagnostic Aphasia Exam (BDAE-III), Boston Naming Test (BNT) – 30-item version, Clinical Evaluation of Language Fundamentals (CLEF-4), Comprehensive Assessment of Spoken Language (CASL), Expressive One-Word Picture Vocabulary Test, New Reynell Developmental Language Scale (NRDLS), Peabody Picture Vocabulary Test 4th Edition (PPVT-4), Preschool Language Scales-Fifth Edition (PLS-5)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Memory	<p>Core: None</p> <p>Supplemental – Highly Recommended: Amyotrophic Lateral Sclerosis Depression Inventory-12 (ADI-12) *</p> <p>Supplemental: Memory Assessment Scale, Summary of Recommendations for Global Outcome, Wechsler Memory Scale IV (WMS-IV)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Muscle Strength Testing	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Manual Muscle Testing-Using the Medical Research Council Muscle Grading Scale, Maximum Voluntary Isometric Contraction Testing (MVICT)</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Neuropsychological Testing	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Bayley Scales of Infant Development (Bayley III, BSID)</p> <p>Exploratory: None</p>

Mitochondrial Disease CDE Highlight Summary Document

Disease/Domain	Recommendations
Outcomes and Endpoints; Pulmonary Function Testing/Respiratory Status	<p>Core: None</p> <p>Supplemental – Highly Recommended: Pulmonary Function*</p> <p>Supplemental: None</p> <p>Exploratory: None</p>
Outcomes and Endpoints; Quality of Life	<p>Core: None</p> <p>Supplemental – Highly Recommended: Pediatric Quality of Life Inventory (PEDIQL), World Health Organization Quality of Life Assessment (WHOQOL-BREF)*</p> <p>Supplemental: Child and Adolescent Scale of Environment (CASE), Child and Adolescent Scale of Participation, Craig Handicap and Assessment Reporting Technique (CHART-SF) – Interview version*, Craig Handicap and Assessment Reporting Technique (CHART-SF) Paper version, Quality of Life in Neurological Disorders (Neuro-QOL), Short Form 36-Item Health Survey (SF-36)</p> <p>Exploratory: EurQol-5 Dimension Questionnaire, Family Strain Questionnaire Assessment of Preschooled Children’s Participation), Pediatric Quality of Life Inventory Multidimensional Fatigue Scale</p>
Outcomes and Endpoints; Visual-Spatial Processing	<p>Core: None</p> <p>Supplemental – Highly Recommended: None</p> <p>Supplemental: Judgment of Line Orientation (Benton JLO)</p> <p>Exploratory: None</p>

*Special circumstances apply.