

# Semax Comprehensive Dosing Guide (5 mg & 10 mg Specifications)

## I. Overview

**Semax** is a synthetic heptapeptide based on the ACTH (4-10) sequence. Human studies have evaluated intranasal Semax in healthy volunteers and selected neurological-disease research[1][2][3]. This guideline provides preparation-and-calculation methods for intranasal administration for both 5 mg and 10 mg vial specifications. Published human Semax studies predominantly used intranasal drops or metered intranasal solutions.

**Research Background:** Refer to relevant Semax peptide reviews for evidence regarding mechanism of action, human and pre-clinical studies, limitations and safety.

## II. Intranasal Preparation & Calculation Guidelines

### 5 mg Specification Preparation Options

Both protocols start by adding 3.0 mL solvent to the peptide vial. Transfer the fully dissolved solution, then add sufficient solvent to reach the measured final volume.

| Measured Final Volume | Solvent Added After Transfer | Final Concentration | Per-Spray Verified 0.10 mL Dose | Nominal Spray Count |
|-----------------------|------------------------------|---------------------|---------------------------------|---------------------|
| 5.0 mL                | Approx. 2.0 mL               | 1,000 mcg/mL        | 100 mcg                         | 50 sprays           |
| 10.0 mL               | Approx. 7.0 mL               | 500 mcg/mL          | 50 mcg                          | 100 sprays          |

**Calculation Basis:** Each row uses one full 5 mg vial and assumes the spray pump is verified to deliver 0.10 mL per full actuation. Nominal spray counts are calculated prior to priming and normal residual hold-up.

### 10 mg Specification Preparation Options

| Measured Final Volume | Solvent Added After Transfer | Final Concentration | Per-Spray Verified 0.10 mL Dose | Nominal Spray Count |
|-----------------------|------------------------------|---------------------|---------------------------------|---------------------|
| 5.0 mL                | Approx. 2.0 mL               | 2,000 mcg/mL        | 200 mcg                         | 50 sprays           |
| 10.0 mL               | Approx. 1,000 mcg/mL         | 1,000 mcg/mL        | 100 mcg                         | 100 sprays          |

**Calculation Basis:** Each row uses one full 10 mg vial and assumes the spray pump is verified to deliver 0.10 mL per full actuation.

## III. Reconstitution Procedure

- Verification:** Confirm peptide vial (5 mg or 10 mg), selected sterile research-grade solvent, spray-bottle capacity and nominal pump output.
- Initial Dissolution:** Add 3.0 mL of compatible sterile solvent (e.g. sterile 0.9% saline) into the vial using aseptic technique.
- Mixing:** Gently swirl until contents are fully dissolved. Do not shake.
- Transfer:** Transfer the entire 3.0 mL solution into a sterile 5 mL or 10 mL intranasal spray bottle.
- Volume Adjustment:** Add enough solvent to reach an exact measured final volume of either 5.0 mL or 10.0 mL. Theoretical additions are approximately 2.0 mL and 7.0 mL respectively.
- Labelling:** Secure the pump assembly; record peptide content, final volume, concentration, pump output and preparation date on the bottle label.
- Priming:** Prime the pump per actuator instructions and log the number of priming sprays in the research logbook.
- Solvent Background:** This example uses sterile 0.9% saline as the research solvent. Kaplan et al. used physiological saline in one human trial[1]. The registered 0.1% Semax product uses purified water with methylparaben; therefore the saline example is not equivalent to the commercial multidrop formulation[1][4].

## IV. Research-Dose & Spray-Count Conversion

### 5 mg Specification (based on 0.10 mL per spray)

| Research Dose | 5 mL Protocol (100 mcg/spray) | 10 mL Protocol (50 mcg/spray) |
|---------------|-------------------------------|-------------------------------|
|---------------|-------------------------------|-------------------------------|

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|        |          |           |
|--------|----------|-----------|
| 200mcg | 2 sprays | 4 sprays  |
| 300mcg | 3 sprays | 6 sprays  |
| 400mcg | 4 sprays | 8 sprays  |
| 500mcg | 5 sprays | 10 sprays |

**10 mg Specification (based on 0.10 mL per spray)**

| Research Dose | 5 mL Protocol (200 mcg/spray) | 10 mL Protocol (100 mcg/spray) |
|---------------|-------------------------------|--------------------------------|
| 200 mcg       | 1 spray                       | 2 sprays                       |
| 300 mcg       | 1.5 sprays (theoretical)      | 3 sprays                       |
| 400 mcg       | 2 sprays                      | 4 sprays                       |
| 500 mcg       | 2.5 sprays (theoretical)      | 5 sprays                       |

**Important Note:** These conversions represent mathematical concentration translation not universal dosing regimens. Fractional values such as 1.5 sprays are purely theoretical because metered pumps cannot deliver partial full actuations. Always match any research dose to its original study context.

## V. Intranasal-Spray-Pump Output Verification & Calculation

A 0.10 mL actuator is a common nasal-pump configuration, but pump output is not universal. Pharmaceutical literature reports spray volumes ranging from approximately 0.025 mL to 0.20 mL per actuation[5]. Always follow manufacturer specifications or perform validation measurements for your exact hardware.

**Core Formulas**

$\text{mcg per spray} = (\text{Total peptide mcg} \div \text{Final volume (mL)}) \times \text{Verified mL per spray}$

$\text{Nominal number of sprays} = \text{Final volume (mL)} \div \text{Verified mL per spray}$

Concentration-Conversion Examples for Different Pump Outputs (for reference)

**5 mg Specification:**

| Verified Actuator Output | 5 mL Protocol (1,000 mcg/mL) | 10 mL Protocol (500 mcg/mL) |
|--------------------------|------------------------------|-----------------------------|
| 0.05 mL                  | 50 mcg/spray                 | 25 mcg/spray                |
| 0.10 mL                  | 100 mcg/spray                | 50 mcg/spray                |
| 0.13 mL                  | 130 mcg/spray                | 65 mcg/spray                |

**10 mg Specification:**

| Verified Actuator Output | 5 mL Protocol (2,000 mcg/mL) | 10 mL Protocol (1,000 mcg/mL) |
|--------------------------|------------------------------|-------------------------------|
| 0.05 mL                  | 100 mcg/spray                | 50 mcg/spray                  |
| 0.10 mL                  | 200 mcg/spray                | 100 mcg/spray                 |
| 0.13 mL                  | 260 mcg/spray                | 130 mcg/spray                 |

**Pre-Recording Actuator Checks**

Confirm the nominal volume per full actuation for your specific pump.

Follow documented priming and re-priming procedures.

Document residual volume and spray tail-off effects when estimating usable spray counts near bottle exhaustion.

Maintain consistent pump orientation and actuation stroke during all research operations.

## VI. Required Supplies

1. Semax research-use peptide vial (5 mg or 10 mg): One vial per prepared intranasal-spray bottle.
2. Sterile research-grade solvent: Disposable sterile 0.9% sodium-chloride saline (example formulation) or other validated sterile intranasal-research solvent.
3. Sterile intranasal spray bottle: One single-user-research-only 5 mL or 10 mL spray bottle.
4. Metered pump: Compatible actuator documented or verified to deliver 0.10 mL per full spray actuation.
5. Calibrated transfer tools: Sterile syringes or pipettes capable of measuring initial 3.0 mL and exact final volumes of 5.0 mL or 10.0 mL.
6. Sterile transfer needle: Required for peptide vials fitted with rubber septa.

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7. Clean-processing supplies: Alcohol prep pads, clean gloves and disinfected work surface.
8. Labels and research logbook: Record peptide quantity, final volume, concentration, pump output, preparation date, priming-spray count and actuation counts.
9. Storage materials: Light-protected, temperature-controlled storage appropriate for the validated formulation.
10. Sharps container: For workflows that utilise transfer needles.

## VII. Protocol Summary

### 5 mg Specification Brief Summary:

Primary human-research administration route: Intranasal drops or solution.

Total peptide content per vial: 5,000 mcg.

5 mL protocol: Concentration 1,000 mcg/mL; 100 mcg per spray (0.10 mL verified output).

10 mL protocol: Concentration 500 mcg/mL; 50 mcg per spray (0.10 mL verified output).

Volume-adjustment rule: Bring transferred solution up to an exact measured final volume.

### 10 mg Specification Brief Summary:

Primary human-research administration route: Intranasal drops or solution.

Total peptide content per vial: 10,000 mcg.

5 mL protocol: Concentration 2,000 mcg/mL; 200 mcg per spray (0.10 mL verified output).

10 mL protocol: Concentration 1,000 mcg/mL; 100 mcg per spray (0.10 mL verified output).

Volume-adjustment rule: Bring transferred solution up to an exact measured final volume.

## VIII. Storage Instructions

### Storage conditions depend on complete formulation, container and handling practices.

Registered 0.1% commercial product: Store protected from light at  $\leq 10^{\circ}\text{C}$ ; do not freeze[4].

Custom research-prepared formulations: Apply formulation-specific stability and microbial-control protocols.

Labelling: Record preparation date, final volume, concentration, solvent and storage conditions.

Handling: Keep bottle tightly sealed; minimise unnecessary temperature increases and light exposure.

## IX. Important Considerations

### Minor measurement and hardware details can materially alter delivered dose per spray.

Use measured final volume, do not rely solely on printed bottle graduation marks.

Verify actuator delivers 0.10 mL per full stroke before applying main conversion tables.

Prime and re-prime strictly per pump specifications and document those actuation counts.

Keep bottle upright and use complete, consistent strokes for every recorded spray.

Treat theoretical 50- or 100-spray counts as nominal values, as priming and residual hold-up consume part of the solution volume.

Any custom multidose preparation requires validated laboratory-handling and stability protocols.

## X. Nasal-Actuator Technique

### Use standardised device-operating procedures to maintain consistent documented dosing for research observations.

Inspect labelled concentration and verify actuator output prior to use.

Prime or re-prime pump following manufacturer instructions.

Maintain specified bottle orientation and deliver one complete, smooth actuation stroke.

Immediately log every actuation including priming sprays.

Wipe nozzle with device-compatible cleaning material and replace cap.

Return bottle to documented storage conditions upon completion of research-related procedures.

**Important Disclaimer:** This document serves educational- research purposes only and does not constitute medical advice, diagnosis or treatment. Semax is for research- use only and is not intended for human consumption. Consult a qualified healthcare professional before considering any peptide- based intervention. Individual responses may vary; adequate medical oversight is essential for safety- and- efficacy monitoring.