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)

Aminoacidopathies

Disorder	Enzyme Blockade	Accumulated Substrate(s)	Presentation	Treatment
Tyrosinemia	Fumaryl-acetoacetase (fumaroaceto-acetate, → fumarate + acetoacetate)	Tyrosine (blood), Succinylacetone (urine)	Liver failure, RTA - due to accumulation of **succinylacetone**	Nitisinone (blocks early step in Tyr metab - can't make succinylacetone), Tyr restriction

Carbohydrate Metabolism

PowerPlans	Galactosemia Admit Orderset
Biochemical Defect	Issues with glucose/fructose/galactose metabolism
Presentation	Timing depends on intro to culprit carb (**galactosemia** early d/t breastmilk, **fructose** introduced later) and from timing of spacing feeds (longer fasting = need to mobilize glycogen stores → GSD becomes manifest); often p/w metabolic crises (lethargy, encephalopathy, HD instability); may have stigmata of toxic deposition (see chart)
Diagnosis	Galactosemia is on the NBS (hereditary fructosuria and GSD are not); definitive with enzyme assays from blood (also done on cultured fibroblasts & liver); suggestive labs = hypoglycemia, ketosis, metabolic acidosis, liver dysfunction; reducing substances in urine present in galactosemia + hereditary fructose tolerance

Disorder	Enzyme Blockade	Accumulated Substrate(s)	Presentation	Treatment
Classic Galactosemia	Galactose-1-phosphate uridyl transferase (allows for transfer of Gal-1-P to Glu-1-P)	Gal-1-P, total galactose + urine **reducing substances**	Hepatomegaly, jaundice, vomiting, cataracts, FTT, lethargy, proximal RTA (Fanconi syndrome), *E Coli* sepsis after starting galactose-containing feeds (e.g., breastmilk).	No **galactose** - includes no **lactose** (milk / dairy)
Hereditary Fructose Intolerance	Aldolase B (splits F-1-P into DHAP + glyceraldehyde)	F-1-P - urine **reducing substances**	Similar to classic galactosemia, but **no cataracts**; occurs w/ fructose-containing foods	No **fructose** from diet - includes no **sucrose** or **sorbitol**
Glycogen Storage Disease (GSD) Type Ia (von Gierke)	Glucose 6 phosphatase (G6P → glucose + Pi)	G6P → lactate, triglycerides, and uric acid	~3-6 months: hypoglycemia 3-4 hrs after meal,, lactic acidosis, hepatomegaly, hypertriglyceridemia, hyperuricemia, "doll face," small size	Frequent meals, Uncooked cornstarch 1.5-2.5 g/kg PO q4-6h, avoid sucrose/fructose/ galactose, $NaHCO_3$ for acidosis, allopurinol for hyperuricemia

Carbohydrate Metabolism continued on next page →