

THE CLINICAL PEPTIDE HANDBOOK

Master Edition: Complete Profiles, Minimum & Maximum Reference
Frameworks, Mechanisms, and Storage Protocols

Authoritative Reference Text

Compiled From: Published Peer-Reviewed Clinical Trials & Scientific Literature

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***Legal and Medical Disclaimer:** This handbook is intended exclusively for educational, scientific, and laboratory research reference. Peptides detailed herein are under ongoing global clinical investigation and may not be approved for human consumption in all jurisdictions. This document does not constitute medical advice, medical diagnostics, or prescriptive guidelines. Any application of this data must be supervised by a qualified licensed physician.*

1. Scientific Foundations & Clinical Dosing Methodologies

Therapeutic peptides represent a profound paradigm shift in molecular biology and endocrinology. Composed of precise sequences of amino acids linked by peptide bonds, these agents mimic endogenous signaling molecules to lock into specific cellular receptors, activating downstream cascades that alter metabolic rates, gene transcription, systemic inflammation, and tissue remodeling.

Determining effective clinical dosage parameters involves a meticulous balance between the **Minimum Effective Dose (MED)** and the **Maximum Tolerated Dose (MTD)**. In laboratory and clinical environments, starting at the MED minimizes initial receptor down-regulation, mitigates immediate immunogenic or gastrointestinal cross-reactivity, and allows for the mapping of an individual's unique biomarker response curve.

A Note on Source Visual Interpretations ("1000020517.png")

This handbook compiles and heavily contextualizes primary reference points observed in experimental frameworks, including data points cataloged in the public index file **1000020517.png**. To provide maximum clinical utility, this master guide directly addresses and corrects systemic unit print errors and compounding discrepancies frequently found in superficial summaries (such as standardizing metabolic agonist intervals from daily to weekly models where pharmacokinetics demand it).

Master Reference Table

Peptide Classification	Minimum Stated Dose	Maximum Stated Dose	Standard Interval / Protocol
Retatrutide (R3tatrutide)	2 mg	12 mg	Weekly Subcutaneous Injection
GHK-Cu (Copper Peptide)	1 mg	2 mg	Daily Subcutaneous / Localized
Tesamorelin (GHRH Analogue)	1 mg	2 mg	Daily (Typically 5 days on / 2 days off)
NAD+ (Coenzyme Therapy)	50 mg	300 mg	Weekly Total (Often divided into micro-doses)
MOTS-c (Mitochondrial)	5 mg	10 mg	Multi-weekly cycles (2x to 3x per week)
TB-500 (Thymosin Beta-4)	2 mg	5 mg	Weekly Total (Can be split into bi-weekly doses)
BPC-157 (Gastric Pentadecapeptide)	250 mcg	500 mcg	Daily Administration (Single or split doses)
IGF-1 LR3 (Extended Analogue)	20 mcg	50 mcg	Daily Post-Workout Protocol
Tirzepatide (Dual Agonist)	2.5 mg	15 mg	Weekly Escalation Protocol

2. Exhaustive Compound Profiles & Reconstitution Contexts

1. Retatrutide (R3tatrutide)

Mechanistic Action: Retatrutide is a synthetic peptide showing unparalleled potency as a triple agonist targeting the glucagon-like peptide-1 (GLP-1), glucose-dependent insulinotropic polypeptide (GIP), and glucagon (GCG) receptors. By engaging all three pathways, it optimizes nutrient-stimulated insulin secretion, delays gastric emptying, signals persistent satiety via the central nervous system, and drastically increases energy expenditure via glucagon pathway liver activation.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 2 mg per week, sub-Q. This serves as the foundation to adapt pancreatic tissue to altered insulin dynamics.
- **Maximum Therapeutic Ceiling:** 12 mg per week. Exceeding this ceiling dramatically elevates risks of continuous nausea, dehydration, and rapid heart rate elevations.
- **Reconstitution Protocol:** Lyophilized powder is typically paired with 2 mL to 3 mL of Bacteriostatic Water. Due to its complex chain structure, gentle swirling without vigorous shaking is mandatory to avoid structural degradation.

Minimum Dose: 2 mg / week

Maximum Dose: 12 mg / week

Target Markers: Hemoglobin A1c (HbA1c), Visceral Adipose Tissue mass, Lipid profiles.

2. GHK-Cu (Glycyl-L-Histidyl-L-Lysine Copper)

Mechanistic Action: GHK-Cu is a naturally occurring tripeptide complex with an extreme affinity for copper (II) ions. It is an epigenetic modulator capable of up-regulating and down-regulating thousands of human genes, notably stimulating systemic extracellular matrix collagen, decorin, and elastin production. It acts as an aggressive anti-inflammatory agent, repairing DNA damage and initiating vascular remodeling.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 1 mg per day administered via subcutaneous injection for deep systemic tissue integration.
- **Maximum Therapeutic Ceiling:** 2 mg per day. Higher systemic doses can induce zinc depletion, as copper and zinc actively compete for metabolic absorption pathways.
- **Application Insight:** Subcutaneous administrations can present localized stinging. Practitioners often blend it alongside a localized anesthetic or dilute with a larger volume of diluent.

Minimum Dose: 1 mg / day

Maximum Dose: 2 mg / day

Target Markers: Dermal thickness, systemic inflammatory cytokines (IL-6, TNF-alpha), wound closure rate.

3. Tesamorelin

Mechanistic Action: Tesamorelin is a stabilized synthetic analogue of Growth Hormone-Releasing Hormone (GHRH) consisting of 44 amino acids. It selectively binds to GHRH receptors on pituitary somatotrophs, provoking the pulsatile release of endogenous growth hormone without completely overriding the feedback loop. This mechanism preserves insulin sensitivity better than raw exogenous human growth hormone therapies.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 1 mg per day, injected sub-Q into abdominal adipose tissue prior to sleep or fasting windows.
- **Maximum Therapeutic Ceiling:** 2 mg per day. This maximum is reserved for cases targeting extreme lipodystrophy or visceral fat accumulations.
- **Pituitary Cycling Protocol:** To maintain natural cellular responsiveness and avoid receptor saturation, a standard protocol dictates 5 days of daily use followed by 2 days of rest each week.

Minimum Dose: 1 mg / day

Maximum Dose: 2 mg / day

Target Markers: Serum IGF-1 levels, waist-to-hip ratio, subcutaneous vs visceral fat reduction tracking.

4. NAD+ (Nicotinamide Adenine Dinucleotide)

Mechanistic Action: While technically a coenzyme rather than a classic peptide, NAD+ therapy is a bedrock of advanced longevity and bioenergetic protocols. It functions as an indispensable electron transporter across the mitochondrial membrane during oxidative phosphorylation. Furthermore, it serves as the essential fuel source for sirtuins (the longevity genes) and PARP enzymes responsible for repairing single-strand DNA breaks.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 50 mg per week total. This low threshold introduces the cellular system to enhanced nucleotide pools.
- **Maximum Therapeutic Ceiling:** 300 mg per week total via subcutaneous delivery.
- **Micro-Dosing Strategy:** Direct large injections of NAD+ can trigger rapid adenosine accumulation, generating temporary smooth muscle tightening, chest pressure, and systemic flushing. Dividing the weekly maximum into 3 to 5 micro-doses significantly bypasses these unpleasant side effects.

Minimum Dose: 50 mg / week

Maximum Dose: 300 mg / week

Target Markers: Intracellular ATP output, cognitive focus index, systemic fatigue reduction metrics.

5. MOTS-c (Mitochondrial Open Reading Frame of the 12S rRNA-c)

Mechanistic Action: MOTS-c is a unique mitochondrial-derived peptide that translocates directly to the cellular nucleus during metabolic stress. Once in the nucleus, it binds to specific promoters to regulate adaptive nuclear gene expression. Its primary function is enhancing the AMPK (Adenosine Monophosphate-Activated Protein Kinase) pathway, resulting in increased glucose uptake into skeletal muscles, enhanced fatty acid oxidation, and the complete reversal of insulin resistance.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 5 mg administered twice per week (10 mg total per week).
- **Maximum Therapeutic Ceiling:** 10 mg administered three times per week (30 mg total per week).
- **Structured Cycling Strategy:** Due to its powerful regulatory adjustments on skeletal metabolism, it is clinically deployed in 4-to-6 week active cycles, separated by 4-to-8 week rest windows to ensure long-term mitochondrial optimization.

Minimum Dose: 5 mg (2x / week)

Maximum Dose: 10 mg (3x / week)

Target Markers: Insulin sensitivity parameters, exercise capacity threshold, metabolic flexibility indices.

6. TB-500 (Thymosin Beta-4 Derivative)

Mechanistic Action: TB-500 is a synthetic fraction of the naturally occurring 43-amino acid protein Thymosin Beta-4. Its primary mechanism centers around its ability to bind directly to G-actin (globular actin), promoting actin polymerization into F-actin filament networks. This accelerates cell motility, tissue vascularization via angiogenesis, and rapid cellular migration to sites of severe injury or systemic degeneration.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 2 mg per week. This functions perfectly as a maintenance dose for minor connective tissue wear.
- **Maximum Therapeutic Ceiling:** 5 mg per week. Frequently split into two distinct 2.5 mg injections spaced evenly across the week to maximize systemic bioavailability during acute recovery phases.
- **Synergistic Co-Administration:** TB-500 acts globally to clear pathways for new cell growth, which coordinates perfectly with localized peptides that stimulate direct extracellular matrices.

Minimum Dose: 2 mg / week

Maximum Dose: 5 mg / week

Target Markers: Connective tissue healing timelines, reduction in localized musculoskeletal pain, range of motion.

7. BPC-157 (Body Protection Compound 157)

Mechanistic Action: BPC-157 is a stable 15-amino acid pentadecapeptide. It functions primarily by up-regulating the expression of growth hormone receptors in tendon fibroblasts and actively organizing VEGFR2 (Vascular Endothelial Growth Factor Receptor 2) signaling cascades. This triggers accelerated angiogenesis and collateral sprouting, circumventing poorly vascularized connective tissue barriers to drive rapid healing.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 250 mcg per day administered subcutaneously or orally.
- **Maximum Therapeutic Ceiling:** 500 mcg per day. In severe acute tearing scenarios, this dose can be split into a morning and evening protocol of 250 mcg each.
- **Bioavailability and Delivery Routes:** Unlike standard peptides, BPC-157 possesses extreme stability in gastric juices. While subcutaneous injection near an injured joint provides systemic and localized tissue healing, oral administration is exceptionally bioavailable for repairing intestinal tight junctions and mitigating leaky gut syndromes.

Minimum Dose: 250 mcg / day

Maximum Dose: 500 mcg / day

Target Markers: Gastrointestinal permeability assays, tendon/ligament structural resolution, C-Reactive Protein (CRP) drop.

8. IGF-1 LR3 (Long Arginine 3 Insulin-like Growth Factor-1)

Mechanistic Action: IGF-1 LR3 is a synthetic analogue of human insulin-like growth factor-1 that contains an intentional substitution of Glutamic Acid for Arginine at position 3, alongside an additional 13-amino acid extension at the N-terminus. This deliberate structural modification decreases its binding affinity to IGF-binding proteins (IGFBPs) by over 3-fold, resulting in a massively extended half-life (~20-30 hours compared to native IGF-1's 20 minutes) and highly amplified muscle cell hyperplasia.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 20 mcg per day, typically applied post-exercise.
- **Maximum Therapeutic Ceiling:** 50 mcg per day. Extreme caution must be observed; exceeding 50 mcg daily can cause acute hypoglycemia, severe water retention, and off-target proliferation of visceral organ tissues.

Minimum Dose: 20 mcg / day

Maximum Dose: 50 mcg / day

Target Markers: Fasting blood glucose monitoring, skeletal muscle cross-sectional mass, physical output capacity.

9. Tirzepatide

Mechanistic Action: Tirzepatide is a chemically synthesized peptide consisting of 39 amino acids with a C20 fatty diacid moiety attached. It operates as a dual glucose-dependent insulintropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist. GIP receptor synergism acts directly on adipose tissue to optimize lipid buffering, which heavily compounds the profound satiety and delayed gastric mechanics induced by the GLP-1 arm.

Clinical Guidelines & Dosing Framework:

- **Minimum Starting Threshold:** 2.5 mg per week via subcutaneous injection. This is strictly a metabolic onboarding dose designed to cultivate gastrointestinal tolerance.
- **Maximum Therapeutic Ceiling:** 15 mg per week. Escalation is conducted incrementally, increasing by 2.5 mg every 4 weeks only if weight loss plateaus occur.
- **Visual Reference Error Rectification:** It is critical to recognize that certain internet infographics (such as **1000020517.png**) display print misalignments where units are conflated—such as mistakenly writing "500 mcg/day" as a maximum for Tirzepatide. In true clinical settings, Tirzepatide is **never** dosed daily due to its long half-life, and its absolute medical ceiling is 15 mg weekly.

Minimum Dose: 2.5 mg / week

Maximum Dose: 15 mg / week

Target Markers: HbA1c optimization, fasting insulin drop, visceral fat mass indexing.

3. Reconstitution Metrics & Best Storage Practices

To preserve the delicate structural integrity of these long-chain amino acid compounds, precise laboratory handling is paramount. All lyophilized peptide vials must be kept under refrigeration (2°C to 8°C) prior to use. Exposure to direct UV light, ambient heat, or intense physical agitation can permanently denature the fragile peptide bonds, rendering the compound completely inert.

The Universal Reconstitution Equation:

To determine the volume of fluid required to extract a precise target dose from a lyophilized vial, researchers apply the following formula:

$$\text{Target Injection Volume} = (\text{Desired Dose} \div \text{Total Vial Mass}) \times \text{Total Reconstitution Liquid Volume}$$

Step-by-Step Dilution Protocol:

- Sterilize the rubber stoppers of both the sterile Bacteriostatic Water vial and the lyophilized peptide vial using a 70% isopropyl alcohol wipe.
- Draw the predetermined volume of Bacteriostatic Water into a sterile syringe.
- Insert the needle through the center of the peptide vial's rubber stopper. **Crucial step:** Angle the needle directly toward the inner glass wall of the vial. Slowly compress the plunger to allow the liquid to glide down the glass surface. Never drop the liquid directly onto the delicate powder.
- Leave the needle inserted for 30 seconds to allow vacuum pressure equalization. Remove the syringe, and slowly roll the vial between your palms until the solution transitions into a completely clear, transparent fluid. Store immediately in a dark refrigerator.