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Avoiding Transition
Acute to Chronic Pain

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Accurate Education

Nutraceuticals for Peri-Operative Period

Supplement/ Nutraceutical	Phase	Recommend	Rationale/Key Evidence	Ref.
Immunonutrition (arginine, glutamine, omega-3 fatty acids, nucleotides)	Postoperative (oral/ enteral)	Consider for major abdominal surgery	Perioperative enteral immunonutrition with multiple components reduces morbidity (OR 0.32); effect on mortality and infection less clear. Efficacy in critically ill patients remains controversial.	[1-2]
High-protein oral supplements (1.2–1.5 g/kg/day)	Preoperative (1–2 weeks)	Recommended for malnourished patients	Reduces postoperative complications in elective GI/colorectal surgery; endorsed by multiple guidelines.	[3-5]
Carbohydrate-containing fluids	Preoperative	Recommended (except diabetics)	High-dose carbohydrate loading (≥ 45 g) reduces length of stay by 1.4–1.7 days; improves insulin sensitivity and reduces hunger/nausea.	[4, 6-7]
Micronutrients (vitamins A, D, E, B6, B12, C, thiamin, folate, calcium, iron, selenium, zinc)	Preoperative	Personalized repletion based on deficiency	Chronic oral vitamin D supplementation increases levels (moderate evidence); iron infusion more effective than oral for ferritin repletion. Critical for bariatric/metabolic surgery candidates.	[8]
Fish oil / omega-3 fatty acids	Perioperative	Continue	Prior bleeding concerns not supported by prospective studies; may be beneficial as part of immunonutrition formulas.	[9]
Bleeding-risk supplements (garlic, ginkgo, ginseng, turmeric, vitamin E, feverfew, saw palmetto, etc.)	Preoperative	Hold 2 weeks	Variable metabolism and uncertain drug clearance; theoretical bleeding risk warrants discontinuation.	[9]
Chondroitin/ glucosamine	Preoperative	Hold 48 hours	Rapid metabolism and shorter half-life allow for shorter discontinuation period.	[9]
Melatonin	Perioperative	Continue	Reduces preoperative anxiety as effectively as midazolam; may decrease delirium in elderly hospitalized patients; safe in perioperative period.	[9]
Lavender	Perioperative	Consider continuing	Efficacious for anxiety including preoperatively; no evidence of potentiating anesthetic effects.	[9]
Green tea extract	Preoperative	Continue	Catechins improve diastolic cardiac function; bleeding risk concerns outweighed by benefits.	[9]
Black tea extract	Preoperative	Hold 2 weeks or taper	May increase bleeding risk; black tea as beverage is safe.	[9]

Chronic Post-Surgical Pain (CPSP) affects 10-50% of surgical patients, with 2-10% experiencing disabling chronic pain at six months. The transition from acute to chronic pain involves **peripheral and central sensitization**, characterized by biochemical and structural changes in nociceptive pathways that amplify and maintain pain signaling. Risk factors include patient characteristics (female sex, younger age, preexisting pain (especially those with pre-existing central sensitization), procedural factors (nerve injury, extensive tissue trauma), **and inadequate acute pain control**.

Perioperative (before/after) nutraceutical supplementation varies by the surgery, nutritional status, and bleeding risk, with the strongest evidence supporting immunonutrition for major abdominal surgery and protein supplementation for malnourished patients. The Society for Perioperative Assessment and Quality Improvement (SPAQI) recommends holding most supplements that increase bleeding risk for 2 weeks preoperatively, but continuing fish oil and select anxiolytics like melatonin.

Regarding nutraceuticals specifically, the SPAQI provides guidance on peri-operatively supplement management but does not identify any supplements with demonstrated efficacy for CPSP prevention. Omega-3 fatty acids, which may be continued peri-operatively and possess anti-inflammatory properties, theoretically could modulate inflammatory components of sensitization, but no studies have evaluated their impact on CPSP development. **Antioxidants and other anti-inflammatory nutraceuticals might theoretically influence peripheral sensitization processes, high-quality research directly linking nutraceuticals to CPSP prevention are absent.**

Multimodal rehabilitation programs incorporating perioperative nutrition improve outcomes and are key to limiting strength and muscle loss. However, nutritional interventions remain under-prescribed despite demonstrated cost-effectiveness. Evidence for nutritional supplementation in orthopedic procedures (hip/knee replacement) is limited but suggests potential benefits for undernourished, frail, or elderly individuals.

References

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