※Revised: February 2024 (2nd version)
Revised: September 2023

Standard Commodity Classification No. of Japan:
873259

Storage : Store at room temperature.
Expiration date: 3 years

Essential amino acid preparation

Approval No.	15400AMZ00102
Date of initial marketing in Japan	July 2002

Hy-Pleamin S Injection-10% "FUSO"

Prescription drug:
(Caution – Use only pursuant to the prescription issued of physician, etc.)

2. CONTRAINDICATIONS (Do not administer to the following patients.)

2.1 Patients with aberrant amino acid metabolism [There is a risk that the administered amino acids will not be metabolised, and that amino acid imbalance will be exacerbated.]
2.2 Patients with severe renal dysfunction or azotemia (both except for patients undergoing dialysis or hemofiltration) [see 8., 9.2.1, 9.2.2]
2.3 Patients with hepatic coma or those at risk of hepatic coma [see 9.3.1]
2.4 Patients with hereditary fructose intolerance [sorbital, which is produced when fructose is metabolized in the body, is not metabolized normally, and there is a risk of inducing hypoglycemia, liver failure, renal failure, etc.].

3. COMPOSITION AND PRODUCT DESCRIPTION

3.1 Composition

Product name	Hy-Pleamin S Injection-10% "FUSO"	
Volume	20 mL	
Active Ingradients	In one ampoule,	
	L-Isoleucine	192 mg
	L-Leucine	218 mg
	L-Lysine hydrochloride	240.6 mg
	L-Methionine	192 mg
	L-Phenylalanine	128 mg
	L-Threonine	128 mg
	L-Tryptophan	64 mg
	L-Valine	192 mg
	L-Arginine hydrochloride	200 mg
	L-Histidine hydrochloride Hydrate	100 mg
	Glycine	298 mg
	D-Sorbitol	1,000 mg
Inactive Ingredients	In one ampoule,	
	L-Cysteine	7 mg
	Sodium hydrogen sulfite	6 mg
	pH adjuster	

Total free amino acid content※ : 9,255 mg/100 mL
Essential amino acid content (E) : 6,903 mg/100 mL
Non-essential amino acid content (N) : 2,352 mg/100 mL
E/N : 2.93
Total nitrogen content※ : 1,426 mg/100 mL

Electrolyte level※:
Na^+ : approximately 8 mEq/L
Cl^- : approximately 137 mEq/L

※Including inactive ingredients

3.2 Composition and product description

Product name	Hy-Pleamin S Injection-10% "FUSO"
Dosage form	Aqueous injection
Appearance	Clear and colorless to pale yellow liquid
pH	5.0 - 6.5
Osmotic pressure ratio (ratio to saline)	3.9 - 4.3

4. INDICATIONS

Amino acid supplementation in the following conditions:
hypoproteinemia, malnutrition, and before and after operation.

6. DOSAGE AND ADMINISTRATION

Usually, for adults, slowly administer 20 to 500 mL per dose intravenously or by intravenous drip infusion. The desirable infusion rate is about 10 g of amino acid per 60 minutes. Usually, for adults, administer 200 mL of the drug over 80 to 100 minutes, and take more time to administer it to pediatric or elderly patients, and patients with serious conditions.
The dose may be increased or decreased according to age, symptoms, and body weight of the patient.
The maximum daily dose is 100 g of D-sorbitol.

8. IMPORTANT PRECAUTIONS

The amount of urea and other substances removed and the amount accumulated in patients with severe renal impairment or patients with hypernitrosemia undergoing dialysis or hemofiltration will differ depending on the dialysis method and the patient's condition. The patient's condition should be confirmed by evaluating blood biochemistry, acid-base balance, and fluid balance, etc., before deciding whether to start or continue treatment. [See 2.2, 9.2.2]

9. PRECAUTIONS CONCERNING PATIENTS WITH SPECIFIC BACKGROUNDS

9.1 Patients with complications, past medical history, etc.
9.1.1 Patients with severe acidosis
There is a risk of worsening acidosis.
9.1.2 Patients with congestive cardiac failure
There is a risk that symptoms may worsen due to an increase in circulating blood volume.
9.2 Patients with renal impairment
9.2.1 Patients with severe renal impairment or patients with hypernitremia (except for patient undergoing dialysis or hemofiltration)
Do not administer. There is a risk that the accumulation of urea and other metabolites of amino acids may worsen the condition. [See 2.2]
9.2.2 Patients with severe renal impairment or hypernitrosemia undergoing dialysis or hemofiltration
There is a risk that the accumulation of urea and other metabolites of amino acids may occur. [See 2.2, 8.]
9.3 Patients with hepatic dysfunction
9.3.1 Patients with hepatic coma or those at risk of hepatic coma
Do not administer. There is a risk that symptoms may worsen or be induced due to insufficient amino acid metabolism. [See 2.3]
9.5 Pregnant use
Administer only when the therapeutic benefit is considered to outweigh the risk to the pregnant woman or a woman who may be pregnant.
9.6 Breast-feeding use
Consider the benefits of treatment and the benefits of breast-feeding, and decide whether to continue or discontinue breast-feeding.
9.7 Pediatric use
Clinical trials have not been conducted to evaluate the efficacy and safety of this drug in children.
9.8 Use in Elderly
Use caution, such as by reducing the dose or slowing the administration rate. In general, physiological functions are reduced.

11. ADVERSE REACTIONS

The following adverse reactions may occur, so please monitor the patient closely and take appropriate measures such as discontinuing the drug if any adverse reactions are observed.

11.2 Other adverse reactions

	Incidence unknown
Hypersensitivity	Rash
Gastrointestinal	Nausea, vomiting
Cardiovascular	Chest discomfort, palpitations
Massive/rapid administration	Acidosis following massive/rapid administration

Others	Chills, pyrexia, feeling hot, headache, vascular pain

14. PRECAUTIONS CONCERNING USE

14.1 General Precautions

14.1.1 Take precautions against infection when using.

14.2 Precautions for Preparing the Solution

When mixing the solution, take care to avoid changes in the mixture.

14.3 Precautions for Administering the Solution

14.3.1 Because it contains approximately 8 mEq/L of sodium ions and approximately 137 mEq/L of chloride ions, be careful of electrolyte balance when administering large doses or when using electrolyte solutions in combination.

18. PHARMACOLOGY

18.1 Mechanism of action

This drug shows the effect of supplementing amino acids.

※ **18.2 Amino acid supplement effect**

Unlike carbohydrates and fats, the main function of protein as a nutrient is not to provide energy, but to supply the amino acids necessary for protein synthesis in tissues, and it is useful for supplementing proteins that are physiologically broken down and utilized, or proteins that are deficient due to cell damage and destruction during illness or injury[1].

In 1957, the FAO announced provisional standards for essential amino acid composition based on the idea that the ideal intake protein pattern for biological utilization could be expressed by combining essential amino acids. This product is an L-type amino acid preparation with an essential amino acid pattern based on the FAO standard[2-4], and is used for the purpose of supplying amino acids when oral intake or intestinal absorption is insufficient or impossible, and protein demand is increasing. Furthermore, this preparation contains the non-essential amino acids L-arginine hydrochloride and glycine as nitrogen sources for the synthesis of other amino acids (essential amino acid/non-essential amino acid ratio = 2.93).

In addition, since some of the supplied amino acids are used as an energy source in the case of insufficient energy, D-sorbitol is added as a carbohydrate that does not undergo chemical changes with amino acids[4].

20. PRECAUTIONS FOR HANDLING .

20.1 To maintain quality, the product is packaged in gas-barrier packaging and contains a desiccant, so do not open the blister packaging until you are ready to use it.

20.2 Do not use the product in the following cases

- If the blister packaging is damaged
- If there are any water droplets or crystals on the surface of the blister packaging or container
- If the liquid medicine is leaking from the container
- If there are any crystals that do not dissolve even when the container is heated or shaken
- If there are any abnormalities in the properties or other aspects of the liquid medicine

22. PACKAGING

20mL 50 Plastic ampoules (with oxygen absorber)

23. REFERENCES

1) Drill's Pharmacology in Medicine, 4th ed., 1309（1971）

2) Inoue G et al., Jpn J Clinical Medicine, **24**, 12（1966）

3) Kodeki K et al., Jpn J Clinical and Experimental Medicine, **50**, 463（1973）

4) Kimura N et al., 臨床薬理学大系, 8th ed., 40（1972）

26. MARKETING AUTHORIZATION HOLDER, ETC

26.1 Marketing Authorization Holder,

FUSO PHARMACEUTICAL INDUSTRIES, LTD.

2-3-11, Morinomiya, Joto-ku, Osaka 536-8523, Japan