PERIOME CLINICAL BRIEF

The Clinical Rationale for Structured Perioperative Preparation

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The Perioperative Window as Clinical Variable

The physiologic state a patient brings into the operating room is the most consistently unaddressed variable in surgical care. The procedure has been optimized through decades of surgical technique refinement, specialization, and technology. The anesthesia plan has been optimized through pharmacologic advancement, monitoring standards, and ERAS-informed protocols. The operating room itself is governed by institutional standards for sterility, equipment, and workflow.

The patient's physiologic preparation has none of this. No specialty consistently owns it. No standardized protocol addresses it. No clinical infrastructure exists to deliver it at population scale.

ERAS protocols represent the closest existing parallel. They formalized perioperative carbohydrate loading, multimodal analgesia, fluid management, and early mobilization — meaningful advances in perioperative outcomes. But ERAS was designed to optimize institutional workflow around the surgical day. It was not designed to build the patient's physiologic readiness in the days and weeks before surgery. Every ERAS guideline carries an embedded assumption: that the patient arrives metabolically, nutritionally, and cognitively prepared. In the majority of surgical patients, that assumption does not hold.

This gap is now a financial exposure. Under the CMS Transforming Episode Accountability Model and the broader shift to value-based surgical care, institutions are financially responsible for the full episode — including complications, readmissions, and recovery trajectory. The patient who arrives physiologically underprepared creates costs that the institution absorbs. Addressing upstream readiness is no longer an academic argument. It is an operational imperative.

The Physiologic Burden of Surgical Stress

Surgery imposes a simultaneous, multi-system physiologic insult. The demands are well-characterized and begin before incision.

Catabolic state activation. Mandatory preoperative fasting depletes hepatic glycogen stores within hours and initiates protein catabolism before the surgical insult has begun. The patient enters the operating room in energy deficit. ERAS-recommended carbohydrate loading addresses the final hours; the preceding days remain unstructured.

Inflammatory cascade. Tissue injury activates a systemic inflammatory response including IL-6, TNF-α, and C-reactive protein elevation. The magnitude of this response correlates with complication risk and recovery trajectory. Baseline inflammatory status at the time of incision is a modifiable variable.

Oxidative stress and mitochondrial dysfunction. Surgical stress and ischemia-reperfusion injury generate reactive oxygen species that exceed endogenous antioxidant capacity. Mitochondrial function — the primary determinant of cellular energy availability during repair — is compromised at the moment of highest demand.

Fluid and electrolyte derangement. Patients routinely arrive hypovolemic from fasting, reduced oral intake, and in some cases bowel preparation. Intravenous fluid resuscitation addresses intraoperative needs but does not correct a hydration deficit that began 12 or more hours prior.

Neurocognitive vulnerability. Postoperative cognitive dysfunction affects 25–40% of patients over 65 following major surgery. Sleep disruption, anxiety, fasting-related metabolic shifts, and medication effects degrade neurocognitive baseline before induction. The quality of cognitive recovery is influenced by neurotransmitter precursor availability at the time of anesthetic exposure — a modifiable variable that current perioperative protocols do not address.

GI mucosal disruption and microbiome destabilization. Fasting, perioperative antibiotics, anesthetic agents, and surgical stress converge on the gut simultaneously. Barrier integrity, microbial diversity, and absorptive capacity are compromised during the window when nutrient delivery for repair is most critical.

These effects are concurrent, compounding, and — critically — partially addressable before the patient reaches the operating room. The case for structured preparation rests on a simple premise: it is more tractable to build physiologic resilience before surgery than to repair physiologic damage after.

The Five Physiologic Domains

PERIOME PROTOCOL organizes perioperative preparation around five physiologic domains. Each is independently supported by peer-reviewed perioperative literature. Each addresses a distinct mechanism of surgical stress. Together they form a coherent system rather than a collection of unrelated ingredients.

The formulation is taken once daily for seven days pre-operatively and seven days post-operatively. The pre-operative window builds the physiologic baseline the patient brings into the room. The post-operative window supports recovery through the period of highest metabolic demand. The protocol is not a chronic supplement. It is a perioperative intervention, bounded by the surgical window.

01 Hydration & Electrolytes

Surgical fasting, reduced oral intake, and bowel preparation produce a predictable fluid and electrolyte deficit before induction. Intraoperative IV fluids address acute intravascular volume; they do not restore the intracellular and interstitial depletion that began hours to days before arrival. The protocol provides structured oral electrolyte preparation across the pre-operative days, supporting the fluid balance that IV resuscitation alone does not address.

02 Mitochondrial & Metabolic Support

Surgical stress imposes an acute metabolic burden at the cellular level. Catabolic activation, oxidative stress, and ischemia-reperfusion injury increase mitochondrial demand while simultaneously impairing mitochondrial function. Cellular energy availability during the repair window directly determines tissue healing capacity, immune competence, and recovery velocity. The protocol provides cofactors and substrates that support mitochondrial function and cellular energy production through the perioperative catabolic window.

03 Neurocognitive Resilience

Postoperative cognitive dysfunction remains one of the most prevalent and underaddressed complications of anesthesia and surgery, particularly in patients over 65. Preoperative anxiety, sleep disruption, fasting-induced metabolic shifts, and medication effects degrade the neurocognitive baseline the patient brings to induction. The protocol provides neurotransmitter precursors and cognitive resilience substrates designed to support clarity through the anesthetic exposure window and the early post-operative recovery period. No claim is made regarding prevention of POCD; the rationale is supporting neurocognitive resilience through a period of known vulnerability.

04 GI Integrity & Recovery

The perioperative gut faces a convergent assault: fasting compromises mucosal integrity, perioperative antibiotics destabilize the microbiome, anesthetic agents impair motility, and surgical stress triggers autonomic disruption. This occurs at the precise moment when absorptive capacity for recovery nutrients is most needed. GI discomfort following surgery — nausea, delayed gastric emptying, constipation — is among the most common complaints in ambulatory care and a primary driver of extended PACU time and delayed discharge. The protocol provides substrates that support gut mucosal integrity and GI tolerance through the surgical window.

05 Microbiome & Micronutrient Foundation

The perioperative microbiome is disrupted by antibiotics, fasting, and physiologic stress at a moment when microbial stability contributes to immune function, nutrient metabolism, and barrier defense. Concurrently, surgical stress and wound healing increase demand for zinc, selenium, B-vitamins, and vitamin D — micronutrients that standard dietary intake does not guarantee in the perioperative period. The protocol provides targeted probiotics for microbiome resilience alongside foundational micronutrient repletion at doses reflecting perioperative demand rather than RDA sufficiency targets.

Formulation Principles

Four principles governed every formulation decision. These are not marketing guardrails. They are the clinical constraints that determined what was included, what was excluded, and why.

Perioperative mechanism required. Every compound in the formulation was selected for a specific, peer-reviewed perioperative mechanism. No ingredient was included for general wellness, marketing convention, or category expectation. If it did not have a documented role in the surgical stress response, fasting catabolism, anesthetic emergence, or post-operative recovery physiology, it was excluded.

Dosing for surgical stress, not RDA. Dosing reflects the acute metabolic demands of the perioperative period, not Recommended Dietary Allowance sufficiency targets. Surgery is an acute stressor. The formulation is dosed accordingly for a bounded 14-day window, not for chronic daily use.

Activated forms only. Every ingredient is selected in its most bioavailable, clinically active form. Form selection reflects absorption and efficacy under the conditions of surgical stress — including compromised GI function — not cost or convention.

Gut-safe under surgical stress. The perioperative gut is compromised by fasting, antibiotics, and autonomic disruption. No ingredient that carries risk of GI irritation, barrier disruption, or clinically relevant pharmacokinetic interaction with standard perioperative medications is included in the formulation.

Recommendation Pathway

PERIOME PROTOCOL is designed for deployment at the institutional level. The recommendation pathway requires no prescription, no formulary integration, and no new clinical workflow. It maps to the communication structure the surgical team already uses with patients.

1 Identification. At the point of surgical scheduling, the patient is identified as a candidate for structured perioperative preparation. ASA physical status I–III patients undergoing elective or semi-elective procedures are the primary population. The clinical team determines appropriateness in the context of the patient's medication profile and surgical plan.

2 Patient communication. A brief structured handoff from the scheduling team or surgeon's office introduces PERIOME PROTOCOL as part of the surgical preparation pathway. The recommendation carries

clinical weight because it comes from the physician or surgical program — not from a consumer marketing channel.

3 **Pre-operative window.** Days −7 to −1, taken once daily at home. Final pre-operative dose timing follows NPO and fasting guidance from the surgical team. The protocol is designed around standard fasting requirements, not in conflict with them.

4 **Post-operative resumption.** Days +1 to +7, once daily at home, alongside standard post-surgical care. This window corresponds to the period of highest metabolic demand for recovery, immune activation, and tissue repair.

5 **Completion.** The 14-day perioperative course is complete at day +7. PERIOME PROTOCOL is not a chronic supplement. It is a perioperative intervention, bounded by the surgical window. One supply covers the complete course.

Programs interested in institutional deployment, pilot design, or clinical partnership can reach the founding team directly at partners@periome.com or through periome.com/pages/health-systems.

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