Mitochondrial Disease Version 2.0 NINDS CDE Project
Endocrinology Subgroup Summary

The NINDS Mitochondrial Disease v2.0 Common Data Element (CDE) Endocrinology Subgroup considered CDEs related to the diagnosis, evaluation, and management of endocrine disorders impacting individuals with mitochondrial disease to be within their purview.

Across the lifespan, individuals with mitochondrial disease can develop a variety of endocrine disorders, as demonstrated in natural history studies (e.g., Al-Gadi et al., 2018), and reviewed in multiple publications (e.g., Ng et al., 2022). Clinical care guidelines (e.g., Parikh et al., 2017) recommend monitoring for disorders of carbohydrate metabolism (including both hypoglycemia and diabetes mellitus) and other treatable conditions whose prevalence may be increased in mitochondrial disease (e.g., hypoparathyroidism, adrenal insufficiency, pituitary hormone deficiency, thyroid disorders, reproductive endocrine disorders), especially in specific sub-types where endocrine manifestations are prominent, including, e.g., large-scale mtDNA deletion syndrome. In addition, like other individuals with chronic illness, individuals with mitochondrial disease often develop disorders of growth, puberty, and bone health that are multi-factorial in etiology.

Where available, CDEs that are already in widespread use in the context of endocrine disorders were reviewed and included, e.g., anthropometric measurements and associated population reference values and outcomes reflecting diagnosis and management of diabetes mellitus. Where no appropriate CDEs were available, tools for collection of CDEs were developed and/or adapted from v1.0 CDEs. Potential overlap with other subgroups was addressed; specifically, the Endocrinology Subgroup reviewed tools to assess growth, pubertal development, and bone health in collaboration with the GI/Hepatology and Nutrition Subgroup. Symptoms referrable to hypothalamic impairment (e.g., sleep and circadian problems, temperature dysregulation) will be addressed elsewhere.

Summary of Recommendations

Subdomain	CRF Name	Classification
General Health History	Bone Health History	Supplemental
	Diabetes-Related Medical History	Supplemental – Highly Recommended; Exploratory
	Reproductive and Hormonal History	Supplemental
Imaging Diagnostics	DXA	Supplemental
Laboratory Tests and Biospecimens/Biomarkers	Diabetes Labs	Supplemental – Highly Recommended; Supplemental; Exploratory
	Labs of Bone Mineral Metabolism	Supplemental

References

Al-Gadi IS, Haas RH, Falk MJ, Goldstein A, McCormack SE. Endocrine Disorders in Primary Mitochondrial Disease. J Endocr Soc. 2018 Feb 19;2(4):361-73.

Ng YS, Lim AZ, Panagiotou G, Turnbull DM, Walker M. Endocrine Manifestations and New Developments in Mitochondrial Disease. Endocr Rev. 2022 Jun;43(3):583-609.

Parikh S, Goldstein A, Karaa A, Koenig MK, Anselm I, Brunel-Guitton C, Christodoulou J, Cohen BH, Dimmock D, Enns GM, Falk MJ, Feigenbaum A, Frye RE, Ganesh J, Griesemer D, Haas R, Horvath R, Korson M, Kruer MC, Mancuso M, McCormack S, Raboisson MJ, Reimschisel T, Salvarinova R, Saneto RP, Scaglia F, Shoffner J, Stacpoole PW, Sue CM, Tarnopolsky M, Van Karnebeek C, Wolfe LA, Cunningham ZZ, Rahman S, Chinnery PF. Patient care standards for primary mitochondrial disease: a consensus statement from the Mitochondrial Medicine Society. Genet Med. 2017 Dec;19(12):10.1038/gim.2017.107.