

MOTS-C Comprehensive Dosing Guide (10 mg, 20 mg & 40 mg Formats)

I. Overview

MOTS-C is a mitochondrial-derived peptide (MDP) consisting of 16 amino acids. It functions primarily as a metabolic modulator through AMPK activation [1][2]. Preclinical studies demonstrate that it enhances insulin sensitivity, promotes fat oxidation, improves exercise capacity, and counteracts age-related metabolic decline [1][4]. To date, no completed human clinical trials are available [8]. This educational protocol outlines a once-daily subcutaneous injection method with gradual dose titration. The guide covers vial dosing protocols for 10 mg, 20 mg and 40 mg specifications.

Research Background: For evidence regarding mechanism of action, human and pre-clinical studies, limitations and safety, please refer to relevant MOTS-C peptide reviews.

II. Dosing & Reconstitution Guidelines

2.1 10 mg Format

Reconstitution: Add 3.0 mL bacteriostatic water → resulting concentration approx. 3.33 mg/mL

U-100 insulin syringe conversion: 1 unit = 0.01 mL ≈ 33.3 mcg

Shelf-life after reconstitution: Use within 7 days under refrigeration (2–8°C) for optimal potency [7].

2.2. 20 mg Format

Reconstitution: Add 3.0 mL bacteriostatic water → resulting concentration approx. 6.67 mg/mL

U-100 insulin syringe conversion: 1 unit = 0.01 mL ≈ 66.7 mcg

Shelf-life after reconstitution: Use within 7 days under refrigeration (2–8°C) for optimal potency [7].

2.3. 40 mg Format

Reconstitution: Add 3.0 mL bacteriostatic water → resulting concentration approx. 13.33 mg/mL

U-100 insulin syringe conversion: 1 unit = 0.01 mL ≈ 133.3 mcg

Shelf-life after reconstitution: Use within 7 days under refrigeration (2–8°C) for optimal potency [7].

Standard / Progressive Protocol (Once-Daily, Subcutaneous Injection)

Identical dosing protocol applies to all formats; injection volume (syringe units) varies due to differing concentrations.

Weeks	Daily Dose (mcg)	10 mg Format (3.33 mg/mL)	20 mg Format (6.67 mg/mL)	40 mg Format (13.33 mg/mL)
Weeks 1-2	200 mcg (0.2 mg)	6 units (0.06 mL)	3 units (0.03 mL)	1.5 units (0.015 mL)
Weeks 3-4	400 mcg (0.4 mg)	12 units (0.12 mL)	6 units (0.06 mL)	3 units (0.03 mL)
Weeks 5-6	600 mcg (0.6 mg)	18 units (0.18 mL)	9 units (0.09 mL)	4.5 units (0.045 mL)
Weeks 7-8	800 mcg (0.8 mg)	24 units (0.24 mL)	12 units (0.12 mL)	6 units (0.06 mL)
Weeks 9-10+	1,000 mcg (1.0 mg)	30 units (0.30 mL)	15 units (0.15 mL)	7.5 units (0.075 mL)

Frequency: Once-daily subcutaneous injection [7].

Titration Recommendation: Remain at each dose level for approximately two weeks, monitor for adverse reactions before dose escalation [7].

Syringe Recommendation: For doses ≤10 units (≤0.10 mL), 30-unit or 50-unit insulin syringes are recommended for improved reading accuracy.

III. Reconstitution Procedure

1. Withdraw 3.0 mL bacteriostatic water using a sterile syringe.
2. Inject slowly along vial wall to avoid foam formation.
3. Gently swirl / roll vial until dissolved (do not shake vigorously).
4. Label with reconstitution date, store refrigerated at 2–8°C (35.6–46.4°F), protected from light.
5. Use within 7 days for optimal potency [7].

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IV. Required Supplies

4.1. 10 mg Format

Planning is based on daily protocol with progressive dose adjustment spanning 8-12 weeks.

Peptide vials (MOTS-C, 10 mg per vial):

8 weeks $\approx$ 3 vials

12 weeks $\approx$ 6 vials

16 weeks $\approx$ 9 vials

Insulin syringes (U-100):

Per week: 7 syringes (1 per day)

8 weeks: 56 syringes

12 weeks: 84 syringes

16 weeks: 112 syringes

Bacteriostatic water (10 mL vials): $\sim$ 3.0 mL required for each peptide-vial reconstitution.

8 weeks (3 vials): 9 mL $\rightarrow$ 1 $\times$ 10 mL vial

12 weeks (6 vials): 18 mL $\rightarrow$ 2 $\times$ 10 mL vials

16 weeks (9 vials): 27 mL $\rightarrow$ 3 $\times$ 10 mL vials

Alcohol swabs: One for vial stopper, one for injection site each day.

Per week: 14 swabs (2 per day)

8 weeks: 112 swabs $\rightarrow$ recommended 2 $\times$ 100-count boxes

12 weeks: 168 swabs $\rightarrow$ recommended 2 $\times$ 100-count boxes

16 weeks: 224 swabs $\rightarrow$ recommended 3 $\times$ 100-count boxes

4.2. 20 mg Format

Planning is based on daily protocol with progressive dose adjustment spanning 8-16 weeks.

Peptide vials (MOTS-C, 20 mg per vial):

8 weeks $\approx$ 2 vials

12 weeks $\approx$ 3 vials

16 weeks $\approx$ 5 vials

Insulin syringes (U-100):

Per week: 7 syringes (1 per day)

8 weeks: 56 syringes

12 weeks: 84 syringes

16 weeks: 112 syringes

Bacteriostatic water (10 mL vials): $\sim$ 3.0 mL required for each peptide-vial reconstitution.

8 weeks (2 vials): 6 mL $\rightarrow$ 1 $\times$ 10 mL vial

12 weeks (3 vials): 9 mL $\rightarrow$ 1 $\times$ 10 mL vial

16 weeks (5 vials): 15 mL $\rightarrow$ 2 $\times$ 10 mL vials

Alcohol swabs: One for vial stopper, one for injection site each day.

Per week: 14 swabs (2 per day)

8 weeks: 112 swabs $\rightarrow$ recommended 2 $\times$ 100-count boxes

12 weeks: 168 swabs $\rightarrow$ recommended 2 $\times$ 100-count boxes

16 weeks: 224 swabs $\rightarrow$ recommended 3 $\times$ 100-count boxes

4.3. 40 mg Format

Planning is based on daily protocol with progressive dose adjustment spanning 8-16 weeks.

Peptide vials (MOTS-C, 40 mg per vial):

8 weeks $\approx$ 1 vial

12 weeks $\approx$ 2 vials

16 weeks $\approx$ 3 vials

Insulin syringes (U-100):

Per week: 7 syringes (1 per day)

8 weeks: 56 syringes

12 weeks: 84 syringes

16 weeks: 112 syringes

Bacteriostatic water (10 mL vials): ~3.0 mL required for each peptide-vial reconstitution.

8 weeks (1 vial): 3 mL → 1 × 10 mL vial

12 weeks (2 vials): 6 mL → 1 × 10 mL vial

16 weeks (3 vials): 9 mL → 1 × 10 mL vial

Alcohol swabs: One for vial stopper, one for injection site each day.

Per week: 14 swabs (2 per day)

8 weeks: 112 swabs → recommended 2 × 100-count boxes

12 weeks: 168 swabs → recommended 2 × 100-count boxes

16 weeks: 224 swabs → recommended 3 × 100-count boxes

V. Protocol Summary

Brief Summary:

Objective: Support metabolic homeostasis, insulin sensitivity and age-related physical performance based on pre-clinical evidence [1][2][4].

Timing: Daily subcutaneous injection for 8-12 weeks (extendable to 16 weeks as needed).

Dose Range: 200-1,000 mcg per day, titrated gradually over approximately 10 weeks.

Reconstitution: Reconstitute different-specification vials with 3.0 mL diluent respectively to achieve precise measurable concentrations.

Storage: Lyophilized powder frozen at –20°C (–4°F); post-reconstitution refrigerated at 2-8°C (35.6-46.4°F); avoid repeated freeze-thaw cycles.

VI. Dosing Protocol

Starting Dose: 200 mcg daily for two weeks.

Titration Schedule: Increase by approximately 200 mcg every two weeks: 400 mcg (Weeks 3-4), 600 mcg (Weeks 5-6), 800 mcg (Weeks 7-8).

Target Dose: If well tolerated, reach 1,000 mcg (1.0 mg) daily starting from Weeks 9-10 [7].

Frequency: Once daily (subcutaneous injection).

Cycle Duration: 8-12 weeks; optional extension to 16 weeks.

Injection Time: Fixed time each day; rotate injection sites.

VII. Storage Instructions

Proper storage preserves peptide quality and potency.

Lyophilized Powder: Store at –20°C (–4°F) or below under dry, dark conditions; include desiccant if available to minimize moisture exposure.

Post-Reconstitution: Refrigerate at 2-8°C (35.6-46.4°F). Peptides degrade rapidly at room temperature (approx. 25 % activity loss after 24 hours at 4°C) [7]. Use within 7 days for optimal potency.

Aliquoting: For long-term storage, aliquot into single-use portions and freeze at –20°C (–4°F); avoid freeze-thaw cycles.

Before Use: Allow vial to reach room temperature to minimize condensation uptake.

VIII. Important Considerations

Practical considerations for consistency and safety. Use a new sterile insulin syringe for every injection; discard into sharps container [11].

Rotate injection sites (abdomen, thighs, upper arms) to reduce local irritation and prevent lipohypertrophy [11].

Inject slowly; wait several seconds before withdrawing needle. Document daily dose, injection site and any observations to maintain consistency.

Discontinue use and consult a healthcare professional if any concerning symptoms occur.

IX. Perceived Benefits & Adverse-Effect Profile

Observations derived from pre-clinical literature (no completed human clinical trials to date) [8].

Metabolic Health: Improved insulin sensitivity and glucose metabolism in mouse models; prevention of diet-induced insulin resistance [1][7].

Body-Weight & Fat Reduction: Prevention of obesity and reduction of visceral fat in obese mice via elevated energy expenditure and fat oxidation [1][7].

Post-Menopausal Metabolism: Attenuation of metabolic decline in ovariectomized mice; prevention of menopause-related fat gain and insulin resistance [3].

Physical Performance: Enhanced exercise capacity and counter-action of age-related frailty; treadmill running duration doubled in aged mice [4][7].

Organ Protection: Reduced hepatic lipid accumulation, improved cardiac function, and preliminary suggestive support for cognitive function [2][7].

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Bone & Immunity: Promotion of osteoblast activity, inhibition of osteoclast formation; modulation of immunosenescence and protection of pancreatic islet cells in autoimmune-diabetes models [5][10].

Safety: No adverse effects reported in pre-clinical studies; human tolerability remains unknown. A modified analogue (CB4211) demonstrated favourable tolerability in Phase 1 trials [7].

Note: These benefits have only been demonstrated under controlled research settings using mice or cell systems. Human translational effects require clinical investigation.

X. Injection Technique

General subcutaneous-injection guidance sourced from clinical best-practice resources [9][11].

Clean vial stopper and skin with alcohol; allow to dry completely.

Pinch skin fold; insert needle into subcutaneous tissue at 90° angle (45° angle for very lean subjects) [11].

No aspiration required for subcutaneous injection; inject slowly and steadily over several seconds [9].

Withdraw needle at identical angle; apply light pressure upon bleeding (do not rub).

Systematically rotate sites (abdomen minimum two-inches away from umbilicus, outer thighs, posterior upper arms) to avoid irritation and lipohypertrophy [11].

Discard used syringes promptly into appropriate sharps container (never reuse needles) [11].

Disclaimer: This document is for educational purposes only and does not constitute medical advice, diagnosis or treatment. MOTS- c is an experimental compound intended for research use only. No completed human clinical trials exist to date. Always consult a qualified healthcare provider before initiating any new therapeutic intervention. Individual responses may vary, and appropriate medical supervision is essential for safety- and- efficacy monitoring.