Resources

1. **Information for patients and families:** newenglandconsortium.org, https://www.newbornscreening.info/
2. **Acute Illness Protocols:** https://newenglandconsortium.org/for-professionals/acute-illness-protocols/
3. **Newborn Screen Resources:** https://www.acmg.net/ACMG/Medical-Genetics-Practice-Resources/ACT_Sheets_and_Algorithms.aspx, http://genes-r-us.uthscsa.edu/resources.htm

What to do for a patient with a "metabolic crisis"?

- Page metabolism!
- No known dx: see overviews for specific crises (hyperammonemia, metabolic acidosis, etc.)
- Known dx: see above acute illness protocols.

Classification + Overview

Major classification of IEMs and examples are adapted in part from Rice GM et al, *Pediatrics in Review* 2016;37.

Glossary

3OHB	3 Hydroxybutyrate
3PGD	3 Phosphoglycerate dehydrogenase deficiency
CAH	Congenital adrenal hyperplasia
CPS	Carbamoyl phosphate synthetase
CPT-I&II	Carnitine palmitoyl transferase deficiency Type I and II
DH	Dehydrogenase
FAOD	Fatty acid oxidation defects/disorders
FDP	Fructose diphosphate
GALT	Galactose-1-phosphate uridylyltransferase
GIR	Glucose infusion rate
GLUT1	Glucose transporter protein type 1
GSD	Glycogen storage disease
HHH	Hyperammonemia, hyperornithinemia, homocitrullinuria
HMGCoA	3-Hydroxy-3-methlyglutaryl-CoA
IEM	Inborn error of metabolism
IVA	Isovaleric acidemia/Isovaleryl-CoA DH deficiency
LCAD	Long-chain acyl-CoA DH deficiency
LCHAD	Long-chain hydroxyacyl-CoA DH deficiency / 3-Hydroxyacyl CoA DH deficiency
L/P	Lactate/pyruvate ratio
MCADD	Medium-chain acyl-CoA DH deficiency
MCD	Multiple Carboxylase deficiency

Glossary continued on next page →

Glossary	
MMA	Methlymalonic acidemia
MSUD	Maple syrup urine disease
OA	Organic acidemia
OTC	Ornithine transcarbamylase
PA	Propionic acidemia/Propionyl-CoA carboxylase deficiency
PC	Pyruvate carboxylase
PDH	Pyruvate DH
PKU	Phenylketonuria
TEE	Total energy expenditure
THAN	Transient hyperammonemia of the Newborn
UCD	Urea Cycle Defect
VLCAD	Very long-chain acyl-CoA DH deficiency

Aminoacidopathies	
PowerPlans	Metabolism MSUD Admit Orderset
Biochemical Defect	Defect in AA metabolism → toxic AA metabolites accumulate
Presentation	• May present early (neonatal period) as catastrophic 'intoxication'-like disease → feeding difficulty, lethargy, tachypnea, and poor perfusion → encephalopathy (e.g., MSUD) • May present later w/ chronic encephalopathy (e.g., PKU) • Often NO acidosis or hyperammonemia (vs organic acidemias and UCDs)
Diagnosis	Definitive = quant plasma AAs + sequencing; may be suggested by NBS, labs w/ hypoglycemia, ketosis, liver dysfxn
Management	Restrict culprit AA in diet, monitor plasma AAs carefully, avoid catabolism

Disorder	Enzyme Blockade	Accumulated Substrate(s)	Presentation	Treatment
Phenylketonuria	Phenylalanine hydroxylase (Phe → Tyr)	Phenylalanine	Neurotoxicity, intellectual deficits, microcephaly, GDD, eczema	Avoid Phe, give special Phe -free diet, consider cofactor tx (sapropterin), enzyme substitution (adults)
Maple Syrup Urine Disease	Branched-chain alpha-keto acid dehydrogenase	BCAAs: Leu, Ile, Val, **Leu is neurotoxic, causes hypoNa**	Catabolic stress, high Leu intake → HA, confusion, halluc, lethargy, N/V → coma/ death	Stop all Leu, give Leu-free feeds, dex-containing IVF, AVOID hypotonic fluids (cerebral edema)
Homocystinuria	Cystathionine β -synthase (Hcy → cystathionone)	Homocysteine, Methionine	Intellectual disability, tall stature, thrombosis (Hcy is thrombophilic), downward lens dislocation, osteoporosis	B6 (cofactor for cystathionine β-synthase) in responsive patients,,, betaine (Hcy → Met)