

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

FM = Functional medicine goal personalized to symptomatic patients with clinical decision making

Caution for all supplements with kidney or liver disease

Nutrient	Labs	Safety	Dose	Forms
Zinc	Serum zinc and copper, FM goal 100 zinc/ 100 copper mcg/dL <ul style="list-style-type: none"> Zinc/Copper = inverse relationship, zinc tends to go too low/copper too high Note OCP = high copper 	Long term 1-2 gram/d can inhibit immune/kidney system or decrease copper	<ul style="list-style-type: none"> 1-3 yr = 5-10mg/day 4-12 yr = 10-25mg/day 13-18 yr = 25-50/day 1-2 mg/kg/day (Up To Date) Pediatric studies 10-50mg/day 	<ul style="list-style-type: none"> Rx Zinc Sulfate (sulfate lower absorption vs. picolinate/gluconate/citrate) Liquid Pure Encapsulations, Chew Douglas Labs 10mg, Cap 30mg Zinc picolinate Pure Encapsulations If nausea, take w/meals or better absorbed forms (zinc picolinate/gluconate/citrate) Separate from iron b/c of competition
Carnitine	Total carnitine FM goal is > 40 umol/L	Described GI sx, anxiety or body odor. No toxicity with overdose. Seizure concern written on product, but a systematic review reports no evidence for this association (Zeiler, 2016)	50-100 mg/kg/day, max 2g/day. Common dose kids > age 5 is 1000 mg/day x 3-6 mo duration, if longer consider lab q6-12	<ul style="list-style-type: none"> Rx Carnitor 330mg tablets or liquid 1g/10ml (artificial cherry flavor) Powder: Vital Nutrients Acetyl-L Carnitine OR Bioclinic Naturals Mitochondrial Formula (+ cofactors) Capsules: Designs for Health: Acetyl-L Carnitine 800mg/cap or Mitochondrial NRG = carnitine + mito cofactors
Omega	Omega Check (Quest) FM goal > 5.4% total EPA+DPA+DHA	“Fish Burps” possible Bleeding/bruising at high doses Note Cod liver oil often contains vit A	Supplement x 6mo or more <ul style="list-style-type: none"> 6-12 mo = 50-100mg/day, 1-5 yr = 100-500mg/d, 6-12 yr = 1000mg/d, > 13 = 2000mg/d Can batch 1x/week 	<ul style="list-style-type: none"> Rx Lovaza and omega 3 DHA/EPA fish oil Liquid: Eicosamax SFI or Nordic Naturals high dose (best \$ Value), Swirls Barleans or Aspire, Mini-beads Nordic Naturals 2x, Cap Nordic Naturals Pro-Omega 1100 mg
Iron	Ferritin FM goal > 40-70 mcg/dL, validate w CRP, Iron studies, CBC	<ul style="list-style-type: none"> Toxic at high doses, store safely Risk oxidative stress if too high/low Risk microbiome disruption if too high 	Iron rx 2mg/kg/day or 65mg elemental iron/day x 90 <ul style="list-style-type: none"> Take w/Vit C and not w/Calcium 	<ul style="list-style-type: none"> Rx Liquid 15mg/ml or tablet 65mg Celebrate Iron w C 30/45/60 chewable/cap, Liquid Nova Ferrum High Potency 25mg/ml Chelated (greater absorption, GI tolerated, no teeth stain) Food: cast iron pan, heme iron sources, organic liver, blackstrap molasses

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

Vitamin D	25(OH)D, FM goal 50-70 ng/mL	Hypercalcemia/uria, nephrolithiasis, rare cases acute renal failure <ul style="list-style-type: none"> Caution supplementing vitamin D with hypercalcemia, primary hyperparathyroidism, sarcoidosis, Williams syndrome Upper thresholds 4000/day IOM, 10,000/day Endocrine Society 	<ul style="list-style-type: none"> Maintenance FM (especially in non-summer months): <ul style="list-style-type: none"> > age 5 = 1000 IU/d > age 10 = 2000 IU/d can batch 1x/week Replenishing low lab value: <ul style="list-style-type: none"> Rx teens < 30 ng/mL: 50,000 IU q week x 6-8 weeks RX, then maintenance 	<ul style="list-style-type: none"> Rx: liquid 400 IU per 1 ml, various tablets Drop: Carlson's Super Daily D 6000 IU/drop, Orthomolecular D + K2 1000 IU/drop Optional note: some Vit D have K2, studies show K2 helps direct calcium to the bones and avoid vascular calcification. In studies, vitamin D3 may have a longer half-life than D2 and be more potent Can batch 1x/week as it's fat soluble
Leucovorin (folinic acid) for suspected cerebral folate deficiency in autism	Autism Treatment Evaluation Checklist (ATEC) Autism Research Institute, blind teachers. Do not test serum B9 (this is a CSF issue)	Side effects <ul style="list-style-type: none"> Possible Hyperactivity (go slower, can use magnesium glycinate, L-theanine/GABA) Current studies in autism duration 12-24 weeks 	<ul style="list-style-type: none"> 0.5-2mg/kg/day divided bid, max 50mg divided bid Start at 2.5-5mg bid, increase by 5mg bid q 1-2 weeks Trial 12 weeks full dose Avoid milk (casein), Studies show casein may exacerbate FRa antibodies 	Tablets (can crush) Can be compounded into liquid Note Lactose in all commercial tabs (lactose typically is not an issue with milk intolerance (typically related to milk casein protein), note milk allergy also typically related to protein. Compounded options with no lactose or excipients (additives) are available.
Magnesium		Magnesium contraindicated with renal insufficiency and myasthenia gravis	Supplement (elemental): <ul style="list-style-type: none"> 1-3 yr = 25-100mg/d 4-8 yr = 50-150mg/d 9-12 yr = 150-300 mg/d > 12 = 300-450mg/d 	Citrate/Hydroxide (supports stooling): <ul style="list-style-type: none"> Rx Cap magnesium hydroxide Rx Liquid magnesium citrate Caps Pure Encapsulations Powder CALM Natural Vitality Citrate Gummies Dr. Mortiz 400mg Glycinate/Threonate (brain): <ul style="list-style-type: none"> Powder Bioclinic Naturals, OptiMag Neuro Xymogen Capsules Pure Encapsulations Tinies Bears Gummies 250mg
Digestive Enzymes	Pancreatic Elastase FM pediatric goal > 500 (adult goal > 350) or symptoms		Creon dose: 500 lipase units/kg per meal (max 2,500 lipase units/kg/meal), age 5-10 = 6000 units lipase/meal and > age 10 = 12,000-24,000 units lipase/meal	Rx Creon or Caps Enzymedica, chewable/powder Kidz Digest by Transformation Enzymes (or others on Fullscript)

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

Melatonin		<ul style="list-style-type: none"> • Long-term peds safety data limited • Melatonin can suppress the hypothalamic–gonadal axis, raising theoretical concerns re puberty. Studies in children + adolescents w ASD + melatonin x 2 yrs = no evidence of delayed or precocious puberty, nor detrimental effects on growth or BMI • High dose melatonin x 3 mo in adults =no change in endogenous basal rate 	<ul style="list-style-type: none"> • 0.5 -3 mg given about 30-60 minutes before bed 	Fast dissolve chewable: Natrol, Liquid Pure Encapsulations or NutraMedix, Lozenges Source Naturals
L-Theanine		Most studied under 2000mg/day	<ul style="list-style-type: none"> • 3-5 yr 25-50mg qd or bid • > 5 yr 50-200 mg qd or bid 	Liquid: NuMedica, CopaCalm by OrthoMolecular, Powder: Calm and Cool Spectrum Awakening, chewables Calm-Pro by Bioclinic Naturals
Pain/ Inflammation Support		<p>Quercetin – generally studied under 1000mg/day</p> <p>Quercetin – inhibits P450 enzyme.</p> <p>NAC – most studied under 3000mg/day</p>	<ul style="list-style-type: none"> • Quercetin <ul style="list-style-type: none"> ○ 3-4 yrs 50mg/d ○ 4-8 yrs 50-200mg/d ○ > 8 yrs 200-500mg/d • NAC <ul style="list-style-type: none"> ○ 60 mg/kg/day div bid (studies generally 1000-2700mg/day, OCD 2400mg/day) • Xlear Nasal Spray (Xylitol + Grapefruit Seed Extract) 	<ul style="list-style-type: none"> • Quercetin <ul style="list-style-type: none"> ○ Liquid Source Naturals, chewable D-Hist or D-Hist Jr chewable by OrthoMolecular • NAC <ul style="list-style-type: none"> ○ Cap 600mg Pure Encapsulations, powder Trace Minerals Research watermelon, powder Pure Encapsulations NAC + Glycine • Xlear Nasal Spray
Pain/ Inflammation Support		<ul style="list-style-type: none"> • PEA – most studied under 1200mg/day • Ginger – out of an abundance of caution, stop 2 wk before planned surgery due to theoretical antiplatelet effects, Ginger possible warming or heartburn sensation (take with food). 	<ul style="list-style-type: none"> • Ginger, > age 5 children 550 mg capsules or 500 mg chewable, 1-3 times daily • PEA (palmitoethylalamide), > age 5 children 400 mg capsule or 600 mg chewable, 1-2 times daily 	<ul style="list-style-type: none"> • Ginger, <ul style="list-style-type: none"> ○ Natural Factors, Nature’s Way (look for GMP label) • PEA (palmitoethylalamide) <ul style="list-style-type: none"> ○ Cap: Bioclinic Naturals, chewable Discomfort Relief chewable by Life Extension
Cofactor Support Multivitamins		B12 water soluble. Note B12 is above tolerable limit (however doses 10x	<ul style="list-style-type: none"> • Dose as directed • B Vitamins: Bioavailable forms: 	<ul style="list-style-type: none"> • Powder: Spectrum Needs + Q Needs, study doi:10.3390/ijms26062479

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

Formulated for Autism Biochemistry		higher in multiple studies e.g. UC Davis, Hendren, 2016). B vitamins associated with “energy,” take in the morning	<ul style="list-style-type: none"> ○ Methylcobalamin (B12) ○ Methylfolate (B9) ○ Pyridoxal 5-Phosphate (P5P) (B6) 	<ul style="list-style-type: none"> • Powder and Caps: Autism Nutrition Research Center, studies doi:10.3390/nu10030369 and doi:10.1186/s12887-022-03628-0 • Powder: Simple Spectrum
General Multivitamins			<ul style="list-style-type: none"> • Consider bioavailable B vitamin forms (above) 	<ul style="list-style-type: none"> • Powder, Aspire Multi+ Vitamin • Small Cap Junior Nutrients, Pure Encapsulations • ONE Multivitamin, Pure Encapsulations
Probiotics for prevention of Antibiotic Associated Diarrhea (AAD)		Caution: Safety data are reassuring, with no serious adverse events in otherwise healthy children. CAUTION w/premature and immuno-compromised (w/infection risk factors including central venous catheter)	<p>AAD prevention:</p> <ul style="list-style-type: none"> • Start with or soon after antibiotics and continue for 2 weeks + • Give > 2 hours apart from antibiotics • Microbiome care with food: fiber, phytonutrients and ferments 	<ul style="list-style-type: none"> • <i>Lactobacillus rhamnosus GG</i> <ul style="list-style-type: none"> • 5-40 billion CFU/d • Pure GG by Pure Encapsulations (25 billion), Culturelle (10 billion) • <i>Saccharomyces boulardii</i> <ul style="list-style-type: none"> • 5-10 billion CFU • Florastor (powder), Orthobiotic by Orthomolecular (powder), S Boulardii Seeking Health (small capsule), SFI Therbiotic ABX support (L rhamnosus + S Boulardii)
Probiotics for Colic in full-term infants		Caution: Safety data are reassuring, with no serious adverse events in otherwise healthy children. CAUTION w/premature and immuno-compromised (w/infection risk factors including central venous catheter)	<ul style="list-style-type: none"> • <i>L. reuteri</i> DSM 17938 studied • Bifidobacterium animalis subsp. lactis BB-12 studied • Other strains also studied with positive outcomes, but these 2 (above) have most evidence (2024 meta w 24 studies: sig reduce avg crying in colic infant by 51 min/d) <p>Duration without a microbiome stool test:</p> <ul style="list-style-type: none"> • Bifidobacteria: only 21-28 days, bifidobacteria is “bossy” and can take over • Lactobacillus ongoing for other reasons is ok because lactobacillus “leaves” 	<ul style="list-style-type: none"> • BioGaia: L reuteri DSM 17938 (with D) • Culturelle infant: Bifidobacterium animalis subsp. lactis BB-12 and Lactobacillus Rhamnosus GG ATCC 53103 (latter not studied in colic but, yes in atopy) • Enfamil infant: Bifidobacterium animalis subsp. lactis BB-12 and L rhamnosus GG • Kendamil probiotic drops: L reuteri (strain not provided) and Bifidobacterium animalis sbps Lactis (DSM32269). Same species, different strain. • Colic PLUS (e.g. atopy prevention), include B Infantis (absent in ¼ US babies, esp c-sec/formula). Consider: <ul style="list-style-type: none"> • Smidge infant (B infantis + Bifidobacterium lactis) • SFI/Klaire Infant (B infantis + Bifidobacterium lactis)

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

SUPPLEMENTS

- Caution in all supplements with kidney or liver disease (screen LFT's and creatinine)
- FDA regulations = Good Manufacturing Processes
 - 3rd parties certify these (NSF, USP, Consumer labs)
- GMP Choices:
 - Fullscript Website
 - Annual proof of third-party cGMP certification
 - Potency and purity 3rd party testing within 2 years
 - Patients contacted for any recalls
 - Purchase directly from 3rd party GMP certified vendors
 - Examples: Pure Encapsulations, Seeking Health etc.
 - Buy direct from Whole Foods, Co-ops (ensure GMP)
 - Amazon reports that it verifies GMP once every 2 years, use vigilance (under the price, check to see from whom Amazon obtained the product)
 - To check RX medical assistance Coverage: [Minnesota.primetherapeutics.com/drug-lookup](https://www.minnesota.primetherapeutics.com/drug-lookup)

Commonly used GMP Supplement Brands

- Aspire
- Autism Nutrition Research Center
- Bioclinic Naturals
- Designs for Health
- Microbiome Labs
- Nordic Naturals
- Pure Encapsulations
- Seeking Health
- Spectrum Needs
- SFI/Klaire labs

Pediatric Functional and Integrative Medicine Resources (Cheat Sheet)

Resources

- Conferences:
 - A4M Pediatrics
 - Institute for Functional Medicine, Certification Program
 - Medical Academy of Pediatrics and Special Needs, Fellowship Program
- Learning memberships for providers:
 - Elisa Song, MD, [Practitioner Membership & Mentoring Program - Healthy Kids Happy Kids](#)
 - Nancy Ohara, MD, [Practitioner Membership & Mentoring Program | Drohara.com](#)
 - Psychiatry Redefined, [Integrative Psychiatry Certification | Psychiatry Redefined, Pediatric Fellowship](#)
- NEWS medical life sciences news-medical.net, free email research newsletter, <https://www.news-medical.net/medical/newsletters>
 - [Life Science Newsletters](#), choose medical newsletters, healthcare and wellbeing, children's health, microbiome, nutrition + your choice
- Facebook: Pediatric Functional and Integrative Medicine Practitioners Forum
- Books: Healthy Kids, Happy Kids by Elisa Song
-
- Resource for your patients:
 - Eating for Pediatric Health and Healing, from Allina Penny George, patient hand-out
 - **Food for Healthy Kids and Teens** <http://allinafiles.com/910273.pdf>

